



Contemporary Studies in Environmental and Indigenous Pedagogies

A Curricula of Stories and Place

Andrejs Kulnieks, Dan Roronhiakewen Longboat
and Kelly Young (Eds.)

Foreword by Dwayne Donald

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A Curricula of Stories and Place

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DWAYNE DONALD

FOREWORD

On October 18, 2012, the Canadian government tabled in the House of Commons a massive omnibus bill with the official title ‘A second Act to implement certain provisions of the budget tabled in Parliament on March 29, 2012, and other measures,’ but commonly known as Bill C-45. There are many aspects to the Bill, but the provisions of Bill C-45 that have garnered the most critical attention from people living in Canada are those concerned with revisions of the Indian Act, Navigation Protection Act, and the Environmental Assessment Act. In general, the proposed revisions to these three Acts are guided by the ruling Conservative Party ideology that is founded on the main tenets of market capitalism and faith in the conviction that government policies are most beneficial when they are focused on reducing restrictions and regulations that hinder the entrepreneurial interests of businesses and corporations. The suggested revisions to the Indian Act have to do with making it easier for First Nations reserve lands to be leased; the Navigation Protection Act removes the burden of responsibility for pipeline and power line corporations to ensure that their development projects will not damage or destroy a navigable waterway, unless the waterway is on a list prepared by the transportation minister; the Environmental Assessment Act revisions focus on reducing the environmental restrictions placed on industry development projects and expedites the approval process for such projects.

Resistance and protests against the provisions of Bill C-45 quickly coalesced in Canada in the form of the *Idle No More* movement. The *Idle No More* coalition was instigated by four women activists in Saskatoon, Saskatchewan in early November 2012. A short time after this initial teach-in, *Idle No More* quickly became a social media phenomenon that spread across Canada and found allies around the world. The movement spread and gained support so quickly—largely in the form of flash mob round dances in malls and other public venues across Canada—that within a month of its beginnings, a National Day of Solidarity and Resurgence was organized and held on December 10, 2012. Although *Idle No More* has been understood as a movement led by Indigenous peoples and focused on issues of Indigenous sovereignty and resurgence in relation to the Canadian state, the movement has also been unique in the ways in which it has fostered participation of other people living in Canada who have expressed unity and solidarity with Indigenous peoples. These people, although not themselves identified as Indigenous, understand that their interests, as human beings who require access to clean water and healthy biomes that keep us alive, are also threatened by the agenda expressed in Bill C-45. This unique unity seen

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in the *Idle No More* movement effectively traverses perceived historic and current social divides and suggests the possibility of a new ethic of relationality arising in Canada today. Instead of replicating inherited colonial frontier logics, supporters of *Idle No More* express impatience with moribund government leaders and leadership and seem to be seeking new ways of living in relation with each other predicated on partnership understandings intrinsic to Treaty agreements in effect across Canada.

This book is a very timely and important contribution to this emerging interest in a new ethic of relationality because it focuses on the intersections and connections linking Indigenous and environmental understandings of curriculum and pedagogy focused on the critical question: How best to live well in the world and honour those entities that give life? Perhaps the most refreshing contribution the editors and authors of this book make is to provide inspirational leadership on how we might eschew inherited colonial divides and actually engage with the spirit and intent of the partnerships imagined in the Treaties. As the Treaties teach, we are called to work together in ways that bring benefits to all people who live on the land alongside us. These teachings place emphasis on learning from each other in balanced ways and sharing the wisdom that comes from working together in the spirit of good relations. Such an approach to knowledge and knowing is embedded within an ecological framework guided by an intimate and ancient understanding that the sustainability of human life and living *depends* on the repeated renewal of good relations with the entities that give us life. This book is inspired by knowledge of this approach and a commitment to visualize its enactment in the realm of curriculum and pedagogy. As I see it, the field of education is in desperate need of this imaginative and creative work.

ANDREJS KULNIEKS, DAN RORONHIAKEWEN LONGBOAT &
KELLY YOUNG

INTRODUCTION TO ENVIRONMENTAL AND INDIGENOUS PEDAGOGIES

An Integrated Curriculum

The impetus for this collection comes from our conversations exploring the importance of integrating environmental and indigenous pedagogies into curriculum. We conceptualize our book through three interconnected and overlapping approaches addressing the topic of environmental and indigenous pedagogies in terms of principles, portraits and practices. By principles we include models of curriculum for integrated relationships between scientific and indigenous knowledges. By portraits we include historical understandings, critical discussions and eco-justice approaches to environmental and indigenous education. By practices we include methodological approaches to Indigenous and environmental pedagogies that consider the relevance of landscapes, place, and stories.

This book is unique in that it offers a variety of perspectives, inviting the reader to engage in a conversation about the multiple dimensions of the relationship between environmental and Indigenous pedagogies by including contemporary essays about environmental education. The sections feature principles, portraits and practices of environmental and indigenous pedagogies that are interrelated.

In the first section, Principles of Environmental and Indigenous Pedagogies, we begin with Dan Roronhiakewen Longboat, Andrejs Kulnieks & Kelly Young's chapter, as they explore the ways in which environmental education curricula in North America is primarily based upon a scientific model of inquiry. In an age of unprecedented environmental degradation resulting in the loss of biodiversity, exponential population growth, sustainability questions, and as global climate change continues to soar to daunting heights, environmental education is failing to interpret the status quo that necessitates change. They call for a paradigm shift, with a purpose to develop a model that bridges and seeks to integrate both academic disciplines and cultural knowledge systems into a more "integrative" process to address environmental complexity. Ultimately, they outline the distinction between a scientific and Indigenous approach to environmental learning and propose a transdisciplinary Indigenous environmental studies curriculum model enacted in an environmental studies program and in faculties of education through an eco-justice framework.

In Thomas Ryan, Lisa Van Every, Vera McDonald and Astrid Steele's chapter, they explore the ways in which change is surfacing within the education system in Ontario and elsewhere, as more Indigenousness seeps into our curriculum. They include strategies that support and encourage First Nation, Métis and Inuit consultation and involvement at all levels affecting education. Many believe that solutions to Indigenous educational challenges will be found in the traditional understandings of First Nation, Métis and Inuit cultures. Inclusion of Aboriginal history, rooted in the natural world deepens learning and enhances curriculum. They believe that educators must infuse curricula with Aboriginal perspectives and pedagogies that have been constructed upon the principals of harmony and respect for the environment. It is Indigenous peoples' relationship to their land that represents a model for human interaction with Nature. They understand that the question of curriculum authenticity is a priority, as it is linked to the issue of authorship, and our need for educational resources that reflect an Indigenous perspective.

In Robin Wall Kimmerer's chapter, she provides many lenses to understand the importance of place. She writes from an Anishinabekwe perspective, as well as that of a plant ecologist and an educator. Her concern for mother earth is evident as she outlines the wisdom and pedagogy of plants. Drawing upon her experience of being a teacher as well as a scientist, she conceptualizes how Indigenous and Western scientific inquiry can be useful allies. She works within the realm of knowledge integration and the impact that languages have on our vision of the world around us. Her work illustrates why a deep consideration of sustainability, climate change, and a loss of biodiversity should be part of curriculum design in public systems of education. She outlines how cultural conflicts with research agendas beckon a rethinking of scientific institutions through respect, reciprocity and responsibility. She outlines how Indigenous knowledge and science can move us beyond reductionist paradigms to help address the absence of Indigenous participation in scientific education. She explains how teaching about mind, body, emotion, and spirit are an integral aspect of the partnership between Indigenous and Western culture as outlined in the Two Row Wampum and the Silver Covenant Chain.

In Deborah McGregor's chapter, she relates key personal and professional experiences regarding Aboriginal Environmental Knowledge (AEK), based upon her own life as an Anishinaabe, as well as on conversations and interactions with a wide variety of Indigenous Elders and knowledge holders undertaken over two decades of research. Lessons learned from AEK include the idea that, rather than being just knowledge *about* living sustainably with the earth, AEK *is the living itself*. From an Indigenous perspective, living sustainably focuses on *giving* to Creation rather than on simply taking. The author envisages an important future for AEK in resolving ongoing environmental crises, to which not only Elders but also youth and other knowledge holders play a significant contribution.

In Nicole Bell's chapter, she explores what it means to live spiritually from an Anishnaabe perspective and how it can inform environmental education and sustainability. The chapter starts by examining traditional Anishinaabe education

and how it is informed by the land. The Anishinaabe traditional teaching of 'bimaadiziwin' is defined with a presentation of the seven ancestral teachings and the gifts of the four directions. From an Anishinaabe perspective when considering the foundations for environmental sustainability traditional values must be employed. Ultimately she explores the role respect, relationship, reciprocity, and responsibility plays in creating a spiritual connection to the environment to ensure its survival and ultimately our own.

In the second section of the book, Portraits of Environmental and Indigenous Pedagogies, we begin with Joseph Sheridan's chapter as he locates environmental education's origin on Turtle Island within Indigenous expertise and heritage. So doing challenges orthodox views that foundational praxis began with(in) settler culture. Absence of overdue recognition of this immemorial praxis mires environmental education's culpability for racism, volitional and indeterminate memory and theoretical gossamer. The chapter argues for reciprocity and implies long memory's restoration to encourage settlers contribution to overdue mutual praxis and balance for obligatory spiritual and intellectual dimensions of environmental thought. This to reconcile occupation of traditional territory. Co-evolving a belief system both consequential and autochthonous summons Indigeneity as the cultural dimension Turtle Island herself obliges for partaking of her blessing and bequeath.

In Derek Rasmussen's chapter, he helps us understand the world through a variety of lenses, which are not often brought to our attention by the media. He provides an historical outlook about how lands are increasingly becoming enclosed due to private ownership. Through his discussion, he asks us to think about many of the concepts that are taken for granted in Western systems of thinking but not so in indigenous ways of knowing. For example what is land ownership and the value of money and how are these contributing to the destruction of the planet. He asks us to consider corporate rights over public rights and how these "rights" are undermining living systems. Rasmussen condenses many of the key issues that are at the pinnacle of theories of environmental education and globalization. He connects the oil industry and garbage production to class values and the impact that a relentless destruction of ecosystems and natural places has on humankind. He leaves us with important questions including how much do we need to consume and produce before we understand why we are here?

In Jeff Edmundson & Rebecca Martusewicz's chapter they explore the insights of conservationist Wendell Berry as they inform Ecojustice Education. First, they establish the need for an ethic of responsibility at the heart of education, connecting this to themes of community and responsibility that resonates throughout Berry's work. Yet, Berry's work also shows that the same discursive forces that tear apart community also destroy the ecosystems upon which we all rely. Berry, thus, is a true conservative, challenging the destruction of community via modern ideology. He invites us to ask of the so-called conservatives "what is it that you actually want to conserve?" This leads to a challenge to modern education. Berry notes that "a proper education enables young people to put their lives in order." Building on this insight, the chapter develops the concept of education based on a pedagogy of responsibility.

In Johnny Lupinacci's chapter he considers the ways in which, as agents of change, environmental educators have both the capacity and the responsibility to make an ethical choice to examine and challenge how dominant Western cultural ways of thinking have isolated us from recognizing the realities of our ecological existence. His chapter lays out an eco-ethical environmental education framed by EcoJustice Education with a focus on how people learn to both identify and examine violent habits of Western industrial culture, suggesting we confront our assumptions about existing as individuals separate from and superior to the greater ecological systems to which we belong.

In James Borland's chapter he explores an historical overview of outdoor education in Ontario. Prior to the 1940s the direct study local natural areas was considered an important part of a student's education. By the 1960s, to appease public concern for the future environmental education of Ontario students, school boards decided that the direct observation and study of a student's natural surroundings would be more effectively taught if it was located far away from where students live and study, at specialized facilities, on specialized properties called outdoor education centres. While these decisions created a short boom in the development of outdoor education centres across the province, the development of these centres depended upon the ecological viability of operating automobiles and school buses to transport students to these facilities. After two decades of cuts and closures to many of Ontario's district school board operated OE centres, it is time to question the relevancy of these facilities for an emerging 21st century post carbon world.

In the third section of our book, Practices of Environmental and Indigenous Pedagogies, we begin with Chet Bowers' chapter as he addresses the following: (1) How environmental education within the context of First Nation cultures needs to introduce students to the interdependent nature of cultural and natural ecologies. (2) That a key characteristic of sustainable cultural ecologies is the local intergenerational knowledge, skills, and mentoring relationship that are part of the cultural commons, which reduces dependency upon a money economy and that have a smaller ecological footprint. Introducing students to the modern forces of enclosure, such as reliance upon western values, technologies, and language, is important for understanding the modern forms of enclosure as a process of colonization. (3) How the environmental educator should introduce the characteristics of computer mediated learning and communication that promote abstract thinking and the loss of cultural knowledge that cannot be digitized. (4) How the environmental educator needs to introduce the differences between the western myth of individual intelligence and the ecological intelligence.

In Brigitte Evering & Dan Longboat's chapter, they describe the principles and practices that are integral to Trent University's *Introduction to Indigenous Environmental Studies* course. They detail the seminar assignments that provide undergraduate students with the opportunity to apply the understandings developed in the lectures. They include a description of the context for the course that includes the Indigenous Environmental Studies program itself, the people they work with,

and spaces at the university that support related student learning. The principles embedded in the content of the lectures are organized into themes of Indigenous Cultural Knowledge Foundation (From People, Place and Spirit), Relationships With and Where, and Weaving Multiple Knowledges. Finally, they show how those principles and related values turn into action through three types of seminar assignments and the classroom dynamics we promote. The chapter offers educators and others involved in programming different perspectives, understandings or knowledges currently represented by the disciplines of Indigenous Studies and Environmental Resource Sciences/ Studies.

In Rebecca Martusewicz's chapter, she introduces the contributions of ecofeminist philosophy, in particular the work of the late Australian scholar Val Plumwood, to an analysis of the cultural and ecological commons offered by EcoJustice Education, focusing especially on the ways that women's knowledge forms an unexamined part of marginalized and inferiorized commons-based skills and practices. While we may learn to engage to a lesser or greater degree the ancient knowledges, practices, and skills necessary to sustain life, the definitions and the power/knowledge relations born of white hegemonic masculinity and enclosure are internalized and become subjective realities inscribed in the ways we are in the world, what we're able to see and to do and to say, including in those spaces we may define as the commons. And yet, we are also *in* interdependent relationships, and we do know how to take care of one another, how to give aid. For centuries, this is what women have been taught to do, have been expected to do as marginalized and under-valued labor. Understanding the commons requires that we recognize such excluded epistemologies.

In Darren Stanley's chapter, he ruminates about gardens, with their history, purpose, and design, and he considers how they offer much to those who find themselves taken by their beauty or immersed in their function. Not all gardens, however, are created the same, and, surely, they have different things to teach those who pass by, dwell in, or reflect upon these human-made structures. That said, the classical Chinese garden, specifically, has much to offer a visitor—to one who enters into the strange, planned, and yet surprising, world to meditate, as so many scholars have historically done, or to one, like the author, who pays a visit for the first time. Like the "leak windows," specially framed views of the garden, this chapter offers a selection of carefully selected and framed narratives that capture and reflect certain ideas that are the underlying principles of life. To that end, he presents some reflections on some early visits to one particular scholar's garden that resonate well with the emerging contemporary field called complexity theory, a relatively contemporary theoretical framework used in the study of dynamical systems.

In Nicholas Ng-A-Fook's chapter, he explores the complexity of place by outlining why science education should take multiple cultural contexts into consideration. He asks us to reconceptualize scientific praxis and to take into account traditional ecological knowledges in relation to local understandings of place. He reconsiders scientific practices of education through respecting and engaging with multiple perspectives that different disciplines can provide. He introduces

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ways of incorporating eco-justice education in literacy and media studies through a consideration of how teacher candidates can develop closer relationships with ecosystems. He explores how narrative can enable a deeper exploration of place, specifically, through paying close attention to the animals that inhabit the places that we visit and live within.

PART ONE

**PRINCIPLES OF ENVIRONMENTAL AND
INDIGENOUS PEDAGOGIES**

DAN RORONHIAKEWEN LONGBOAT, ANDREJS KULNIEKS &
KELLY YOUNG

BEYOND DUALISM

*Toward a Transdisciplinary Indigenous Environmental Studies Model of
Environmental Education Curricula*

Reproduced with permission from *The EcoJustice Review: Educating for the
Commons*, 1(1), 1–18.

Contemporary educational systems, ways of living, ways of relating to other people and other cultures have evolved from a paradigm that does not serve life, but modern technology. (Cajete, 1994, 80)

INTRODUCTION

Environmental education curricula in North America is primarily based upon a scientific model of inquiry. Clearly in an age where environmental degradation, loss of biodiversity, population growth, issues of sustainability, and global climate change continues to soar to daunting heights, environmental education is failing to interrupt the status quo and requires a model that integrates both scientific understandings within themselves, and Indigenous knowledge systems (IK) cross-culturally. The purpose of this paper is to outline the distinction between a science versus Indigenous approach to environment through a brief historical trajectory. We propose a “transdisciplinary” Indigenous environmental studies curriculum model that has been enhanced in both an environmental studies program in Canada and in faculties of education across North America through an eco-justice framework. By transdisciplinary we include interdisciplinary and multidisciplinary approaches to inquiry and endeavor to move beyond these methods by bringing together academic and community perspectives in order to focus on engagement and analysis of issues facing the world such as local versus global concerns.

As for environmental education, we imagine the “practice and process” as an emerging discipline that is moving beyond teacher education programs and environmental and Indigenous studies programs into the health sciences, humanities, international studies, business, philosophy and other disciplines. Living in an evolutionary state, the nature of environmental education is continually evolving as the impact upon our environment creates change. It is our contention here that environmental education is broadly conceived *beyond* routine teaching and learning about *nature* to include an emerging pedagogy that espouses an understanding of the

relationship of land to food, local and global issues, diminishing biodiversity, climate change, etc. Through an active and engaging analysis of the cultural and linguistic roots of the ecological crisis, eco-justice pedagogy is a vehicle for transformation and a doorway into providing a model of change that can initiate a discussion about links between human rights, ecological rights, ecoracism, ecofeminism, Indigenous Peoples and environmental justice enacted in educational practice (Bowers 2006, 2002; Bowers and Martusewicz 2006; Kulnieks 2006; Martusewicz and Edmundson 2004; Young 2005, 2008; Bartz 2007; Gaylie 2007; Rasmussen 2005).

Eco-justice is defined as “the condition or principle of being just or equitable with respect to ecological sustainability and protection of the environment, as well as social and economic issues” (OED, 2008, online version). Since education is a vehicle for change toward sustainable living and for returning to a balanced perspective of all living things, and eco-justice is a pedagogical approach that provides a framework for bringing into view “social practices and traditions, languages, and relationships with the land necessary to the sustainability of their communities” (Bowers & Martusewicz, 1), it is important not to restrict learning about the environment to a scientific inquiry model. Rather, science and Indigenous knowledge (IK) can inform environmental learning and help to change values about human and environmental survival (Suzuki and Knudtson 1992; Sheridan and Longboat 2006; Longboat 2008). Suzuki & Knudtson (1992) write:

Through Guujaaw, I realized that the concept of Mother Earth is not a metaphor but a literal way of seeing the planet. According to aboriginal tradition, we are created out of the elements of earth, air, fire and water... As I reflected on these ideas, I realized that such traditional knowledge does not conflict with science but is corroborated by it. (xxx)

Corroboration, from the Latin *corroborare* means to strengthen, confirm or give support to something, and in the case of bringing together science and Indigenous, reinforces the need for all educators to consider the possibilities of such an approach as a stepping stone into a natural evolutionary process whereby environmental education is deeper, broader and better than even a decade ago. Cajete (2000) writes:

An eco-education would draw from the knowledge, understanding, and creative thinking of past and present in order to prepare for a sustainable future. These sources are multidimensional, multicultural and multisituational. (63)

Historically, during the latter half of the twentieth century, there was a concern about nature that grew into environmental sciences based upon a scientific model “about nature” rather than a naturalist and experiential model “in nature.” Environmental studies moved into books and “field courses”. At this time there was a kinaesthetic loss of learning whereby humans no longer fully experienced nature and moved toward “text based knowledge” as a dominant method of learning about the environment in systems of education. The methods involved a shift from experiential learning in nature to learning about the environment in a library. The birth of environmental education as outlined by Carson’s *Silent Spring* (1967) can be seen as a beginning call for people to critically question human relationships with the natural world.

From this early questioning to today, environmental education has continually evolved and will continue to evolve, driven by both response and need to broaden its understanding of human and environmental interaction.

ENVIRONMENTAL SCIENCE MODEL AND INDIGENOUS ENVIRONMENTAL MODEL

The rise of environmental education in North America included a distinction between environmental studies and environmental sciences. Environmental studies looked at the *human* aspect between human and the environment drawing upon a social root metaphor (“subjective” investigation of human in relation to environment as data). Environmental sciences divided into specializations or disciplines in biology, chemistry, geography, and physics classified as “the natural sciences” and positioned the environment as a system drawing upon a mechanistic root metaphor of nature (“objective” investigation of environment as data) – measure, classify, quantify, and examine it over a specified time, to develop a predictive model that could then be universalized and generalized. With the rise of science as a sophisticated tool to predict and manage to continue to dominate and control nature, it extends from religious and philosophical beliefs in a human domination of nature through a Cartesian paradigm (Bowers 2002; Gatta 2004; Merchant 1980; Orr 1992). A science model is tied to political and economic consumer-producer model through an “objective” analysis. This began a process of legitimization whereby if science backs an idea then it must be “true”, and that if it must be “true” then it has “value”, and value can be equated to a dollar amount.

Since the way that science is most often funded is so inextricably linked to the producer-consumer model, it has value in its voice and is an extension of an elitist model whereby Latin is the foundational language and English became the mode of scientific reporting to academia. This is evidenced by the fairly recent publication of the *Oxford Dictionary of Ecology*, first printed in 1994, that merges ecology and environmental sciences without any link to Indigenous Knowledge (IK). Another example includes a recent effort to rejuvenate all aspects of the K-12 curriculum with a focus on the environment through a report “*Shaping our Schools, Shaping our Future*” (Report June 2007), by a working group on environmental education of the Ontario Ministry of Education in Canada. The report itself examined how issues related to environmental education could be integrated across the school curriculum through an incorporation of an analysis of the environment, climate change, and the importance of conservation into curricular designs. The working group reproduced an approach to environmental education based on a scientific model in their report, exemplifying once again the reality that Indigenous Environmental Knowledge (IEK) is often overlooked in environmental education curriculum decision-making processes.

As the devastating effects of global climate change are harder and harder to ignore, the natural environment has become a “hot topic” across multiple disciplines

(not just education). A question arises around the validity of “science approaches” to the environment and the role and direction of environmental education for the future. We strongly believe that there is a need to seek different models and frameworks for environmental education since science has the weakness of monetarily motivated influences. Governments and private businesses increasingly seek out scientists to back ideas with scientific “evidence” and is ever-increasingly tied to global economics. This leads us back to a time when a framework for environmental studies involved experiential and naturalist perspectives (See Seton’s *The Book of Woodcraft and Indian Lore*, 1912). The necessity to look at other ways of knowing and relating to the environment in a return to the origins of environmental education, namely a naturalist view led to a direct connection with Indigenous Knowledge.

By a return to the origins of environmental education we mean including the natural and experiential approach in *corroboration* with scientific inquiry facilitated through an Indigenous environmental studies model enacted not only in emerging environmental studies programs but also in faculties of education. For example, in the early 1970s, courses in environmental education began to be offered and the first program of study in environmental studies in Canada was offered at Trent University in Peterborough, Ontario. Previous taken for granted notions about the environment started to be questioned by researchers at the same time that scientist David Suzuki, brought awareness of the environment via the television show, *The Nature of Things*. The evolution of Environmental Studies at Trent University in the late 1990s involved experiential programs that looked at nature, taxonomy, and in the field solutions and possibilities to a dualist model of science in a relationship with Indigenous based knowledge environmental education. Researchers questioned how to make things work better through dialogue, sharing knowledge, capacity building, consensus, and common understandings and by bringing awareness of IK and using the knowledge and technology of science. The focus turned to bringing people a broader perspective of knowledge about the environment in which they live and media informing the public about environmental issues that society as a whole was and continues to be facing.

Historically, at the same time, Bateson’s (1972) text, *Steps to an Ecology of Mind*, brought awareness of the ways in which language carries forward historical understandings. Researchers were revisiting Thoreau’s (1886) *Walden*, Seton and Butree’s (1931) *Woodcraft*, and Leopold’s (1948) *Land Ethic* as important contributions to growing perceptions about nature as informed by the *naturalists*. Romantic notions of environment were closely related to Indigenous understandings of nature but most often failed in their attempts to address the reality of natural systems in relationship to human value and practices. Naturalists working with biologists began to develop the *earth sciences*. It was a time when IK was just beginning to be recognized as an informant to science and a recognized approach to questions about the environment, particularly within the field of ethnobotany. Haudenosaunee thinker John Mohawk’s (1978) *Basic Call to Consciousness* identified the need involve Indigenous Knowledge in considering future generations in day-to-day

environmental decision-making. This was later followed by the 1987 *Brundtland Report*, or the *Report of the World Commission on Environment and Development*, the 1992 *United Nations Conference on Environment and Development*, and the *Convention on Biodiversity* (CBD) in recognizing the contributions of Indigenous Knowledge. Naturally, more and more faculties of environmental studies were being developed in universities worldwide that continued to follow the status quo in environmental education as most did not fully recognize Indigenous Knowledge, nor involve it as a field of study.

The experiential learning taking place during the late 1980s and mid-1990s through the writings of the deep ecologists such as, Berry (1995; 1996), Capra (1996), Lovelock (1988), Maturana and Varela (1998), and Snyder (1990), (to name a few), was also influencing an environmental movement that included a recognition of IK. Between the 1970s and late 1990s, informed by the work of Bateson (1972) and the seminal writings of Basso (1996), Bringhurst (2002), Cajete (1994), Cruikshank (1981), Kane (1995), Laduke (1999), Orr (1992) and Sheridan (1994). This movement brought together the work of major thinkers that continue to influence the growing field of eco-justice education, including: Bowers (2000; 2002; 2003; 2004; 2005; 2006), Berry (1995; 1995; 1996), Bringhurst (2002; 2006), Snyder (1990), Leopold (1948), Martusewicz (2001; 2005)(2001; 2005; 2001; Martusewicz and Edmundson 2004), Merchant (1980; 1996), Plumwood (2002; 1994), Polyani (2001), Sachs (2001), Sale (1995), Shiva (1993; 2000; 2001; 2002), among others. These contributions have initiated a new direction for environmental education, which seeks to broaden understanding of environment through collaborative processes across disciplines and cultures. The ecojustice education movement, growing alongside a unique Indigenous Environmental Educational studies movement (Longboat, 1998), involves an important recognition of a critical approach to science corroborated with IK as a model for learning about the environment.

While science is still the dominant paradigm of environmental education, the science community is beginning to raise questions about the validity of scientific environmental knowledge (SEK) as a sole basis of knowledge. It is important to recognize the role that Indigenous Knowledge can play (Kulnieks 2006; Longboat 2008; Sheridan 1994; Young 2006) in regards to environmental education. For a literature review on the relationship between environmental science and IK see *Environmental Educational Leadership and its Origins* (Young 2007). Investigation of the ways in which a critical analysis of science can inform approaches to learning about the environment in collaboration with Indigenous Knowledge continues to grow. Kimmerer (2002) writes:

TEK is increasingly being sought by academics, agency scientists, and policymakers as a potential source of ideas for emerging models of ecosystem management, conservation biology, and ecological restoration. It has been recognized as complementary and equivalent to scientific knowledge. (432)

IK's recognition in scientific research and examination of IK's role in environmental education that is being taken up in terms of the ways in which IK can inform education from Kindergarten to PhD is a growing area of research (Battiste and Henderson 2000; Cajete 1994; McKinley 2005; McGregor 2004; Simpson 2008). Environmental problems impacting communities led to the need to address "building capacity" to help resolve environmental issues. A collaboration of scientists, ecotourists, community leaders and Elders led to the creation of and Indigenous Environmental Studies (IES) program at Trent University in 1998.

Between 1993 and 1995, during my, (Longboat's), Ministry of Natural Resources employment, I traveled across Ontario and many parts of Canada to visit communities to talk about environmental and natural resource issues. This led to the realization that there was a need to develop a curriculum that would eventually evolve into the creation of the IES program. By 1999, the proposal for IES was approved by Trent University Senate. The year 2000 was the first intake of students and 2003 was the first graduating cohort with a total of eight cohorts to date. This curriculum addresses a need to value diversity and integrate science with Indigenous Knowledge as a model to create synergy and to collaborate together. It influences environmental education to include stories, songs, life practices, and natural experiential learning in order to become ecologically literate meaning to develop a "fluency in nature" or a "literacy in nature." The reason why we urge that IK be integrated into environmental learning is that it provides an opportunity to build, share capacity, and develop a common understanding of environment in a much broader sense, both objectively through science and subjectively through experiential and cultural learnings. Bringhurst (2006) writes:

Those who grow up, as most of us have, in industrialized economies and colonial regimes, are encouraged to think there is no other choice than to take control and manage the planet. But there is another choice, That choice is to *participate* in the biosphere, learning enough about it to recognize and accept that we can never be anything more than junior partners: a few million or billion human cells in a brain the size of the planet. (269)

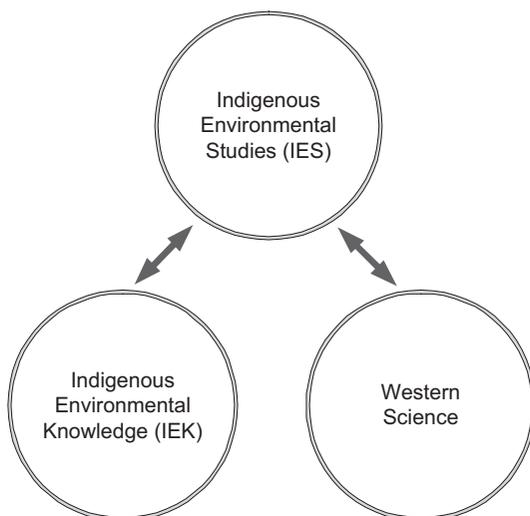
A helpful example includes an analysis of the ways in which western humans learn about frogs. Examples of the ways in which science and IK can inform environmental learning include moving beyond *reading* about frogs in books followed by diagramming, labelling the parts and finally dissecting a frog soaked in chemicals, toward learning about frogs in their natural environment that entails listening to the frog and the stories about the frog, following the frog, touching the frog, observing the frog in and with its natural environment that is connected to the larger ecosystem in which it lives. The study then becomes more than simply reading, diagramming and dissecting the frog. It becomes a way of personally embracing a deeper understanding of the frog in its natural, local habitat. The process of learning about the frog that necessitates separation from its natural environment consequently

loses its meaning in terms of a holistic understanding of the frog's existence as an integral part of the web of life. Since a Western model of science privileges print over experience, a *valid* knowledge about frogs seems only to exist textually. By building on the information contained within texts and moving into the natural world, science and Indigenous Knowledge can inform experiential learning-based institutional pedagogies. A true understanding of the frog involves understanding its relationship with an intact ecosystem that sustains life. This approach is in alignment with a *corroborated* environmental learning methodology, but it also serves to provide a living connection between local place, the frog and human beings.

Another example involves a story shared by Dr. Longboat of his reading of Dr. Suzuki's trip to the Amazon in the *Wisdom of the Elders*. Dr. Suzuki was accompanied by a number of scientists to study frogs. He was impressed with the knowledge of a scientist accompanying him who had led a field trip at night whereby he could find a frog an inch long. When later asked about a bird sitting in the tree, the scientist responded, "I'm a herpetologist, you need to ask a ornithologist." When Dr. Suzuki asked an Indigenous Kayapo in the same area, they not only knew about the frog and the bird but they could tell a story about them and their origins, uses, and relationships to the plants, birds, animals etc. The Indigenous wealth of knowledge that they had about their own habitat was far more comprehensive than that of a scientist from the West (Suzuki and Knudtson 1992).

Discussing the Suzuki experience, as he himself has evolved into an interdisciplinary and cross cultural integration thinker, inspires an elaboration on one of the benefits of having a diversity of knowledge from our own respective positions, as it enables researchers to collaborate and create more informed understandings, not only because it has a multi-discipline perspective applied to the work. Environmental education provides an opportunity for students to develop integrative thinking and in doing so, a much richer and broader understanding of the environment. Time is required to investigate multiple aspects of a story, which enables a relationship with key concepts. Expert knowledge is highly prized in the academy whereas collaboration and integration of skills and knowledge is valued in Indigenous settings. From these examples, the goals and benefits for learning about the environment involve, among other things, working collaboratively, and a need to share knowledge from various disciplines that seek to integrate knowledge across cultures. Doing so creates recognition of the strength and richness of diversity, and a close analysis of language (root metaphors) through an eco-justice pedagogy. The following diagram illustrates a bridging of science and IK into an emerging field of Indigenous environmental studies.

Implications of this research beckon a return to the origins of environmental education including the natural and experiential approach in *corroboration* with scientific inquiry through an Indigenous environmental studies model enacted not only in emerging environmental studies programs but also in faculties of education. The knowledge that emerges from discussions with Indigenous Elders is a technique



that investigates stories that are embedded in particular and specific places throughout North America. The anticipation is a focus of bridging ecologically sustainable knowledge and practices of both Indigenous and settler culture. Sharing knowledge about the local environments can provoke an informed dialogue about environmental issues that society as a whole was and continues to be facing. The significance of this work is that it provides opportunities for educators to become aware of an emergent field of environmental learning that includes an Indigenous understanding of the ecology of place and its relationship to human beings in that place.

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BECOMING VISIBLE

Reconceptualizing Curriculum

INTRODUCTION

Globally, we inhabit this earth and survive daily due to an environment that provides oxygen to breathe, food to eat, and water to drink. Our needs are universally similar, no matter the language spoken, the location of residence or the daily lived experiences that constitute life on earth. Humans strive to live and learn each day, sometimes in formal settings and often within informal settings. Admittedly, the quality of life can vary as we increase our knowledge and skills via learning, education and experience. In Canada, the northern most country within the North American continent, Aboriginal people¹, referred to recently as First Nations, continue to pursue education via informal and formal systems, programs, organizations, and institutions. This pursuit of education can be enhanced if you know where you come from, as history informs and facilitates the development of new knowledge, skills, and understanding. Inclusion of Aboriginal history, rooted in the natural world deepens learning and enhances curriculum because,

the accumulated knowledge of the remaining indigenous groups around the world represents a body of ancient thoughts, experiences and actions that must be honoured and preserved as a vital storehouse of environmental wisdom. ... Modern societies must recapture the ecologically sustainable orientation that has long been absent from its psychological, social and spiritual consciousness. (Cajete, 1994, p. 78)

We must infuse curricula with Aboriginal perspectives which have been constructed upon the principals of harmony and respect for the environment. It is Indigenous peoples' relationship to their land that represents a model for human interaction with Nature (Beckford & Nahdee, 2011, p. 4). Our past thoughts, experiences, and actions inform our pre-understanding and give way to new understanding and knowledge.

PRE-UNDERSTANDING

Pre-understanding can, within the present, influence one's stance, actions and worldview; "the concept of pre-understanding refers to people's insights into

a specific problem and social environment before they start . . . (Gummeson, 2000, p. 57). This is not straightforward and it is necessary to make a distinction within pre-understanding (Ryan, 2011). We can easily construct two categories of pre-understanding: first-hand and second-hand. First-hand (level/plane) pre-understanding is acquired through personal experience (Dewey, 1916) whereas second hand (level/plane) is collected through intermediaries such as lectures, literature, stories and other media (other peoples' pre-understandings). Generally, the notion of pre-understanding includes knowledge, yet it also implies a certain stance while sensing, analyzing and processing information in one's lived experience within formal and informal settings (Ryan, 2011). As a result, pre-understanding must be considered a cognitive factor that can augment and limit thoughts and actions. We draw on our pre-understanding to interpret the present and move forward (Ryan, 2011).

CURRICULUM AUTHENTICITY: INDIGENOUS

From an Indigenous perspective, pre-understanding can be used to judge the authenticity and accuracy of literature before us, the curricula we use and the curriculum we are immersed within. The notion of authenticity is very much linked to the issue of authorship. For example, school textbooks of the past were written from a non-Indigenous perspective (Eurocentric tradition/values) and included ideologies, theories, history and culture from a non-Indigenous perspective. By reading and learning from these textbooks our pre-understanding of both our environment and the people within this environment has been altered. Today, our need for educational resources that reflect Indigenous perspectives is critical to advancing an inclusive curriculum (Battiste, 2000; Paquette & Fallon, 2010). Indeed,

Eurocentric knowledge, drawn from a limited patriarchal sample remains as distant today to women, Indigenous peoples and cultural minorities as did the assimilation curricula of the boarding school days. For Indigenous peoples, our invisibility continues, while Eurocentric education perpetuates our psychic disequilibrium. (Battiste, 1998, p. 21)

There are some who subscribe to the notion that it takes an Indigenous educator to teach Native Studies. There is little doubt that a Native Studies curriculum taught by an Indigenous educator would be different than that taught by a non-Indigenous educator. This is largely true because each educator is different in their pre-understanding and in the actions they apply in the schools and classrooms.

In a DVD released in 2010 titled, *Manitou Api*, elder David Courchene from the Anishnabe Nation stated: "As educators, we must ensure children have the opportunity to be on the land and offer students more land-based (authentic) experiences"(Courchene, 2010). He further suggested,

effort must be made in order to be able to be a part of nature. Children deserve the right to feel the land. This is where we have failed in the education of the children is the education of their spirit and there's nothing more universal and more common to all of us than the land. The land will speak to the child. (Courchene, 2010)

These two strategies may seem unusual to some who possess the Eurocentric (western view) of education but they are deeply rooted in Indigenous culture and still exist today in the pedagogy of Indigenous education.

In the 1970s, children attending first grade on the largest First Nation territory in Canada, learned to read from the Mr. Whiskers series readers (Ed. John McInnes. Toronto, ON: Nelson.1965–1969). Written by non-Indigenous authors, this series of readers was given to the schools by the Department of Indian Affairs to be part of their curriculum. At that time, the federal government made all decisions about what constituted the elementary curriculum and very few educational resources were written by First Nation authors.

It was only a matter of fifteen years before that the Department of Indian Affairs' policy on education included language teaching and they did not include Indigenous languages. They emphasized language arts and concentrated on the English language in Ontario and the French language in Quebec. It was this language training that they saw facilitating the transfer of Indian students to non-Indian provincial schools (Milloy, 1999, p. 199).

In 1971, Six Nations clan mother, Alma Greene (Gah wonh nos doh) authored a book titled, *Forbidden Voice, Reflections of a Mohawk Indian*. The book included her experiences while living at Six Nations. Controversy ensued locally as there were those in the community who thought sharing cultural knowledge was wrong and writing it in a book was not culturally appropriate. Alma Greene was a pioneer in this aspect of publishing cultural experience and communal attitude would eventually change to equate documenting culture with preserving culture.

At that time, there was an educational policy in Canada devised to benefit Indians through appropriate pedagogy, while at the same time Indigenous people's attitudes toward the development of educational resources conflicted with their sense of cultural preservation. The Canadian government outlawed Native dances and forbid people to speak Indigenous languages. The only way to preserve these cultural traditions was to move them underground and keep them secret and hidden. It would be a difficult challenge to bring these traditions back into the public domain. Traditionalists argued that it was by hiding the ceremonies, language and cultural traditions that they were kept alive and intact. This is a highly plausible argument because they have survived and still exist today.

An example of this in the community of Six Nations of the Grand River is the clan system. Even though it was contradictory to the matrilineal system of the community the Canadian government took the nation of the father and registered children under this identifier. Today, there are nations that have been altered by use

of that identifier but the clan system is virtually unaltered as it was not used by the Canadian government and was passed down orally as it had been for generations.

Forty years ago, there were still residential schools in operation in Canada. The trauma and affects of this education system on the Indigenous people of Ontario were still socially and politically ignored. It was another twenty-eight years (1998) before the Canadian government acknowledged the legacy of the residential school system and its effect on the Indigenous population and another ten years before an apology came from the Prime Minister in 2008. The residential school system was imposed on Indigenous people from the 1890s to the 1990s perpetuating their negative attitude toward a federal and provincial education system that still exists in Indigenous communities today (Ledoux, 2006, p. 269). For the past 300 years, the educational reality for Aboriginal education has been non-Aboriginal people using non-Aboriginal methods directed by non-Aboriginal views to teach Aboriginal students (Ledoux, 2006, p.273). Ledoux (2006) argued that education has, and still is, used as an instrument of oppression.

The Indigenous people and the Canadian government are only in their infancy in terms of healing this catastrophic attempt at cultural genocide so it is understandable that cooperation in the development of educational resources for a Native Studies curriculum is also in its infancy. This is where the educational system came from, and there are many challenges that lie ahead.

FORWARD: WHERE WE ARE GOING

In 1972, the federal government gave First Nations the right to operate their own schools provided they utilize provincial curricula. At the time, that curricula was greatly underdeveloped in terms of Native resources and inadequate, regarding the needs of Aboriginal students (Ledoux, 2006, p. 270). Wilson and Wilson (2002) argued that no amount of cultural infusion into an existing educational system will make any difference unless and until those in power formally recognize Indigenous people and employ Indigenous educators. It was also argued by Ledoux that infusing Aboriginal content into an already developed curriculum was inadequate; what was needed was a change in core assumptions, values and logic of the curriculum itself such that it would be rooted in Aboriginal understanding of the world (Battiste, 1998; Ledoux, 2006).

As a starting point, consider the challenge of balancing the physical, emotional, mental, intellectual and spiritual aspects of one's life. How an individual lives in balance with each of these aspects of self, attending to and caring for each one, is a source of identity. The Aboriginal learner and their success are dependent upon educators and schools respecting the balance of those aspects. Table 1 detailed a regional view (Ojibwe) of good life teachings and their implications for education.

Table 1.0 - Ojibwe good life teachings and implications for education

<i>Teaching</i>	<i>Implications for Education</i>
Respect	By having high expectations for the Aboriginal student through honouring their culture, language and worldview in our schools.
Love	By demonstrating our belief (as educators) that all Aboriginal students can and will succeed through our own commitment to their learning/teaching styles.
Bravery	By committing to change our school curriculum through including the contributions, innovations and inventions of Aboriginal people.
Wisdom	By sharing our best practices on Aboriginal Education with each other through on-going Professional Development and Research that focuses on imbuing equity.
Humility	By acknowledging that we have limited knowledge about the diversity of Aboriginal People and accessing Key First Nation Resources to enhance that state.
Honesty	By accepting that we have failed Aboriginal Students in the past and reviewing those factors to encourage change in the education system (increased parental/guardian involvement, schools, teacher education).
Truth	By evaluating the school success (with measurable outcomes) of Aboriginal students as a key indicator of 'how' inclusive our curriculum and pedagogy really is.

Note: The seven good life teachings are values/principles that are central to the Anishinabek (Ojibwe, Odawa, Pottawatomi) Peoples. The recommendations represent the implications for education that parallels each of these teachings. (Toulouse, 2008, p. 2)

In the past, Battiste (1998) concluded that public schools have evolved to develop inclusive curricula that adds Indigenous knowledge but has taken the route of using an “add-and-stir” model that treats Indigenous knowledge as separate knowledge and not of equal importance to Western (Eurocentric) knowledge. Beckford and Nahdee (2011) have recently explained how and why indigenous philosophies and practices are to be implemented in mainstream education; they acknowledge that some educators do ‘add and stir’ at present and suggest, “for educators unaccustomed to teaching Aboriginal content in mainstream classrooms . . . teachers need not be steeped in knowledge of aboriginal perspectives” (p. 2). Instead, they suggest using authentic and credible examples, media sources, guest speakers, and field trips to infuse the content.

INDIGENOUSNESS IN EDUCATION

Battiste (1998) has argued that one of the issues in public schools is that they do not offer teaching of different knowledge bases; most teachers have not taken courses (i.e., Indigenous Ecology) about Indigenous peoples or from Indigenous peoples. This is essential because “limiting ourselves to science as a way of knowing our world is myopic . . . there are other, sometimes more relevant, ways of thinking, understanding, and constructing our world” (Congdon, 2006, p. 46). For example, Aboriginal people work towards ensuring all elements of nature are respected from plants and animals to the earth. Everything is believed to be alive and ought to be treated with respect (Garrett & Herring, 2001). Aboriginal people are taught to respect and live in harmony with nature whereas many other cultures are taught to control nature (McCormick & France, 1995). This understanding is not infused in the mandatory training of teachers (preservice) (Cherubini, 2010).

It is this continued exclusion of Indigenous knowledge in learning environments that perpetuates sameness in public education and engages the slow pace of change to policies and knowledge permeating education. Federal government policy that restricts First Nations schools to this curriculum bias exacerbates the problems of engaging Aboriginal students (Battiste, 1998, p. 23). In the last thirty-five years Indigenous educators and scholars have realized that the way to change is through schools and texts (digital & print). They must be active in the transformation of knowledge (Battiste, 1998). In accordance with many Indigenous cultures, the responsibility of effecting change lies with the Indigenous people. It is this responsibility that leads Indigenous educators to take on the task of offering Indigenous students a non-fragmented curriculum that reflects them and their Indigenous knowledge (Battiste, 1998). Faries (2004) in a survey of 80 First Nations schools in Ontario discovered that eleven schools did not, “have Native courses nor units of study in their curriculum. Reasons given for not offering Native studies were, in order of priority:

1. No curriculum
2. Lack of materials, textbooks, references with Native content
3. No funding to develop and implement Native studies
4. Lack of teachers with Native studies knowledge and expertise.
5. Other reasons for not offering Native studies were: lack of time to develop curriculum and materials
6. all materials have to be locally developed and created by teachers
7. great need for expertise in Native content
8. Native studies is sporadic and self-generated
9. lack of funding to support curriculum development. (p. 6)

Clearly, there are many obstacles in the road ahead when it comes to providing Aboriginal content in both public and first Nations schools. This is especially confusing since not all Indigenous communities are solely responsible for their

education systems, and the ability to operate from their distinct framework is suspect. But, in order to offer their students an academically even playing field, (eventually students must leave the community to attend and compete academically at provincial schools) Indigenous communities relent and allow provincial standardized testing to be implemented in their educational institutions (classrooms). Hence there is pressure to teach to the provincial test to position students in the best possible way to achieve success on this test. Teachers must then consider teaching those skills that will help First Nation (FN) students pass standardized testing, which means trying to integrate and manipulate FN learning styles into classroom testing preparation in the hopes that these skills will transfer effectively to the test or, alternatively, abandoning the learning styles inherent in their FN students and trying to reteach the skills needed for positive results on standardized tests. In other words,

Because the stakes have reached disproportionate levels, educators are often forced to abandon all things unrelated to the test and consequently lose sight of what is important: the whole child, who is not simply composed of intellect but is emotional and spiritual as well. (Barrier-Ferriera, 2008, p. 138)

CLASSROOM IMPLICATIONS: A HEALTHY SELF

Toulouse (2011) has written about the “relationship between Aboriginal students’ self-esteem and educational attainment” (p. 1). The linkages between self-esteem, self-efficacy and improved quality of life involves a healthy cultural, social class and gender identity development. Indeed, “critical perspectives about their schooling help students find identities as transformative actors rather than the disaffected or resistant students they might be labeled” (Oakes & Lipton, 2007, p. 275). When schools incorporate and honor students’ heritage languages, cultures and worldviews students can negotiate healthy identities. Egbo (2009) has noted how “...schools, by their very nature as loci of social transmission, also contribute to the construction of individual identities and group identities through their manifest and latent functions, and their explicit and implicit curricula” (p. 5). “The object is not to lower standards or just teach what is of interest to the students, but to find the students’ interests and to build an academic program around them” (Delpit, 2002, p. 45).

Talouse (2011) presented an aboriginal model of self-esteem with four interconnected aspects representing the self. The four aspects of self-esteem include: intellectual, emotional-mental, physical and spiritual (p. 2). When educators are connected with issues central to the local community in their teaching and relationships with students and families, teachers are more likely to create meaningful change and success with Aboriginal students (Beckford & Nahdee, 2011). A cultural framework of the Ojibwe people, with seven guiding principles to be explicitly taught is yet another example of incorporating indigenous principles. These seven principles central to the Anishinabek good life teachings include: respect, love, bravery, wisdom, humility, honesty, and truth (Talouse, 2011, p. 2). A teacher can

engage with these principles via cultural components throughout the day, using a wide range of Aboriginal resources and materials, incorporating the uniqueness among and across Aboriginal cultures, and acknowledging the traditional territory the school is located on (Talouse, 2011). Protocols vary widely, from a formal ceremony at a traditional place (such as the convergence of two rivers or a canoe landing) to a cross-cultural acknowledgement at the door such as a carving, perhaps a welcome in heritage language(s), or having a person visible near the door to greet people coming into the school. Meaningful and accurate inclusion of “Aboriginal people’s contributions, innovations, and inventions” (as cited in Talouse, 2011, p. 1) also nurture an inclusive and welcoming climate in a school.

There is a body of research related to students’ perception of teachers as caring, and the impact that caring has on student success (Noddings, 2005). Factors contributing to academic success for Aboriginal students include: teachers with high expectations who truly care; classrooms “that honour Aboriginal students’ culture, language, world view and knowledge” (Talouse, 2011, p. 1); consideration of learning styles most likely to be congruent for Aboriginal learning, and strong community partnerships. Teachers’ love of learning and of their students can be evident to children and families in the use of culturally responsive learning strategies with steps for success for all students. Aboriginal students lean towards:

- holistic education (learning from whole to part)
- use of a variety of visual organizers and hands-on manipulatives
- reflective mode of learning (time to complete tasks and answer questions)
- preference for collaborative tasks (group & pair work). (as cited in Talouse, 2011, p. 2)

Additional strategies for Aboriginal student success that reside under the fourth principle of wisdom include celebrations of successes; engaging all aspects of development; using a variety of teaching methods and particularly “holism, visual organizers, kinesthetic opportunities and reflection, and creating an environment where humour and ‘group talk’ are accepted (as cited in Talouse, 2011, p. 3). The extensive educational interest in learning styles requires a comment regarding *increased probability* versus *stereotyping*. Egbo (2009) cautions that “far from engaging in essentialist generalizations, we must be careful in our conceptualizations of cultural differences not to resort to stereotyping since membership in a culture or subculture is not an inevitable predictor of behavior” (p. 5). A combination of cultural identity inclusion, teaching with highly probable learning styles, developing meaningful curriculum content locally, building strong relationships for project partnerships from the strengths of Aboriginal people currently and historically, and including local elders, matriarchs and knowledge holders in school curriculum projects can change student outcomes. The Shki-Mawtch-Taw-Win-En-Mook (Path to New Beginnings) curriculum project in northern Ontario is an example of bravery in combining Ministry of Education expectations with responsible and accountable local curriculum development (Talouse, 2011, p. 3).

The last three principles of humility, honesty and truth are closely connected in educationally regenerative work with indigenous peoples. Stepping out of habits, roles, and positions of privilege, and power, to partner with indigenous peoples requires all three of these Ojibwe living principles. The change requires the humility to continually re-invent, organize and disseminate relevant curriculum with indigenous people; the honesty to build new and lasting coalitions for indigenous student success; and the examination of varied data for truth in tracking a new path away from the education gap (Talouse, 2011, pp. 3–4). Perhaps transformative change can occur, tracking a new path to address the education debt to indigenous peoples (as Ladson-Billings, 2008, described the white/African-American achievement gap in the US). Teaching to our communities' traditional ecological knowledge would be one way to begin to address indigenous student strengths, as well as addressing a brighter ecological future for all students.

TRADITIONAL ECOLOGICAL KNOWLEDGE

Consider the work of Houde (2007) who conceptualized traditional ecological knowledge typologies within a (five face) pentagon image. In the centre of the pentagon, *cosmology*, "...a branch of astronomy [metaphysics] that deals with the origin, structure, and space-time relationships of the universe..." (Fish, 2004, p. 282). The five faces surrounding cosmology included:

- 1) Factual observations,
- 2) Management systems,
- 3) Past and current uses,
- 4) Ethics and values, and
- 5) Culture and identity. (Houde, 2007, p. 5)

These areas are part of a focus on collaborative processes to include local and specific knowledge bases, and to direct Canadian resource management from local devastation and global unsustainable resource removal practices to something more indigenous and natural. Some areas of rapid change include: recognition of First Nations traditional territories and land claims, giving more authority to oral histories and narratives, increasing First Nations leverage in resource policies, sharing the power and responsibility for resources, and bringing the values and worldviews of traditional ecological knowledge to the forefront (Houde, 2007). Some controversies include: traditional ecological knowledge accuracy and purpose when no longer governed by local protocols, understanding both the dynamic and the contextualized nature of traditional knowledge, on-going input when context changes, negotiating tensions as they emerge among groups, and willingness for authentic learning towards the greater good around these issues.

However, as long as First Nations do not have more control over the final decisions being made in resource management...factual TEK [traditional

ecological knowledge] is open to being misinterpreted or discarded when it does not serve the particular interests of the state or private interests represented by the state. (Houde, 2007, p. 5)

The changes in curriculum and activities involving indigenous perspectives and ecological knowledge would involve educators in mediated and explicit inclusion of the elements of indigenous knowledge. Inclusive classrooms reflect the values and worldviews of the people's upon whose territories we teach. A research project with ten successful aboriginal school cases summarized elements of their success as follows:

- Strong leadership and governance structures, often with long tenure
- High expectations for students
- Focus on academic achievement and long-term success
- Secure and welcoming climate for children and families
- Respect for aboriginal culture and traditions to make learning relevant
- Quality staff development
- Provision of a wider range of programs/supports for learning. (Bell, 2004. p. 13)

When a continuum of indigenous inclusion has not been actively developed in public school classrooms, indigenous students were being immersed in Euro-traditional education, values and worldviews. Paquette and Fallon (2010) described one impediment to the incorporation of indigenous ecological knowledge in K-12 classrooms, explaining how, "...this view of the relationship between mainstream curriculum and programming on the one hand and Aboriginal culture and language on the other, sees the two in direct competition" (p. 234). While either co-management, or full jurisdiction over First Nations education, are both options in BC, the status quo is more likely to be the case in subject areas, curriculum content, materials, classroom contexts, literature, learning strategies, science and ecology paradigms, buildings, seasonal focus, religious holidays, economic worldview, military history, professional development, and so on. The Euro-traditional focus is very strong and is seldom identified as problematic as the maintenance and "the superiority of the world view and value assumptions underlying mainstream curriculum" are at the forefront (Paquette and Fallon, 2010, p. 235). This superiority stance encourages silencing of accurate vocabulary as one way to silence non-white, non-European, and non-English speaking students (Graveline, 2004). Cajete (1994) suggested "that modern societies must recapture the ecologically sustainable orientation that has long been absent from its psychological, social, and spiritual consciousness" (p. 78). New global realities emerge which confuse and perplex many for example, Smith (2006) described the chaotic messages swirling around the Maori people:

No, we are told, this is post-colonialism. This is globalization. This is economic independence. This is tribal development. This is progress. Others tell us that this is the end of modernism, and therefore the end of imperialism as we have known it. That business is now over, and so are all the associated projects such as decolonization. (p. 97)

Leading indigenous educators and researchers Marie Battiste, Lorna Williams, Linda Tuhiwai-Smith, Manulani Meyer, and others, advocate increased success for indigenous students through an engagement with indigenous ecological knowledge, language and cultural identities, worldviews and ancient sustainability practices. The first steps can occur early in the school years if we act now to reconceptualize our narrow curricula.

TEACHING FOR ECOLOGICAL SUSTAINABILITY

Beckford and Nahdee (2011) described an Ontario curriculum decision that has teachers looking for effective ways to foster responsible environmental citizenship, with incorporating indigenous perspectives considered as one way to do so. A common element of Aboriginal environmental philosophies is a general “understanding of the complex and interdependent relationships between human beings and nature” (Beckford and Nahdee, 2011, p. 2). An example of key tenets from the Walpole Island First Nation of southwestern Ontario included:

1. inseparable relationship between people and the natural world
2. respect for all aspects of the environment, everywhere – not just in the community
3. recognition of the dependence of people on the physical environment
4. view of the land as sacred
5. responsibility to future generations
6. respectful and responsible use of resources
7. preservation, conservation, and enhancement of the natural environment.

(Beckford and Nahdee, 2011, p. 2)

Walpole Island First Nation is an exemplar of aboriginal environmental and sustainability philosophies in action. The group has been able to maintain extensive and unique biodiversity, and earn: “international acclaim and World Heritage status” (Beckford & Nahdee, 2011, p. 2). Encouraging classroom teachers to develop their own continuum for infusing Aboriginal ecological perspectives, starts from at-hand “examples, illustrations, evidence, analogies and cases” with the caveat of seeking advice as needed, and verifying accuracy locally, developing confidence and expertise depth over time, and in collaboration with Aboriginal knowledge holders and communities (Beckford & Nahdee, 2011, p. 3). Elders, matriarchs and knowledge holders need to be included in development of local curriculum for many reasons: authentication, multiple perspectives across time, respectful treatment of information, establishing relationships and protocols, for continuity in the event of teaching staff changes and for bridging relationships with parents and children impacted by Eurocentric schooling and resulting identity reconfigurations.

There are also considerations for cross-cultural competencies such as “being open-minded and prepared” and to “avoid sentimentalism and romanticism, utilize traditional ecological knowledge and cultural evidence, teach values of sustainability, and utilize aboriginal expertise” (Beckford & Nahdee, 2011, p. 3). Our own

learning as teachers needs to be dynamic and accurate as well as actively rebuilding relationships with many aboriginal people who have been influenced away from indigenous philosophies and practices by European experiences and schooling. Facilitation skills around topics such as food security, food and water pollution, health concerns and employment will also need to be addressed in a sustainability curriculum. “Disillusioned young people try and make sense of their lives while being put through training programmes to prepare for work in communities where no one is employing [them]” (Tahiwai Smith, 2006, p. 96). Identity and socioeconomic questions may be in the foreground of student experience, regardless of curriculum efforts towards relevant and pressing long range issues such as environmental sustainability. Acculturation may also play a strong role in student engagement with new curriculum as media “imports American culture and educates the tastes of the young for labeled clothes and African American rap” (Tahiwai Smith, 2006, p. 96). Teachers’ efforts towards authentic inclusion and collaboration with families, elders, matriarchs, councils and traditions of indigenous peoples can address commercial and pop culture identities. A dynamic interchange can result, sustained over time through developing curriculum for ecological sustainability based in indigenous philosophies and practice.

A local northwestern BC example of such a partnership can be found in many schools and classrooms taking care of aquariums full of salmon fry (Thornhill Elementary School visit, April, 2011). The children learn the salmon life cycle and changes in salmon harvesting past to present, while preparing to go and release the older fry into local rivers for maturation. Elders could come in to describe their experiences with salmon over time, students could visit a drying shed and/or build one on campus with their families, salmon resources and projects could fill a corner of the classroom or a part of the school. Students could connect with other schools nurturing salmon fry (Skeetchestn Elementary School visit, May, 2011) and document runs, changes in fishing regulations, stream conditions, and so on. Local fisheries information and global fisheries could be explored with several classes and communities for further ideas on enhancing habitat and harvest.

EDUCATIONAL RESOURCES: ISSUES

Bernadette Wabie, Senior Education Officer, Ontario Region South for Indian and Northern Affairs Canada (INAC), stated that accurate and culturally relevant educational resources for Native Studies education were virtually non-existent ten years ago. “In the last ten years, there has been an increase in the development of First Nations resources and materials for and by First Nations (B. Wabie, personal communication, November 16, 2009). By legislation of the Indian Act, the federal government is responsible for the education of First Nation, Métis and Inuit students. INAC provides funding directly to First Nations and First Nation organizations to develop educational resources, as well as funding to seven Educational Cultural Centres to develop specific resources for the First Nations that support them.



Figure 1. Part of the Skeetchestn band school salmon fry project (Savona site visit, 2011).

Within Canada the Ontario Ministry of Education is working to create new accurate and relevant resources that have the input of First Nation, Métis and Inuit educators. Just as the Ontario Ministry of Education wishes all Native Language teachers to be qualified teachers, some boards including the Grand Erie District School Board (GEDSB) want resources developed by educators only. The Grand Erie District School Board needs to be involved through the development stages in order to endorse the resources for use in the classroom. The GEDSB wants all their Native educational resources vetted by Goodminds.com (First Nations Business) and endorses the idea that all Ontario school boards should do the same. Since educators have little time to develop their own lesson plans to use with the resources, it is beneficial that all resources include lesson plans for educators. If this is the ideal, then it is important for school board administrators to collaborate with developers (educators) of resources to ensure that the resource is developed to have the best potential for usage by the school board (J. MacDonald, personal communication, July 14, 2010).

Do these policies and ideals further perpetuate the dominant way of thinking and marginalize Indigenous views and responsibilities? In Indigenous culture, it is the knowledge holders who have the responsibility of passing on culture through language. Does the person holding this Indigenous knowledge, but not holding a degree from a Western learning institution, negate their knowledge in terms of language? Does it eliminate their responsibility? Indigenous culture says, “No.” The policy of Native Language teachers being qualified teachers and the position that only educators should develop educational resources, are discriminatory. However, a healthy compromise could be initiated. School boards need to adopt the view that Indigenous knowledge matters just as Western knowledge does, and invite it into the learning environment in ways that respect Indigenous approaches.

Within Indigenous communities, speakers of the traditional language are held in high esteem because they have succeeded in preserving their language despite

continual attempts to eliminate it through Canadian (Federal) residential school and assimilation policies.

Because traditional languages, and the cultures that exist in them, have been passed down for generations orally, when transcribed into text misconstructions often occur. The only language textbook available for teaching the Cree language is *Spoken Cree* by C. Douglas Ellis. This textbook was originally published in 1962 and was revised and expanded in 1983. The book includes the James Bay dialect which is different from the Plains Cree dialect spoken on the prairies (Ahenakew, 1985). Other textbooks including *Meet Cree: A Guide to the Cree language* by H. Christoph Wolfart & Janet F. Carrol, 1981, is about the Cree language and not lessons for learning the Cree language. The sentences are in the Plains Cree dialect and are difficult to understand because they are missing the necessary pronouns (that) and discourse participles (now) that are vital in understanding the Cree language (Ahenakew, 1985, p. 51). Yet another resource, *Cree: An Intensive Language Course*, published in 1954 by Mary Edwards includes Plains Cree lessons but in the illustration of grammar, makes use of negative stereotypical depictions (Ahenakew, 1985, p.53). Ahenakew suggests that it is the responsibility of Cree speakers to develop appropriate teaching materials for Cree culture.

STORYTELLING AS A RESOURCE

Storytelling is an ancient form of communication in many Indigenous cultures. Tuhiwai Smith (2002) illuminated the significance of preserving the orality of the culture by noting how important storytelling and elder perspectives were within Indigenous research. “Each individual story is powerful. But the point about these stories is not that they simply tell a story . . . new stories contribute to a collective story in which every indigenous person has a place” (p.144). As traditional Indigenous knowledge was passed on orally, much of this knowledge has been lost or only partially transferred due to evolving language barriers (as many Indigenous peoples no longer speak or understand their Indigenous language); assimilation at residential and day schools; lifestyle changes of the Elders and the youth; and displacement or disenfranchisement (Umpleby, 2006).

Storytelling as a form of evidence was recognized in the precedent-setting *Delga'muukw* (2001) ruling by the Supreme Court of Canada, which was the first to acknowledge the oral traditions of a First Nations tribe (Umpleby, 2006). This acknowledgement by Canada's highest court was noteworthy as it, for the first time in history, equated this form of information as a legitimate source of proof that could be used in court (Roth, 2002). The ruling was evidence that, in Canada, Aboriginal voices are being heard and understood by eminent jurists (Umpleby, 2006, p. 57).

VanEvery-Albert (2008) suggested the challenge that exists in stories resides within their accuracy (validity) and how inaccuracies change the depiction of Indigenous peoples in the history of a country. Mihesua (2004) explained how Indigenous intellectuals are becoming increasingly vocal in their objections to the way their ancestors have been portrayed or ignored in works of history and “how

those images and absences in stories about his country's past translate in the present" (VanEvery-Albert, 2008, p.144). In the Native culture, the oral tradition has been the way to teach the roles and responsibilities of the people and storytelling is the strongest way to give the knowledge. Most cultures value their oral tradition as a way to impart values within the culture and these cultures continue this tradition today. Since it is a valuable way to transfer knowledge, it can be a useful part of the curriculum. Thomas King (2008) wrote,

stories are wondrous things. And they are dangerous. For once a story is told, it cannot be called back. So you have to be careful with the stories you tell. And you have to watch out for the stories you are told. (p. 9)

Why do you have to be careful with the stories you tell? Because stories come with responsibility to tell them accurately so the foundation of the moral remains intact. This is why, even though stories are passed down from generation to generation in a culture, their essence remains unchanged.

Anyone who has ever read a bedtime story to a child knows the allure of a good story; it entertains, it informs and it teaches (Estes, 1995), and some stories remain with us for a very long time. Paul Hart (2003) noted how, "a story is never simply a story. It is a statement of belief containing messages in what is said and what is not said. It represents or embodies a philosophy or worldview, a theory by which our practices are made intelligible" (p. xvi). Every culture has its stories through which it explains itself, and by which it teaches its children (Estes, 1995). For North American Indigenous people, storytelling has been a central pedagogy for millennia, whereby each generation acquired diverse information on culture, ideology, medicine, practical knowledge and history (Crowshoe, 2005). Indigenous explanations for physical phenomenon (what we would call science) are based on examples and stories, whereas scientific explanations are based on hypotheses, theories and laws. (http://www.nativescience.org/html/traditional_and_scientific.html.)

Indigenous knowledge was based on an holistic, integrated system, rather than an analytical, reductionist view of isolated parts; it was based on acquiring wisdom over time rather than short-term predictability; it was based on a cyclical model rather than a linear one. Given the ecological health and longevity of Nature under indigenous habitation, we would be wise to attend to their attitudes towards knowledge acquisition and their form of instruction, in which storytelling was pivotal.

Consider the following story as told by an Ontario educator:

Early in my education career I lived and worked on a First Nations reserve in a small, remote settlement in Northwestern Ontario. There I met and became friends with Georgina, an Oji-Cree elder in the community, whose grandchildren I taught, and around whose fire I would often sit and chat. I tell this story called 'Georgina's Gift' in honor of my friend.

One day, close to the end of my years in the community, Georgina phoned me and in her usual clipped English she said, "You come. We go in the bush." I

grabbed boots and a coat and headed for the door. My years of friendship with her had taught me that when an adventure beckoned I should embrace it in that moment. Together we headed into the boreal forest, Georgina in the lead, and she began to talk about her life as a little girl; how she had grown up in the bush with her parents and lived off the land. She also talked about her married life as a wife and mother, and how her children had been taken from her to be sent to residential school.

As she told her stories and walked with familiarity through the landscape, she would stop at a plant, take a leaf or some bark, and crush it between her fingers. Then she would sniff at the pungent odors released and identify the plant and its medicinal qualities. We stopped in front of a stunted willow where she peeled the bark off one of the tender twigs and motioned for me to smell it. “Good for pain,” she said, “you make a tea.” And then we wandered on. By the beach she picked up a discarded fish skeleton and dislodged a few of the vertebra, the size of large peanuts. “When we were children, we dyed them with berry juice and made a necklace,” she said. She showed me leaves and roots, berries and fungi; had me smell each of them deeply, wanting me to commit them to memory. “You smell it?” she would ask? And then tell me in detail how to prepare it as a remedy for ailments or use it for food.

I felt profoundly moved when I began to understand what a privilege it was to be out there with her, but I also felt such despair. The knowledge that she was imparting would be lost to me in short order – I did not have the skills to learn in an oral tradition, to internalize so much information in so short a time. Still, I have never forgotten that walk with her on a sunny afternoon. And decades later I continue to explore the natural world through my senses; I crush the leaves of plants and inhale the fragrance of them, storing them in a place of memory that I have built over the years. That was Georgina’s gift.

I have told the story of *Georgina’s Gift* often in science classes when studying topics like chemistry, pharmaceuticals and medicines, and botany. There are layers to the story: one of its meanings lies in its content information, for example, willow bark contains the chemical salicin, similar to aspirin in its ability to subdue pain and fever. As well, there is the realization that the world can be keenly perceived and powerfully understood in non-Western ways. There is a sense that the boreal forest is not the dark, brooding and dangerous domain of bears and wolves, rather the landscape embraces and sustains life. And there is the story of lives forever changed by residential schools.

As a science teacher, and now as a pre-service teacher educator in science methods, one of the pivotal points of my practice has been that science studies should have relevance outside the classroom; what students learn in school should be inextricably linked to the world they live in and should resonate with meaning for them. While there may be any number of ways to do this, I believe that story is a

powerful methodology that has been used extensively in cultural education but has not been given its due in science pedagogy.

Indeed, science education has traditionally been delivered with a heavy emphasis on the acquisition and memorization of content knowledge through lecture and textbook interfaces. Science activities took the form of recipe-based laboratory activities that recreated, in less sophisticated ways, the work of notable scientists. Both the process of science and the teaching of science were perceived to be rational, positivist enterprises, separated from emotion and values by the scientific method. Alsop and Watts (2003) suggested,

in science there has been a long-standing Newtonian–Cartesian tradition of separation, prizing apart the mind and body, divorcing and polarizing reason from feeling. From Francis Bacon to Richard Feynman, emotion has been viewed in Western philosophy as a hindrance, a countenance to reason, truth and objectivity. (p.1044)

Many of those attitudes and practices continue in science instruction, resulting in school science teaching that is authoritative, technical and depersonalized (Xu, et. al, 2012). But as Caine and Caine (1998) have explained, “the brain does not naturally separate emotions from cognition, either anatomically or perceptually”(p.14). In a discussion of contemporary education, Parker Palmer (1998) considered how traditional schooling has led to the separation of the head from the heart, resulting in ‘minds that do not know how to feel and hearts that do not know how to think.’ Current research on brain function indicates, among other findings, that emotion is the gatekeeper to learning, and memory is intricately tied to personal meaning (McGeehan, 2001). We tend to learn about and remember those things that catch our attention, that capture our imagination and that become personally important to us. Surely, a good story is a catalyst for learning.

Blenkinsop and Judson (2010) posit that the story can be a robust learning tool in four ways: the transmission of culture; the expression of personal experience; the relating of shared experience; capturing attention through levity or suspense.

...what would happen if we were to use it more deliberately as a learning tool? The story can be a heavy lifter for learning, because it shapes information in a way that is emotionally and imaginatively engaging. When we learn something in story form, our emotions and imaginations are evoked and we come to feel something about what is being learned. The educational value of story, then, is that it provides an emotional context and can be applied in any part of the curriculum. The story has huge significance in oral cultures for this very reason, doesn't it? It makes knowledge meaningful and, when done well, memorable for the listener. This must be educationally significant. (p. 176)

Terms such as story, narrative, vignette, are used interchangeably at times and indeed their meanings often overlap, however, for purposes of clarity we suggest for them

the following interpretations: a story is a piece of prose that has a beginning and an end, in which protagonists act out a plot and through which the reader or listener receives a message. Story is a comprehensive rendering of experience and meaning; narrative can be understood as a fragment or excerpt of the larger story, but lacking one or more of the elements of the full story; it may be in the form of snippets of conversation or a cursory recollection; in a similar way the vignette is a very brief yet evocative account of an episode within a larger story; the vignette may be rich in detail and description, but lacking the breadth of story. But in a technological age we need to expand our notion of story.

You Tube is arguably one of the most popular and pervasive storytellers in the video medium followed closely by blogs, and podcasts (multi media). Since stories can work so powerfully on emotion and imagination, and since they have such a long and successful history as keepers of culture and knowledge, it would seem self-evident that they have a place in contemporary pedagogy, including science teaching. Stories can help to bridge the affective and cognitive domains; re-join the mind to the body and allow all students to fully engage in science education that matters.

The elders believe that the culture is in the language and the language is in the stories. This is why the languages of the Ongwehonwe people are languages of concepts, description and action. An example in the Mohawk language for the word, "believe," is "*tasetakh*" which translates to "the thing that you take on your journey." Would a qualified teacher know to explain the concept behind the word? Would they know all the culture that is present and lives in the words of an Indigenous language?

Storytelling can be the bridge that successfully brings understanding in diversity. It is a renewable resource that we need to make use of in education. King (2008) writes, "The truth about stories is that that's all we are" (p.153). We are all stories for example, in 2009, Kawenni:io/Gaweni:yo Language Preservation Project at Six Nations of the Grand River developed educational kits relating to various topics including corn and wampum. The wampum kit is presented in a 15.5" x 11.5" x 2" glossy box. The box contains wampum quahog shells; one whole, one white partial, one purple partial, one pre-drilled; wampum belt replica; one audio CD; one DVD; Booklets (3) Wampum Belts, Wampum Beads and Belts, Making a Wampum Belt; As Long as the Rivers Flow (Larry Loyie) with Primary Lesson, Junior Lesson, Intermediate Lesson (Elementary Teachers' Federation of Ontario); Teacher's Resources.

John MacDonald, Aboriginal Education Teacher Consultant for the Grand Erie District School Board reviewed the kits for the board but could not recommend them for use in the classroom. One of the technical difficulties with the DVDs for both the corn and wampum educational kits was that the covers stated that the videos were for home use only. If the Board were to show them in the classroom in a public viewing, this would leave them open to legal action. Also, there were no lesson plans included with the kits. Due to an absence of communication with the educators and the resource developers, these technicalities led to the resources collecting dust on the school board shelf instead of informing the minds of students (J. MacDonald, personal communication, July 14, 2010).

Considering the gap that exists regarding teaching methods and teaching qualifications, MacDonald is creative in teaching Native Studies at the secondary level. He has invited culturally knowledgeable resource people into the classroom to sit and talk one-on-one with a Native Studies class. The class talk was video-conferenced with two other Native Studies classes and a Grade 9 Geography class. The Geography class was able to ask questions that explicitly dealt with their class curriculum. According to MacDonald, this was a successful way of injecting cultural knowledge into the classrooms. End of story.

Invitations to Indigenous educators to visit classrooms can be a very creative solution to injecting accurate and authentic knowledge into the classroom in real time. The teacher can elicit the amount of knowledge needed and guide the learning process. However, environmental education (EE) is a complex and still evolving field (Sauve, 2005) that can only benefit from the infusion of indigenous stories, and resources.

THE (GOVERNMENT) MINISTRY AND INDIGENOUS STUDENTS

Within, Ontario First Nation, Métis, and Inuit Education Policy Framework, Delivering Quality Education to First Nation, Métis and Inuit Students in Ontario's Provincially Funded Schools, the word, "Aboriginal" which includes First Nation students attending Ontario's provincially funded schools, is used. This word is not accepted by some First Nation communities in describing them and they prefer "First Nation" and "Indigenous" when referring to them instead. The word "Aboriginal" refers to a people that have been colonized which my First Nation community of Six Nations of the Grand River maintains we remain a sovereign nation, not subject to the Crown but allies with it.

There are over 50,000 First Nation, Métis and Inuit students attending provincially funded elementary and secondary schools in Ontario. These students come from five separate areas including First Nation students who live in First Nation communities and attend federally funded elementary and secondary schools in First Nation communities, First Nation students who live in First Nation communities and attend provincially funded schools under a tuition agreement and First Nation, Métis and Inuit students who attend provincially funded elementary or secondary schools. These students come from distinct cultures and histories. They share a history of residential school trauma which has perpetuated their general mistrust in the education system.

Globally, the relationship between Aboriginal peoples and governments has been one of assimilation, abuse of power, and domination the world over. Other countries, besides Canada, have been a part of these same crimes on FN peoples:

The impact on education from the historical legacy of Australia's racist past is impossible to overestimate. It is clear these effects are still being felt today. But there is great uncertainty attached to how educational opportunity can be revived among Indigenous people so systematically denied such opportunities. How many generations does it take for the damage to be undone? In this respect, Canada, the USA and Australia share a similar historical experience.

In various ways, all are struggling with the same intergenerational problems. (Beresford & Gray, 2008, p. 207)

Add to this the distinct learning styles that affect their place within the learning framework established by the teachers, schools and school boards. The result is a general mistrust of being ‘counted’ by the government and being included in any government evaluation process. This mistrust impedes the assessment and evaluation process of any government strategy that is directed toward First Nation, Métis and Inuit people. The result is noted in a recent report by the office of the Auditor General of Canada which presented an alarming picture of Aboriginal education: “There is a 28 year educational gap between First Nations and Canadians” [and the] “educational achievement of Aboriginal students ... has not changed significantly in 10 years” (Office of the Auditor General of Canada. 2004; Toulouse, 2008, p. 3).

Regarding the assessment of First Nation, Métis and Inuit students, there is currently no ministry policy requiring school boards to implement Aboriginal student self-identification protocol. Therefore, Aboriginal specific data is not available for enrolment, provincial standardized test results, graduation rates or drop-out rates. As of 2006/2007, only seven school boards had student identification policies. The ministry has encouraged and supported school boards as they develop and implement policies for Aboriginal students’ self-identification. Representatives from First Nation communities on school boards do have statistics on drop out rates and achievement, but the information is the property of the community. As we write there still exists a wide gap between First Nation, Métis and Inuit students and the rest of the student populations (Canadian Council on Learning, 2009; Wotherspoon, 2007). However, some closure of the gap has been made. Two percent more Aboriginal students received a high school diploma from 1996 to 2001 bringing the statistic to 23%. An impressive five percent increase to 38% received post-secondary qualifications during the same period.

Does this mean Indigenous students are identifying more with integration of their Indigenous view framework into education? Or are they becoming standardized to the provincial system and adapting better? More research could be focused on this area.

One of the curriculum issues raised in Ontario by the Ministry of Education (2008) in their documentation is low literacy and numeracy scores compared to non-Native students, retention, graduation rates and advancement to postsecondary education. The Ministry of Education has made First Nation, Métis and Inuit education a key priority with identifying goals to meet by 2016. They identify the goal of working to improve achievement of First Nation, Métis and Inuit students and to bring them closer to non-Native students in the area of achievement (Ontario Ministry of Education, 2008). This goal further solidifies the viewpoint that First Nation, Métis and Inuit students can be and need to be the same as non-Native students in terms of educational success. It implies all students need to be of one standard regardless of distinct learning styles, constitution of academic success or culture. However, the Ministry will engage certain strategies aimed at the different cultural groups to achieve the educational standard.

The Ministry of Education proposes to implement certain strategies to address the issue of educational divide between First Nation, Métis and Inuit and non-Native students. Some of these strategies include supporting school boards in developing policies to identify First Nation, Métis and Inuit students in order to assess and evaluate them, encourage teaching institutions to attract First Nation, Métis and Inuit educators (Fulford, 2007), enhance the skills and knowledge of non-Native educators to prepare them to work with First Nation, Métis and Inuit students and research and support practices that will help First Nation, Métis and Inuit students succeed academically (Godlewska, Moore, Bednasek, 2010).

Other strategies that the Ministry, boards and schools could implement include building educational leadership by giving the First Nation, Métis and Inuit added voice and more opportunity to be heard at the Ministry level of provincial government (The Education Partnership Table), coordinate with the federal government and First Nation, Métis and Inuit organizations on education and ensure First Nation, Métis and Inuit education is appropriately addressed in qualification guidelines for principals and supervisory officers.

An interesting strategy that the Ministry of Education hopes to implement is to build capacity to support identity building and appreciation of First Nation, Métis and Inuit perspectives, values and cultures by all students, school board staff and elected trustees (Ministry of Education, 2008). This strategy involves a major increase in First Nation, Métis and Inuit educational resources. The Ontario Ministry of Education will integrate content that reflects First Nation, Métis and Inuit histories, cultures and perspectives throughout the Ontario curriculum. School boards will offer training for teachers about First Nation, Métis and Inuit histories, cultures and perspectives. However, as Redwing and Hill (2007) explained, “the largest problem lies in educators locked by pedagogies of practice that simulate past unsuccessful methods” (p. 1016). Nonetheless, Schools will acquire and provide access to a variety of accurate and reliable First Nation, Métis and Inuit resources such as periodicals, books, software and resources in other media including materials in the main languages of First Nation, Métis and Inuit peoples.

The lack of abundant accurate and reliable resources to teach Native Studies has long been a curriculum issue in the educational system in Ontario and beyond. There has been a shortage of resources available to accomplish this goal. Curriculum policy documents have been developed for Native Studies, Grades 9–12. The documents include a broad range of knowledge relating to First Nation, Métis and Inuit peoples. A resource guide is being developed to support the integration of Indigenous content in social studies programs.

NATIVE STUDIES RESOURCE INITIATIVES

According to Sheila Staats from Goodminds.com, British Columbia and Alberta are further ahead than Ontario in addressing the issue of educational resources (S. Staats, personal communication, August 10, 2010). British Columbia and Alberta

are two provinces that have moved forward in creating education resources for the secondary school curriculum. The Aboriginal Studies series 10, 20 and 30, by the Kainai Board of Education, Métis Nation of Alberta, Northland School Division and Tribal Chiefs Institute of Treaty Six are image heavy publications dealing with issues such as Aboriginal Perspectives, Peoples and Cultural Change and Contemporary Issues. Each textbook is accompanied by a Teacher Resource to assist in the teaching of the material. Contributors from First Nations, Métis and Inuit organizations are listed in the book. All textbooks are validated by fifteen elders and cultural advisors from various First Nations as well as committees of external reviewers and internal reviewers. Another Alberta publication is First Nations, Inuit, and Métis Peoples by John Roberts that also comes with a Teacher Resource binder. This resource explores origins, characteristics, impact of colonization, treaties, sovereignty, socioeconomic issues, justice and resurgence of culture. Goodminds.com and is currently working on a grade 11 textbook resource and Pearson Publishing is working on a grade 10 textbook resource for Ontario secondary schools. There still exists a need for a grade 9 textbook resource in Ontario.

However, in the elementary schools, there still exists a real shortage of teaching materials. Educators at this level must still collect many different resources to assist them (S. Staats, personal communication, August 10, 2010; B. Wabie, personal communication, November 16, 2009).

Currently in elementary schools in Canada, the textbook, *Canada Revisited* is used to teach Grade 6 social studies. It, too, is very image heavy and spans historical events from the 1600s to the 1920s. What it doesn't offer is contemporary issues regarding First Nation, Métis and Inuit peoples. There were inaccuracies found in the book and it was taken from the shelves of the elementary schools at Six Nations of the Grand River.

The book titled, *Early Settlers* by Bruce and Kim Henbest is now used in the Grade 3 Alberta curriculum. It explores the Wendat, Anishinabe, First Europeans and village life and times. One criticism of the book is that it combines the early settlers of the 1800s with life of Aboriginal people in the 1600s and implies that life at both periods in history for the Aboriginal people remained the same. The criticism is that Aboriginal life changed from 1600s to 1800s and this change is not reflected in the book.

Possibly the most acclaimed initiative in Native Studies educational resources is a collaboration by The Social and World Studies and The Humanities Department of the Toronto District School Board in partnership with the Aboriginal Studies Centre. Together, they developed a Guide to Teaching Aboriginal Studies in K-8 Classrooms in 2006 called *Aboriginal Voices in the Curriculum*. The guide was developed by four Anishinabe and Mohawk writers from three different First Nation communities and reviewed by Anishinabe, Cree and Mohawk reviewers. The 372-page guide gives an introduction of Aboriginal/Native Studies. It addresses teaching issues such as cultural symbols, land claims and treaties, residential schools, traditions and talking circles. The guide also includes a section

on identifying and dealing with bias as well as curriculum connections and other recommended resources. A criticism of this guide is the fact that it is missing the oldest Native newspaper source at Six Nations of the Grand River, Tekawennake, and print resources specific to Six Nations of the Grand River, the Little Lorrie series. This is a series of three books with accompanying audio CDs about Ongwehonwe traditional celebrations.

As recently as November 13, 2009, it was announced by The Department of Education's Mi'kmaq Liaison Office and the Office of Aboriginal Affairs that new teaching resources in the form of a video is available to Grade 10 and 11 Nova Scotia students for the Mi'kmaq and Social Studies programs. The video follows the journey of four Mi'kmaq youth who have all found successful careers as a veterinarian, boxer, professional hockey player and Royal Canadian Mounted Police officer. Education Minister Marilyn More of Nova Scotia commented that "This is just one of the many ways government is infusing Mi'kmaw content into the public education system. These resources will benefit all Nova Scotia students" (Nation Talk, November 17, 2009).

WHERE WE CAN BE

Although resources are continuously being developed, it is critically important that evaluators, reviewers and validators from First Nation, Métis and Inuit communities are consulted in the creation of these resources to ensure accuracy and authentication.

Thomas Peacock quotes educator Larry D. Foreman, when he says that Native education mimics mainstream models only because Indigenous perspectives have not been considered. "A void seems to exist in areas that examine ways by which American Indian values and world-views might be incorporated into educational designs appropriate for the age of self-determination" (Bergstrom, Miller-Cleary, Peacock, 2003, p. 173). Peacock (2003) also states that real change in Native education will only happen with real courage and self-funding. Peacock argues that accepting funding only compromises educational freedom. Peacock's solution is to ensure Indigenous perspectives are within education and then integrate mainstream theory and standards.

Aboriginal people need a solid Aboriginal knowledge foundation in their early years, so that they have a sense of belonging and a positive identity as Aboriginal people. If they are deprived of this very important foundation, they will be lost, and most tend to wander all their lives. (Aboriginal educator, interview, Sudbury, Ontario, April 5, 2004)

Slowly, post-secondary institutions are creating programs that have Indigenous knowledge foundations. One such undergraduate teaching degree model based on Anishinaabe philosophy exists at the Duluth Teacher Education Program at the University of Minnesota. In Ontario, York University is in consultation with Indigenous educators and knowledge keepers discussing development of a graduate program in Indigenous Thought.

GOODMINDS.COM

Regarding First Nation resources available in schools in Ontario, most boards of education develop their own lists. There is a private business in Ontario that offers more than 4,500 titles that are accurate, bias-free and educationally sound. Goodminds.com is a First Nations-owned and managed educational resources wholesaler at Six Nations of the Grand River Territory located within the city limits of Brantford, Ontario. The business began distribution of educational resources in April, 2000. Goodminds.com offers resources that include books, videos, CD-ROMs, audiocassettes and educational kits offered through their warehouse and online. The business boasts resources that are respectful to First Nations, Inuit and Métis people. An electronic catalogue can be downloaded from their website at www.goodminds.com.

Sheila Staats has been working at Goodminds.com since it began as a Native Information Specialist. It is her job to review, annotate all Aboriginal titles. She also delivers workshop presentations regarding selecting and assessment of Aboriginal Peoples resources. Through this workshop entitled, *Native Resources 101: Assessing Aboriginal Materials for School and Public Libraries*, she shares knowledge on the Goodminds.com criteria for selection of resources, terminology and Aboriginal Peoples, books to avoid and website resources. In the last year, Goodminds.com has assisted Thames Valley District School Board; Durham Catholic District School Board; District School Board of Niagara; Durham District School Board; Halton Catholic District School Board; ATEP Program at Queen's University and libraries at the University of Western Ontario and Queen's University. Staats also delivered a webinar to the Ontario Public Librarians.

Goodmind.com also offers a service to review and validate any publication for Canadian educational publishers. Many Canadian educational publishers including Pearson Education Canada have used this service at the textbook manuscript and draft stages.

In addition, Goodminds.com offers customized book lists for grades, interest level, subject areas and Nations. In the last year, they have assisted the Toronto Catholic District School Board with customized list of readings and resources in their preparation to deliver Ontario Native Studies courses. Goodminds.com also offer customized lists for character education (K-12) in a framework of 27 attributed deemed most relevant by First Nations teachings and school boards. They provide support and consultation for educators, consultants and school boards throughout Canada.

Goodminds.com attends Educational trade shows, symposiums, library and educational book fairs, conferences and workshops (S. Staats, personal communication, August 13, 2010).

In the educational field, Goodminds.com is possibly the most reliable listing of educational Indigenous resources in Canada. The fact that they have reviewed every title of their catalogue for accuracy and unfavourable bias promotes resources that are reliable for historical and cultural authenticity.

Not all Indigenous resources have been reviewed for accuracy like those titles in the catalogue of Goodminds.com. There could be titles that are selected by educators that have not undergone the Goodminds.com review process. Who has screened them for cultural accuracy and non-bias? Is there still colonial knowledge being taught to students today in Canada?

CONCLUSION

Slowly, change is coming to the education system in Ontario and elsewhere, as more Indigenous influence seeps into the curriculum. Strategies that support and encourage First Nation, Métis and Inuit consultation and involvement at all levels affecting education are increasing, and need to continue to do so. It is imperative in order to secure real change for Aboriginal students. Many believe that the solutions to Indigenous educational challenges will be found in the traditional philosophical understandings of First Nation, Métis and Inuit cultures. Inclusion of Aboriginal history, rooted in the natural world deepens learning and enhances curriculum. We must infuse curricula with Aboriginal perspectives and pedagogies that have been constructed upon the principals of harmony and respect for the environment. It is Indigenous peoples' relationship to their land that represents a model for human interaction with Nature (Beckford & Nahdee, 2011, p. 4). The question of curriculum authenticity is a priority as it is linked to the issue of authorship and our need for educational resources that reflect an Indigenous perspective.

Research acknowledges distinctness of Aboriginal students and their learning styles (Ledoux, 2006, p. 272) yet, the educational system continues to train teachers with little or no focus on these Indigenous perspectives in education. This produces "teachers [who] are generally unaware of these complexities and in most instances are unprepared to address the uniqueness of Aboriginal epistemologies in their pedagogical practice" (Cherubini, 2010, p. 335). According to Bernadette Wabie, there is still a lot of work to be done when it comes to educators understanding and accessing appropriate First Nation, Métis and Inuit resources and being confident in teaching about First Nation, Métis and Inuit people and issues (B. Wabie, personal communication, November 16, 2009). Hopefully, educators embrace their abilities to access the authentic resources to assist them in teaching any aspect of the curriculum that incorporates Indigenous education.

Indigenous people have a different worldview than non-Indigenous people. It is from this worldview that their view or education originates. For Indigenous people, education will always pass through this Indigenous lens and be filtered by residential school, assimilation and other aspects of colonialism. Their strong sense of cultural recovery plays an important role in education today.

According to Deneen Montour, Aboriginal Education Teacher Consultant for the Grand Erie District School Board (Ontario), Indigenous people must play a more prominent role in the development of educational resources, reviewing of curriculum documents and delivery of cultural content. Finding our voice in the written word

of educational resources is crucial (D. Montour, personal communication, August 19, 2010).

Indigenous people possess very clear historical realities from where perception, mistrust and experience with prior integration originate. As we travel further down this path of curriculum review, we gain further insight into the current state of First Nation education in this province as it tries to co-exist within the parameters of a provincial curriculum. And it is within this curriculum that educational resources authored, reviewed, and authenticated by Indigenous people are critical.

NOTE

- ¹ In this paper, the word Aboriginal is used to include First Nations, Inuit, and Métis peoples of Canada. The word Indigenous is used interchangeably with Aboriginal throughout the chapter.

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