

Heart Knowledge:
Towards (w)Holistic Ecoliteracy in Teacher Education

by

Christopher Stephen Filler
BPHE University of Toronto, 2003
MEd, University of Toronto, 2004

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ABSTRACT

Despite repeated calls internationally, nationally and provincially to place the development of ecoliteracy as a curricular priority, there continues to be a lack of attention provided towards this goal, in particular opportunities for direct contact with the natural world in terms of fostering ecoliteracy in student teachers (Tuncer, 2009; Davis, 2009, Gough, 2009, Beckford, 2008; Blanchet-Cohen & Elliot, 2011). Teachers play key roles in advancing environmental education efforts and the environmental literacy of future generations. Insufficient teacher preparation has been identified as one factor in the weakness of environmental education efforts and environmental education curriculum (Beckford, 2008; Lin, 2002; Knapp, 2000). Furthermore, adequate environmental education preparation of students in teacher-training programs is essential for helping future teachers design and implement effective environmental education curriculum (Cutter-Mackenzie and Smith, 2003; Mc Keown-Ice, 2000; Spork, 1992)..Future generations of students need to begin to perceive themselves, once again, in terms of

being connected to a larger story which includes the more-than-human world. I argue that education needs to play an important role in that re-connection, and that teacher education, as a fertile place of in-betweenness, can represent an important step toward that goal. Using a combination narrative and phenomenological inquiry, I explore the storied insights of ten student teachers as they struggle to navigate the tensions, disruptions and opportunities that form the waters between their nature-self and their teacher-self. Along with a questioning of current conventional approaches to teaching ecoliteracy in schools, the Aboriginal concept of “heart knowledge” (Aluli-Meyer, 2008) is provided as a way of knowing which is congruent with the aims of an holistic ecoliteracy within teacher education.

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I would also like to thank my participants above all, for their efforts, willingness to engage and share, and mostly for their desire to effect change.

DEDICATION

I dedicate this research to my family.

To my parents who privileged me with the opportunity to pursue my studies from day one.

To my daughters Tia and Anya who continuously inspired me to do this work, while showing me levity and perspective throughout. I especially want to thank Tia for the many, many heart drawings which became a real life manifestation of my inquiry.

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PREFACE

Re-vision: A Lament

My inquiry into ecoliteracy and student teachers begins with a lament. A lament for what has been lost, a lament for what has been forgotten. It is a mourning of sorts for a time when children were kids, and playing in close contact with the natural world was considered 'natural'. Where time was told by the phases of the sun, a "just-make-sure-you're-home-by-the-time-the-street-lights-come-on" type of time. A time where kids knew their surroundings intimately in ways only a kid could know. 'This is how long it takes to bike from here to the quarry on a windy day'; 'this is where the best blackberries are in August'; 'this is where I once saw the dead deer on the side of the road'; 'this is the best part of the river for catching trout in Spring'; 'this is the coolest place in the forest on a hot summers day, plus toads live under the leaves here too'; 'this place stinks of seaweed worse than any other place along the shore at low tide'.

This is a lament for all the special places that have already been lost, or been altered beyond recognition.

This is a lament for all the bears, caribou and children who aren't able to roam where they once did.

This is also a lament for the species which have already succumbed to extinction from this wondrous planet.

This is also a strong hope for the future, a realization and trust in choice to return to the land, where we can all be kids again, exploring, learning, trying, failing, imagining, wondering, succeeding, and getting to know; getting to know our neighbours in the more-than-human world, and getting to know ourselves.

This is a hope for what is still yet to come.

<p>A little too abstract, a little too wise, it is time for us to kiss the Earth again. - Jeffers</p>

CHAPTER 1:
RE-INTRODUCTION

The old man said,
“most people never hear those things at all.”
I said “I wonder why?”
He said, “They just don’t take the time you need for
something that important.”
I said, “I’ll take time. But first you have to teach me.”
“I’d like to if I could” he said, “but the thing is...you have
to learn it from the hills and ants
and lizards and weeds and things like that.
They do all the teaching around here” (Knapp, 1989, p. 6).

Purpose: A Re-Situating

There is a practice in New Zealand which involves introducing yourself based on the land from which you come. I see this as a fitting way to introduce this inquiry, to re-situate myself as researcher within the context of who I am in relation to the lands and oceans from which I come, and from which my memories of connection are rooted.

I am from the Soper Creek Valley – crawfish, garter snakes, clay, frogs,
meadows, shoelaces wrapped around bike pedals.
I am from Algonquin Park – canoes, trout, loons, moose, mosquitoes.
I am from North Rustico – sea salt, brine, sunshine
I am from Barkley Sound – cedar smoke, eel grass, eagles, whales.

Choosing to conduct this research was more than just a simple choice, rather it was an answer to a call to action. Representing a culmination of years of personal experience, contemplation and conviction, my choice to explore the connection between teacher education and (w)holistic ecoliteracy became an invitation to re-search my own story in relation to this topic of inquiry. As my own journey in education informed the meaning making process of this research, my decision to weave my own story with that

of my participants began to take root. Consciously or not, I've been adding to my own Earth story along the way ever since.

In relation with my participants throughout, interacting with their stories, I have been re-experiencing my own story, and as such been transformed through a shared meaning-making process. As Jardine (1990) suggests, a purpose for this type of inquiry is the invitation and permission to re-experience my own personal perspective, and to be changed along the way. At the core of a concept of (w)holistic ecoliteracy is the ability to tap into memories, foundational experiences which make up who we are today.

The purpose of my study was to inquire into the ways student teachers drew on their early experiences in nature towards the formation of their own identity as a teacher, the development of their own ecoliteracy, including how they view knowledge/knowing and how it impacts the formation of philosophical, epistemic and ontological orientations. As student teachers explored the tensions relating to their own personal identity as teachers-to-be within their teacher education programme, I also gave consideration to the place of environmental outdoor education within the broader system of education as participants began to envision themselves as moving from being a student to becoming a teacher.

My purpose in this inquiry was also to understand in more depth the experience of ten participant student teachers in terms of how 'nature' is approached in a teacher education programme, and where possibilities for improvement lie and for growth may exist. As re-searcher, I am acting with intention and purpose as an advocate for place-based, outdoor experiential education at all levels, while focusing on teacher education as a point of entry. I place value on providing ample opportunities for students of all ages to

experience nature directly, and that by providing student teachers with opportunities for direct contact will enable, encourage and help foster a sense of comfort and confidence in teaching outdoor experiential education when it comes time for them to ignite their own students' curiosity towards ecoliteracy. By listening to how participants place value on ecoliteracy, my goal was also to open up possibilities through the expansion of cultural definitions in terms of how knowledge is valued in education as a social institution. A Western socio-cultural paradigm which values a positivistic, rational and instrumental worldview, including an over reliance on techno-scientific knowledge to the exclusion of all other ways of knowing is questioned as unnecessarily narrow and deterministic while failing to account for a diversity of possible reciprocal perspectives. My purpose was also to inquire into what impact, if any, childhood and other pre program experiences have had on these student teachers' own ecoliteracy as well as their own self-identity as teacher-to-be.

Finally, it was the purpose of this study to explore the possibilities that exist for ecoliteracy to re-inhabit education, to infuse through possibilities of learning from other cultural examples, namely Aboriginal Peoples worldwide, and the transformative capacities of storytelling.

Rationale: A Re-Enchantment (What Did You Do Once You Knew?)

All My Relations

I come to this inquiry with purpose larger than myself. At the very root is a recognition that all decisions, actions, and choices made will have impact on my Great

Grandchildren's Grandchildren's Grandchildren. It is with that consideration sunk solidly in my thinking heart and feeling mind that I find my convictions rooted, feeling compelled to do my part, to explore the possibility, and to further punctuate an issue that could potentially have positive and transformational impact on the planet, communities, schools, families and individual students of all ages.

Scott (2006) in his discussion of the "spirit(ual)" (p.92), speaks to the responsibility of the researcher in terms of 'relation':

'all my relations' is a phrase borrowed from First Nation traditions. It is a spiritual recognition of connection and responsibility. The future is present as a witness, as a relation, awaiting how it will be shaped. We have a responsibility to choose and act for those yet to come. The past is also present witnessing our actions. The ancestors are alert to our capacity as are all the other creatures of the world and the world itself. We are related to all things and are accountable to them for word and deed. We are entangled in life. Our choices matter beyond ourselves as the spirit(ual) is connection beyond the self" (p. 93).

Therefore as I have proceeded along this research journey, exploring the possibilities for ecoliteracy in teacher education, and education more broadly, with a bigger purpose of re-connecting students with the natural world, I am acting not only for myself, not only in terms of my research agenda, or personal commitment, but with respect for those that have come before, as well as consideration for those who are yet to come.

21st Century Student

For children to live only in contact with concrete and steel, and wires, and wheels and machines and computers and plastics, to seldom experience any primordial reality or even to see the stars at night, is a soul deprivation that diminishes the deepest of their human experiences (Berry, 1999, p. 82).

When asked why he liked to play indoors, the grade four student replied “I like to play inside because that’s where all the electrical outlets are” (Louv, 2007, <http://www.orionmagazine.org/index.php/articles/article/240>). This revealing statement punctuates the growing trend for children to choose indoor activities, often tied to electronic devices of some sort, over outdoor activities, more traditionally associated with unstructured play time (Louv, 2008). The impacts on children as a result of the increasing dis-connection that exists between students and nature are well documented (Godbey, 2009; Kuo, 2010; Townsend & Weerasuriya, 2010; Jack, 2010; Munoz, 2009; Lester & Maudsley, 2009; Moore & Cooper, 2008; Louv, 2008). While the physical impact on children spending less and less time outside is becoming more apparent (see Temple, Naylor, Rhodes, & Wharf- Higgins, 2009), for example as demonstrated by an elevated incidence of childhood obesity (Louv, 2008), there is also an impact on the more-than-physical levels as well, as students lack of time spent outside represents opportunities lost, and a coinciding dis-enchantment with the sacrality of planet Earth. More than simply a crisis of time spent inside, the lack of connection with the natural world has impacts which transcend the physical well being of the student to manifest as an atrophy of emotional, psychological and spiritual realms as well. When one considers the perspective that humans, from a cellular level through to our classification as mammals in the animal kingdom, are made up of the same stuff as the rainforest, the rat and the rock, it becomes impossible to completely sever that connection and that nature can be anything other than a part of us inside and out.

The Role of Education

Despite repeated calls for inclusion of environmental education curriculum into schools on a global level, including Article 29(e) of The United Nations Convention on the Rights of the Child (UNCRC), which states that all education should be directed to “the development of the child’s personality, talents and mental and physical abilities to their fullest potential” including “the development of respect for the natural environment” (United Nations, 2005), there still remains a distinct lack of attention provided to the development of ecoliterate teachers in teacher education programmes, arguably the most important conduit in the delivery of ecoliteracy content to students of all ages (e.g. Blanchet-Cohen & Elliot, 2011; Davis, 2009; Greenall-Gough, 2003; Johnston, 2009; Stir, 2005; Daskolia & Flogaitis, 2003; Knapp, 2000; Puk & Makin, 2006; UNESCO, 1997).

According to the World Commission on the Environment and Development (1987) teachers play a key role in advancing environmental education efforts and the environmental literacy of future generations. Insufficient preparation of teachers has been noted as an important factor towards a lack of appropriate environmental education being taught in schools (Knapp, 2000; UNESCO, 1997). Speaking of the educational landscape in terms of early childhood education, Blanchet-Cohen & Elliot (2011) suggest that “environmental education in early childhood has been largely ignored; few early childhood educators value the outdoors as an opportunity for learning; many do not know how to facilitate children’s curiosity and connection with the natural elements” (p.760).

Even when the environment is not a formal subject within the curriculum, it is still being taught.

Our omissions communicate to our students either (A) where the boundaries of reality lie, or (B) where the boundaries of knowledge worth bothering about lie...thus, in classrooms where nature is never discussed as anything more than background of human action, object for human study or resource for human use, some students may not graduate beyond this limited view...The general point to be gathered here is that even educational programs and curricula that never raise a question about human-nature relations end up doing environmental education – by omission, as it were (Hall, 1997, p.371).

According to many environmental education researchers, this problem is of systemic proportions, and is not one which is easily solved, where foundations of education from a modern Western perspective are questioned for their inability to account for the complexity of a (w)holistic ecological literacy (Weston, 2004; McKeown, Hopkins, Rizzi, and Chrystalbride, 2002). For example, McKeown, Hopkins, Rizzi, and Chrystalbride (2002) suggest that education has failed in the development of ecoliteracy among graduates. They conclude that: “the most educated nations leave the deepest ecological footprints....[m]ore education increases the threat to sustainability” (p. 10).

A Piece of the Puzzle

Environmental educator David Orr (1992) reminds us that education does not act in isolation, and that as a social institution, it exists within a broader Western cultural paradigm, including the larger trajectory towards the propagation for a human-nature disconnect. He reminds us that “the anomie, rootlessness, and alienation of the modern world are part of a larger system of values, technologies, culture, and institutions which also produce acid rain, climate change, toxic wastes, terrorism, and nuclear bombs” (p. 4). Considered one part of a larger complex social paradigm, the ability for teacher education, as a part of the broader system of education which itself is part of a larger socio-cultural fabric, is explored as possible fertile ground for the planting of seeds of

ecoliteracy into schools and ultimately becoming a catalyst for change at all levels of education. Schools and education, while playing a role in the reproduction of social norms, represents but one piece of the overall puzzle. Any plan for change in education therefore needs to acknowledge and be responsive to that relationship of embeddedness. Likewise, nested within the system of education, teacher education acts as a single part of a bigger whole, and therefore impacted by the cultural norms and political landscape which govern education as a whole. In terms of my inquiry, while I am purposefully focussing on teacher education as a discrete step in the education of teachers, the influences and impacts which have accumulated over the years of being indoctrinated into a system of schooling are acknowledged as powerful, relevant, embodied in memory and senses, and are therefore not easily forgotten. Any change called for in teacher education must therefore be contextualized in terms of the overall system of education, including its limitations and roles within a broader social paradigm.

As we become less and less attuned to the processes and voices of the natural world with education as an institution mirroring this rift through a systemic de-valuing of intuitive, tacit, embodied and experiential ways of knowing, children of all ages are at risk of suffering from what Louv (2008) has termed the “nature deficit disorder” (p.5). As students become more and more alienated from their own ‘nature-selves’, the rationale behind adding to this conversation of re-acquainting, re-turning, re-creating, re-acknowledging, and re-connecting students at all levels with the natural world in a (w)holistic way takes on a higher level of urgency (Davis, 2009). Future generations need to begin to perceive themselves, once again, in terms of being connected to a larger story which includes the more-than-human world in a personally meaningful way. I argue that

education needs to play an important role in that re-connection, and that teacher education, as a fertile place of in-betweenness, can represent an important step toward that goal.

Re-search Questions

My inquiry into ecoliteracy in a teacher education programme was informed by the following guided research questions which serve as points of entry into a larger conversation around the role of nature in education, and education in nature.

Primary research question:

What is the meaning attributed to ecoliteracy which informs a student teacher's perspective on education including how they envision themselves as becoming a teacher?

Supporting research questions:

How does ecoliteracy contribute to the self identity of the teacher-to-be ?
 How do early experiences in nature contribute to the development of ecoliteracy for student teachers?
 Where does ecoliteracy emerge within a teacher education programme?
 What role can other cultures, namely Aboriginal, play in terms of developing ecoliteracy in teacher education?
 What tensions exist in reconciling the elements of holistic ecoliteracy with the institutional realities of schooling?
 How can education as embedded within a larger social fabric respond appropriately to the transformative goals of ecoliteracy?

Guiding Metaphors:

The Anatomy of Knowledge & The Science of Hydrodynamics

Here's the paradox: if the scientists are right, we're living through the biggest thing that's happened since human civilization emerged. One species, ours, has by itself in the course of a couple of generations managed to powerfully raise the temperature of an entire planet, to knock its most basic systems out of kilter. But oddly, though we know about it, we don't *know* about it; it hasn't registered in our gut; it isn't part of our culture.

Where are the books? The poems? The plays? The goddamn operas?
(McKibben, 2005, n.p.) (emphasis added)

Knowing it Off by Heart

Environmental educator David Orr (1994) bluntly asserts the foundational role that nature plays in education and curricula when he states “first, all education is environmental education” (p.12). This acknowledgment forms the foundation of all further considerations when discussing where nature belongs in schools. He goes on to state: “by what is included or excluded, students are taught that they are part of or apart from the natural world” (p.12). Considering nature as the underlying fabric beneath all social institutions including education, and recognizing that without ‘nature’ there would be no ‘education’ in the first place, Orr’s statement begins to take on new meaning.

Similarly, Thomas Berry (1999), in discussing the ineffectiveness of simply adding a new course in ecology, suggests that the environment can never be subtracted, rather it exists within all other disciplines:

The difficulty cannot be resolved simply by establishing a course or a program in ecology, for ecology is not a course or a program. Rather it is the foundation of all courses, all programs, and all professions because ecology is a functional cosmology. Ecology is not a part of medicine; medicine is an extension of ecology. Ecology is not a part of law; law is an extension of ecology. So too, in their own way, the same can be said of economics and even the humanities (p. 84).

There is a healthy amount of indeterminacy and a serious lack of consensus on how the broader goals of environmental education should take shape in the context of modern education. At the heart of this inquiry lies a simple yet potentially powerful premise, that there needs to be more opportunity for direct contact with nature for

students of all ages. Simple in its ‘naturalness’ as an act of genuine childhood, yet complicated and quite possibly revolutionary in the challenge it represents to a school system built around a linear, mechanistic and classical model.

For ecoliteracy to emerge, there needs to be more opportunities for meaningful relationship to land, more discussions, more debates, more questioning of the way things are done, more connection within seemingly disparate areas of the curriculum (and students’ own lives), more unlikely partnerships, more chance for nature to become the teacher, and most importantly more time spent listening, listening to the “exuberances of the mockingbird and the owl, the waves and the wind” (Dellinger, 2006, p. 27).

Students need more stories. They need more stories in which they are able to see themselves as part of something bigger; they need more stories where they are able to see the natural world as part of themselves and their own selves as an integral part of it. Through direct contact with the natural world, students would be taught once again to listen, and thus how to read the book of nature, to become truly (*eco*)literate once again. Berry (1988) states that we are currently “in between stories” and that a new story is sought,

It’s all a question of story. We are in trouble just now because we do not have a good story. We are in between stories. The old story, the account of how we fit into it, is no longer effective. Yet we have not learned the new story. (p. 33).

From this perspective, and in contrast to the positivistic and empirical roots of a system of education which celebrates knowledge from a very narrow lens, ecoliteracy is disruptive, and calls for nothing short of a transformation. Berry’s quote about being “in between stories” can also be read as a metaphor for the student teacher. The ecoliterate

student teacher who is caught in-between the story of their nature-self which is becoming increasingly incompatible with the development of their teacher-self.

Orr (1991) reminds us that not all education is created equal. “[M]ore of the same kind of education will only compound our problems...it is not education (per say) that will save us, but education of a certain kind” (p.8).

Different Forms of Knowing & Knowledge

In response to calls for change, the prominence of one way of knowing as controlling the learning landscape is questioned. Holmes (2002) refers to “heart knowledge” (p. 41) as a form of knowing which is deep, embedded and embodied, a way of knowing at odds with an approach that privileges one single manifestation of knowledge over all others. Knowledge which involves the participation of the whole person which cannot be easily quantified, tested, or measured against standard educational proficiency tools; knowledge which is not preoccupied with celebrating a narrow and hollow cognitive victory over a multiple choice curricular puzzle. At issue is the approach of the vast majority of environmental education curricula which places emphasis on the development of dissociated cognitive skills, through disconnected add-on initiatives, what Knapp (2000) refers to as the “activity-guide mentality” (p. 34). This narrowness succeeds only at the expense of growing an organic, long term and personal connection to the planet, “an experientially based intimacy with the natural processes, community and history of one’s place” (Sanger, 1995, p.4).

Speaking from a traditional Hawaiian Aboriginal perspective, Aluli-Meyer (2008) refers to heart knowledge as “knowledge that endures” (p. 218). This is compared to

knowledge which dwells at the surface, a narrow approach to knowledge which never penetrates into the being of the student.

Two examples of approaches to teaching ecoliteracy help to illustrate two very different views which exist along the same continuum in terms of environmental education. The first is from The North American Association of Environmental Education (2000) which lists as its four essential aspects to ecoliteracy:

1. developing inquiry, investigative, and analysis skills.
2. acquiring knowledge of environmental processes and human systems
3. developing skills for understanding and addressing environmental issues,
4. practicing personal and civic responsibility for environmental decisions.

A second example comes from the British Columbia Ministry of Education's published guidelines for teachers in terms of environmental education. As exemplified by the following which are adapted from the *Environmental Concepts in the Classroom* (1995).

1. Direct Experience with Nature: Provide students with direct, deep and extended experience in natural setting.
2. Aesthetic Appreciation: Awaken students' sensitivity to the beauty and value of natural environments.
3. Co-existence with Nature: Encourage students to identify with the Earth as part of one's self, and see themselves as having connections with the Earth that is like their own family. Some might describe this holism or oneness as a spiritual connection to the earth.

The NAAEE principles for environmental education rely heavily on positivistic, empirical, scientific, and skill-based knowledge. What could be called the acquisition of *head* knowledge. The BC Ministry of Education guidelines aim to grow students' sense of self by incorporating elements of embodied, experiential and engaged learning, more aligned with an acknowledgement of the importance of what could be called *heart* knowledge. For a number of reasons, I am careful not to define a head vs. heart binary in this way. These two examples rather explore different approaches to the way ecoliteracy can be taught, while existing simultaneously on a continuum of possible approaches.

Jickling (1995) questions the quantifiable outcomes approach as taken by the NAAEE, and suggests that these types of initiatives may actually have the opposite effect then originally intended:

By presuming to provide a set of common guidelines, an understanding of what students should know and be able to do, a definition of what is valued, [the leaders of the NAAEE] appear to be rapidly retreating into the modernist, or deterministic, world view that so many environmental philosophers have identified as the very root of our environmental problems (p. 13).

Therefore, according to Jickling (1995), and environmental education researchers who share his perspective (Orr, 1992; Bowers, 1995; O'Sullivan, 2001; Louv, 2008; Jardine, 1998), it is not simply *that*, ecoliteracy is taught, but *how* ecoliteracy is taught.

Commenting on the heavy emphasis of science education on the complex topic of ecoliteracy, Wade (1996) points to professional development opportunities for teachers within ecoliteracy as opportunity lost. He refers to the National Consortium for Environmental Education and Training's (NCEET) national survey of state environmental education coordinators regarding in-service education for K-12 teachers. He suggests that "professional development in environmental education is dominated by

activity-based, nationally produced curricula; is primarily science-oriented rather than interdisciplinary; and is concerned more with environmental content than educational context” (p.11).

In answering the question “what are the goals of environmental education?” Steen (2003) suggests the need for an approach which considers both an understanding of the environment (*head knowledge*) and the development of an internal desire to want to act towards it in a positive way (*heart knowledge*). He considers this approach which balances two distinct poles on a continuum as necessarily incorporating an element of holism in education. Choosing one to the exclusion of the other is discouraged from the perspective of a holistic ecoliteracy.

Payne and Wattchow (2008) echo this need for holism, as they state that in order for education to appropriately respond to the current eco-crisis,

There needs to be a shift in emphasis from focusing primarily on the “learning mind” to re-engaging the active, perceiving, and sensuous corporeality of the body with other bodies (human and more-than-human) in making-meaning in, about and for the various environments and places in which those bodies interact and relate to nature (p. 16).

The heart as metaphor for knowing and learning will resurface throughout this inquiry, in both literal and figurative terms. Apart from its use in describing an approach towards knowing and learning, the heart in this case becomes a tangible conduit to the emotional, sensual, and spiritual potential that dwells deep within the ecoliterate student and helps to illuminate what it means to experience and embody education from this personal perspective.

Furthermore, the act of love, the verb of the heart, is also important in its relation to the larger topic of human-nature connection, as it is explored through a discussion around

the importance of caring for the natural world, and what implications exist for the way environmental education is taught, and the way students experience the natural world in their school.

What the River has Taught Me: Eddy as Metaphor

I have had the privilege of spending close to a decade as a kayak instructor and ocean guide. One of the first lessons I received when I was learning how to kayak was on the anatomy of the river. Among the features we discussed (and experienced first hand!) was the eddy. The way I recall being introduced to the concept of an eddy was to be taken out onto the Ottawa River one brisk early June morning. Helmets, personal floatation devices (pfd's) and tow ropes in check, we waddled out onto a rocky outcrop to 'scout' the stretch of river ahead. Our instructor pointed to a backward flowing, rather calm looking smallish section of the river, in stark contrast to the white frothy waves at both its sides. He yelled above the roar of the rapids, "That's an eddy. After you pass that rock on river left," he pointed to a massive glacially deposited boulder shooting up defiantly against the rush of the oncoming river, "you have one shot at hitting it, before you get swept into the next set of rapids towards the falls." He pointed to a set of rapids, white crested with a sudden drop at the end as an exclamation of sorts in terms of how necessary it was to 'hit' that eddy. The only other thing I remember about that day was thinking how cold the water was for June as I was swimming to shore after flipping my boat and going over those falls.

From the world of whitewater kayaking an eddy is defined as "the quiet area behind a rock, pillar, bend in the river...etc. A good place to rest." (www.rockandwater.net/pa-ww/terms.html, 2012). By itself, it is perhaps not as easy to

see how the eddy is all that relevant in terms of a metaphor for ecoliteracy in education, however, the eddy is only half the story. An eddy would not exist if it were not for an obstacle or disruption in the normal flow of the river in the first place, which causes the eddy to form in relation to it, “eddies are formed by blockages in the river. A blockage can be a rock, peninsula, ledge, or even a man-made object”

www.ccadc.org/instruction/ACA_RKTLA_Class/TLHazard/Dynamics.html, 2012). In the case of my inquiry into the role of ecoliteracy for the student teacher including his or her perspectives on education, future practice and self identity as teacher, the significance of a disruption which causes the possibility for a moment to pause resonates on many levels which will be explored and elaborated throughout my thesis. As the kayaker holds position within the eddy, there is an opportunity to view the river from a different perspective, to experience it from an angle that was otherwise impossible if the kayaker remained in the downstream fast flowing water. Payne and Wattachow (2009) refer to a concept of “slow pedagogy” (p. 16). Similar to being in an eddy, they suggest that applying a slow pedagogy “allows us to pause or dwell in spaces for more than a fleeting moment and, therefore, encourages us to attach and receive meaning from that place” (p.16).

The experience of moving from the fast flowing river to the calm quiet eddy requires such a change in approach and perspective that it could be said to be transformative. At the juncture where the flowing river meets the calmer eddy water, it is called the “eddy line”. The eddy line becomes significant depending on the difference in speed and volume between the eddy and the down flowing river. For example, “crossing

a placid eddy line gives pause on quiet waters - time, perhaps, to leave the mainstream and admire a pale ellipse of sand draped along the bank.”

(http://test.ourhomeground.com/entrie/definition/eddy_line, 2012). However, when contrasted with a faster flowing river, the eddy line can become a place of high hazard where “the eddy line can cause sudden flips, especially if there is a significant velocity differential between the current going downstream (main flow) and the current going upstream (eddy flow)” (www.rockandwater.net/pa-ww/terms.html, 2012). This point becomes salient given the need to question current direction in terms of approaches to experiential outdoor education in schools today. The more engrained current approaches to teaching (or rather neglecting to teach) ecoliteracy in schools, the more disruptive the potential move toward change, the crossing of the eddy line. In terms of the work that needs to be done in classrooms in terms of incorporating an holistic approach to ecoliteracy, crossing the eddy line, going from the fast flowing river of the way things are done, the way things have always been done, to the calmness of the eddy, may necessarily involve a transformative response.

Another feature of the eddy-as-metaphor which becomes relevant is the issue of scale. For example, as I consider the broader topic of how nature is taught in schools, it becomes pertinent to include all levels of education in the discussion, not solely teacher education as one single subsection, but considering education as a system, as a broader social institution within this discussion. In terms of eddies, there is similar variance in size and scope, ranging from smaller eddies as in my Ottawa River example, to ‘meso eddies’ which can span hundreds of kilometres in size, and influence the major ocean currents around the globe (http://www.gfdl.noaa.gov/ocean_mesoscale_eddies).

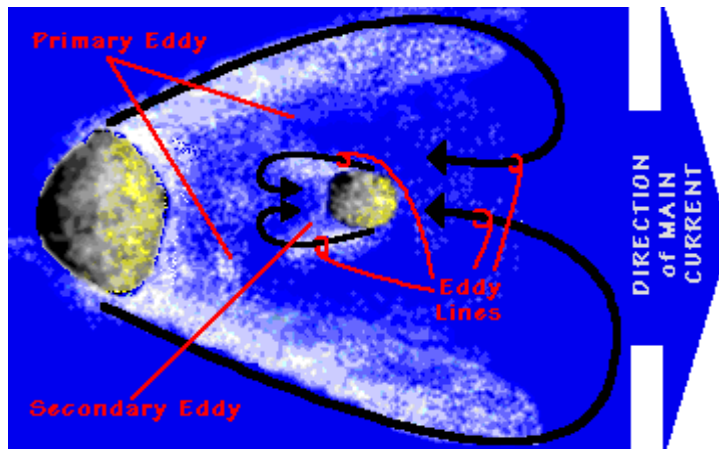


Figure 1. Image of eddy, heart shaped action, in river.
<http://www.paddling.net/sameboat/Images/eddy.gif>

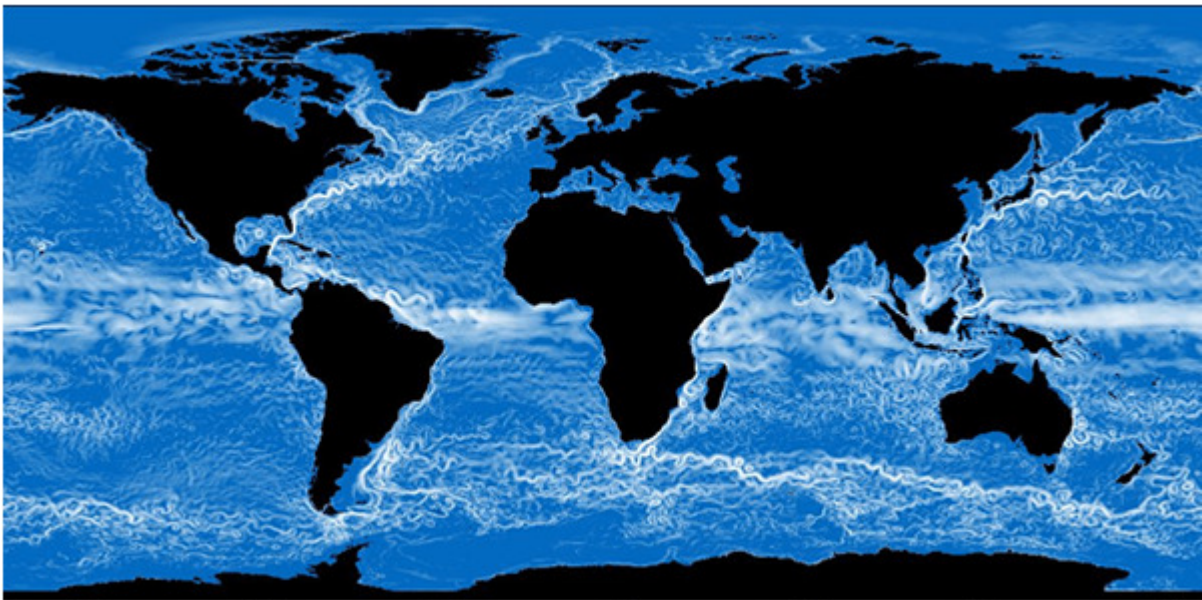


Figure 2: Snapshot of surface current, global ocean model showing the presence of mesoscale eddies. (http://www.gfdl.noaa.gov/ocean_mesoscale_eddies).

Re-Teaching Teachers

The first law of environmental education:
 An experience is worth 10,000 pictures.
 (N. McInnis, in Wood et al, 1993)

Despite repeated calls from international bodies such as UNESCO (1997;2002), as well as Ministries of Education, such as the BC Ministry of Education (1995/2007) to place the development of ecoliteracy as a curricular priority, there continues to be a lack of attention provided towards that goal, in particular opportunities for direct contact with the natural world in terms of fostering ecoliteracy in student teachers (Tuncer et al., 2009; Davis, 2009; Gough, 2009; Beckford, 2008; Blanchet-Cohen & Elliot, 2011). Teachers play key roles in advancing environmental education efforts and the environmental literacy of future generations according to the World Commission on the Environment and Development (1987). Insufficient teacher preparation has been identified as one factor in the weakness of environmental education efforts and environmental education curriculum (Knapp, 2000; UNESCO, 1997). Furthermore, adequate environmental education preparation of students in teacher education programs is essential for helping future teachers design and implement effective environmental education curriculum (Cutter-Mackenzie and Smith, 2003; Mc Keown-Ice, 2000; Spork, 1992)

According to Lin (2002), environmental education research in pre-service programmes has received little attention in Canada. Furthermore, she states that:

The number of Canadian teacher preparation institutions offering environmental education courses to pre-service teachers has remained generally low and the level of priority granted nominal (p. 199).

Young (1980) adds that student teachers' own epistemological views will effect their pedagogical practice. Therefore, as a pre-service teacher is given the opportunity to experience nature as a viable educational initiative and site of learning, they may deem that knowledge as important, important enough to perhaps include in their own classroom.

The rationale behind the Deakin-Griffith Environmental Education Project in Australia speaks of a greater need for teacher education which questions the root social causes of the eco-crisis. Dealing with the current eco-crisis “requires a wider response than the training of skilled environmental managers or the training of teachers in ecology and the interpretation of nature” (Greenall-Gough, 2003, vii). In other words, an approach to teaching nature which focuses on the collection of memorisable facts and disjointed content knowledge fails to meet the complexity of the required approaches to match the scale of the eco-crisis. Similarly, Payne and Wattachow (2009) critique “fast, techno, virtual, and abstract pedagogies in environmental education” for their lack of attention to “calls for immersive experiences, authentic learning, ecological literacy, and reimagining our relationships with nature” (p. 17).

In terms of my participants, Gradle and Bickel, (2010) suggest that a teacher is acting authentically when (s)he approaches curriculum with holism, developing and nurturing multiple perspectives, including recognition of the innate connection between humans and the larger cosmos. Therefore, in considering ecoliteracy, an authentic teacher is one who sees past the ‘abstract pedagogies’, moves beyond acting as simply ‘environmental manager’ to incorporate a plurality of perspectives and approaches to move towards “integration of knowledge, the crossing and combining of disciplines, and deeper complexities of thinking” (Miller, 2005, p. 3).

Finally in terms of looking ahead with purpose, Berry’s (1999) writing represents a way of re-connecting, and re-imagining our place within the natural world. In terms of answering the question, “so now what?” Berry suggests that what is needed is for humanity to start by writing itself back into a cosmological existence based on respect

with the natural world. For too long, we in the West have been reading and authoring other stories, stories which present humanity in the role of dominance and control over a mindless vast expanse of planetary resources, created for the sole purpose of serving our own political and economic interests. Those grand cultural narratives, and the metaphors and social institutions which serve to prop them up, have had powerful and equally as destructive impacts, and have led us to our current eco-crisis we are faced with today. Therefore, as a broader goal, on the level of a paradigmatic shift, Berry (1999) calls for a cultural re-positioning. He prescribes a conscious and creative process to take the form of re-writing our new Earth story, with the human-nature connection within educational institutions at the heart of it all.

In a special manner the universities have the contact with the younger generation needed to reorient the human community toward a greater awareness that the human exists, survives, and becomes whole only within the single great community of the planet Earth. The university would have the universe as its originating, validating, and unifying referent. Since the universe is an emergent reality the universe would be understood primarily through its story. Education at all levels would be understood as knowing the universe story and the human role in the story (p. 80-81).

Re-membering: I Was That Kid

The schools I went to didn't leave any room between their four walls for such folks as myself, 'dyslexic' they'd probably call it now, and maybe also 'attention deficit disorder' or some other dysfunctional label – 'cause they didn't recognize any value in the sort of delicious somatic empathy I inadvertently felt in relation to creatures and grasses and rock faces, and in general, every sensorial thing I met and pondered, which translated into a kind of slowness in regard to less tangible matters like logical theorems and abstract principles (Abram and Jardine, 2000, p. 174)

According to Clandinin & Connelly (2000), it is important to locate myself within my topic of inquiry, where an inquiry "characteristically begins with the researcher's

autobiographically oriented narrative associated with the research puzzle" (p.40). As they suggest, I am in the field, "a member of the landscape", in relationships with students, my main research participants (p.63). As an instructor, as a seminar leader, many of my participants answered my call to participate in my inquiry with prior experience of me as something other than researcher. Therefore, some of my participants came to my study already knowing much about my own personal perspective, my passion, and my story in regard to ecoliteracy.

In many ways my experience in the field of education mimics that of my participants. In many ways I am able to draw comparisons between my experience and my story with that of my participants.

Moments spent growing up in direct connection with the natural world represented life defining moments for me. Many of my clearest and fondest memories have to do with times spent being immersed in nature.

Early memories of school were mixed with pleasure and pain. The pleasure of being outside, even if it was just for a brief glimpse of a recess, enough to get one soaker, is mixed with reliving parent teacher interviews where my Mom would be brought to tears, as my teacher repeated the oft spoken "if only Chris would choose to apply himself, he has such potential". I found my daydreams staring out the classroom window at the large oak tree and its neighbourhood of storied inhabitants as much more appealing and instructional than what was being scraped onto the blackboard. I remember with vivid recollection the field trips which were few and far between. The pilgrimage to the sugar shack in winter, pouring hot syrup onto the fresh fallen snow, and the outdoor classroom at the nature centre where the activities and worksheets tried to keep us focussed on

learning, but where the real learning took place bushwhacking through the swamp, going ‘out of bounds’ and poking/climbing/touching/throwing/tasting and paying attention to the living world around me.

Through engaging this process of inquiry it becomes important to introduce myself, discuss my positionality, my bias, to share my own personal experience with education. Who I am as a White male of Irish and Hungarian heritage, 37 years old, husband, father of two, will impact how I research. Throughout this dissertation, my story will be woven in with the stories of my participants.

After high school, rather than follow the well worn path to university, I chose to take some time off from my studies and set off in hopes to ‘find myself’. Less than a month later I found myself perched on a rickety dock overlooking a red sandstone beach in North Rustico Harbour, Prince Edward Island. It was at that moment when I started work as an ocean kayak guide. The work I chose brought me in direct touch again with the beauty and majesty of the natural wilderness. And so began a newly stoked love affair with nature, which would turn into an all consuming passion toward a primal connection to something bigger than myself. For the next 5 years, I would guide trips in the Atlantic, followed by the Pacific Ocean, becoming witness to a world which I was never taught about, experiencing epiphanies, challenging my core assumptions about learning, knowing, and teaching. Chasing Minke whales up the ancient fjords of Southern Newfoundland, experiencing a once in a century desert bloom in an archipelago in the Sea of Cortez in the Baja, and navigating a foggy crossing to Nootka Island off Vancouver Island, all taught me about myself, transforming my perspective on what mattered to me in terms of teaching, learning and knowing.

Choosing to return to academia, I entered into teacher education with a hope of exploring my passion found on the shores of Cape Breton, dug up on the beaches of Barkely Sound. What I found however was an educational landscape which did not include nature within its four walls. I became disheartened, and rather than become a teacher, I chose at that point to pursue another direction. I chose to work for change through community education and graduate studies.

Dissuaded by a narrow quest for instrumental knowledge marked by a celebration of the positivistic, empirical and quantifiable, I chose to instead focus on ways to incorporate opportunities for change in that system. Having experienced first hand on a personal level the value of learning through direct experience with the natural world, I come to this dissertation with the broader goal of exploring possibilities of re-inserting nature into the curricular landscape.

Having two children of my own has only further solidified my resolve to explore ways that all children attending schools can be provided a solid foundation towards the development of their own ecoliteracy, including copious amounts of direct and extended time spent in natural settings, while learning from nature. Experiencing the Earth through direct contact will aid students to re-write themselves back into their own Earth story.

Re-Considering False Dichotomies: Towards (w)Holism

<p>The world is too much with us; late and soon, Getting and spending, we lay waste our powers; Little we see in Nature that is ours; We have given our hearts away, a sordid boon! (Wordsworth, 1952, p. 260)</p>
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The way of knowing associated with a modern scientific method is considered to be on many levels at odds with an organic, holistic, embodied, and emergent way of coming to know. However, creating a dichotomy of ‘us vs. them’, ‘nature vs. science’ is equally unhelpful (Greenwood, 2010; Miller, 2005). Rather, in the case of exploring notions of ecoliteracy, a topic which is steeped in complexities, pluralities and diversities while eschewing universal definitions, it is crucial to recognize the value in a diversity of perspectives (Capra, 1999). Placing value on one epistemological or ontological orientation to the exclusion of others is therefore considered antithetical to the topic.

Greenwood (2010) refers to these dichotomies as “paradoxes”. He speaks of “the tension of paradox” and provides examples: “local-global; urban-rural; environment-culture; masculine-feminine; native-settler; public-private; human-more-than-human” (p. 10). In his exploration of nature and empire, he suggests that it is important to “hold and balance”, to purposefully embrace the tension between “two poles on a continuum that shape the cultural and ecological contexts of life and learning” (p.10).

By recognizing the tension that exists between them, I am acknowledging that there is a place for each; a need for both in relation to each other, while advocating for more nature, and less empire. More than ever before, there is a need for more nature, as it has been empire that has enjoyed a monopoly, and it continues as “empire grows and nature recedes” (Greenwood, 2010, p. 13). Miller (2005) refers to connectedness in his description of holistic education,

Connectedness refers to moving away from a fragmented approach to curriculum toward an approach that attempts to facilitate connections at every level of learning. Some of these connections include integrating analytic and intuitive thinking, linking body and mind, integrating subjects, connecting to the community, providing links to the Earth, and connecting to soul and spirit (p.3).

He offers the example of yin/yang which seeks balance between the rational and the intuitive. In this case the rational is the instrumental, mechanistic system of education and the intuitive is the connection to the Earth as part of oneself, the primal, sacral way of knowing.

In terms of education this means recognizing these complimentary energies in the classroom. Generally our education has been dominated by yang energies such as a focus on rationality and individual competition, and has ignored yin energies such as fostering intuition (p. 2-3).

Miller (2005) goes on to state that “holistic education rests in the hearts and minds of the teachers and students” (p. 3). In this way I am arguing for a holistic notion of ecoliteracy.

The need to acknowledge the balance between seemingly competing approaches, or epistemological orientations, or ways of knowing, or worldviews while discouraging the creation of binaries is salient given the topic of ecoliteracy. Greenwood (2010) makes the connection between the ecocrisis and the promotion of one single way of knowing (empire) over another (nature). Miller (2005) refers to education as tending to “focus on the head to the exclusion of the rest of our being” (p. 3).

Scale: Self Similarity and the Student / Teacher

Throughout this dissertation when I refer to my participants as students, I am also recognizing the microcosmic effect of them being at one time ‘students of teaching’ and at the same time ‘teachers of students’ to be.

Davis, Sumara and Luce-Kapler (2008) refer to self-similarity as one characteristic of fractals. Patterns which can be seen to repeat themselves at different scales. This feature exists in natural phenomenon such as the branching patterns in veins

and leaves, the different scales of eddies, as well as the patterns of tributaries in watersheds. In terms of my inquiry into ecoliteracy and teacher education, that fractal attribution is represented by the self similarity of the different grades, from early learning, through grade school and up to post secondary education.

Therefore, when I advocate for a particular experience or approach towards teacher education programmes, it is equally as applicable to the students who will be in their classrooms, or students of all ages. Therefore I am not just speaking narrowly in terms of student teachers. What is relevant to the lived experiences of my participants as students will play out as relevant to their professional lives as well and as such will impact directly the lives of their students. At times through story and discussion I will pass back and forth between these layers of education in seamless fashion, as I consider them in many ways all self similar elements within the larger function of the student experience in education.

Re-Negotiating Terminology

I held a blue flower in my hand, probably a wild aster, wondering what its name was, and then thought that human names for natural things are superfluous. Nature herself does not name them. The important thing is to know this flower, look at its colour until the blueness becomes as real as a keynote of music. Look at the exquisite yellow flowerettes in the centre, become very small with them. Be the flower, be the trees, the blowing grasses. Fly with the birds, jump with squirrel.
(Carrighar, 1999, p. 117)

Since its formal beginnings in the 1970's following seminal moments such as the UN Conference on the Human Environment in Stockholm Sweden in 1972, and the UN Educational, Scientific, and Cultural Organization (UNESCO) meeting in Tbilisi Georgia in 1977, environmental education has gone by many names. Environmental educators still

have not come up with a single unifying, all encompassing definition that can adequately capture the complexity inherent within the concept of nature. Many environmental educators feel that perhaps seeking that single definition is not necessary, and furthermore not advisable (Abram, 1996). To define something is not itself an innocent act, and therefore not without consequences. In the case of ecoliteracy, the implications are connected to a complex relationship between science and nature. There exists a resistance to naming something that is, as nature appears, complex, rich, boundaryless, diverse, dynamic. The seemingly simple task of applying a label to a concept such as nature, or environment, or spirit, eliminates possibilities and in many ways destroys the very essence of the complexity of the concept itself. For example, Abram (1996) points to the “impoverishment of language” (p. 40), where the advent of the alphabet began a process of distancing the human from the non-human world.

In the case of my inquiry, as it pertains to the natural world, the naming of ecoliteracy becomes problematic for me. From one perspective, any attempt to define the complex world of outdoor environmental education with a universal signifier is the same as trying to define nature itself, an endeavour which according to Abram (1996) is a stepping stone towards a disenchantment with the more-than-human-world. This is also a perspective which embraces the unknown, and is at home in a milieu of ambiguity and uncertainty. In so far as applying a universal definition to nature is desired, my dissertation is informed by an appreciation for the mysterious, and an acceptance for the uncertain. Where value is given to one form of knowing, where the knower becomes separated from what is known, and where an objective nature of knowing is presented, I employ a preference for diversity, emergence, and temporality.

Ecoliteracy Re-defined

The term ecoliteracy itself mirrors the biodiversity found in nature as its complexities defy linguistic boundaries. While my goal, as mentioned previous, is not to seek a single, all-encompassing definition for ecoliteracy, I feel there is value in engaging in the discussion of the term, by exploring various approaches, perspectives, and assumptions applied to ecoliteracy and literacy in general.

Lankshear (1998), provides a conventional definition for literacy,

At the school level policy documents mainly frame basic literacy in terms of mastering the building blocks of code-breaking: knowing the alphabetic script visually and phonetically and grasping the mechanism of putting elements of the script together to encode or decode words, to separate words or to add them together to read and write sentences (p. 358).

In comparing ecoliteracy to a traditional concept of literacy, environmental educator David Orr (1992) suggests that “if literacy is driven by the search for knowledge, ecological literacy is driven by the sense of wonder, the sheer delight in being alive in a beautiful, mysterious, bountiful world” (p. 86). Therefore my interpretation of Orr’s description sees conventional literacy as driven by a search for head knowledge, whereby ecoliteracy is driven by a search for heart knowledge. While perhaps an overly simplistic look at literacy, not taking into account the possibilities for multiliteracy which exist in schools today, Orr’s description of ecoliteracy brings to life the connection between the student’s experience of the world and learning. While I am careful not to set up a dichotomy of head vs. heart, my position in terms of ecoliteracy is that there has been an overload of ‘information’ coupled with a paucity of attention paid

to the wonder, delight, beauty and mystery of the natural world from a curricular standpoint.

Orr (1992) also refers to Garrett Hardin's interpretation of ecoliteracy as residing in one very crucial question: "What then?" (p. 85). He states that if literacy is the ability to read, and numeracy the ability to count then ecoliteracy is the ability to ask the question "what then?" For example before the last fish stocks are gone, an appropriate question might be 'what then?' This questioning calls attention to the concept of time. In terms of a holistic approach towards ecoliteracy, time is perceived in cyclical terms, as opposed to a linear model.

Kahn (2007) criticizes conventional attempts to define ecoliteracy as having fallen short of multicultural and critical elements that are necessary to the creation of a meaningful and inclusive definition of the concept. He calls for a cultural critical ecoliteracy that:

involves the ability to articulate the myriad ways in which cultures and societies unfold and develop ideological political systems and social structures that tend either towards ecological sustainability and biodiversity or unsustainability and extinction...a critical ecoliteracy would mean (amongst other things) understanding: the historical roles that waves of colonialism and imperialism have had both socially and environmentally, the ways in which industrial capitalism (including modern science and technology) has worked ecologically and anti-ecologically on the planet both locally and globally, the manner in which an ideological image of "humanity" has served to functionally oppress all that has been deemed Other than human by interested parties, and the historical wrong through which ruling class culture and politics terrorizes planetary life whilst marginalizing, intimidating, confronting, jailing and sometimes even murdering socioecological freedom fighters. (p.31)

Steve Van Matre (1979) offers 'Earth Education', as a form of ecoliteracy which encourages connection to the bigger picture by seeing the individual as part of their

environment, and the environment as part of the individual. Earth Education “aims to help learners to build a sense of relationship – through both feeling and understanding - with the natural world and to interact more directly with the fascinating array of living things around them” (p.7). Furthermore, Earth Education espouses an outlook on nature, not as something to be solely revered, but instead something to be in love with, as part of yourself. According to Van Matre, there is need of a relationship between the feeling aspect (*heart*) and the understanding (*head*), rather than one vs. the other.

For Clover, Follen and Hall (2000) ecoliteracy is achievable through an ecopedagogy which takes on a distinctly ethical position.

[eco-pedagogy] is a concept and practice that recognizes and respects the vital function, beauty, rights and pedagogical importance of the natural world. [It] emphasizes the use of nature as teacher and site of learning about the natural world, communicating its right to exist in and for itself, and the place of human beings within it (p. 20).

An Orr-ian approach to ecoliteracy also takes into account where this type of knowing emerges from. It is not solely within the four walls of the science education laboratory, but rather involves the entire “life world” (Husserl, 1970, p. 32) of the student, and therefore recognizes the value and function of non-formal sites of learning and the importance of the community and family units in terms of development of ecoliteracy.

To provide for one simple concise definition for ecoliteracy, environmental education, outdoor education, Earth education, nature education, place-based education would be considered antithetical to my inquiry. Instead I will paint a picture of possibilities through participants words; describe how a plot of potential ingredients

better represents this complex concept while acknowledging the temporality and partiality of one single interpretation.

Nature- self

This is a term which arose out of a conversation between a member of my committee and myself around what represented a person's intrinsic tendency to connect with nature, and it captures the notion of a single component within a whole individual, which is more aligned with processes and chronology associated with the natural world, and is also becoming more and more neglected in terms of the development of a whole person, especially considering the current educational landscape. In this way, the concept of *nature-self* is tied to Gardner's (1999) notion of 'naturalist intelligence' as part of his theory of multiple intelligences. As Louv (2006) states, the 8th intelligence represents "the intelligence within nature, the lessons waiting to be delivered if anyone shows up" (p.78). Rather than perceiving nature to be something outside of the learner, in this case as part of nature, the student represents a vital part of that capacity to learn from the natural world, through our relationship with it.

Nature-self refers to that part of us as humans which is intimately connected with the processes of the planet, the seasons of the Earth, which at one time existed much closer to the surface, but now has been repressed by our current status as an empirically and technologically superior being, drunk with a sense of never-ending entitlement from a resource rich planet, afflicted by a sentiment of 'I can rise above the dark, cold and inconvenient matters of an Earthly existence', the modern Western mode has essentially paved over our natural selves, making room for a techno-rational existence.

The concept of *nature-self* in terms of students of all ages, including that of student teachers, involves paying attention, re-cognizing and getting re-acquainted with the pulses and rhythms of the planet. In a society bombarded with sensory stimuli of a very specific (and manmade) style, becoming immersed in a natural setting calls on a very different set of sensory skills in terms of being able to slow down, pay attention, and re-notice the world of non-human devices. Developing one's own nature-self involves the ability to recognize and define oneself in relation to an other, in this case the more-than-human-world. The more ecoliterate one becomes therefore, the more attuned one is with their nature-self.

Despite existing within an academic system which prefers naming, defining, and categorizing, I have resisted this wherever possible and appropriate (Scott, 2006). I have stubbornly attempted to hold on to that sense of congruence which forms the heart of a natural world left wild, undefined, uncategorized, in other words, left whole. In doing so, I am challenging the need (mine included) to name, to define and be certain. The value of dwelling in a place of uncertainty will be explored as a fertile space, one which requires deeper engagement, and in terms of this inquiry, a deeper awareness of an individual's nature-self.

I have reviewed pertinent literature in relation to ecoliteracy, its place within schools and teacher education with examples from Canada and beyond. I will explore how student teachers' ecoliteracy can influence their perspective on the system of education, including teacher education and their place within it as teacher-to-be.

Through the use of a methodological approach relying on elements of both narrative inquiry and phenomenology, I will explore the stories as told to me by my ten

student teacher participants, while interweaving my own story as researcher. Poetry, both my own and others' will help to unpack some of the bigger themed issues within. The meaning making nature of poems, the ability to see differently, to experience my findings through the use of poetic devices became pertinent to my own journey as researcher and educator. I will also explore the meaning of knowledge and multiple concepts of knowing as it relates to ecoliteracy, including a conversation on scientism as implicated in playing a role towards the continuation of the current ecocrisis. Exploring themes and insights which emerge from reading and re-reading interview and focus group transcripts reveals the lived experiences of ten student teachers in the form of personal narratives, who straddle the world of still-a-student, not-yet-a-teacher as they envision themselves in a school landscape which does not seem to have room for their nature-selves. In this fertile in-betweenness, there are possibilities for transformation which may provide insight towards re-integrating ecoliteracy for students of all ages.

I am calling for a re-newed consideration of the necessity for an integrated focus on the development of a holistic ecoliteracy at all levels of education, including teacher education. This focus will involve elements of transformative learning, creative and aesthetic representation, as well as valuing multiple cultural perspectives such as Aboriginal ways of knowing.

Note on Poetics

I am using poems, 'eco-poetics', in order to express the themes and issues discussed throughout. As they appear, all are boxed, separated from the rest of the text, some of the poems are of my own creation, and others come from other 'eco-poets' where I have given credit. The purpose of these poems is not intended as a description of

themes or an explication of content or of a particular problem or finding. My intent on including these poems is to allow them to stand on their own for what they are, what they say, what meaning they convey for the reader. Through the reader's own personal response to the poems, they become an opportunity to be changed, simply through the experience of reading and engaging with them.

Throughout my process of creating this dissertation, I have been surprised and moved by the ability of these poems to clarify and complicate at the same time. I see eco-poetics as the closest thing in written form to direct experience with the natural world, an element which forms the major theme of my study, namely the value of experiential outdoor education and its purpose within teacher education.

Three types of poems are included throughout, poems derived from participant transcripts, poems of my own creation, and poems which I re-discovered in *The Earth Speaks: An Acclimatization Journal*, (1999) edited by Steve Van Matre and Bill Weiler. As I engaged in a process of reading and re-reading my interview and focus group transcripts, I found myself returning again and again to the journal for inspiration, clarification, and new direction. According to Van Matre (1999), "the journal is a tool for reawakening that sense of wonder we all had as youngsters, that sense of awe in the presence of the mysteries of life" (p. 1). For the purposes of my inquiry, I relied heavily on the eco-poetics found within the pages of the journal to stimulate my own insights into my writing, as well as to re-connect and re-imagine my own experiences growing up as a child close to nature.

'Re' - Prefix to the Past

A note on the frequent use of 're-' as prefix throughout my inquiry. I feel that much of our relationships, the interconnectedness, the wisdom, the primal and sacral knowings that we have largely become separated from in a modern Western context, have played a larger role in previous times in our history (Abram, 1996; Oelschlager, 1993; Jardine, 1990). Therefore in order to represent that concept, throughout this inquiry, I will make use of the 're'- prefix to indicate this, as in re-new, to re-member, to re-notice. For me, this element represents a lost function, and therefore I am advocating for a return to those sacred, primal and ancient knowings. As O'Sullivan (2001) suggests what has become obvious now is our cultural 'disenchantment' with the natural world, which sets up the need for a conscious re-enchantment:

The disenchantment with nature, at a most fundamental level, means denying that nature has any aspects of subjectivity, feeling and experience. Nature is fundamentally an 'object' not a 'subject'. Thus nature when addressed by the human is referred to as an 'it' rather than a 'thou'. The awe and reverence towards nature, so prevalent in pre-modern worldviews, is totally absent in the modern world. With nature as object rather than participating subject, we have a sense of alienation that was not seen in pre-modern cultures (p. 93).

When we speak of a re-enchantment of the natural world, we are stretching ourselves to a new cosmological vision of the world. this is a world in which we can feel at home in the universe...which includes *re*-inserting humanity and life as a whole back into nature, and regarding our fellow creatures not merely as a means but as ends in themselves (p. 66).

CHAPTER 2 LITERATURE RE-VIEW: RE-READ WHAT'S BEEN RE-WRITTEN

Introduction

My review of the relevant literature begins with a recognition of the embeddedness of education within a broader sociocultural paradigm. Potent underlying root metaphors are integral to a social order defined by dominance, control and the ultimate human power over an environment consisting of 'mere mindless matter'. As Suzuki (2003) states: "the way we see the world, shapes the way we treat it" (p. 11). Following is a review of the role that education as a sociocultural institution plays in terms of a modern western paradigm. Following that, teacher education, as a subset of the broader educational system is described for its unique capacity to increase opportunities for ecoliteracy in all levels of schooling. The importance of 'green time' for students is considered next as an important and mitigating factor in a move towards more nature based experiential education at all levels of schooling. A discussion of other factors such as the potential influence of an untenable relationship with science and the implications of language will also be included. I discuss considerations for including ways of knowing and learning which account for a human-nature connection, namely experiential elements, and ultimately the emergence of *heart knowledge* as an approach to teaching and learning which promotes connection and caring. The review of relevant literature ends with an exploration of the debate, both historical and ongoing in terms of research into environmental education from a Canadian perspective.

Of Cultural Blackouts, (*dis*)Connections and the (re)Search For a Back Up Planet

A discussion which centres around teacher education and ecoliteracy cannot exist in isolation without contextualizing within the broader socio-cultural climate, defined by a widening and alarming disconnect between humans and the natural world. Therefore, I cannot explore teacher education in terms of its approach to teaching nature without exploring the broader human-nature disconnect that underlies it. Education exists as but one institution among many which constitute our modern Western socio-cultural paradigm. Charged with perpetuating cultural norms, this larger hegemony is credited with cultivating the milieu from which the current eco-crisis has taken shape and spread. A worldview which values empiricism, positivism, anthropocentrism, reductionism, instrumentalism, scientism and mechanistic rationality does so at the expense of other ways of knowing and being, and possibly of our own survival as a species (Berry, 1999; Suzuki, 2003; Orr, 1994).

As Bell & Russell (2000) note, numerous scholars and environmentalists have argued that the symptoms of our current eco-crisis (e.g., species extinction, toxic contamination, ozone depletion, topsoil depletion, climate change, acid rain, deforestation...etc.) “reflect predominant Western concepts of nature, nature cast as mindless matter, a mere resource to be exploited for human gain” (p. 190) (see also Berman, 1981; Evernden, 1985; Merchant, 1980). The separation of the human mode from the ‘more-than-human-world’ (Abram, 1996) combined with an attitude of dominance and mastery over the Earth fuelled by faith in the deity of science and technology has contributed to our current planet-wide predicament.

This eco-crisis is also a crisis of knowledge, highlighted by a fervent distrust of knowledge gleaned from sources which are considered more embodied, sensorial, tacit, and intuitive than the rational, analytical and instrumental preference of a modern Western knowledge. Current reliance on a limited, narrow and short term perspective on what forms of knowledge are deemed worthy has resulted in a viral case of cultural amnesia, a tragic loss of communal memory, amounting to essentially a cultural forgetting of a part of our own selves, our *nature-selves*. According to Sandlos (1998) this worldview is built upon “ecologically destructive antistories of the modern era” (p. 7). He states that we have essentially become aliens on our own planet:

Contemporary Western society has adopted a Cartesian consciousness that has abruptly severed the mind from the body and the body from the natural world. We no longer have a sense of what Neil Evernden (1985) called fields of self, an extension of the “I” concept beyond the boundary of the skin toward an inclusion of the broader eco-mental environment. The placeless western human is, in the most profound sense, a ‘natural alien’ (p. 6).

Existing within this paradigm of *dislocation*, humans have become separated from their natural selves, autistic to the sounds, smells, touches and sights of their own natural environment. As Swimme and Berry (1992) suggest, this disconnect is not without consequences, and the realization that despite humanity’s best efforts, it is impossible to fully escape our inherent and intimate connection with the natural world around us.

That these centuries of ‘progress’ should now be ending in increasing stress for the human is a final evidence that what humans do to the outer world they do to their own interior world. As the natural world recedes in its diversity and abundance, so the human finds itself impoverished in its economic resources, in its imaginative powers, in its human sensitivities, and in significant aspects of its intellectual intuitions (p. 242).

Swimme and Berry (1992) state that our current divorce from a life lived in relation with the processes of the natural world has resulted in consequences not only for

the individual, the family and the community, but also for education as an intellectual institution and teaching as a cultural endeavour. A curriculum stripped of meaning, where a simple walk in the woods becomes a revolutionary act, and where quantitative abstract measurements of student (school/District) success has overshadowed the very real, and very inherent connection between the student and the natural world around them.

Max Oelschlaeger (1993) describes a literal and physical symptomology which is the result of a migration away from a time when the roots of our limbs used to extend with purpose into the living soil beneath our feet.

The modern ego swollen with pride in our cultural achievement. We cannot see the heavens wheeling overhead in their cosmic course, our city lights and smog have rendered them indistinct. And from inside our human-made habitats we cannot feel the winds and rain, smell the flowers and animal herds, or hear the running water and singing birds. Yet we remain, in spite of the myths of modernity that blind us to primordial insights into the mystery of existence, the human animal, bound with the cosmic flux. (p. 333)

Quite literally, our own universe has become unfamiliar territory, unrecognizable for the over 80% of the population who live in cities according to the 2006 Canadian census. As Chepesiuk (2009) explains “when a 1994 earthquake knocked out the power in Los Angeles, many anxious residents called local emergency centers to report seeing a strange ‘giant silvery cloud’ in the dark sky. What they were really seeing – for the first time – was the Milky Way, long obliterated by the urban sky glow” (p. 21).

In similar fashion I can recall living in Toronto in 2003, on an inconspicuous Thursday evening in August, returning home from school on the subway, when the largest blackout in North American history occurred knocking out power to nearly 50 million homes on the Eastern seaboard of the US and in Canada for over 12 hours. I have vivid memories of walking home, content to make my way slowly along the streets

bustling with people, neighbours unified by the shared experience thrust upon them. Everyone was connected that night, not only to each other, but to the natural world which had turned the tides on us, and taken over the night with a lightshow of its own. Through my roughly fifty blocks of night walking I can't remember how many times I overheard comments of awe and amazement from people with their heads tilted back, staring at the starry sky, seen by some for the first time ever in all its unhindered glory. What was once a nightly sight, was now such a rare occurrence, and it made me ponder the irony that if the populous of eastern Canada hadn't all turned on their air conditioners at the same time, in a vain attempt at 'conditioning' the air inside their homes to combat the humid outdoor summer temperature; had it not been for technology failing us in our moment of need, that opportunity to witness a truth of a starry sky might have never happened.

Johnston (2009) points to the Global Environment Outlook (GEO-4), as part of the 2007 United Nations Environment Programme [UNEP], diagnosis that current research has shown that a lethal combination of climate change, ecosystem degradation, and loss of biodiversity are a threat to the very survival of humanity and most other species on Earth. "The need couldn't be more urgent and the time couldn't be more opportune, with our enhanced understanding of the challenges we face, to act now to safeguard our own survival and that of future generations" (p. 493). Suzuki (2003) points to a UN Environment Program report which predicts that almost one-quarter of all mammalian species will face extinction in 30 years.

According to Wackernagel and Rees (1995) and their work in *Our Ecological Footprint*, if all the world were to live as we do in Canada, we would need an extra three

planets to maintain the current levels we have achieved in terms of energy required to sustain our way of life. Orr (1992) suggests that a lack of appreciation and value placed on the natural world, and humanity's relationship with it, is a reflection of a world that has been created which inhibits that relationship from flourishing. "[T]o a great extent we are a displaced people for whom our immediate places are no longer sources of food, water, livelihood, energy, materials, friends, recreation, or sacred inspiration (p. 264).

From an Earth systems or biospheric perspective, modern western *de*-civilization is proving to be an unviable project. From a perspective which sees the human mode, or more specifically the Western developed world mode, as living with some sense of integrity within a wider Earth community, our current path is unrealistic, unsustainable and to the three quarters of the rest of human population, unjust.

The worldview which considers humans as separate from 'the environment', one which is driven by the wishes of a consumerist path to gluttony has led to a state of planetary distress to such an absurd degree that discussions about contingency planning, 'what if' scenarios aimed at preparing humans for the inevitable collapse of our biosphere and the preparation of back up planets, have become a reality if not prophesized with some sense of urgency. "We have not only controlled the planet in much of its basic functioning, we have, to an extensive degree, extinguished the life systems themselves" (Berry, 1999, p.17).

At the root of this agenda of control is an anthropocentric approach towards nature; an instrumental consideration of the environment as consisting of natural *resources*; and a mechanistic view of the natural world existing as mere inanimate matter. Separate from the rest of nature, Western society has become bent on exploitation, and

the *senseless* domination of the other, while at the same time becoming accomplices in the current eco-cide. As Berry (1999) suggests, our “wonderland” myth is flawed due in part to an incompatibility at a very base level, our need to feed the industrial machine has created “a technosphere incompatible with the biosphere” (p. 167).

To discuss environmental discourses is ultimately to examine all discourses of power including those with political, economic, and socio-cultural roots such as environmental sustainability and the human-nature connection that underlies, quite literally, everything. The ‘environment’ overarches all things because without it there would be nothing. Palmer (1998) provides a dizzying example of how intricately the eco-crisis has been woven into all other areas of human existence.

[R]apid population growth is usually accompanied by serious environmental degradation, including soil erosion, desertification and deforestation; deforestation causes soil erosion, increased flooding, drought and the displacement of whole societies and cultures; the main causes of current and projected lack of availability of adequate amounts of fresh water include poor management, linked to lack of adequate conservation, inadequately treated sewage and industrial waste, loss of natural water catchment areas, deforestation, etc., and pollution, linked to poor agricultural practices which release pesticides and other harmful chemicals into groundwater; air pollution from the increased use of fossil fuels is harming human health, causing acid rain, which in turn damages whole ecosystems and increases the build-up of atmospheric carbon dioxide and the likelihood of global warming and climate instability (p. 56).

In a discussion of the potential pitfalls involved in (de)politicizing environmental education in her classroom, Cheryl Lousley (1999) reminds us of the importance of paying close attention to the way we match solutions to problems in terms of scale. “Environmental problems tend to be some of the most complex social issues of our time, with myriad social, ecological, economic, and political dimensions, yet consistently students frame their solutions to these problems in the simple, easy terms of 'logic' and

'habit" (p. 299). According to Lousley, potential solutions to the eco-crisis based solely on technological innovation (i.e. quick techno-fixes) are being applied to a complex social issue. This approach, according to Lousley is as appropriate and effective as a band aid on a heart attack. Steen (2003) sees responses to such complex issues which assume that all is needed is simply to "iron out the kinks" (p.192) as misguided.

Similarly, Goodman (2003) reminds us that environmentalism exists within the boundaries of modernism, and that modernism is truly a "global world order" where "the elements of the world problematique are not separate, and the fundamental problem is the cultural and spiritual crisis of the First World" (p. 61). Therefore, in order to tackle some of the challenges which are at the heart of developing a sense of ecoliteracy in education, the connection between other manifestations of modernism is necessary and important. Underlying all else is the issue of the health of the planet and the relationships among its inhabitants. According to Orr (1992) the eco-crisis "is not only a permanent feature on the public agenda, for all practical purposes it is the agenda" (p. 83).

There is a call to move towards a new way of being, a way which will determine success through degrees of harmony rather than acts of hegemony. Edmund O'Sullivan (1999) suggests that "all human institutions, programs, and activities must now be judged primarily by the extent to which they inhibit, ignore or foster a mutually enhancing human-Earth relationship" (p.43).

Barab et al. (1999) also point to the omnipotence of the issues of sustainability and environmentalism. While different views of these issues are possible, they are continuously and simultaneously negotiated and moulded through political struggle and

by agents of cultural production such as the media, the government, and its institutions including schools (Lousley, 1999).

Environmental *Miseducation*: From I Know to I Care

Mainstream education is often more part of the problem rather than the cure. Education in the modern world was designed to further the conquest of nature and the industrialization of the planet. It tended to produce people tailored to fit the modern economy. Since conventional educational institutions were tailored to meet the needs of our consumer industrial society, it should not be surprising to anyone that the present direction of our societies aligns itself with programmes that inhibit human-Earth relationships.

(Clover et al.,2000, p.19)

Puk (2003) asserts the importance of education in terms of making a difference in “the health of the ecosphere” which he states ‘is not just dependent upon the ‘experts’ and technological solutions” but instead will require “the participation and knowledge level of a critical mass of people, that is, on the ecological literacy acquired through public education” (p. 218).

Education as a social institution, functioning under the auspices of a modern western worldview, one which propagates an approach towards human-non-human relationships as punctuated by a Cartesian dualist and positivistic worldview, plays a role in reproducing and perpetuating the hegemonic myths of human superiority, empirical certainty and universal truth acquired primarily through the scientific method, as well as the valuation of the scientific method as sole producer of the only knowledge worth knowing.

Existing within this worldview, modern Western education represents the current status of human-nature disconnect, blurring the line between our nature-self and our

conscious existence within a state of plastic capitalist convenience. Foster (2002) points to the global “treadmill of production” which makes up the heart of our current cultural philosophy, as problematic. He divides the treadmill into six elements, one of which is education. He states that “the dominant means of communication and education are part of the treadmill serving to reinforce its priorities and values” (p. 45).

There exists great potential for education as a broader social program to begin to mend the fissure which divides students from their nature-selves. Acting as the catalyst toward change also comes with great responsibility to become part of the cure rather than an accomplice to the problem. With its latent power to engage participants and captivate the imagination of students of all ages, education may hold the key toward rewriting a new Earth story (Berry, 1999), at least in the hallways and back fields of schools all across the country and beyond. Schools, as primary sites of cultural transmission, are poignantly situated in their importance, accessible in their opportunity, and omnipotent in their prevalence.

This thought has historical significance, as Rousseau, Plato, Dewey “considered education to be the primary way of achieving a meaningful relationship between man [sic] and the world” (Scudder and Mickunas, 1985, p.2). Unfortunately as Smith (1992) states, nature in schools today is most commonly approached through second hand experiences:

Nearly all school instruction occurs in classrooms cut off from the natural environment. Within four walls, the world is generally studied at a distance, from books or behind glass, or from the images of films and videotapes. The contact with the earth, animals, plants, and weather that would have been the stuff of the education of children in pre-modern societies is mediated in contemporary schools (p. 61).

McLaren (1989) points to critical pedagogy as a way to uncover some of the hidden agendas which underlie curriculum as taught. Critical pedagogy aims to shed light on the otherwise hidden curriculum which continues undetected within schools. As opposed to mainstream educational theories, critical pedagogy considers the school as a terrain of cultural struggle, “function[ing] simultaneously as a means of empowering students around issues of social justice and as a means of sustaining, legitimizing, and reproducing dominant class interests” (McLaren, 1989, p.167). The task of critical pedagogy is largely archaeological, uncovering “how and why knowledge gets constructed the way it does, and how and why some constructions of reality are legitimated and celebrated by the dominant culture while others clearly are not” (McLaren, 1989, p. 169).

More than ever before, students embedded within this techno-scientific, rational institution need to be re-introduced to their nature-selves; re-connected with the mysteries, magic and wisdom of the Earth; they need to re-activate what Swimme (1990) refers to as the “atrophied areas of human sentience” (p. 21). As Orr (1992) states there is a need for education that is “life-centered” and will work to “heal, connect, liberate, empower, create, and celebrate” (p. x). We need to work against the biophobic tendencies upon which the Western system of education is firmly rooted (Cajete, 1999). However, as Orr (1992) asserts

The crisis of sustainability, the fit between humanity and its habitat, cannot be solved by the same kind of education that helped create the problems.

Orr (1994) critique’s the school building itself as a site of ecological learning, echoing Clover et al’s (2000) suggestion that given what we know of how schools

operate that we should not be surprised at the impacts on students as ecologically illiterate,

Today's student is largely shut off from the natural world, sealed in a cocoon of steel, glass, and concrete, enveloped in a fog of mind-debilitating electronic pulsations...the results – apathy, moral and physical anemia – should surprise no one (p.134).

Pike and Selby (1988) list the features of a mechanistic view of education in terms of an understanding of the world which succeeds in setting scene, creating an atmosphere which does not only make it possible, but celebrates the dislocation of student from their nature-self:

- The whole is the sum of its parts
- Phenomena and events are viewed in isolation.
- The observer is separate from what she observes. Complete objectivity is achievable, especially as the observer can isolate facts from values.
- Rational knowledge and cerebral thinking are separate from and superior to the emotional, the intuitive, the spiritual.
- [There is] a preference for analysis, reduction (understanding phenomena by reducing them to their separate parts).
- Problems are seen in linear problem/solution and cause/effect terms. A 'technical fix' is possible.
- Knowledge is divided into separate subjects/disciplines and into separate modes of experience (economic, environmental, political, social, etc.).
- Humans are distinct from the natural world and natural systems; they can control and dominate both
- The fragmented nature of reality – and our own physiology and psychology– vocationally requires the knowledge and skills of experts upon whom we can rely.

Figure 3. Mechanistic view of education (Pike and Selby (1988, p.29)

While Pike and Selby (1988) provided this list over twenty years ago, I would argue that most if not all of these criteria are just as relevant today as they were then. Largely unquestioned, these features are at odds with an ecoliteracy which considers

the interconnection and interdependency amongst all living creatures as vital, where humans act as an integral part of a whole, while recognizing that there are multiple ways of coming to valued knowledge.

A Re-situation: Toward Holism as a Matter of Metaphor

<p><i>The Answer</i> The greatest beauty is organic wholeness, The wholeness of life and things, The divine beauty of the universe. Love that, not man apart from that. -Jefers, 1999, p.136</p>
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Snively (1989) considers the need to implement an element of holism within education as paramount. A holistic approach which embraces a multitude ways of knowing as well as multiple truths worth knowing. The way education is approached relying on Pike and Selby's (1988) criteria, a way which involves needless dissection, quantification, reductionism and categorization severely limits the ability to approach ecoliteracy on a holistic basis, as "we destroy or curtail certain possibilities of seeing, apprehending, and experiencing" (p. 4). In turn, we treat things in nature as separate elements, neglecting to see the interconnections between them.

According to Orr (1994), the lack of holism in education has had its impacts:

We have fragmented the world into bits and pieces called disciplines and sub-disciplines, heretically sealed from other such disciplines. As a result, after 12 or 16 or 20 years of education, most students graduate without any broad, integrated sense of the unity of things. The consequences for their personhood and for the planet are large (p. 11).

In answering the question of how best to approach the environment as a topic in schools, Steen (2003) suggests that a holistic approach which pays attention to both a conceptual understanding of the environment, but also the flourishing of an intrinsic

motivation to take care of it is needed. In his *Critique of Schooling from an Ecological Perspective*, Steen (2003) considers the incompatibility between tenets of a mechanistic mode of schooling armed with “themes of reduction, separation, atomism, and domination” with a more holistic representation which embodies elements of “networks, systems, flows, relationships, wholeness and synergy” (p. 194).

As Sanders (1999) states, “an ecological intelligence is a sense of impossibility of acting or living alone or solely in our own behalf” (p.89). Therefore, ecoliteracy from Sanders’ perspective would necessarily involve a holism which lies at the heart of every decision, every lesson, and every call for change. The inescapable interrelation of all beings, human and non-human, would become a priority.

Steen (2003) criticizes education’s “spirit of mechanism” which manifests in the form of “elements of reductionism, separation, and specialization...permeates them entirely...witnessed at every level of their operation” (p. 193). He refers to the modern Western school as “a bastion of mechanism” (p. 193) and suggests there is a “discord” between the dominant model of schooling and a more holistic possibility as achieved through ecoliteracy. Taking aim at the very foundational elements of school he states that:

[n]ot in the least bit surprisingly, as a result they perpetuate mechanistic thinking or a mechanistic worldview. Our fanatical though perhaps unconscious devotion to mechanism in how we school makes nearly impossible the adoption of any ecological thought (p. 193).

Similar to Pike and Selby’s list from 1988, Steen provides his own list of criticisms, elements which he sees as the most basic, taken-for-granted assumptions, as working in direct opposition to the development of a holistic, embodied and engaged student learning experience:

- Compulsory assembly in a building called ‘a school’. “The general requirement for a separate building called a school...is so basic that it may be frequently overlooked...If people are being educated in a school, then they are not, at least during that time, being educated elsewhere. Students are being ‘separated out’ from other environments... this necessarily has to limit their opportunity to directly experience the world beyond the school, and to learn from this experience”.
- One adult, one (certified) teacher is placed “in charge” of a group of students. This relationship is further reduced by subject area, and broken down into separate learning rooms within the school itself. Students work for discrete periods of time (40-60 mins) each devoted to a separate subject. “at root here is the construction of a curriculum, or the division of a curriculum into a course list that would sound familiar to all of us, but that seems highly artificial when compared to...the life that it expects to prepare students for.
- Students are separated out in “manageable class allotments”, and further segregated by abstract age categories for a distinct time period of between 4-6 hours per day. This time is devoted to “formal or official learning, the other 18-20 hours come to be understood to be time when learning does not, or need not, occur”.
- Students’ learning materials and specialized equipment further distance students from outside-of-school experiences. “Again we see the hegemony of certain forms of knowledge – if something is written down or recorded or explored in objective or empirical fashion it is of greater worth than, say, an imagined or felt or lived experience which, it is implied, is not to be trusted”.
- The learning is determined by a standard curriculum, set by a central authority which governs individual schools and which “all are expected to cover in an age graded fashion”.
- Standard forms of external assessments which allow students to ‘pass’ particular ‘grades’ or ‘levels’. “this point speaks to the empirical or objectivist evaluation of student learning. Have students learned the pieces of information that they are required to ‘know’?”. While ensuring conformity, it may provide students with the false sense of having ‘completed’ their education upon graduation.

Figure 4. Steen (2003) Bastion of Mechanism (p. 194-199)

Payne and Wattchow (2009) call for a turn to “ecocentric intercorporeality” as they criticize conventional forms of outdoor environmental education for being overly rational and focused on the wrong elements.

[ecoliteracy] often seems to be trapped in a cultural logic of skilled activities and safe performance in the outdoors, where the depth of

learning is too often assumed to correlate with the greater amount of distance traveled and elevation gained...the organic primitiveness of the body and its biological, circadian, and cosmological times of existence and experience are subordinated to a socially constructed, instrumentally quantified, and commodified notion and practice of Euclidean space (p. 16).

Capra (1999) connects the holistic approach in education to that within natural systems themselves. His approach sees the environment as made up of interconnected ecosystems which work to sustain a web of life. Capra's description includes holistic thinking where "the diversity and cooperation among its members is the source of the community's resilience" (p.1). In this way, Capra (1999) promotes "a shift from objects to relationships" (p.4).

Similarly, Davis, Sumara and Luce-Kapler (2008) state that education in today's climate needs to be focussing on a "re-unification" between humans and their nature-selves. Formal education in the Western world was originally focused exclusively on the type of knowledge which was concerned with reunifying humans, "humans were once part of a grand, unified whole, but have somehow become separated from that unity. Hence, the core issue in matters of learning and teaching is a recovery of a lost unity or wholeness." (p. 162). The authors go on to suggest that what is needed is to replace education which propagates "the rhetoric of domination, mastery, ownership, and management – that is, vocabulary that places humanity apart from and superior to other aspects of the world" with "sensibilities that are more tentative, participatory, embedded, embodied and entangled" (p. 213).

Orr (1992) echoes these sentiments when he suggests that "we may infer from the mismanagement of the environment throughout the century that most emerged from their association with these various educational institutions as ecological illiterates, with little

knowledge of how their subsequent actions would disrupt the Earth” (p. x). Therefore, the ecological crisis, as Orr states, represents a failure of education. The very foundational principles of schools are questioned, and any change must reflect a shift in those underlying root metaphors. Orr (1994) puts it in the most simplest of terms, “First, all education is environmental education” (p.12).

Strikingly similar is the following statement by Whitehead (1929) from close to 90 years ago:

There is only one subject-matter for education, and that is Life in all its manifestations. Instead of this single unity, we offer children – Algebra, from which nothing follows; History, from which nothing follows; a couple of languages, never mastered...can such a list be said to represent Life, as it is known in the midst of the living of it? The best that can be said of it is, that it’s a rapid table of contents which a deity might run over in his mind while he was thinking of creating a world, and has not yet determined how to put it together (p. 18).

Pointing to an image of the ‘basics’ which is both unviable and misdirected, Jardine (2003) provides his own list of what could be meant by ‘back to the basics’. He contrasts his vision with a picture made up of “images of breaking things down, fragmentation, isolation, and the consequent dispensing...of the smallest, simplest and most meaningless bits” (p. xiii).

What would happen if we took seriously the critiques of ‘breakdown’ that come from ecology and took to *heart* from these critiques different possibilities for re-imagining the basics? Imagine if we treated these things as the basics of teaching and learning: relation, ancestry, commitment, participation, interdependence, belonging, desire, conversation, memory, place, topography, tradition, inheritance, experience, identity, difference, renewal, generativity, intergenerationality, discipline, care, strengthening, attention, devotion, transformation, character” (p. xiii).

Recognizing that schools do not act in a vacuum and that the same mechanistic structures and valuations of empirical and positivistic elements exist outside the four

walls of the classroom, the question remains ‘what are schools doing about it?’ How can schools function to “challenge the formation of such a worldview?” (Steen, 2003, p. 199). Or can they? Steen (2003) goes on to ask whether schools, existing within the current frame of mechanism and fragmentation are “even capable of producing students with an alternative, in this case holistic or ecological worldview?” (p. 199).

No matter which way Steen’s question is answered, including the potential for an incompatibility of ecoliteracy under the current educational circumstances, it is nonetheless important to ask the question in the first place. As Jardine (1990) states that “we in education may be especially responsible for the questions we don’t ask” (p.114).

Teacher Education: Breaking the Cycle

As existing within the broader landscape of education, teacher education programmes represent a point of entry where goals of ecoliteracy can be approached and have the potential to impact the life world of students and their connection to their own nature-selves on an exponential scale.

Environmental education and the development of ecoliteracy receives little attention in the majority of teacher education programmes in Canada (McKeown – Ice , 2000; Lin, 2000). According to Puk (2003) there needs to be more emphasis placed on environmental education in teacher education programmes

Thus a systematic model for pre-service and in-service training must exist in order to thoroughly prepare teachers. Teachers need a solid foundation so that they do not become dependent upon activity-guides. Some degree of ecological literacy would be compulsory for all new teachers as well as discrete programs for specialist (i.e. by maintaining /creating a teachable) (p. 229-230).

Focussing on teacher education is an attempt to enter the cycle of knowledge production and ideological propagation and dissemination at the point of the pre-practicing teacher. The pre-service teacher represents a fertile in-between space where the metamorphosis from student to teacher takes shape. It is an attempt to break the pattern of neglect when it comes to developing skills of holistic ecoliteracy, opportunities for experiential outdoor environmental learning and the flourishing of the student's concept of nature-self. In short, it is an overt attempt at placing importance on the human-Earth connection through the evolution of a profession of ecoliterate teachers.

Teachers are the front line negotiators between students, curriculum and knowledge. Teachers act as the conduit between provincially regulated standards of education, prescribed learning outcomes and the lives of students themselves. The responsibility therefore rests on the shoulders of teachers to try to navigate the line between mandated curricular requirements in terms of Integrated Resource Packages (IRP's) and Prescribed Learning Outcomes (PLO's) and to take up the challenge of ecoliteracy, a conscious decision towards re-enchanting the curriculum with opportunities for direct experience in the outdoors, towards the flourishing of ecoliterate students.

Student teachers, who enter their teacher education programme with a multitude of degrees of ecoliteracy, may benefit from opportunities in the outdoors in order to begin to cultivate a relationship with the land, explore their own nature-self in relation to the Earth as part of themselves, and discover the potential of the outdoors as a site of teaching and learning. Experiences in learning how to teach in, about and for nature may help a student teacher acquire skills, confidence and practical know how, and ultimately to begin to see themselves as part of the bigger picture of nature, to see nature as part of

themselves (i.e. become reacquainted with their nature-self). If a student teacher is taught how to navigate the complex and rich world of outdoor environmental education they are more likely to incorporate it into their own practice (Young, 1980). On the other hand, if nature is omitted from the curricular landscape, that omission may result in student teachers who graduate without the necessary skills, knowledge and appreciation for nature as teacher, and potential as a site of learning. As Davis, Sumara and Luce-Kapler (2008) state “to be inventive in their pedagogies, teachers must be skilled with the forms that they intend to use”. There is much skill associated with outdoor environmental education, one which must be learned (or re-learned as the case may be). When nature is left out of the teacher education curriculum, the impact on students at all levels is felt.

Capra (2005) sees the first step in achieving environmentally sustainable communities as becoming ecoliterate. He sees ecoliteracy as an important skill in all professions, but most important at all levels of education, from primary grades to university including the re-training of professionals.

Similarly, the British Columbia Sustainability Education Network places education for sustainable development firmly within an ethical and moral landscape:

Education for sustainable development is fundamentally about values, with respect at the centre: respect for others, including those of present and future generations, for difference and diversity, for the environment, and for the resources of the planet we inhabit...Education enables us to understand ourselves and others and our links with the wider natural and social environment, and this understanding serves as a durable basis for building respect. Along with a sense of justice, responsibility, exploration and dialogue, education for sustainable development aims to move us to adopting behaviours and practices which enable all to live a full life without being deprived of basics.

(http://www.walkingthetalk.bc.ca/about/background_and_context)

According to Davis, Sumara and Luce-Kapler (2008), the way a “learning system” reacts and adapts to a new situation is rooted in its “biological and experiential structure – its embodied history” (p. 81). Therefore, considering the embodied history of the student teacher in relation to his or her experiences, it becomes important to include direct experience in nature within teacher education.

A Complex Puzzle

Teacher education as a whole exists in a heavily politicized environment, much more so than most other professions (Crocker & Dibbon, 2008). Standards for accreditation, licensing and certification rest in the hands of political bodies rather than the profession itself, and there is no universal approach to the governance of teacher education programmes across Canada (Darling-Hammond, Pacheco, Michelli, LePage, Hammerness & Youngs, 2005). This lack of consistency has resulted in difficulty for teacher education. As Tom (1997) observed, “the snail’s pace of change in teacher education is due in part to the numerous stakeholders involved in the formal and informal governance of teacher education....In many ways everyone is in charge of teacher education, yet nobody is” (p.7). Crocker & Dibbon (2008) outline a variety of criticisms laid against teacher education, namely the inconsistency of standards, a fragmented and overly theoretical curriculum, and faculties disconnected from schools and community. They suggest that recent research has pointed to those mitigating factors as resulting in graduates from teacher education programmes who are ill prepared for the complexity of schools, and lack the skills necessary to experience success as a teacher.

Young, Hall, & Clarke (2007) state that up until the 1980’s certification of teachers was closely aligned with university credentials, however, since then there has

been a shift which has resulted in tension and struggle between the stakeholders in teacher education and certification,

Since the 1980s many countries have witnessed a substantial effort to define that professional knowledge base and to formulate it into a set of competencies or standards of practise that can serve to direct and regulate the content of initial teacher education programmes and to evaluate their graduates. Where these standards originate outside of individual universities and are a requirement of professional certification, they constitute a significant uncoupling of the requirements of certification and university credentials, and a governance shift away from the universities (p.83).

Governing bodies, such as the Ontario and BC College of Teachers cite as a goal the need for greater professionalization (Kirby et al, 2006). The move towards increased professionalization of the field involves the need to identify key factors and skills which lead to teacher effectiveness, followed by accreditation standards which work to ensure those elements are being transmitted appropriately and effectively in teacher education programmes, including testing and certification to make sure graduates possess those skills and knowledge (Kirby et al., 2006). Some, who call for the deregulation of the teaching profession, have raised issue with the identification and reliance upon those standards claiming that the move is directed towards “imposing a system-wide curriculum orthodoxy by way of certification standards and inspection” (Young, Hall & Clarke, 2007, p.84).

Concerns have been raised that delineating standards may reduce teaching to a checklist and/or a narrow set of technical skills if care is not taken when considering standards so that the potential for depth and complexity in understanding and practice is not restricted (Gambhir, Broad, Evans & Gaskell, 2008, p.7).

Gambhir, Broad, Evans and Gaskell (2008) point to forces both local and global which further add to the complexity of the landscape within which teacher education programmes exist.

Worldwide issues of diversity and inclusion, rapid shifts in information technology, the expansion and deepening of a global economy, issues of civic governance, for example, have prompted discussion about the complexities of these issues in relation to teaching and learning, and in particular, the implications for initial teacher education programs. A variety of issues (e.g., regionalism, French/English relations, Aboriginal self-governance, Canadian/American relations, increasing immigration, concerns about a growing 'democratic deficit') within Canada further complicate this dialogue (p. 8).

In the example of teacher education programmes in BC, since 1987 and up until very recently, the BC College of Teachers (BCCT) was responsible for setting the standards for accreditation, licensing and certification. Despite objections from the teachers federation, the move to adopt the BCCT had been controversial with decisions being questioned and the College being taken to court by one of its larger teacher education programme providers (Young, Hall & Clarke, 2007). Young, Hall & Clarke (2007) suggest that the move from self-regulation to governance by the BCCT represents a challenge to the autonomy of the universities who deliver the teacher education programmes, and continues to result in tensions and struggles, and essentially a constant state of flux.

In 2011 the BC Teacher's Council (BCTC) and the Teacher Regulation Branch were created to replace the discredited BCCT. Under the Teachers Act (2011), the BCTC is responsible for regulating teacher education programs in BC and is made up of 16 elected and appointed members. This move is an example of yet another step in the overall contested landscape in terms of the highly politicized nature of curriculum

development and teacher education programme evaluation which is mirrored in many provinces and states today.

The Importance of Green Time: Re-Naturing at Any Age

Rain and the Rhinoceros

What a thing it is to sit absolutely alone,
 In the forest, at night, cherished by this
 wonderful, unintelligible,
 perfectly innocent speech,
 the most comforting speech in the world,
 the talk that rain makes by itself all over the
 ridges,
 and the talk of the watercourses everywhere in
 the hollows!
 Nobody started it, nobody is going to stop it.
 It will talk as long as it wants, this rain.
 As long as it talks I am going to listen.
 - T. Merton (1999, p. 163).

In his book *Last Child in the Woods* (2008), Richard Louv describes the often underestimated benefits for children who are able to spend unstructured play time outside. He also warns us against the potential detriments of a childhood spent deprived of nature play, while criticizing the current state of declining participation in outdoor experiential opportunities for the youngest generations among us. He talks about the “sensory magic” when children engage in direct experience with nature. He refers to the “re-naturing” (p. 55) of children of all ages.

Children need nature for the healthy development of their senses, and, therefore, for learning and creativity this need is revealed in two ways: by an examination of what happens to the senses of the young when they lose connection with nature, and by witnessing the sensory magic that occurs when young people- even those beyond childhood – are exposed to even the smallest direct experience of a natural setting (p. 55).

In consideration of our “know-it-all-state-of-mind” (p.58), Louv (2008) ponders what we’ve given up in exchange for a ‘there’s-an-app-for-that’ mentality. We may have succeeded in gaining hi-speed connection to the web, yet our connection to the real web of life is lacking.

Reed (2000) calls for more “primary experiences” – that which we can see, feel, taste, hear, or smell for ourselves. According to Reed, we are beginning “to lose the ability to experience our world directly. What we have come to mean by the term experience is impoverished, what we have of experience in daily life is impoverished as well...a century ago that worship of secondary experience in childhood came with at the risk of depersonalizing human life” (p. 66).

Louv quotes Pyle (2001), who provides an example of the ‘enlightenment’ that comes from direct experience with the natural world,

I have been astonished at the small epiphanies I see in the eyes of a child in truly close contact with nature, perhaps for the first time. This can happen to grown-ups too, reminding them of something they never knew they had forgotten (p. 77).

The need to reassert the importance of a connection between students/children and the natural world is matched only by the current barren landscape of disconnect that defines the reality of many children in a modern western context. Contrasting Louv’s notion of nature deficit disorder with previous generations, Louv (2008) indicates that this is a recent phenomenon, one which mirrors the growth of a civilization of convenience, and one which is becoming more and more of a concern as children inherit a world that doesn’t include nature.

Spending time in natural spaces is not a panacea. What is the purpose of the child spending time outside? Is the purpose aligned with scientific interpretation and the

accumulation of discreet and disconnected bits of 'ecological' knowledge? Or rather is the purpose to expose students to experiences which will cultivate a love for the place they are exploring, develop imagination and the intrinsic sense of wonder which blesses all children, while encouraging students to consider the earth as part of themselves, and their nature-self as part of the earth? Modern education is criticized for focusing heavily if entirely on the former to the neglect of the latter (Orr, 1992; Berry, 1999; Louv, 2008).

Seminal author, scientist and activist Rachel Carson (1956) describes it this way:

If I had influence with the good fairy who is supposed to preside over the christening of all children, I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things that are artificial, the alienation from the sources of our strength...if a child is to keep alive his [sic] inborn sense of wonder without any such gift from the fairies, he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in (p. 54).

In today's classroom, attempts at teaching nature rest primarily within the jurisdiction of science education (Robottom, 1991). When subjected to the rigid and artificial limits of a modern Western scientific method, ecoliteracy becomes relegated to an outdoor laboratory. In a system which suffers from an obsession with prefixing and an addiction to scientific classification and reductionism, students become disconnected, essentially ecologically illiterate.

As students experience nature as a part of themselves, or the aesthetic experience in the natural world, they learn to love and appreciate nature as a thing of beauty, as a work of art, something to revere, something to take care of, something to be re-enchanted with, and something that will inspire awe. This is contrasted with the often sterile and

septic modern scientific approach and its strategies of dissecting, identifying, categorizing...etc. where, the mystery of the natural world, the beauty, and majesty, have all been explained away. It is no wonder then as student teachers, traveling through a mechanistic system, void of enchantment with the broader picture of the interconnected Earth, have difficulty in accepting perspectives which question those taken-for-granted tenets of mechanism.

A search for other ways of knowing involves a questioning of the dominance of the science laboratory as venue for ecoliteracy – coupled with a new approach to nature where students become re-enchanted, re-connected to the mystery and magic of the natural world.

Scientism: Learning and the Outdoor Laboratory

<p>The birds I heard today, which, fortunately, did not come within the scope of my science, sang as freshly as if it had been the first morning of creation. (Thoreau, 1999, p. 114)</p>

Berman (1984) refers to the “disenchantment” inherent within the modern scientific paradigm.

Disenchantment is intrinsic to the scientific world view...for more than 99% of human history, the world was enchanted, Man [sic] saw himself as an integral part of it. The complete reversal of this perception in a mere four hundred years or so has destroyed the continuity of the human experience and the integrity of the human psyche. It has very nearly wrecked the planet as well (p. 23).

The natural world has not always been perceived as “mindless matter, a mere resource to be exploited for human gain” (Bell and Russell, 2000, p. 188); nor has it always been defined according to a dualistic, fragmentalist, reductionistic, and

anthropocentric world view where logic, rationality, and an unchallenged faith in “possessive individualism” ruled (Smith, 1992, p. 80). Cognitive, quantifiable, and empirical knowledge has not always been considered the only way to know, nor the best way to come to know (Miles, 1998).

The origins of an ideology which ubiquitously dominates modern Western society can be traced back to the scientific revolution of the sixteenth and seventeenth centuries with the birth of modern scientific thought and philosophy. The development of a modern scientific method led to what Max Weber termed the “disenchantment of the world” (Berman, 1984, p. 69). This Western social de-evolution was characterized by Cartesian dualism and faith in a mechanistic philosophy whereby nature, a complex and arguably inexpressible entity, could be reduced and controlled until it obeyed the scientific and rational laws of mathematics (Berman, 1984; Salleh, 1997; Whalstrom, 1998). Bacon’s notion of “*natura vexatus*” or “nature annoyed” (Berman, 1984, p. 28) where in order to truly know nature, one must “vex nature, disturb it, alter it, anything – but do not leave it alone” (p. 31) was the prevailing sentiment. The Newtonian positivist view of nature was characterized by “hierarchy and rigidity, standardization and uniformity” (Charles, 1998, p. 363) which sought to make “rational mastery of the environment a viable intellectual program” (Berman, 1984, p. 117). It was this type of worldview which spawned the “urge to dominate nature”, contributing to the “destruction of an organic world view” (Orr, 1992, p. 12).

The supremacy of mathematical reason and logic take on a certain absurdity through the perspective of seventeenth century scientist Galileo.

[o]nly those properties of matter that are directly amenable to mathematical measurement (such as size shape and weight) are real; the

other, more 'subjective' qualities such as sound, taste, and color are merely illusory impressions, since the 'book of nature' is written in the language of mathematics alone...this grand book the universe...is written in the language of mathematics, and its characters are triangles, circles, and other geometric figures without which it is humanly impossible to understand a single word of it; without these, one wanders about in a dark labyrinth" (in Abram, 1996, p. 32)

According to Goodman (2003), the scientific method is much more than just a "convenient, ordered way of doing things" (p.76). She looks to science historian J.D. Bernal who describes modern science as "an institution, a method, a tradition of knowledge, a factor in the maintenance of the social order and a powerful influence shaping beliefs and attitudes toward the universe and humanity" (ibid.). She goes on to suggest that once the art of science morphed into the practice of scientism, complete with its ascendancy into worldview status, it began "going beyond the actual findings of science to deny that other approaches to knowledge are valid or other truths true" (p. 23). This represents a critical departure, when scientific knowledge ceased being one form of knowing and sought instead to be *the* form of knowing. It was at that point that the devaluing of nature was possible. Jardine and Abram (2000) describe it this way:

Whether that body blossoming into song is singing in a way that blesses the other bodies that abound, or whether it's proclaiming only and endlessly itself, at the expense of all else, by pretending it's not a body in blossom but a burst of brilliance from beyond Alpha Centauri, a burnished piece of bombast that wants to blast the bodily world to bits (p. 173).

Kahn (2001) highlights the impact that scientific discourses have had on the study of nature, he states that they have been criticized for their "cold, dry-as-dust objectivity, their antiseptic gaze on death and indignity, their consistent use of the passive voice to avoid the appearance of responsibility" (p. 242).

Harris (2002) echoes similar sentiments, suggesting that scientism has overstepped its bounds, becoming a conviction, while convicting other non-scientifically proven ways of knowing:

All students of western education receive an education that presumes the dominant western worldview based on positivistic scientific principles...science serves as a model of intellectual endeavours in the west with influence far beyond its own domain. The belief in the western scientific way of knowing is such a deeply held conviction that other ways of knowing are generally disparaged as superstitious, irrational, false, deluded, and naïve (p.188).

Considering the paradigm of scientism, and its mechanistic approach to the natural world, there is an inherent tension created when the complexity of nature is bounded by the rigid rules of the scientific method. Robottom (1991) refers to environmental education as the “step child of science education” (p. 20). With most environmental education housed in science departments within teacher education programmes, this worldview which pits observer against observed, knower against known, and facts over feeling becomes particularly problematic when value is placed on the elements of holism and interdependency within ecoliteracy. Within the narrow scope of modern science, an ecoliteracy is denied its potential. There is a lost opportunity as the ability of a wild, mysterious nature to instil a sense of wonder and awe in students of all ages is essentially theorized out, as Goodman explains:

No one can deny the spectacular technological achievements of the modern age or its exploration of formerly hidden aspects of the natural world. But these advances have come despite, and also because of, a severely limited view of reality. So much has been deemed outside the scope of science: values, emotions, purposes, morals, consciousness, life, the soul, qualitative knowledge...the list could go on. At the same time, the scientific understanding of our age tells us that only what can be discovered by science is real (p. 128).

Relying on complete control over the production of valued knowledge, while enjoying a monopoly over social normalization and legitimization, this modern scientific philosophy has quickly risen to a privileged position of unquestioned dominance in modern western society. Paralleling the rise of this social “habitus” (Pronger, 1995, p. 440) was the subsequent devaluing of other, non-empirical, non-quantifiable ways of knowing:

Given the modern belief that the universe functions as a machine rather than as an interrelated manifestation of the divine, the most plausible way to discover its operational principles lies not in intuitive discernment, mythology, or the interpretive traditions of medieval scholarship, but in the assumption of a posture of detached objectivity (Smith, 1992, p. 22).

This mistrust of human intuition represents a critical element in the growth of a widespread, and deeply rooted identity crisis, characterized by a marked shift from a relationship of holism, aesthetic and spiritual interconnectedness, to an “alienated consciousness” (Berman, 1984, p. 16). Abram (1996) comments on the effects of such a paradigm shift when he states that, “the fluid realm of direct experience has come to be seen as a secondary, derivative dimension, a mere consequence of events unfolding in the ‘realer’ world of quantifiable and scientific ‘facts’” (p. 34).

Environmental educator Laura Piersol (2010) questions the ability of science to answer adequately the questions arising from a complex natural world.

The number and nature of all possible interactions within one ecosystem is inconceivable; clearly we cannot possibly expect ecological science to identify and describe all of them and then inform us of how to proceed in all of those relationships. But we do! And we often teach our students to expect the same (p. 200).

Today, with society in the midst of an “organic apartheid” (Bell and Russell, 2000, p. 192), an alarming and unnatural gap has been forged between humans and the

rest of the natural environment at the hands of science. We suffer from ecological amnesia, having forgotten “the reality of our embeddedness in the natural world” (Ray, 1997, p. 23). We have essentially become “autistic to the sounds of the natural world” (O’Sullivan, 1999, p. 95).

Instead of demonizing science and technology itself, growth in ecoliteracy must include a critical investigation of the social climate that has allowed for such “misuse of technology’s power” (Pronger, 1995, p. 432) to occur in the first place. We need to re-examine the “foundation of ideas” (Charles, 1998, p. 380) upon which our current social ideologies are built. We need to remember that it is not the tools themselves that are to blame, it is those that choose to wield the ‘hammer of positivism’ who are to be questioned (Cantrell, 1995). “It is not science and technology, but the numbing of our innate human sensibilities that makes it possible for men to dominate, oppress, exploit, and kill” (Eisler, 1990, p. 33).

Humans have not always considered themselves separate from the Earth, conquerors rather than co-operators; hostile rather than harmonious. The world has not always been run according to an anthropocentric hegemony, one which subordinates and oppresses all those it considers to be ‘other than’ itself.

Life, being sacred demands our full participation...Life demands honesty...It demands integrity, ...being integrated into a larger community of selves and life-forms...it requires responsibility and discipline, to make choices and face the consequences, to carry out what we undertake. And finally, life demands love...love, of self and of others...delighted love for the myriad forms of life evolving and changing, love of the eternally self-creating world, love of the light and the mysterious” – Starhawk (1999, p.4)

The permissive climate which allows for current acts of destruction and extinction is mirrored in the treatment of human bodies as machines, limiting the self through repression and control:

[E]ach of us reflect, in our attitude toward our body and the bodies of other planetary creatures and plants, our inner attitude toward the planet. And, as we believe, so we act. A society that believes that the body is somehow diseased, painful, sinful, or wrong, a people that spends its time trying to deny health or disease- is going to misunderstand the nature of its existence, and of the planet's and is going to create social institutions out of those body-denying attitudes that wreak destruction not only on human, plant, and other creaturely bodies, but on the body of the Earth herself (Gunn Allen, 1990, p. 52).

This domination of body and voice can be compared to Heidegger's account of the aggressive and rational neglecting of the "poiesis" and the resultant deterministic perception of Being (Alderman, 1978) in exchange for a "production (i.e., a domination) of beings" (p. 45). This domination is also exemplified by Foucaultian "anatomy- and bio-politics" – an "organization of power over life" (Foucault, 1980, p. 139) as characterized by control over both the disciplines of the human body, as well as regulation of biological processes (Foucault, 1980).

The Power of Language: As the Land Speaks Through Us

<p>Tired of all who come with words, words but no language I went to the snow-covered island. The wild does not have words. The unwritten pages spread themselves out in all directions! I come across the marks of roe-deer's hooves in the snow. Language, but no words Tomas Tranströmer.</p>

As the crickets soft autumn hum is to us so are we to the trees as are they to the rocks and the hills - Gary Snyder
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As with traditional concepts of literacy, in exploring notions of ecoliteracy there can be no consideration more important than that of language used to describe literacy. The power of language plays a particularly complex role in the relationship between environmentalism and the broader concept of a critical cultural ecoliteracy.

Terms such as ‘nature’, ‘culture’, ‘wilderness’, ‘sustainability’ and ‘environment’ itself are wrought with ambiguity and complexity while seeming to elude a single universal definition. Williams (1983) called nature “perhaps the most complex word in the English language”; its modern meaning is far removed from the technical notion of “entities and processes un-interfered with by human agency” (p. 219). In a study of “naturalness” as it is applied to Australian ecosystems, Taylor (1990) concludes that “failure to recognize that naturalness is a culturally constructed concept, rather than a universal one, has produced...inconsistency and ambiguity in the terminology used” (p. 411). Oelschlaeger (1991) provides a similar account of the problems in attempting to define a modern concept of wilderness. Indeed, the immense complexity of some of these terms results in oversimplification as the words we choose fail to represent the inherent connectivity involved in the concepts. Greenwood (2010) suggests that environmental

education “because of its inherent interdisciplinarity and the enormous scope of work, ought to resist specialization by definition” (p. 16).

Abram (1996) acknowledges the difficulty in relying on language to define itself.

Every attempt to definitively say what language is, is subject to a curious limitation. For the only medium with which we can define language is language itself. We are therefore unable to circumscribe the whole of language within our definition. It may be best, then, to leave language undefined, and to thus acknowledge its open-endedness, its mysteriousness” (p. 73).

In many ways, and to many ‘environmentalists’, this approach is preferred when dealing with nature in any form, where nature/outdoors/environment/wilderness is left to be undefined, open-ended, and mysterious, rather than defined, closed and explained.

Jickling (1994) warns against the belief in constant, universal truths when it comes to individual words or concepts:

Whereas studying how a word functions provides some understanding about the enterprise or phenomenon it represents, the analysis remains an interpretation of an abstraction in peoples’ minds. It is a mistake to think of concepts as objects or concrete entities; they are nothing more than conventional signs or symbols. For this reason the idea of a true, correct, or perfect statement about a concept is implausible. Analysis of concepts is essentially a dialectical business and such analyses are in constant need of re-examination and clarification (p. 234).

In terms of the broader arena of human-nature relations, words are often easily misappropriated and co-opted for use towards further domination and subordination of nature. For example, the word ‘progress’. On its own it implies successful movement in a forward direction, while benign on the surface, it is aligned with notions of materialistic gain, and capitalist necessity. As Berry (1999) points out, a deeper look at the ambiguity of the term progress brings to light an ulterior motive.

Just now, a rectification is needed in the term progress. There is a sense in which progress is needed in relieving humans from some of the age-old afflictions that humans have borne. Yet this sense of progress is being used as an excuse for imposing awesome destruction on the planet for the purpose of monetary profit, even when the consequences involve new types of human psychic and physical misery (p. 63).

Another contested term used often in conjunction with the environmental movement and ecoliteracy is ‘sustainability’. Critics point to using ‘sustainable development’ as a permission slip to continue practices of dominance and mismanagement of the Earth. Jickling (1994) refers to sustainable development as “fraught with imprecision... a vague slogan, a bold platitude, susceptible to manipulation and deception” (p. 233). Arguably, anything can be sustainable, the question becomes one of underlying intent and motivation, which often go undetected below the surface. This popular tag word has been associated with green-washing, shallow environmentalism and is commonly used by multinational corporations and organizations such as the United Nations (UN), who declared 2005-2014 the UN Decade of Education for Sustainable Development.

Environmental educator John Disinger (1990) reinforces doubts about the meaning of sustainable development. “To some, the term sustainable development is an oxymoron - a self-contained non sequitur between noun and modifier” (p. 3).

In terms of environmental education, Nina Bulhof (1992) feels that the language used in mainstream environmental education works to essentially separate student from nature even further. She states that

the words (names) we use, for example the categories we devise, are of our own making, they refer to things, but do not express them... what nature is, is ascertained by human beings with the help of man-made instruments and then articulated in human words – by those same men who investigated her. That is to say that in the experimental study of

nature the (male!) scientists represent nature by their words; that they speak in nature's place. To represent nature means to speak about her and to render her from a distance in a different medium by means of verbal pictures or representations (p. 141).

As a response to the complexity and common misinterpretations, the 1980's saw the field of ecolinguistics being born out of the growing concern over the impact of language on environmentalism. Mühlhäusler (2003) suggests that much of our current environmental discourse concerns the relationship between language and the world. He refers to four different linguistic approaches to this relationship:

1. Language is for cognition: It exists in a social and environmental vacuum (Chomsky).
2. Language is constructed by the world (Marr).
3. The world is constructed by language (structuralism, poststructuralism).
4. Language is interconnected with the world: It both constructs and is constructed by it (ecolinguistics). (p. 2)

Proponents of ecolinguistics warn against neglecting to pay attention to the terms used to describe and discuss environmental issues in schools. Being aware of the interconnected and constructed nature of language is an important element to a holistic ecoliteracy.

Metaphor, as an instrument of language, holds particular power in how nature and the environment are perceived, and thus treated (Bowers, 1993, 1995). Mills (1982) identifies three core metaphors by which Western societies have lived for the past 1000 years: nature as a book written by God (Middle Ages); nature as a reflection of the human body (Renaissance); and nature as a machine, first a clock, then a steam engine, and most recently a (bio)computer (the present). The notion of nature as machine is problematized further given the perspective of a mechanistic approach to curriculum and schooling as discussed by Steen (2003) for example.

Incorporating elements of critical literacy, a key concept of Freirean pedagogy, stresses the importance of reading both the word and the world (Giroux, 1985). Paulo Freire illustrates that literacy is a tool of the people to fight against oppression (Freire, 1992). Critical literacy suggests a necessary understanding that the author's interpretations are different from those of the reader; and therefore, the reader should attempt to understand the historical context of the writing (Freire, 2005).

To define something, to give it a name, is not in itself an innocent act, it is not without consequences. In the case of environmental education, the implications are connected to a complex interrelationship between science and nature, between our scientific mind and our nature-self. Naming something that is, as nature appears, complex, rich, boundaryless, diverse, dynamic, emergent is problematized. The seemingly simple act of applying a name to such a concept is limiting, can eliminate possibilities; and destroy the essence of the concept itself.

Therefore, in order to begin to move towards the creation of a critical cultural ecoliteracy in education it is crucial to begin to recognize the cultural construction of the words we use. We need to shed light on the way we speak language but also the way language is speaking us in our everyday lives. Critical cultural ecoliteracy will involve raising levels of awareness as to the power of language in the human-nature relationship. Central to this would be to recognize the futility of universal definers when it comes to nature, and instead promote a healthy multiversity of expressions (Harmon, 2002).

Abram (1996) contrasts language from a modern scientific perspective with Indigenous concepts of language and communication. Whereas with Indigenous cultures, language works to "give voice to, and thus to enhance and accentuate, the sensorial

affinity between humans and the enviroing Earth” which is the opposite of the modernist agenda where language “functions largely to deny reciprocity with nature – by defining the rest of nature as inert, mechanical, and determinate” (p. 71). The topic of language as it relates to a study of ‘nature’ or ‘Earth stories’ is particularly salient given the origins of language in context to nature and early symbols as direct representations of nature, or natural phenomena (Abram, 1996). Abram (1996) suggests that from an Aboriginal context, language functions to bring the speaker closer to the non-human world.

Language works to “encourage and augment the participatory life of the senses, while in Western civilization language seems to deny or deaden that life, promoting a massive distrust of sensorial experience while valorizing an abstract realm of ideas hidden behind or beyond the sensory appearances” (p.71-72).

Let my words
be bright with animals,
images the flash
of a gull's wing.
(Joseph Bruchac, 1987, p.20)

Knowledge – Ways of Knowing vs. Knowing the Ways

This feather is perfect.
No matter how scientifically rigorous,
politically informed,
or culturally responsive.
Environmental education is barren
if it does not include re-enchantment
with the wide world of creation,
encounters with the others,
and gratitude for the gift of life.
(Greenwood, 2010, p. 10).

Orr (1992) suggests that one of the main problems with modern education is the way that knowledge is defined. Rather than focusing on knowledge which is geared

towards our continued ability to “live humanely, peacefully, and responsibly on the Earth” (p. xi), we instead focus on a limited agenda of predication, explanation, and control of the natural world.

At issue are the particular epistemological assumptions which guide the human-nature relationship. Questions around what knowledge is valued, and valid, and who determines what knowledge counts, as well as questions about the narrow view of one single universal truth abound. From a critical ecoliteracy perspective, the act of knowing is embedded within the larger social cultural labyrinth:

Knowing cannot be understood in terms of dispassionate academic exercises or production of goods for sale. Rather, knowing is about who you are and what you are doing, and it unfolds within interlaced sets of political, social, and environmental conditions (Davis, Sumara and Luce-Kapler, 2008, p. 11)

Following from the recognition of the complexity and contextuality of knowing, Davis, Sumara and Luce-Kapler (2008) state that in order to respond appropriately to the current global eco-crisis, there needs to be a focus on “knowing differently, rather than merely to know more” (p. 11). The difference therefore lies in the quality of the knowing, rather than merely the quantity of discrete nuggets of knowledge gained.

Davis, Sumara and Luce-Kapler (2008) discuss the way education has participated in the perpetuation of a mindset which places emphasis on “the development of instrumental competencies.” They state that “stress has been placed on learning *how* to do things, not on learning *why* things are done or if they are sustainable. More cogently, the emphasis has been on *knowledge*, not *wisdom*” (p. 212)

In terms of education, Davis, Sumara and Luce-Kapler (2008) speak of a new groundswell which has roots in uncommon spaces.

[R]ecent discussions of the nature of knowing, the processes of learning, and the possibilities for teaching have presented challenges to the reductive, fragmenting mentality underlying checklists, linear curricula, rigid lesson formats, standardized evaluation rubrics, and related artefacts. Emerging from such seemingly disparate domains as anthropology, neurology, sociology, psychology, mathematics, computer science, cultural studies, ecology, and biology, there has been a confluence of ideas around the *embedded, embodied, and situated nature of knowing* (p. 278).

Clandinin (1985) refers to “personal practical knowledge” as knowing which is manifested through “a body of convictions, conscious or unconscious, which have arisen from a teacher’s experience and which are expressed in a teacher’s actions.” This form of knowing for teachers is rooted in individual memory informed by a background of personal experience and lived out through conviction and action. It is this type of knowing which is missing in exchange for dissociated forms of decontextualized prescribed learning.

According to Britzman (1991) personal practical knowledge is embodied in the teacher, as it is “contextual, affective, situated, flexible and fluid, aesthetic, intersubjective, and grounded in the body” (p. 50).

In our current school environment, students are not encouraged to connect to place and community. What is lost is a critical sense of place, “an experientially based intimacy with the natural processes, community and history of one’s place” (Vickers & Matthews, 2002, p.16). Indeed it is this ‘intimacy’ which forms the core of “heart knowledge” (Holmes, 2002, p. 44). Counselling us to “trust in the intelligence of feelings” Aluli-Meyer (2008) provides an Indigenous Hawaiian perspective, where knowledge itself becomes entwined in the physical act of knowing:

[K]nowledge was the by-product of slow and deliberate dialogue with an idea, with others knowing, or with one’s own experience with the world. *Knowing itself was in relationship with knowledge, a nested idea that*

deepened information (knowledge) through direct experience (knowing)
(p. 221).

Aluli-Meyer (2008) suggests that quite the opposite of the scientific hallmark of separating the knowing mind from the feeling body, it is precisely the “union with cognition” which allows for knowing to become embodied in the first place whereby “knowing something is bound to how we develop a relationship with it” (p. 221). Knowledge of self, for example a student’s ecoliteracy, which students may bring to school, and student teachers may come to their programs with is valuable even if not recognized as such. In order for education to move beyond the reliance of the narrow mechanistic model, more trust in intuition, students’ own memories, our own embodied, sensorial knowledge, what is considered lacking in an educational model with roots in the Greek “disciplined acquisition of knowledge” (Oeschlager, 1993, p.34)

Doerr (2004) developed a practice she called “Environmental Autobiography” to counterbalance the mechanistic objectification of the scientific approach, as a means to let students begin to emotionally connect with their environment. She explains what happened in her ecology class - “during the times we were exploring the basic scientific principles of ecology, we were also exploring the interior lives of people interested in ecology—themselves... I needed to find something that would move my students from “*I know*” to “*I care*.” (pp. 30-31). Essentially she’s putting the heart back into knowledge by trying to connect the personal, reinserting the subjective back in to the unfeeling barren curricular landscape of school.

Howard (2010) highlights the importance of understanding relationships in the quest for a more ecoliterate future.

Our society is in need of a highly ecologically literate citizenry as in no time in the past. To achieve this, we must move beyond the scientific into a conversation designed to bring to light our strongly held beliefs and values concerning our relationship with the more-than-human world. (p. 25)

Archibald (2008) sees the heart and mind as working together in terms of coming to know something through listening. “Listening only with our ears is not enough, we must also attend with our *hearts* as well. That we must listen with our three ears, the two on the sides of our head and the one in our heart” (p.87).

A Hawaiian Aboriginal concept of knowledge brings to light its’ reflection of the human-nature relationship, Aluli-Meyer refers to it as “knowledge that endures” (2008, p. 218). She contrasts this form of ‘enduring’ knowledge with the shallow approach to environmental education that students are provided in schools today. Seen from this perspective, outdoor experiential, environmental knowledge is enduring, because it is about us...who we are and makes ties to our hearts. Therefore without our ‘heart’ knowledge we don’t have the emotional capability to connect to the meaning-making which is a critical element to education. In Hawaiian culture, wisdom or ‘na’auao’ also translates as “heart, emotion and intelligence”. Hawaiians have learned to “dismiss these tuggings of one’s embodied knowing for the objective, unfeeling one” (p. 218).

Heart knowledge is an example of a way of knowing which transcends traditional school based disciplinary boundaries and serves to connect to emotion, engaging the whole of a student to the topic – to the experience, it will endure, it will live on, perhaps it has changed the learner, transformed the ‘knower’. This is knowledge which makes a difference.

Tisdell (2003) incorporates heart knowledge through the inclusion of an element of spirituality in education. According to Tisdell (2003), incorporating spirituality in higher education to promote transformation is about:

Engagement of passion, which involves the knowledge construction process of the whole person. The engagement of people's passion is generally not only about critical reflection or rational discourse, it is also about engaging people's hearts and souls, as well as their minds (p. 188, in Clandinin & Connelly, 2000).

Different epistemic and ontological orientations will influence what types of knowing 'count' in a society and its institutions. An orientation which relies on principles of positivism and empiricism will value a certain form of knowledge and paths to acquiring that knowledge. It becomes important therefore to allow for alternatives to the positivist and empiricist paths toward determining what knowledge counts.

Questioning the overly quantified knowledge in environmental studies curricula, Johnston (2009) developed an arts and humanities based program called "Good Neighbours Come in All Species", an attempt at showing teachers that they needn't have a background in traditional core science curriculum in order to pass on environmental education concepts to her students. In this case, students (K-8) participated in six outdoor experiential sessions designed to "develop a reverence for all life and kindle their innate connection with the rest of nature". It also involved each student finding a "heart spot" (p.153) which they revisited each week, helping them to create a sense of place within their natural world.

Seen from a perspective which values the embedded and embodied elements of knowing, acquiring such forms of knowledge become necessarily aligned with the

broader concept of experiential education, where participating in co-creation is more salient than becoming a passive recipient as in a traditional transmission model.

Knowing is not a matter of inert bits of information, but is inseparable from doing and being...teaching then, is never simply a personal or an interpersonal act. It touches the subpersonal through the planetary. Teaching is a deliberate participation in what is (Davis, Sumara and Luce-Kapler, 2008, p. 225)

Knowing and doing are not different phenomena. I interpret this to mean we cannot separate our mindful knowing from our bodily doing, pointing to experiential outdoor education as an important method towards creating learning opportunities which provide for the flourishing of heart knowledge. Abram (1996) refers to a way of perceiving nature which goes beyond the scientific formulae:

The poetic view of nature gravitated towards its wild and mysterious aspects, the felt qualitative rather than measured quantitative dimensions of experience, known through immediate contact rather than through experimentation (Abram, 1996, p. 99).

In terms of valuing a different way of knowing, the growth of heart knowledge is inherently connected with direct experience with the natural world. The key component to learning in nature is that it takes place in direct contact with a sometimes cold, dark, messy, complex, uncertain and ambiguous nature. As a core element to the flourishing of one's nature-self, experiential education lies at the very heart of this approach. The seemingly simple act of taking students outside can have long lasting transformative impacts and can represent the first steps toward a transformation of educational purpose and outcomes.

According to the BC Ministry of Education's (2007) guidelines for environmental learning in the classroom, all students should be receiving plenty of experiential

opportunities in a natural setting, through deep extended times in direct contact with nature.

According to Abram (1996), it is the act of perception which is altered when we experience our senses through the world of nature. “Perception as participation” (p.51) allows for a realization of the interconnectedness of all things, and the impact that each has on one another.

[A]s we begin to appreciate the reciprocal nature of direct perception (participation) then we start to acknowledge that what we touch is actually an extension of ourselves – this then forms the basis for a new-old way of stewardship/land ethic, creating a new ‘environmental ethic’ (p. 69).

In this perspective we are essentially in a very real and physical way writing ourselves into a broader Earth story. By touching, smelling, seeing, feeling, hearing, tasting, and leaving behind, we are literally and figuratively inserting ourselves into the pages of the spaces we call our natural environment.

Aluli-Meyer (2008) points to the notion of reciprocity as coming from the experiential. In close contact with nature, an individual begins to see themselves as reflected through the “other” with the result being a capacity for change personified in an altered “idea of self through other” (p.221). Soon the notion of ‘other’ disappears completely, and one begins to realize that they are the other and the other is them; the nature-self concept is created. She states that “we are Earth, and our awareness of how to exist with it extends from this idea” (p.221). The way we are in the world, the way we choose to act and behave, stems from this perception or awareness of our ‘place’ in this ‘space’. Using Swimme & Berry’s (1999) concept, the way we are in the world has to do with how we write ourselves into the Earth story, how we perceive of our nature-self.

Embodied learning involves not only the physical body, but the mind body as well. “Our thinking body is not separated from our feeling mind. Our mind is our body, our body is our mind. And both connect to the spiritual act of knowledge acquisition” (Aluli-Meyer, 2008, p.217).

Davis, Sumara and Luce-Kapler (2008) advocate for a type of knowing which relies on the embodied elements of experience through direct participation on the part of the learner. They describe this as a preference for “a way of knowing that is tentative, evolving , and partial – one that does not position the student as a sponge, a consumer, a mimic, or someone to be colonized, but as a participant” (p. 12).

Experiential outdoor education is not solely about the student being able to act as a direct participant in the process of learning the curriculum, but in essence it is also about how that direct experience teaches students about themselves, and how they connect with and fit within their broader surroundings/ecosystem.

According to Howard (2010) the role of the teacher in the creation of heart knowledge is to provide for an environment which allows the bringing forth of the experiences which can lead to developing one’s nature-self.

The teacher nurtures a space that allows opportunities for students to respond; the teacher creates a community in which young people experience deeply, and in their response re-create, re-vision, and re-new a sensibility, an ecological sensibility, for what it is to dwell rightly on this Earth at this time (p. 114).

Do student teachers feel prepared to re-create and re-vision in this way? How have their early experiences with nature helped them in this regard? What role does the teacher education programme play in order to support the student teachers in this regard?

Changing the System: Now What?

Steen (2003) refers to the need for more attention paid to change which goes deeper. He refers to Fullan (1991) in *The New Meaning of Educational Change*. Fullan describes two types of change: “first-order changes” are those which “improve the efficiency and effectiveness of what is currently done, without disturbing the basic organizational features, without substantially altering the way that children and adults perform their roles” (p. 29). In comparison, he describes “second order change” as seeking “to alter the fundamental ways in which organizations are put together, including new goals, structures, and roles” (p. 29)

“Can a holistic message be conveyed through a mechanistic medium?” (Steen, 2003, p. 193). If McLuhan (1965) is correct, and “the medium is the message” (p.7), then a transformation is needed if broader goals of holism are to be achieved.

Steen (2003) asks “does integration sufficiently address a mechanistic approach to schooling, or is it simply one more tactic that can be worked into our model of schooling that will leave unchallenged its current form?” Will alternative models stand a chance of real change “if they are simply slotted into the overall mechanistic structure of schooling?” (p. 199).

In response to these fundamental questions, Steen (2003) proposes the deschooling movement as a “powerful ally” while “diametrically opposed to education” (p. 201). “[F]irst off, and most notably, deschooling offers the potential for a high dosage of experiential outdoor education – education, unlike our schooling model, that puts people in regular and intimate contact with the natural world” (p. 201).

Orr (1994) states, “We are not likely to fight to save what we do not love (p. 46)...therefore... “I am proposing a jail break that would put learners of all ages outdoors more often” (p. 52). In this way, Orr’s ‘jail break’ infers a break from the confines of the conventional schooling system.

Just as commitments on the part of the current BC government have been set in motion which seek to change the foundation of education in this province, “the world has changed, the way we educate our children should to” (<http://www.bcedplan.ca/>), one of those areas of change may include an increased emphasis on the value of outdoor environmental learning, along with elements of holistic ecoliteracy as a systemic foundation. That change must entail a re-examination of current values and approaches to knowledge in terms of alternatives to the rhetoric of ‘more knowledge = better student/citizen’ as well as the over-emphasis and reliance on quantification of progress indicators and subsequent devaluation of other forms of embodied, embedded knowing.

Debate in Environmental Education Research

Just as debate exists in terms of how to ‘teach’ nature within schools, there is similar debate in how environmental education research is approached and undertaken. Similar to the perceived fallacy of attempting a universal definition for nature, or environment, or wilderness, there is a lack of consensus around environmental education research methodologies and intentions. In her call for a “restructuring of current educational directions” Ali Sammel (2003) points to the need to “go beyond the conventional, historically cultivated, and socially reproductive agendas of education” (p. 157). She states that “with respect to environmental education, research has historically

been conducted within the quantitative paradigm” (p. 10). She calls for more alternatives, specifically areas of qualitative inquiry.

In *Being Brave: Writing Environmental Education Research Texts*, Heila Lotz-Sisitka & Jane Burt (2002) discuss the complex and often challenging process of writing in the field of environmental education, including the need to be aware of the complexity of the topic.

Research journeys follow many different paths, particularly in environmental education. Some say that a lone quest for truth may not be a safe journey. Like environmental problems, the Dragon we set out to capture tends to exist in complex, diverse, and often conflicting forms. Lone journeys and narrow quests in environmental education research seem to limit the potential to engage meaningfully with/in the complex features of environmental and educational issues and concerns (p. 133).

Orr (1992) calls for substantial refocusing of educational priorities including a “serious effort to rethink... the purposes and use of research” (p. 152).

According to Robottom, (1989) there is a need for a conscious appreciation for the methods we choose to study the environment within education along with the necessity for problematizing the current paradigm;

What seems to be required is a deliberative choice of methods – we need in particular to deliberate carefully upon the political theory embedded in alternative evaluation (research) approaches on the one hand, and the spirit of ... environmental education on the other. We do need to regard as problematic the merit of the paradigm of our research (p. 442).

Similarly, Payne (2003) calls for a closer look at methods chosen to study environmental education,

The pedagogical importance now attached to curricular experiences within the social construction of environmental education calls for more astute research methods that are capable of furnishing better interpretations of human(s)-environment(s), culture(s), nature(s), action(s), interaction(s) and relation(s) (p. 171).

In *Re-engaging Critical Debate in Environmental Education Research*, Robottom (2005) provides an historical perspective to the debate in environmental education research. He breaks up the developments into three timelines. The 1970's and 80's he termed the 'norming' years, "a period of unreflective environmental education research" when the most dominant approach was applied science in the form of empirical, quantitative, quasi-experimental research "almost to the exclusion of all others" (p. 63). The late 80's and early 90's saw the 'storming' years, a period which witnessed "challenging the citadel of established research practice". Intense methodological debates centred around the need to question the positivist, objectivist and instrumentalist foundations of the status quo and move to adopt new alternative approaches. Following the "metatheorizing" of the storming period, came a period of large-scale externally funded research projects which utilized methodologies which came out of the previous years debate. Robottom (2005) points to the inclusion of "methodological justification" sections within these large projects as a marker for the period.

Robottom (2005) points to at least two articles which have re-ignited the debate in environmental education research, Walker (1997) and Oulton & Scott (2000) which question the effectiveness of new research alternatives (socially critical theory) and conclude that the failure of implementation of environmental education curriculum is due in large part to the methodological and theoretical choices of the researchers. Robottom (2005) refutes both these claims.

Robottom (2005) finishes his article with a number of methodological recommendations, one of which is: "to continue to engage in deliberation about the

relationship of methodological choice, research-in-practice, research context, and the literature in the field” (p. 74).

There have also been calls from other areas; for example Aoki (2005) provides Kenneth Beittel and Elliot Eisner as examples of art education researchers who challenged the “underlying presuppositions of the dominant tradition in curriculum conceptions and research calling for close examination of curriculum orientations at the root level” (p.92). Beittel called for “uncovering the root metaphors in art education”, while Eisner urged for “conceptual underpinnings and the goals of assumptions ...of major orientations to curriculum”. As Aoki (2005) points out, “theirs has been a vibrant call for calling into question the constraining mould of tradition” (p.92). Similar questioning of the underlying methodological structures which serve to define inquiry into environmental education research is needed.

Aoki (2005) suggests that Beittle, Macdonald, and Apple “have identified the crisis in curriculum research as related to the mono-dimensional effect of the dominance of the traditional orientation to research, what Paulo Freire has termed a “limit situation” within which many curriculum researchers seem encapsulated” (p.87).

Sandlos (2008), Bell and Russell (2000) and Hart (2002) provide examples of narrative inquiry as a method particularly well suited to exploring the topic of ecoliteracy as it relates to teacher education. They refer to the polivocal capacity of narrative, and its inherent capability to invoke change in the reader, or listener of the story, therefore becoming part of an active transformative potential.

Methodology: Experience as Story – A Fusion of Phenomenological Narrative

The Speed of Darkness:
The universe is made of stories,
not of atoms.
(Rukeyser, 1968, p.115)

Embedded within the debate in the field of environmental education research is a call for a transformative approach, one which recognizes the value in providing an opportunity to ‘re-notice’, to disrupt and provide for an experience which defamiliarizes. Following Orr’s (1991) call for “education of a certain kind” (p.8), where he reminds that more of the same education will not be effective in eliciting the change that is necessary, and Davis, Sumara and Luce-Kapler’s (2008) call for more questioning combined with less answers, I am arguing for a similar approach to research in environment education. More of the same, in this case, when dealing with our eco-crisis, is not what is needed. Transformation and a return to the embodied nature of knowing while encouraging multiple ways of coming to that knowledge is called for.

In this case, I used elements of both narrative and phenomenological inquiry as a means to explore my findings and provide a foundation for the further meaning-making in terms of threads and patterns found within. The possibility of exploring experience and transformation in terms of storied insights and the lived experiences of student teachers’ own concepts of ecoliteracy is important.

As Van Manen (1990) describes, the process for selecting a methodology for the qualitative researcher can be an uneasy journey, fraught with detours and unseen pitfalls, as “things turn very fuzzy just when they seem to become so clear” (p. 41). In terms of an inquiry into ecoliteracy, while perhaps frustrating as a process for myself as researcher,

the very nature of a methodological journey which requires navigation through foggy areas, and isn't clear cut for all to see, I argue, is both appropriate and fruitful.

As discussed previous, there is a need for education which questions a mechanistic, instrumental 'one size fits all' approach toward knowledge, as well as education which is transformative in its capacity for change, and education which succeeds in reaching the heart of the student in terms of being embodied, embedded, engaging, and valuing sensorial, intuitive and tacit ways of knowing. Therefore, a methodology, or fusion of methodologies which resonate along the lines of these features of a holistic ecoliteracy becomes appropriate in terms of congruence.

For my purposes, I found a home in utilizing the tools of phenomenological and narrative inquiry as methodologies for exploring and making meaning from my findings. Using a fusion of methodological inquiries allows me to benefit from emergent capacities, allows for the appearance of the unknown, uncertain, and ambiguous. In particular, the phenomenological approach toward the lived experience of student teachers coincides with the prominence of the experiential element within a study of ecoliteracy amongst student teachers. I argue that it is precisely the experience gained from being outdoors in close and intimate contact with the natural world which makes all the difference to the development of ecoliteracy from a personal perspective. In terms of a narrative component, I feel that by incorporating the use of narrative as a way of approaching and exploring my findings, has allowed me to stay true to the roots of my topic as stories are formed by personal, meaningful, and deep experiences which connect with broader goals of ecoliteracy through the use of story. Also, considering the implications from Berry (1999), Swimme & Berry (1992), and O'Sullivan (2002) and the

need to re-write our own modern Western human story by including a symbiosis built on reciprocity, caring and respect between humans and the more-than-human world, the power of story to change, to transform, becomes salient indeed. By forming this methodological foundation, I am provided with guideposts in terms of a framework from within which I am able to mould my study to fit the design. To appeal to my sense of dedication to openness and fluidity, a narrative phenomenological inquiry as methodology allows for emergence, partiality and spontaneity to exist.

Some, such as Berry (1999) and Bowers (1995) have called for a new story to be created in order to move us beyond our current paradigm where we can begin to write ourselves into the planetary story as stewards, a part of rather than apart from the natural world. Aboriginal traditions of storytelling and storymaking can help to enrich this approach.

We often hear that 'we' - meaning settlers, or westerners, or cybernetic age people - are in need of new stories. We need stories of our place in the biosphere, stories of the human organism as a living moment in connection with environment. We need stories of justice that enlarge our thinking, stories of relationships to place that enlarge our thinking. In settler societies we need enlarged conversations with Indigenous people, not only because we share our homelands with them, but equally because in many areas they already have more expansive and connective concepts of the relationships between humanity and biosphere. (Rose, 2004, p.6)

Gregory Cajete (2009), an Aboriginal scholar states that by being open to possible flows of research, and emergent springs of knowing, throughout all stages of researching and writing, that my study becomes an example of “research as story” (p.48) itself.

According to Trahar (2009), narrative inquiry is grounded in phenomenology as the study of participants’ narrative accounts are windows into their experiences, along with the meaning that they ascribe to them. For its capacity to inform the broader topic of

ecoliteracy, in particular the connection to the focus on a development of an Earth story via the ecozoic, as well as the inherent centrality of the experiential element within ecoliteracy, I have chosen to explore my findings using both narrative and phenomenological inquiry.

In terms of representation, I will use both realist tales (Sparkes, 2002) and poetic representation to shed light on the patterns gleaned from storied insights into the lived experience of my participants. Relying on both approaches provides complimentary and diverse ways of looking at and therefore experiencing my findings. Mirroring a call for multiple ways of knowing and a focus on embodied, engaged, and experiential education, my use of multiple lenses through which to explore my findings is both appropriate and congruent.

CHAPTER 3:

METHODOLOGY

EXPERIENCE AS STORY: A FUSION OF PHENOMENOLOGICAL NARRATIVE

For the purposes of exploring meaning from my findings, I chose to combine elements of both narrative and phenomenological inquiry in creating a storied understanding of eco-literacy in terms of participants' own lived experiences. Narrative inquiry as methodology considers my participants interview and focus group transcripts as 'stories', life stories told in relation to their own lived experiences from a phenomenological perspective and in relation to their development as ecoliterate student teachers. I've employed realist tales by including direct quotations from transcripts, and poetic representation through the creation of thematic poems from participants' and my own words to elaborate on thematic concepts from the findings. By utilizing multiple vehicles for providing the reader insight into my findings, I feel there is more opportunity for reader engagement, and re-interpretation of participant insights in relation to the readers own lived experience. According to Richardson (1992) this approach allows for "multiple and open readings...knowledge is thus metaphored and experienced as prismatic, partial, and positional, rather than singular, total, and univocal" (p. 25). This perspective is congruent with a call for challenging the universal scientific voice in the approach to ecoliteracy in education.

Context over Content: Congruency in Methodology

Congruency between topic of inquiry and methodology is an important consideration when undertaking any research, and I believe in this case, considering the

complexity of the topic of ecoliteracy compounded by political and historical influences, it is even more critical. The notion of approaching an organic, complex topic comprised of principles of holism, irreducibility, and interconnectivity. These features, what I argue which represent the heart of the relationship between ecoliteracy and the student teacher, are at odds with an overly mechanistic, instrumental and reductive research agenda based on positivism and empiricism.

In terms of an historical perspective, for example Chawla (2006) notes that, [ecoliteracy] research has been overwhelmingly quantitative. It has primarily focused on what students know or think, with little attention to the feelings and self-understandings that transform their knowledge and attitudes into action, or bind them to inaction (p. 360).

Greenwood (2010) refers to Aldo Leopold's expression of a "land ethic" as he comments on the potential for research into ecoliteracy to work against broader goals of holism, reciprocity and interconnectivity. "Today, it is even possible to observe that some environmental education research is headed away from, rather than towards, intense consciousness of land" (p. 15). He suggests that the development of such a conscious ethic will only occur "through direct experience of sufficient frequency, duration, curiosity, and reverence so that we may learn to listen and to love" (p. 15-16).

Hungerford and Simmons (2003), in conversation with Hart, provide another example of how the dominant research methodologies in ecoliteracy are being questioned. They suggest that a new approach to research into ecoliteracy in teacher education is necessary.

Hart (2003) speaks of how he recognizes the need for a diversity of methodologies in ecoliteracy research, noting particularly the move to forms such as ethnography, phenomenology, narrative inquiry and participatory action research. He

considers this diversity to be a strength, much like the strength of a biodiverse ecosystem when compared to a monoculture. In response to criticism that educational research does not effect education as practice, Hart also suggests that rather than looking at ecoliteracy from an 'agenda' perspective, that we should consider the issue from an emergent nature considering the field as a whole and issues which are salient to the bigger picture where "beyond the quest to generalize, there is a need to explore (with teachers) how research might actually penetrate teachers' ideology or consciousness in order to even begin to understand resistances to change or to understand practice" (p.5). I found this perspective salient with my purpose, namely to explore the lived experience of student teachers through personal narratives into their own ecoliteracy and its impacts on their identity as teacher-to-be. In this way I am not seeking to generalize but rather to explore the possible tensions and insights into participants' own ecoliteracy. What results is a look into how student teachers approach the inconsistencies and incompatibilities between their own sense of ecoliteracy and the system of education which they are a part of. The tensions provide insight into a lack of fit as experienced by student teachers in terms of locating their nature-selves within the broader professional landscape of education. This approach is in line with Clandinin & Connelly's (1985,1990) exploration of teachers' 'personal practical knowledge' as the way teachers, in my case student teachers, come to navigate the realities of school life (institutional practices) in light of their own beliefs, experiences, and personal narratives. Exploring the personal practical knowledge of student teachers in the case of developing ecoliteracy is fruitful in terms of the tensions that exist. They state that "the difficult tasks of transformation and reconstruction a teacher faces, especially during times of contradiction and imbalance between his or her

image and the demands of situations” are well suited to an approach that takes provides space for personal narratives of past and present experiences. In the case of my research, the tensions, contradictions, and imbalances are explored in terms of the meaning created for the student teacher, their desire for ecoliteracy in their practice, and the institutional realities of teaching within the current system of education.

Hart (2003) goes on to echo criticisms of a historical focus on disconnected empirical studies in ecoliteracy, overly narrow in their scope and unnaturally divorced from contextual considerations, including the personal.

[T]his type of research has proven insufficient for understanding the perceptions, feelings, understandings, and motivations of people. There is a difference in the kind of inquiry appropriate for understanding physical and social (personal) reality. Social/educational reality requires research methodologies and methods that are capable of pursuing social questions about, for example, how educators interpret and make sense of their experiences (p.5).

According to Hungerford & Simmons (2003) the issue becomes one of mismatch, a lack of congruence between our chosen methodologies toward research in ecoliteracy, and the topic being researched. He states that a shift away from “traditional knowledge-based approaches to environmental studies” to include more embodied and engaged methodologies may yield “better transformative potential” (p. 9). The ability for a combination of realist tales, and poetic representation to encourage engagement and embodiment on the part of the reader aids in responding to calls such as those from Hungerford and Simmons (2003).

In this case, a look into the embodied personal memories and stories of student teachers, brings the focus back onto the individual student teacher as catalyst for the development of an ethic of ecoliteracy within classrooms. The transformative potential of

emotion, spirit and conviction on the part of the individual student teacher is considered as central.

Hall (1997) calls for an increase in qualitative research in environmental education in order to gain a further understanding as to its impacts on performance and overall classroom practice. Little is known about how teachers and students understand and engage with environmental issues and activism or how their discourses and actions may be shaped by community, institutional, policy, and social contexts. Other scholars in education such as Orr (1992; 1994), O'Sullivan (1999), Berry (1999), Robertson (1994; 1998), and Bowers (1993; 1997) have been adamant in their calls for a shift in thinking from an overly 'technozoic' approach to an 'ecozoic' one (O'Sullivan, 1999). According to O'Sullivan an 'ecozoic' approach is a worldview which celebrates an holistic perspective towards human-nature relationships, one which questions an overly narrow, deterministic, anthropocentric and instrumental approach. As O'Sullivan (2001) states, an ecozoic vision "can also be called a transformative perspective because it posits a radical restructuring of all current educational directions" (p. 2). By remaining consistent with the overall tenets of an ecozoic worldview, I maintain this approach throughout my research process into ecoliteracy in teacher education.

A qualitative study seeks to explore an issue at depth, as opposed to a shallow approach to breadth of data (Whitmore, Chase and Mandle, 2001). Similarly, nature based experiential learning values knowledge gained from personal experience, deep meaningful, embodied knowledge, as opposed to generalizable, statistically measurable and easily reproducible nuggets of abstract information. Western society's over-reliance on quantitative technological reasoning and scientific rational truth-seeking, O'Sullivan's

(2001) 'technozoic' has helped to further grow the rift that exists between humanity and their nature-selves, the non-human 'other', i.e. the rest of the environment.

The emergence of a technozoic worldview where quantifiable scientific evidence has held a monopoly on what knowledge is valued, has contributed to the formation of an attitude toward the natural world from an overly utilitarian perspective, and has helped solidify a resource based perspective towards the Earth. This approach tends to promote a single way of knowing and simultaneously negate all other ways of knowing (O'Sullivan, 2001; Swimme & Berry, 1992).

Based on the inability of a quantitative lens to describe and explore many of the inherently complex, ambiguous and unquantifiable aspects of an inquiry into ecoliteracy, from this perspective I chose to explore my topic through a qualitative lens, specifically, how participants perceived ecoliteracy based on their personal experiences and beliefs in it as a teacher. This approach is relevant as it reveals in the feeling, sensing, organic world which Western society has grown alarmingly apart from and which we must reacquaint ourselves with once again.

According to Hart (1996) the field of environmental education research has experienced a paradigm debate which he sums up in the following way:

The basic problem is that applied science methods systematically and intentionally exclude "subjects" from critical consideration about the substance and method of the inquiry as well as any creative thinking that goes into making sense of the inquiry. In a field such as environmental education which espouses a worldview in which humans are encouraged to actively participate in and to challenge contemporary social and environmental policies and practices, as well as the taken-for-granted assumptions of the dominant worldview, should not the research process encourage participants to challenge traditional methods? In other words, given the socially critical charter of environmental education, how can

environmental education research not be qualitative, participatory, and critical?

Hart (1996) goes on to suggest that it is precisely the “form taken by the process of inquiry within educational research” which matters, and that it “seems to make good sense to base decisions about method on notions of knowledge, action, and reality that are consistent with our own developing worldview” (see also Reason, 1988, 1994). For this study Hart describes narrative inquiry as a methodology which “embraced a view of experience-based personal practical knowledge and theory, which valued practitioner-derived experiential knowledge over expert-derived objective knowledge”. My study involves the life world of ten student teachers, their ‘stories’ of growing up close to nature, and insights into their teacher education programme and beyond into the world of teaching. My study looked at the storied insights of student teachers as they explored the tensions created when the nature-self is not represented in the world of the teacher-self.

In exploring the world of student teachers in relation to the way they experience nature within their own lives as well as their teacher education programme and looking beyond to their future practice as professional teachers I am seeking further understanding of this phenomenon, listening to stories, while sharing my own. In this case I am not looking to make predictions, and I am not seeking to formulate statistically significant generalizations across populations, but rather to explore in depth the patterns and the meaning behind the personal narratives into the lived experience of participants in terms of locating their own sense of ecoliteracy within a broader educational landscape, ‘barren’ of the experiential element which lies at the heart of what it means to be ecoliterate.

My goal in applying narrative is to share the voices of student teachers. Student teachers, their identity-forming experiences connected to the land and institutional reality of the curricular landscape which features little of the personal meaning, deeper connections and heart knowledge which represents a critical component to their sense of identity as ecoliterate students, teachers, and human beings. My goal in applying narrative elements of poetic representation and realist tales is to share insights with the reader, allowing for diverse readings and opportunities for engagement with the findings in relation to the readers own interpretation.

Creating the space for voices to be heard became a key form for my research. By listening to each other's stories in focus group sessions, and by sharing stories together, our own life stories will have been changed forever (Clandinin, Davies, Hogan & Kennard, 1993). As participants note a distinct lack of attention provided to ecoliteracy within their teacher education experience, the ability for their insights, memories, challenges and worries to come forth has been poignant for myself as researcher and has helped shape the process of gathering, digesting, and making meaning from the narratives provided through interviews and focus groups. According to Clandinin and Huber (2000) the act of telling and sharing our stories becomes transformative for both myself as researcher and my participants "as each retelling their own stories, and as a coming to changed identities and practices" (p.17).

As I shared my stories with my participants, during the collection phase, through a conversational style during both interviews and focus groups, I felt a sense of shared belonging. The synergistic relationship allowed for thoughts and insights to build upon each other, complimentary and recursive. In that way, I included myself as researcher-as-

participant into the inquiry as part of a co-construction of ecoliteracy, and as such I've also chosen to include my own stories within this written dissertation.

The Importance of Story: What Stories are Important?

A need to tell and hear stories is essential to the species *Homo sapiens*--second in necessity apparently after nourishment and before love and shelter. Millions survive without love or home, almost none in silence; the opposite of silence leads quickly to narrative, and the sound of story is the dominant sound of our lives, from the small accounts of our day's events to the vast incommunicable constructs of psychopaths.

(Price, in Gregory, 1995, p.35).

Thomas King states simply “the truth about stories is that that’s all we are” (2003, p. 2). Truths come through our stories, our stories speak our truths. The fundamental nature of narrative or story is as organic as Earth itself. Gregory (1995) speaks to the omnipotence of story, and points out that a story appears in many forms. For my inquiry, I did not set out with a prescribed agenda to ask my participants to ‘tell me a story when’, however, during the transcription process, reading and re-reading, thinking and re-thinking, stories began to emerge. Life events, lived experiences that hinted at larger personal narratives, sound-bytes that eluded to unspoken meaning. Chronologically from childhood memories, through adolescent and early work experiences, their teacher education programme and onto visions of their future classroom and practice as an educator, the stories that I heard began to fuse as patterns emerged, forming threads which joined stories into larger narratives within and between each other. These narratives read as the stories of my participants, and the story of a teacher education programme on Southern Vancouver Island.

As I read and re-read my interview and focus group transcripts, one theme that stood out was the one of development of teacher identity. As student teachers recounted experiences and passions for nature, they were telling me what they value about themselves, how they see themselves, and the ever important development of their own identity as a soon to be professional teacher. As King reminds, we are stories, and so as researcher I am listening to the stories of my participants to find out who they are, through what they tell me. As Tanaka (2009) suggests, stories become maps, “reminding us of where we’ve been – inspiring and guiding us towards future directions” (p. 74). As I listen to the stories as told by my participants, who are all pre-service teachers, I am able to make meaning of their collective and individual experiences, while I learn more about who they are, where they come from and where they see themselves as heading. The feelings, insights and experiences all work towards a fuller and richer description of the interplay between students’ experiences with the natural world, their own development as ecoliterate student teachers, and the realities of schools as part of a bigger system of education, itself part of a larger social fabric. Focus group sessions also provided for opportunities for participants to share insights and make meaning from the experiences of others.

Stories have been pertinent throughout my research, participants have come to me to share their stories, I have listened to and transcribed their stories. Through thematic coding and discovery of patterns I have created new stories which interconnect my participants own individual narratives together. Also, my own story as researcher plays a role in my overall dissertation.

The coding process began with an exploration of individual transcripts, noting moments, memories and experiences which related to their own sense of ecoliteracy. Forming nodes which spanned across participants' interviews allowed for patterns to emerge which led to the creation of common themes. Focus group transcripts further added to the thematic coding, strengthening existing themes while creating new nodes through the coding process.

“Narrative inquiry is based firmly in the premise that, as human beings, we come to understand and give meaning to our lives through story” (Andrews, Squire & Tambokou, 2008). That fundamental belief is mirrored in the premise that as students, and as human beings, we come to understand and give meaning to our lives through direct experience in nature. This also forms my philosophy as an educator and researcher towards the development of ecoliteracy in students of all ages. The experiences we have in nature begin to form the pages of our own identities, helping to create each individual's own life story, while at the same time adding to the broader chapters of a collective cultural Earth story. As the student is re-introduced to their nature-self, there is an opportunity for cultivating a deep love, and an equally deep comfort and confidence in spending time and paying attention to the processes and nuances of the natural world. It is precisely through these early experiences that the foundation for future connection to and development of ecoliteracy is formed and evolved.

Narrative theory indicates that humans are natural storytellers and that the study of narrative reveals how humans experience and create meaning in their lives (Britton & Pellegrini, 1990; Bruner, 1986, 1987; Connelly & Clandinin, 1990). According to Lampert (1985) the way teachers view themselves and their work will only emerge as

teachers present themselves in the stories they tell about their work. Elbaz (1990) views this statement as an epistemological claim, that teachers' knowledge is in fact ordered by story and can best be understood this way. Within this view of knowledge story can be used as findings, as method (Hart, 1998). In terms of my inquiry, it is the identity forming stories of student teachers in terms of their self-selected accounts of ecoliteracy which are explored and prompted by my questioning.

Thayer-Bacon (2003) proposes that narrative inquiry revolves around the creation of both a relational ontology "the unifying spiritual belief that we are one with the universe" – the universe story (Thayer-Bacon, 2003, p.259), as well as within a relational epistemology that "describes knowers as social beings-in-relation-with-others, not as isolated individuals" (Thayer-Bacon, 2003, p.250) – in this way, we gain a sense of self by having ourselves reflected back to us by others" (p.251). This ontological position is salient with an inquiry into ecoliteracy through its connection to a larger earth narrative, as well as the element of holism in terms of participants recognizing their place in a larger planetary context, and thus not acting alone.

Smith (1999), speaking of the importance of story telling to an Aboriginal cultural worldview states that an individual story has significance not only in and of itself, but also in terms of its contribution to a larger collection of cultural knowing. "[T]he point about stories is not that they simply tell a story, or tell as story simply. These new stories contribute to a collective story in which every Indigenous person has a place" (p.144). Relating to what Swimme and Berry (1992) suggest, there is an importance in creating a new culturally significant and relevant Earth story which can also aid in the formation of a collective story, the story of how humans and nature relate.

By exploring the stories of student teachers in terms of their view of ecoliteracy, I am approaching narrative as “a way of coming to understand by being open to the stories individuals tell and how they themselves construct their stories, and, therefore, themselves” (deMarrais and Lapan, 2004, p. 111). This approach becomes particularly salient given my participants and their stories of self identity as experienced through nature, and how it has become part of how they see themselves as teachers-to-be.

As my participants recounted their stories to me, they were in a way forming themselves through their own stories. The act of telling me their stories has impact on their process of self identification as student teachers, transitioning and envisioning themselves as teachers. “[T]he stories we hear and the stories we tell shape the meaning and texture of our lives at every stage and juncture...they contribute both to our knowing and our being known” (Withrell & Noddings, 1991, p.1). In a real sense, the research process seemed to contribute to the way the participants were coming to know themselves as teachers becoming within the teacher education programme. This sense of nature-self and teacher-self did not always work in together, rather leading to stresses, contradictions and tensions. This in turn raised questions about how the teacher education programme provides spaces for ecoliteracy to take root and flourish.

As story plays a central role in narrative as methodology, and considering the larger purpose of a holistic ecoliteracy in terms of questioning the dominant approach to knowledge, it is relevant to expand the concept of story to include other cultural representations of story, namely Aboriginal peoples from around the world, including how story plays an important and identity shaping role in many Indigenous societies. Viewing narrative from an Aboriginal perspective involves the recognition and respect of

a 'larger than me' picture. According to Kawagley and Barnhardt (1999) "human thought, feelings and words are inextricably bound to all other aspects of the universe" (p.120). The next section will explain how Aboriginal ways of knowing were used within the methodology of this dissertation.

Connection to Aboriginal Ways of Knowing

The Indian sense of education is that nature informs us and it is our obligation to read nature as you would a book, to feel nature as you would a poem, to touch nature as you would yourself, to be a part of that and step into its cycles as much as you can (Mohawk in Snively, 2006, p. 11).

The importance of storytelling from an Aboriginal cultural perspective is well understood. It becomes relevant therefore to employ a narrative methodology that attributes value to the oral recounting which occupies such a foundational role in Aboriginal ways of knowing and the passing on of cultural knowledge, including place based ways of knowing (Cajete, 1994). My inquiry into teacher education and nature explores alternatives to the status quo in terms of approaches towards 'teaching nature', and Aboriginal concepts of knowing and learning form a prominent role in that regard. I approach Aboriginal ways of knowing from a stance of a non Aboriginal. I approach the varied and rich history of cultural knowings highlighted by a relationship to the land and ocean as sacred, with the premise that we, i.e. non-Aboriginals can learn from this unique worldview in terms of how nature/outdoor/environment is approached and provided sacred space within the current curricular landscape.

From this perspective, the story told is tied to the individual, to the living breathing person. It becomes impossible to disconnect, to distance the observer from the observed. This distinction has its roots in a different form of knowing (Aluli-Meyer,

2008). In terms of connecting to my chosen methodology, I am providing a space for student teachers to express their own sense of connection to land, via their own storied insights into their nature-selves, their interpretation on ecoliteracy in education and the impact on the development of their own teacher-identity as a result of the inclusion or omission of experiences to explore ecoliteracy within their teacher education programme.

The Transformative Capacity of Story

Stories are meant to change. A story when told, changes both the audience and the teller. The audience by 'experiencing' a story will be altered forever. As Palmer (1969) states:

Reading a work, then, is not a gaining of conceptual knowledge through observation or reflection, it is an experience, a breaking down and breaking open of one's old way of seeing. It is not the interpreter who has manipulated the work, for the work remains fixed, rather, the work has impressed itself on him and he is so changed he can never regain the innocence lost through experience (p. 249).

I have been transformed after hearing the stories of my participants, and my participants are different themselves from having told and retold their stories to me. Likewise, as we engage with the natural world, as we experience that part of ourselves, we are forever changed as the pages of nature write themselves into our own stories. Are we not affected as the moon affects the tides? "[B]eing in the outdoors encourages a new noticing...pointing to different aspects of the world in a deliberate attempt to foster different habits of interpretation" (Davis, Sumara, and Luce-Kapler, 2008, p.35). As I noted earlier, finding yourself in an eddy allows the paddler time to re-situate, and re-familiarize with his or her surroundings, the relative calmness of the eddy affords a moment to pay closer attention to things otherwise passed over, to reflect on the

experience as story lived so far and ready to launch into a new experience, create a new story to tell.

Phenomenology: the Lived Experience as Essential

While I am not subscribing in whole to the research processes required to undergo phenomenology, I am choosing to apply tenets of a phenomenological inquiry into the lived and storied experiences of my participants. In line with my premise that the experiential element within ecoliteracy in education is foundational, the essence of the experience becomes important in a number of ways. First, in terms of my participants' own lived experiences in becoming ecoliterate teachers, second through my process working with participants own stories and the experience of weaving my own, co-constructing meaning with my participants, and third the experience of the reader in engaging with the realist tales and poems presented in my thesis.

As Max Van Manen (1990) describes, phenomenology looks at the "lived experience" (p.37) of the individual with the hope of coming to a deeper understanding of the personal meaning making for the individual. From a phenomenological perspective, the lived experience of my participants becomes their story with the natural world. Through my study I sought to explore the meaning that participants attributed to their lived experiences from childhood to present day, around their own concept of ecoliteracy, and how that relates to an identity as teacher-to-be and their perspective on the purpose and function of education as a whole. This form of inquiry asks what is it about the experience of being in nature for the pre-service teacher that makes it what it is? The question, one which is continuously negotiated and recreated between the researcher and

the participants comes from a deep place of meaning. This method is congruent with the aims of ecoliteracy as a topic and as a concept.

According to Connelly & Clandinin (1990) “the study of narrative ... is the study of the ways humans experience the world” (p.2). According to Bruce (2008), “[e]xperience is the starting place for narrative research. This research method affirms experience over against a tendency within science-oriented research to prefer objective and detached experimentation” (p.326). In light of the broader goal of making meaning from my project, it is through stories that this meaning occurs.

Connelly and Clandinin (2006) make explicit the connection with narrative inquiry discussed previously in this chapter, and phenomenology:

Arguments for the development and use of narrative inquiry come out of a view of human experience in which humans, individually and socially, lead storied lives. People shape their daily lives by stories of who they and others are and as they interpret their past in terms of these stories. Story, in the current idiom, is a portal through which a person enters the world and by which their experience of the world is interpreted and made personally meaningful. Viewed this way, narrative is the phenomenon studied in inquiry. Narrative inquiry, the study of experience as story, then, is first and foremost a way of thinking about experience. Narrative inquiry as a methodology entails a view of the phenomenon. To use narrative inquiry methodology is to adopt a particular narrative view of experience as phenomena under study (p. 477).

Phenomenology is congruent with ecoliteracy as a topic of inquiry through the emphasis on the experiential element. As Van Manen (1990) suggests, to truly understand a phenomenon, one must do that particular phenomenon, be actively engaged within it. This experiential element is inherent within the aims of ecoliteracy as it is the active engagement with nature which forms the essence of the concept (Van Matre, 1990;

Abram, 1996; Bateson, 1979; Berry, 1999; Bowers, 1993,1997,2001; Cajete, 1994; Gough, 2003; Knudson and Suzuki, 1992; Orr, 1992, 1994; Robottom, 1991).

Phenomenology searches for what it is like to be more fully human (Van Manen, 1990). In the case of my inquiry, what it means to be a student teacher navigating the transition from student to teacher in terms of their own conception of ecoliteracy. This aim is significant in that it aligns itself with one of the main features of ecoliteracy, being that of self identity through experiences in nature. Re-knowing ourselves, our nature-selves, via intimate interactions and conscious reflections with nature. In this way, phenomenology is pertinent given its commitment to thoughtful reflection, and a sense of grounding of the experience, the lived experience (Van Manen, 1990).

Phenomenology has also been described as a way of placing educational research within a broader humanist context.

Phenomenology can restore to the philosophy of education its traditional function of helping educators recognize the place of education in the total human venture in two ways. First, by focusing on our relationship to the world, phenomenologists avoid the pitfalls of treating man [sic] alone or the world of things alone. Secondly, phenomenologists show us how to become aware of the meanings already present in our encounter with the world. Thus, phenomenology is not a reincarnation of prescriptive systematic philosophy. It is descriptive rather than prescriptive. Rather than seeking to derive the meaning of education from a normative system, it seeks this meaning by describing educational relationships as they are found in the lived world, the world in which we all live and move and have our being (Scudder & Mickunas, 1985, p.3).

While perhaps not meant literally in the original context, I read Scudder and Mickunas' description of phenomenology as inclusive of an exploration into ecoliteracy which deals specifically with student teachers' relationship to the natural world, with an emphasis on holism, interconnectivity and the value given to reflection on individual experience within nature.

Phenomenological inquiry breathes authenticity, questions shallow objectivity, and never loses sight of the whole in order to examine or analyze the parts (Van Manen, 1990). This position is salient with a study of ecoliteracy given the deep holistic vision of an Earth pedagogy, imbued with a sense of the genuine in a rejection of the abstract, and relying on a cosmological philosophy which embodies the whole as bigger than the sum of its parts.

Similar to ecoliteracy being about a celebration of the mystery, the magic, and the awe of the natural world, phenomenology as a method of questioning, respects the mystery of the question, “a mystery in need of evocative comprehension” (Van Manen, 1990, p.49), by not searching for a solution to a ‘problem’. This is also reflected in the rejection of the techno-scientific quick-fix to environmental dilemmas.

As van Manen (1990) states “we should try to resist the temptation to develop...categorical abstractions of knowledge. Instead we should refer questions of knowledge back to the lifeworld where knowledge speaks through our lived experience” (p.46). Van Manen’s point of view is congruent with an inquiry into ecoliteracy in terms of questioning the need to develop categorical abstractions of knowledge, as well as valuing the experiential.

Through a number of rich and textual examples, Wattchow (2004) points to phenomenology as a methodology which provides the possibility for genuine reflective, holistic, and transformative meaning-making through vivid and dialectic interpretations and re-interpretations of the lived-experiences of all parties involved in ecoliteracy. Through phenomenology, one enters into “being-in-conversation-with-the-world” (p.18), mindful of the role of interconnected and reciprocal relationships of researcher-

participant-reader, teacher-student-nature, and their ability to inform and affect change via reflexively interpreted lived-experiences (Wattchow, 2004).

Representing Using Poetics

Representing my findings using eco-poetics is appropriate given the ability and function of poetry to engage the emotions, and enable a more embodied experience with the topic (Richardson, 2000). This is congruent with the aims of ecoliteracy, namely the emphasis on engagement and embodiment of the teaching and learning process in nature. According to Richardson (1992), using poetics in this way to represent my findings “can recreate embodied speech in a way that standard sociological prose does not” (p.26).

Richardson goes on to suggest that poetry as an embodied activity:

Touches both the cognitive and the sensory in the speaker and the listener...lived experience is lived in a body and poetic representation can touch us where we live, in our bodies. Thus poetry gives us a greater chance of vicariously experiencing the self-reflexive and transformational process of self-creation than do standard transcriptions (p. 26).

Richardson (2000) also claims that the use of poems may elicit new understandings, as the “settling of words together in new configurations lets us see, and feel the world in new dimensions” (p. 933). She also suggests that the use of poetic representation may be appropriate in research which is focused on change and tackles epistemological challenges, as it is “a viable method for seeing beyond social scientific conventions and discursive practices” (2001, p. 877). This is congruent to my research given the argument for heart knowledge as an underserved, yet critical component to the development of ecoliteracy in teacher education.

According to Dewey (1958) there is special value attributed to events dealing with the production and consumption of a work of art. He sees the experience with a work of

art as aesthetic in nature and while it follows the pattern of ordinary experience, it is heightened in its intensity and so exemplifies what Dewey refers to as having ‘an experience’. The focus on the importance of aesthetic experience is pertinent in the case of studying ecoliteracy in teacher education in BC, for example the Ministry of Education’s own principles of environmental education, as outlined in *Environmental Learning and Experience* (2007). One of the guiding principles focuses on an aesthetic appreciation of nature, stating that it aims to “help students to develop an aesthetic sense of respect and appreciation for the natural world through study, physical challenges, and other experiences in nature” (p.12).

Vessey’s (2006) further description highlights the inherent connections with studying a natural world that is, through its very essence, best experienced in its entirety.

An experience stands out by its integration of part and whole, its experienced unity, its integration of emotional and intellectual elements, and its transformative power. Having an experience moves us. We begin to understand an experience in its elements only after the fact; during an experience we are in the experience, using “in” in the existential sense, much as we are ‘in love’, ‘in need’, or ‘in a mood’ (p.210).

Gadamer (1989) also considers aesthetic experience as a unique form of experience, an ‘experience of truth’ (p.xxi). Accordingly, “when we enter into the play of the experience of the work of art we open ourselves to the possibility of being transformed through new insights” (Vessey, 2006, p.210). In *Truth and Method* Gadamer (1989) writes,

I maintain a work of art, thanks to its formal aspect, has something to say to us either through the question it awakens, or the question it answers. ... An artwork ‘says something to someone.’ In this assertion is contained the dismay of finding oneself directly affected by what was said by the work, and being forced to reflect again and again on what was said there, in order to make it understandable to oneself and others (p. 70).

For Gadamer, like Dewey, aesthetic experience is emotional, intellectual, and transformative; and is an event we find ourselves part of rather than controlling. Once again, echoed by the tenets of environmental education where the natural world is considered as something that humans are an essential part of, and not something which is controlled by humans.

In some cases I chose to pull out participants own words and create poems by linking together quotes from each participant using their answers to specific questions. By separating these quotes, and reading them in a new light, I was able to re-frame the insights gained from the narrative in a new context. While this points to a constructed text leading to a constructed meaning by myself as researcher, it also invites the reader to enter the “interpretive realm”, to pull out their own meaning, “make leaps while staying close to the data” (Glesne, 1997, p. 215). What resulted were new insights, and new understandings in terms of themes and patterns which surfaced across individual participant boundaries. According to Sparkes, Nilges, Swan & Downing (2003) employing poetic devices in representing narratives, can offer researchers “a different lens through which to view the same scenery, and thereby understand data, and themselves in different and more complex ways” (p. 155). Poems can bring about change where the poem results in bringing an object, concept or status quo out of “non-conscious familiarity” (Davis, Sumara & Luce-Kapler, 2008, p.214).

The inclusion of poetics as representing participants’ narratives, as well as the weaving of my own poetry as researcher, also works to balance the bracketing effect of using realist tales in re-presenting direct quotes from interviews and focus groups (Sparkes, 2002).

The poems I include are created both from participants' words, and my own words. I have also included works from eco-poets whose poetry helped inform the topics I was exploring, again with the purpose of providing new insights into a salient theme or issue. These poems are represented by separate boxed sections, each to be read in and of itself, with the reader attaching meaning from the experience with in and topic being discussed.

I chose to include (and write) poetry also because, as passionate as I am about the ultimate and incredible beauty of the Earth, poetry for me is the closest thing I can get to nature through the limitations of the two dimensional text on a page.

Poetic Transcription

My use of poetic representation, specifically my decision to select excerpts from transcripts and compile them into creative writing, poems, most closely resembles what Glesne (1997) refers to as "poetic transcription", which involves "the creation of poemlike compositions from the words of interviewees"

Poetic transcription moves in the direction of poetry but is not necessarily poetry...Poetic transcriptions approximate poetry through the concentrated language of the interviewee, shaped by the researcher to give pleasure and truth. But the truth may be a small 't' truth of description, re-presenting a perspective or experience of the interviewee, filtered through the researcher. It may not reach the large 'T' truth of seeing 'with the eyes of the spirit' for which poetry strives (p. 213).

Through the use of poetic transcription, a third voice is created which is neither solely the writer or the participants, but as Glesne (1997) states is a combination of both as

the researcher uses the interviewee's words to compose the pieces that tell a certain story, make a point, or evoke a feeling told, heard and felt by either the researcher, the interviewee, or both. As a consequence, poetic transcription disintegrates any notion of separation of observer from observed (p. 215).

Participants: Who They Are

All ten participants were female student teachers within the teacher education programme at the University of Victoria. They were either enrolled in the Physical Education Bachelor of Education program, the Bachelor of Education - Elementary Years Program, or the Post Degree Professional Program (PDPP).

The following is a brief description of each participant (names have been changed to protect anonymity) followed by a poem made up of each participant's answer to the question: Did the outdoors play a role in your own childhood? I chose to include the following insights as they were expressed to me during interviews, and represent the main descriptors in terms of the teacher-identity as it relates to their own nature-selves.

Allison

PDPP Middle Years Program

- Both of Allison's parents are teachers. Growing up, she spent summers camping, on Vancouver Island and Mainland BC. She also spent lots of time at a residential summer camp. As a child she would live there during the summer months with her parents who were both employed at the camp. Allison would become a camper then also work as a staff at the camp, in charge of the challenge rope course, and has experience leading school groups through the course. She attributes her parents influence as well as that of her brother to developing her own ecoliteracy. She doesn't consider herself particularly 'outdoorsy'.

we did a lot of camping as a family
summer camp, my whole life,
since I was a baby at summer camp, that was really good.
camping was always a big part of my life
we played outside a lot, we lived by a park,
being outside is where we played crazy nature hide and seek games,
being outside is what we did.
we had a garden, a huge backyard and when I was a baby,
I remember sitting and my Mom was doing gardening
it's always been a big part actually it makes sense...
outdoors is what we did because we didn't have other stuff going on.

Nancy

PDPP Middle Years Program

- Nancy grew up in Oak Bay. Many of her fondest memories growing up were of playing outside and on the beaches of Oak Bay. Camping was a big part of the family activities she experienced. Her family had a boat so they would camp and sail during the summer.

I grew up by Willows Beach Uplands Park Cattle Point Oak Bay Marina.
 walking along the tide line was just part of our play.
 We were always outdoors playing.
 not something we ever considered anything other than play,
 but the fond memories, being a kid, is me playing in the outdoors.

Amanda

BEd - Physical Education Program

- She grew up in both Ontario and BC. In summer her family would spend time at a cabin, they did trips together as well to Hawaii and other places. She joined brownies in elementary school and went on out trips with them. She has fond memories of her outdoor schools she attended as part of her regular school curriculum. She remembers spending lots of time in her backyard. Her parents would often send her and her siblings outside and say “come back as soon as it’s dark”. In high school she took an extracurricular class through PE department which allowed her to go on lots of out trips, such as canoeing, rock climbing, hiking the Grouse Grind. Later she worked for a boat rental company running wildlife viewing zodiac tours in Desolation Sound. She attributes her desire to become a teacher to her early experiences in school doing outdoor education.

we were outside growing up.
 my backyard;
 hide and seek;
 there was this huge forest...that was our freedom area,
 parents would send us outside
 come back when its dark, and not before
 go play in the park.
 I got really comfortable in the forest, crawling on logs.
 stuff like that was normal.

Mandy

BEd - Physical Education Program

- It wasn’t uncommon for Mandy and her sister to come home from school to find that their parents had locked the television into a cabinet. Growing up, her family spent time lots of time outside, but she didn’t consider her family a “camping family”. Mandy spent time in summer camps, and going to Brownies and Girl Guides. She credits her 3 years working with the Boys and Girls Clubs of Victoria

as her biggest influence in terms of learning and teaching outdoors. She considers herself to be more ecoliterate than the average teacher.

my dad really encouraged, liked to garden
 always be asking for help to come outside.
 outdoors was more fun...I want to take part.
 I've always enjoyed being outdoors
 so outdoors is what I... where I love to be...
 I'd rather be outside than indoors...
 Yeah, that was a typical summer, I guess.

Kim

PDPP Middle Years Program

- Growing up on a farm in the 1970's, she was given lots of freedom to roam around her property, and her neighbourhood. Playing outside was seen as "natural". She has an adventurous spirit and is experienced in backcountry hiking, canoeing and camping, having undertaken 21 day long trips in the wilderness. She grew up in Alberta, and has been in Victoria for the last 5 years. She has worked at an out of school care centre where she strove to take kids outside whenever possible.

I'm an Earthling.
 being outside feels really natural to me;
 I feel like I've always been outside,
 being outside feels natural.
 as a kid, growing up, we just played outside,
 we played outside in our yard,
 we played outside in our neighbourhood.
 when I was young we had a farm so we had a farm and a wild area
 I was told there were foxes and it was really scary;
 we used to skate on a pond that was frozen over during the winter
 there was always something to do outside.
 A creek.
 I wrote a whole book called Willow Creek Summer
 about climbing willow trees and sorting out my life up there
 ... living in that fear, it's creepy outside, what's going to happen to me,
 embracing that fear, it's very powerful
 we go to the beach ever since my kids were babies.
 I just took them there, being outside, exploring the natural world
 so it did play a big part in my life
 we weren't sort of kept in the house like ordinary kids,
 we were really left to go away and play.

Jane

PDPP Middle Years Program

- While growing up, Jane remembers camping a lot with her family. Skiing, fishing, just being outside all the time. Her family had 20 acres of property near Campbell River, so summers were spent exploring the territory, enjoying the lake and “living on the land”. Through school she partook in outdoor education offerings, culminating in her acquiring her Duke of Edinburgh Award for commitment to outdoor pursuits, environmental stewardship and service to community. She also has lots of experience working in the area of outdoor education, including four summers of outdoor leadership with Campbell River Parks & Recreation. Jane also assisted with outdoor education trips with St. Michaels University.

My family...we did trips, we camped a lot, we skied,
we played outside all the time.
In summer: camping fishing and all that kind of stuff.
My family... has 20 acres up in Campbell River
raw property, spend it on the lake playing around.
in the mud and in the dirt and staying outside in general

Gloria

BEEd - Physical Education Program

- Gloria grew up camping and living at the cabin in the summers, doing hiking, kayaking...etc. She attended private high school in Vancouver and she participated in a year long outdoor education course in lieu of physical education credits. The class would participate in all sorts of outdoor pursuits, kayaking, mountain biking, hiking, canoeing, snowshoeing...etc. as well as going on one longer trip/ month. She worked as a trip leader running outdoor summer camps for a boys-only private school.

It's the way things were. When you were a kid, you were outside.
you were outside until the street lights came out.
we would go camping.
We had a boat; we would go sailing.
camping was a big part of the family.
monopoly on the sun porch.
that was a parental “get out of the house”
It was where kids were.
When I was younger, I rode horses.
it was just what you did. ... like learning through being in the environment,
that was a huge part of my upbringing.
A beautiful part, like building imagination and that sort of thing.
how do you build a fire when you're eight ?

Maddison

BEd - Physical Education Program

- Growing up in the interior of BC, she had 10 acres of land to call home. Tobogganing, snowmobiling, basically just exploring and doing “normal kid stuff”. Her Mom worked as a phys ed teacher. She recently worked with an organization called Katimavik which specializes in providing experiences for youth to engage in a new culture, which included outdoor experiential component.

I'd say it played a really large role, I'm from the interior BC.
I grew up on about 10 acres of open property with fields and hills.
I spent a lot of time just playing outside-
snowmobiling-tobogganing-exploring-making forts.
you know normal kid stuff.
it's just always been a part of my life.
I feel really connected to the natural world.
It's something I seek out everywhere I go.
they always encouraged us to play outside.
we wouldn't stay cooped up inside...
summer is kind of a luxury where I come from

Gail

BEd - Elementary Years Program

- When she was growing up, her parents owned a boat, and they would sail around the Gulf Islands, camping and exploring. She refers to the outdoors as a “big part of my childhood” during high school she participated in an outdoor education program which took the place of her regular phys ed classes. That program included planning trips, for example a three day kayaking trip to Sechelt Inlet. She worked at a summer camp, instructing sailing, kayaking, and camp set up. She also worked at an out of school care centre where she would promote going outside every chance she could.

we would sail around the Gulf Islands,
head out and explore the islands by day.
being outdoors was a big part of my childhood.
we had a boat since I was six, a long time ago.
we definitely enjoyed being outdoors, going camping.

Leslie

PDPP Middle Years Program

- Leslie relates her passion for the outdoors as beginning with her familial experiences of growing up at the cottage, camping and just playing outside. Through high school she took part in outdoor education extracurriculars, including overnight camping, bike trips and canoe trips. Leslie has worked as a scuba instructor, and a marine biologist.

<p>what I've moulded my life around; when I was a little kid canoe, bike, camping; that's where I got my interest in biology outdoor ed that took me farther...pushed me farther I grew up at the cottage, grew up camping, you learned that by watching; my Parents "go play outside... just go play outside and enjoy."</p>
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Methods

Participants were recruited by visiting classes in the BEd - Elementary Years Program, the PDPP program and the BEd – Physical Education program. Potential participants were required to sign up for the research through a short description of the project, as well as an introduction of myself as researcher (see Appendix A).

After receiving confirmations from ten participants, semi-structured, conversational style interviews were undertaken with each participant. While I started out with an itinerary in terms of questions I wished to ask, the flow of the interview dictated the eventual direction, with later questions building off of earlier responses from interviewees (see Appendix B).

With the exception of one (due to a gale!) all interviews took place outside, in a natural setting. Wherever possible, each participant was asked to choose a place outside in order to conduct the interview. Interviews were all approximately one hour and were recorded.

Following a process of re-listening to the recordings and transcribing the interviews, a series of three focus group sessions were arranged in order to follow up on themes which had emerged from the individual interviews, as well as to explore emergent

areas of questioning (see Appendix C). The participants were divided into three focus groups. Each of the focus groups had three participants scheduled to attend, with one participant not living in Victoria and therefore not able to attend a focus group follow up.

Each of the focus group sessions took place at an outdoor setting of the groups choosing. The first taking place at Mystic Vale on the University campus, the second at Mt. Doug park in Saanich, and the third at Uplands Park in Saanich. Two participants were forced to cancel for the second focus group, leaving one participant and myself. Each focus group session was also recorded.

Upon completion, the focus groups were transcribed. The transcriptions of both interviews and focus group sessions were returned to participants for an opportunity for member checking. Transcriptions were then coded using NViVO2.0 as described earlier. Themes which ran through individual interviews as well as across interviews and focus group sessions were created, as patterns emerged.

Analysis

Through a process of reading, and re-reading the transcripts from both individual interviews and focus group sessions, narratives began to emerge. Individual stories as lived experiences of participants began to merge into broader narratives as themes surfaced. Rather than representing each individual story as separate, when I read through the transcripts there were similarities which surfaced organized chronologically as well as around general feelings and opinions of ecoliteracy based on the interview questions I asked. I chose to divide the findings and analysis section into two chapters, where each chapter represents a different stage of analysis. In chapter 4, I introduce many of the salient issues around ecoliteracy for my participants, starting with a chronological

exploration of ecoliteracy experiences through early childhood years, schooling and work/volunteer opportunities. Using participants' own words in the form of realist tales (Sparkes, 2002), I explore the development of ecoliteracy for participants through their own lived experiences. After the chronological analysis, I explore the findings in terms of where participants see ecoliteracy as fitting within schools, as well as within teacher education. Chapter 4 ends with a discussion of barriers and frustrations in terms of participants' incorporating ecoliteracy within the current system of education. Chapter 4 closely follows the loose interview schema which I relied on during interviews and focus group sessions.

Chapter 5 introduces the themes and threads which began to emerge after going back multiple times to the transcripts recoding and re-exploring the patterns within and between participants' accounts. Each time I revisited the transcripts, I read them with new eyes, seeing new patterns, new connections with new insights emerging as threads interwoven throughout the transcripts. These threads, experience, tension and potential, represent broader common narratives which emerge as a result of weaving individual and focus group stories together. Chapter 5 provides a synthesis of many of the issues as explored through participant transcripts in the previous chapter, while building and expanding on them based on the new readings and new insights generated.

CHAPTER 4: LOST & FINDINGS

Introduction

From an exploration of my findings, participants' own stories as transcripts from interviews and focus group sessions, along with an exercise in reflection on my own educational journey, several categories have emerged as I transcribe, read, code, re-read and re-code. What surfaced were categories based around the power of experience in terms of setting the foundation for ecoliteracy, the apparent lack of fit between a holistic ecoliteracy and the system of education, and the tension created when student teachers experience education which seems to be at odds with the complexity of ecoliteracy manifested as heart knowledge.

Through the process of narrative inquiry, what emerged from the transcripts were narratives formed from memories from childhood through to the present day. Experiences with family, early grade school experiences in the outdoors, and time spent in the teacher education programme, memories of living and being in close contact with the natural world surface as moments of influence in the lives of these student teachers. Their experiences as expressed in interviews begin to write themselves in as important components in the life story of participants, building the self-identity of the student teacher. Early unstructured experiences in close contact with nature formed the foundation of participants' ecoliteracy. Participants reminisce about the time of their lives when being outside meant freedom, and time spent playing in nature held value for its

own sake as an experience, needing no justification or explanation other than “normal kid stuff” (Maddison). Participants describe those early connections as

“a really, really big part of my growing up” – Gail

“it has always been a big part of my life” – Allison

“it played a really large role... I feel really connected to the natural world” – Maddison

“most of the fond memories I have, being a kid, is me playing in the outdoors” - Nancy

When it comes to stories of outdoor education from grade school and early employment opportunities, the intimate connection to the natural world through the experiential element was described by numerous participants as very special, with lasting effects, as Kim states “[times spent in direct contact with nature] start to be part of my life and what shapes me”. The experiential component was also shown to be very important to many of my participants in terms of school and work based examples of outdoor education as well.

Opportunities growing up as well as through school and work, to engage with the natural world first hand led many participants to contemplate teaching as a profession, and for some it solidified the intent to include nature based experiential education within their own classroom. Participants described how their own development of ecoliteracy through direct experience had imprinted on them, who have made it priority to include those same experiences for their own students in their own future practice. As Kim states

Kids spend a lot of their time in school, so that’s a good place to work it from. I have a really strong connection to nature and nature is human nature, and like you said we’re a part of it, it’s a part of us and I do really strongly, and more and more strongly, want to bring that into teaching in the school system.

While all participants agreed that ecoliteracy has a role to play in education and that plans to incorporate direct experiences with nature within their own practice represented the majority of responses, many expressed feelings of frustration, tension and insecurity in relation to the perceived lack of fit of outdoor education in the school system, as reflected in its neglect or complete omission, including for them, at the level of teacher education.

Through early memories and recalling experiences, participants paint a vivid picture as to the power, both on a personal and professional level, of teaching and learning in the outdoors, yet at the same time are faced with, what Blanchett-Cohen and Elliott, (2011) describe as a ‘barren’ educational landscape in terms of access to those experiences. Their cumulative experiences growing up, of which nature based experiences have played a large role, has led to the student teacher they report to be, and when the nature based opportunities they have come to expect are not given the same priority in the institution which they perceive as designed to teach them to become teachers, a tension is created. The representative outdoor element that was so potent growing up, especially in the early childhood years, seems to disappear as they enter school, fading further and further as they move up at each level, culminating in an almost non-existent glimmer of what outdoor experiential education could and should be.

When asked what participants would change if they could create a teacher education program of their dreams, each one suggested that more opportunity for experiencing the outdoors first hand would be considered, as Gloria says “really beneficial...How can we get more experience-based learning into the classroom, and to

have more meaning? How could that create more learning? And less about teachers teaching, and allowing students to teach themselves”.

However, there was some debate as to what form that would take, what space it would occupy within the current curriculum. Some suggested radical shifts, large scale changes which would see large portions of student experiences being in close contact with nature. The overarching ability of the environment to be everywhere but nowhere at the same time, translates into a difficult task of housing ‘nature based experiences’ inside a single course.

All participants stated that outdoor experiential education needed to be included, and not simply considered as a curricular ‘add on’, or as an *extracurricular* opportunity that only some were allowed to experience.

As self-chosen for this study, each participant came already with a degree of experience in leading groups in the outdoors, a variety of levels of ecoliteracy, and a certain amount of comfort in spending extended personal time in nature. All demonstrated a personal passion for including the outdoors in both their lives as well as their chosen profession as a teacher. Despite the high level of interest and experience in the topic of outdoor education, there was still a great deal of uncertainty, a lack of self confidence in terms of how to teach what for many is a passion for being outside, arguably a very natural thing to do. This should not come as a shock considering that each of the participants have been taught within a system which, built around a linear, mechanistic and positivistic model, has a difficult time incorporating elements which are transformative, and built on a model of uncertainty, ambiguity and complexity. The frustration expressed by participants may perhaps be seen as a reaction to their own

insecurity in struggling to approach a topic such as outdoor experiential education based on their experience as a student within the education system. The personal experience in the outdoors for these participants in many cases has seemed to be the catalyst behind a desire to include nature based experiences into their own practice.

Participants reported having more questions than answers in terms of using the natural world as a classroom, taking their students out beyond the four walls of the classroom to experience life in the outdoors.

Participants recount how easy being outside as a child was, how effortless it was, how there was no need for justification, it was just seen as normal, natural. For Leslie it was simple, “it’s the way things were. When you were a kid, you were outside”.

From interviews and focus group sessions, participants report how complicated, how uncertain and how there are many questions, or administrative barriers when it comes to taking a class of students outside. It should come as no surprise that attempts at incorporating an element such as outdoor experiential education into a system of education, which is modeled around a rigid, linear, and mechanistic framework, is not a simple, nor a straightforward task.

The Element of Experience

Our bikes were extensions of our legs, and we would pedal to the four corners of our dominion any chance we could. We knew all the friendly fences and the driveways to stay off. Summers were spent in or around Soper Creek, wading in knee deep, overturning rocks to expose startled and blinded crawfish which lay uncovered and defenceless. If you turned the rock over fast enough, you could catch them off guard as the silt cloud , if you grabbed them right behind their front claws, they couldn’t reach around to get you. Garter snakes, turtles, and at least four different types of frogs were also regular catches. I enjoyed complete freedom, I learned what I was capable of, and perhaps more importantly what I wasn’t capable of. I engaged my environment, I wasn’t passive in the interaction, I impacted my surroundings, and in turn was impacted myself.

Without knowing it, I was negotiating my place in the wider world. I was writing chapters of my own Earth story.

Participants recount experiences from their own lives which attest to the power of direct contact with nature in its ability to maintain a lasting impact, rooting itself in memory, and representing on the level of nature-self. Participants' experiences are grouped into three sub sections, childhood, early school, and work/volunteer experiences. In each category, participants recount experiences with direct contact and experiential outdoor learning as impacting them on a deep level, as well as crediting those experiences as influencing future career decisions and forming foundational epistemic, ontological and philosophical assumptions.

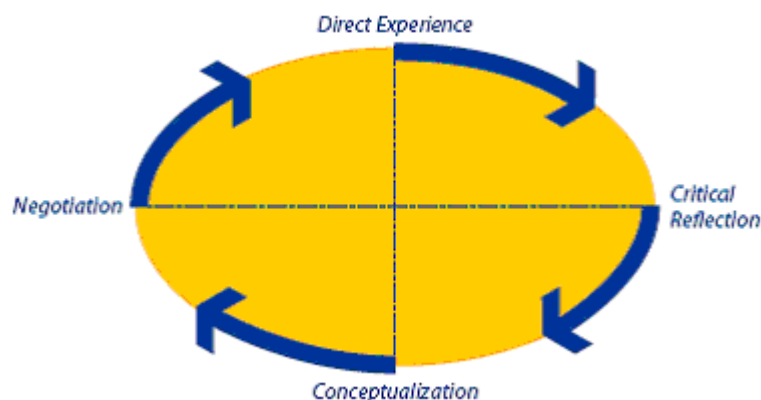


Figure 5. BC Ministry of Education Experiential Learning Cycle Model (2007).
http://www.bced.gov.bc.ca/environment_ed/images/fig1.gif

According to many participants, early experiences in nature helped form the heart of the development of ecoliteracy. As the BC Ministry of Education's Experiential Learning Cycle depicts, the hands on, dirt-under-your-fingernails application of experiential outdoor education cannot be substituted. As Allison comments,

“I really think that ultimately all education should be experiential, that's how you learn...you learn from doing...experiential education has a lot to do with being outdoors for sure, and it's about community, it's about interrelations”.

The experience in a natural setting provides the conditions upon which ecoliteracy can not only take root, but to flourish in a teacher education programme. As Maddison states, “the entire mood changes as soon as you step outside the classroom”. The experience of being connected to something bigger, part of larger story, can serve as possibly an important step towards the development of a broader level of ecoliteracy which works to call into question the assumptions of the dominant Western worldview towards an isolated, reductionistic, empirical and positivistic view towards the human-nature relationship. This worldview also translates into a narrow, content driven curriculum, not compatible with a holistic concept of ecoliteracy.

According to Allison, the experiential element is so embedded within the concept of ecoliteracy that it becomes the defining factor itself “that’s the thing about ecoliteracy that I think sets it apart from other literacies, is that it really involves physical activity in the environment”. The physical surroundings, the place and space itself, and the experience which comes ‘naturally’ from spending time in an outdoor place, with that space, is what gives outdoor environmental education its inherent ability to impact students of all ages.

During one focus group session, a participant wondered how those rich connections to outdoor experiences could take shape in schools,

How can we get more experience based learning into the classroom, to have more meaning? Create more learning...less about teachers teaching, and allowing students to teach themselves while we guide them. ...As soon as you’re outside, you’re already having an experience, so you’re already going to learn more than if it were just in a classroom.

This discussion centred around the power of the outdoor experience in relation to the indoor experience. The sentiment from the group was that too often indoor

experiences were about “teachers teaching” and not enough opportunity existed for alternative arrangements in terms of the role of the teacher, for example co-learning, facilitation, or guiding.

As Davis, Sumara and Luce-Kapler (2008) state, “teaching is not about what the teacher does, it is about what happens to the learner” (p. 158). In terms of experiential outdoor education, what happens to the learner is the creation of more meaning, more connectedness, more engagement and more stories.

From conversations and discussions with participants, it became clear that the most impactful experiences leading to the development of each student teacher’s own nature-self, began in childhood, growing up spending time in close contact with nature.

Participants recounted vivid memories, moments which stuck with them throughout the years, adding to their own story of who they were.

Early Experiences

Being...
I’m an Earthling, being outside feels natural It always has, it’s just always been a part of my life.
Being outside...
was freedom, dark, wet, creepy, beautiful...freedom.
I was crawling on logs, fishing in the sun, alone except for the rest of the whole world around me.
I grew up.
Being outside is...
Learning through being. Family, friends, imagination fun. It was a big part. My connection to me through my world.
Being outside is just...

Where I love to be.
 Where I always am.
 Where I always return to.
 Where I find myself, waiting, wanting to crawl,
 fish,
 be alone except for the rest of the whole world
 around me.

Being outside is just what...
 You know – normal kid stuff.
 I've been on a boat since I was six.

Being outside is just what you...
 Knew. Not know now, but knew then.
 I knew myself then.
 That's what kids did, that's where kids were.

Being outside is just what you did.
 Memories.
 Ever since I can remember, it's all I can remember.
 It was just what you did, it was just where you were.
 My childhood, brought up in forts, on logs, up to
 my knees in creeks.
 I wish the streetlights would never come on.
 Being outside is just what you did.

Where does that experience-as-catalyst begin to take shape for student teachers?
 Through discussions with participants it became clear that experiential education in the outdoors begins very early on. When asked, many participants recalled early examples of family based experiences in the outdoors. These opportunities to create bonds with the natural world proved to have lasting effects for participants. Many credited early family excursions to the lake, or backyard adventures growing up as laying the groundwork for an intention to include teaching in nature within their own practice. One common thread amongst all these early cases of learning was the outdoor experiential element.

Nancy recalled how the outdoors played a strong role in the development of lasting memories -- playing outdoors in her neighbourhood was not scripted or prescribed, it was just what she did for play.

Well, I guess I'm old enough that we didn't call it outdoor education. I grew up by Willows Beach and so as a child the beach and Uplands park and Cattle Point and walking along the tide line to the Oak Bay marina was just part of our play. We were always outdoors playing. And it just not something that we ever really considered that is was anything other than play, but that most of the fond memories I have, being a kid, is me playing in the outdoors.

According to Nancy, spending time in the outdoors was impactful for her as it provided opportunities for learning and development that otherwise wouldn't have been possible.

I guess if I sort of in my own perspective think about it as being like learning through being in the environment, then that was a huge part of my upbringing. A beautiful part, like building imagination and that sort of thing. Being outdoors, doing the problem solving of how do you build a fire when you're eight. You know, like the sort which you wouldn't even have that opportunity to experience if you weren't out there.

For Nancy it was more than just being taught in an outdoor setting, ecoliteracy for her began with her own personal sense of imagination. She states how important the experiential outdoor component was to her upbringing, forming a "huge part" for her.

Similarly, Maddison describes early experiences while growing up immersed in the natural world as developing an early connection with nature, a lasting relationship which continues to impact her life today.

I'd say it played a really large role, I'm from the interior BC, I grew up on about 10 acres of open property with fields and hills and I spent a lot of time just playing outside snowmobiling, tobogganing and exploring making forts, you know normal kid stuff, it's just always been a part of my life and I feel really connected to the natural world. It's something I seek out everywhere I go.

For Maddison, spending time outdoors has been influential in the development of her nature-self. According to her it was simply “normal kid stuff”, and that connection is so important that it continues to be a part of her life today.

For Kim early childhood provided plenty of opportunity for her to experience the natural world. Apart from playing in the outdoors, her experiences represented an opportunity to escape, to reflect by herself and to tap into her creative side.

[B]eing outside feels really natural to me and I feel like I've always been outside, and being outside feels natural, so as a kid, growing up...I mean we just played outside, we played outside in our yard, we played outside in our neighbourhood, and when I was young we had a farm so we had a farm and a wild area in the back... we used to skate on a pond that was frozen over during the winter and then we moved to more of a, not a farm, but a rural setting, so again in the backyard we had a tree and a clubhouse and there was always something to do outside, a creek, I wrote a whole book called Willow Creek Summer about the solace I took from going to climbing willow trees and sorting out my life up there.

Once again Kim reports a sense of naturalness about the outdoors to her growing up. For her, the opportunities to be immersed in the natural world represented more than just a place to play, but a place of “solace” where she became motivated from creating to “sorting out my life up there”.

The imprint left on participants through their childhood experiences in the outdoors became clearer the more I listened to their stories of time spent in direct contact with nature. The normalization effect through early family routines and lifestyle choices provided for powerful and influential experiences in the outdoors which have remained relevant with participants many years later as they enter into their chosen field of teaching.

Similar to Kim seeking solace in her writing tree, O'Sullivan (2001) recalls his early childhood experiences in nature as providing an appreciation later in life of the

“sacred space”, and now when he looks back, he realizes that “this very Earth which I call my home is a sacred place” (p. 68). David Suzuki (2003) refers to “the forest that was my epiphany” (p. 9) while growing up. These all represent the impact that early experiences in nature can have on the development of ecoliteracy later in life.

Snyder (1999) paints a picture of how the world is experienced through the ways of a child.

The childhood landscape is learned on foot, and a map is inscribed in the mind – trails and pathways and groves – the mean dog, the cranky old man’s house, the pasture with a bull in it – going out wider and farther. All of us carry within us a picture of the terrain that was learned roughly between the ages of six and nine. You can almost totally recall that place you walked, played, biked, swam. Re-visualizing that place with its smells and textures, walking through it again in your imagination, has a grounding and settling effect...our place is part of what we are (p. 94-95).

Early experiences with family while growing up, through a process of normalization, have aided in writing those experiences into the life story of these student teachers. Their story of the Earth involves direct experiences, foundational experiences as participants directly engage with a vibrant and beautiful natural world. As the story is written, it becomes part of who they are. They become the story they experience.

Nature Based Experiences at School

We were taught to identify which plant was which,

I learned how deep I could step in the half frozen river bank before my boot would fill with water.

We were taught to memorize the bird calls,

I learned that the snow sounded different in the shade.

We were taught to identify different animal tracks,

I learned that sap was hard to get rid of.

It was early school experiences which took root, planting seeds toward a growing interest in the outdoors. Some participants point to times spent in the outdoors as the most memorable and influential experiences of their entire education. According to Amanda, her early experiences in the outdoors in her physical education classes (camping, kayaking and climbing) were influential in her decision to become a teacher:

Especially in my phys ed classes just, and I've always liked [physical education], but once we got in and did all the outside of the school stuff, was when I really loved it and that was probably when I wanted to get into teaching.

For Allison, it was her experiences in outdoor education in grade school which have remained sharply in her memory.

Grade seven I went on the fall trip, I remember that, I don't remember anything else from that year, but I sure remember where I went on that trip, and I remember the experience, I remember the people, *that* sticks out, I *did* something... I remember going to Fort Langley in grade five I remember that, do I necessarily remember the text books I read about the early settlements on West Coast, hell no, but you remember going there.

Similar sentiments were echoed by Amanda during a focus group discussion on her memories spent outdoors during grade school.

The most clear memories that I have are all ones where we went outside. I remember every outdoor school I ever went to, even when I was in grade two and I don't remember a single other thing. I can even remember specific lessons that I learned in outdoor school when I went in grade seven, and I don't remember anything else.

In my interview with Gail, she reflected on the excitement she felt about her outdoor education experiences while attending private school on the mainland. She points to the impact spending time outdoors had while growing up and hinted at the influence it has had on her as an adult.

When I got into high school, I was involved in this program called Outdoor Education, which was a great, great program. I got to take it for PE and

basically we learned leadership skills and also learned how to plan camping trips. We would plan a three-day kayaking trip up the Sechelt Peninsula. So we had to learn how to do that and pack and leave no trace. It was just a really, really big part of my adolescence and my growing up and it turned me on to being outdoors as an adult.

For Leslie her opportunities for outdoor education at public school in Manitoba came in the form of extracurricular activities. Once again, the impact of those experiences affected not only her educational interests but her career path as well.

[I] did extra curriculums in school: canoe trips, school bike trips, overnight camping, things like that in high school. And that's where I got my interest in biology – outdoor education, it started out and then that took me farther...so it's the outdoor education route that's pushed me farther with the education.

However, not all of those I interviewed reported being given the same opportunity to partake in outdoor education through their education. For example, Mandy states that

I went to Belmont and even Dunsmuir there was no outdoor education programs there, but even the phys ed program focussed on recreation so bowling or golfing.

The majority of student teachers I interviewed reported that their experiences in 'outdoor education' in grade school represented very powerful and impactful moments for them. For some, the memories are what remain from those experiences, for others the time spent in nature represents was pivotal in terms of their career choice to become a teacher.

Work/Volunteer Experiences

Some participants credit work and/or volunteer placements as providing for experiences in outdoor education from which grew a passion for the outdoors and a desire to pass it on to others.

For example, Mandy describes how her work experiences with the Boys and Girls Club shaped her passion for the outdoors.

I would have to say Boys and Girls Club would probably be the strongest influence. Just learning from experience, like building on the three years that I was there and just the guidance that Lindsay and all the other staff there gave. So it just opened my eyes to a whole different world of experiential education that I wasn't aware of because of high school and elementary not being exposed to it before. So, yeah, I was kind of like, wow, this is really...to impact someone is empowering, so those were the experiences that influenced me for sure.

Similarly, Jane found outdoor experiences through her employment as giving her motivation to pursue nature based education on a larger scale:

So that led to my first experience with outdoor education, working for Campbell River Parks and Recreation. I was an outdoor leader for them. For four years in a row during my undergrad when I was going to university at Queens doing my undergrad...And leading lots of varieties of trips. Sometimes they were weekend trips, sometimes they were weeklong trips, day trips. Weeklong we'd go on sea kayak trips to Tree Island in Campbell River. We did an adventure camp on Hornby. We have an outdoor program there with rope courses and adventure based learning... So lots of different experiences through that.

Later, Jane continued her work in the outdoors, moving from recreation to the field of education.

I worked with St. Michael's University (SMU) as an adult leading trips once I graduated. I became part of the program in that way... Being able to do some things like white water kayaking my family wasn't into it- we did lake kayaking, that kind of stuff, but being exposed to climbing and all that kind of thing too, through SMU, and the experiences that I had with recreation made me want to continue that and be able to do some sort of outdoor education, adventure-based learning all year round.

According to Leslie, her professional training in diving gave her opportunity to explore and expand her level of ecoliteracy. Diving represented the vehicle, but it became much more than simply the techniques of scuba which were meaningful to her.

Probably my scuba training would be the kind of formal but informal. During your scuba training you learn so much just about the mechanics of diving. But when you're out there during the experience, it makes you want to learn more about the creatures that you're seeing and learn more about that. I find that with teaching diving that as well. People love the fact that I have marine biology background because I get asked ten times more questions about the marine life than I do about the mechanics of diving.

Maddison highlights her work with a non-profit youth organization as providing her an opportunity to gain skills in leading trips with young people.

[M]ainly my project work with Katimavik last year, it's kind of an experiential learning kind of a program, it concentrates on 5 different learning principles for the kids, and one of them is environmental awareness and another is healthy lifestyle, so we did a lot of outdoor activities hiking, orienteering, like any kind of other learning program or competency, if we could get them outside.

These experiences form the foundation of not only the self identity of participants but also helps establish their educational philosophy, how they define knowledge as they envision a day when they can provide similar opportunities for their own students. The common theme which travels through these accounts of growing up, going to school, and working is the experiential component. The powerful learning opportunities, the development of ecoliteracy, the memories, were all defined by the literal connection made through the experience in the natural world. For some, it was impactful enough to be included in their goals for when they become teachers themselves.

I know that there's a lot to do with budget and why we can't do that all the time, but I don't know why we didn't do something earlier, so we just had one trip, where, it was a canoe trip we went out and we just canoed, did a little hike and canoed back, it wasn't, I don't think it could've been too expensive to do once a year just to get people out there a little more. So that's something that I would really want to plan for when I'm teaching, build it into the curriculum (Amanda).

Envisioning Themselves as Teachers

According to Kim, her personal connection to the natural world drives her to envision ways to include it in her classroom.

I have a really strong connection to nature, and nature is human nature, and like you said we're a part of it, it's a part of us and I do really strongly, the more and more strongly, want to bring that into teaching in the school system.

For Kim, her decision is based on her own sense of self as ecoliterate. Despite her best intentions there was still a note of question in terms of how she would exactly do it, or whether it was even possible to do. As she recognized the difficulty of incorporating her element of ecoliteracy, which for her is tied to her concept of spirituality, into a system of education which at times seemed incompatible to the broader goals of ecoliteracy, she stated that she would be the one to change, not the system:

I just want to see what, how can I morph 'me' into the school system or education in whatever form and bring nature in or bring students out.

Kim's quote has implications for the student teacher, in terms of the lack of fit between their self identity as an ecoliterate teacher and a rigid linear system of education. Kim decides that it is she who must 'morph' in order to exist as ecoliterate within the school system.

Many participants told me that they planned on incorporating outdoor education into their own classroom once practicing. The following quote from Leslie emphasizes the concern and worry that pre service teachers experience when faced with the "daunting" task of performing a field trip.

Certainly I would put more emphasis on the field trips and on teachers getting out of the classroom and dealing with the legalities. I mean, we touched on it, but at the same time, in my practicum, I don't even know,

still, if I feel comfortable enough going, okay, we need to do this field trip. Let's go on a field trip to this place. It's just kind of one of those exhausting things, how do I do it? *It just feels a lot safer to stay in the classroom rather than venturing out.* There are so many different forms and people you have to talk to and arranging transportation and things like that. It's, I might take the kids out of the classroom—I have taken kids outside the school to learn about something, but it's going to a place where you actually find real nature, is a little bit more daunting.

In Leslie's case she came to the program as an experienced outdoor leader and instructor, yet even for her the idea of leading a group in an outdoor setting as a new teacher seems almost too much to handle. She has almost crippling concerns around safety, perhaps hidden behind complaints of forms and logistics. Considering Leslie's high level of ecoliteracy, her apprehension becomes problematic.

Jane reiterates her intentions in terms of teaching nature to her own class:

That's why I became a teacher, because I wanted to go to school and be able to use my background to create either an outdoor education program...those kind of programs I feel are super super important.

Mandy discusses how she will build on the passion she developed through her work experiences at Boys and Girls Club, in order to plan for incorporating ecoliteracy into her own practice,

I would like to hopefully, at whatever school I end up working at...build on an outdoor education program so that students are exposed to being able to appreciate nature and do outdoor activities...give other students a chance to engage...get that appreciation for nature.

From the perspective of those interviewed, the practicum experience provided the best chance to practice nature based teaching and learning and the development of ecoliteracy within their pre service education. Some of the participants saw benefit in experiential components within their practicum placements in terms of outdoor

environmental education. When asked how nature is best taught in the classroom, Jane replied

[E]xperiential learning...period. Meaning doing, not just talking about it, like we did the ecosystem unit in my practicum, when I did my five week practicum and it's so easy, to read the textbook and learn it by, you know videos and Bill Nye's and all that sort of stuff, but we did a trip to Cattle Point to discover the tide pools, we did a trip up Mt. Tolmie to examine the Garry Oak ecosystems, and those were the things that stuck with the kids and those we are using, oh, and the very first class we went outside and I did predator and prey with them and brought a whole bunch of different elements in that we would learn and then I used those experiences to base the textbook on, so it's stuff that we need to learn for the PLO's and for the curriculum and they were able to relate it back to those hands on experiences, and it's made a lot of more sense for them. And we just flipped through the stuff from the textbook and the things that the PLO's said that they needed to learn but the actual experiencing of it was the main feature of that unit, and I think that was the best way of doing it.

In Jane's example, there is meaning and sense-making which originates from the experience of being outside, in direct contact with nature. It is the experience which they keep coming back to in order to connect with something tangible, something with meaning to the individual, a reference point, a point of reference which serves the student time and again throughout the term.

Gail explained the importance of her alternative practicum as an experience with outdoor education. She points to a sensory connection made between the student and the environment.

[I]t went really, really well. I'm really glad that I did it. Basically I had groups of kids, about grade four, grade five, usually. They come out for three days and we get them to connect with nature by taking them on hikes, get them to touch things, to smell things, get them to taste things. To get a little more excited about the outdoors because it's a natural thing to be excited about the outdoors. Some of them have never been given that opportunity and we get them to realize that, especially the ones that are a bit older that they can make a difference... and we actually spent the whole time outdoors, the only time they're inside is when they're sleeping or during, when they come for the first day, we give them a pie chart, it's a big pie

chart and a little sliver, four per cent, it says 4% of their waking time is spent outdoors, 4%, that's nothing, right. And so here at our outdoor school we switch that around, 96% of your time will be outdoors.

I feel that Gail is touching on an important comparison between the learning, ecoliteracy, that she took away from her earth and ocean science class and the learning, ecoliteracy, she took away from her alternative practicum experience at Sea to Sky Environmental School. When seen through the lens of literature on environmental education, her classroom based experiences provided her with “a lot about how everything works...all that information”, while she identifies her practicum experience as providing the difference in terms of being able to envision herself as teaching ecoliteracy to her own students.

In terms of envisioning herself as a teacher, Kim relates her perception involving a hope for the future, for her students, and for her own children:

In a way I have hope, and then sometimes I don't, but I know to live happily, or to live with meaning then I do have to believe that there's hope and that's why I'm choosing this profession, and you know, the minute my kids were born we took them outside to say 'this is nature'.

Kim attaches deeper meaning to her purpose in becoming a teacher while recognizing that in order for her to incorporate ecoliteracy in her practice, there needs to be passion to see it through:

I have to feel the love, I have to have the passion that is going to fuel me, and yes I understand there's the curriculum and there's you know there's the PLO's and there's the stuff that we're required to deliver and there's how you're going to deliver it, the context and what environment...I'm talking more about just helping young people make the connection to start to get it, be open to it, think about it, consider it, experience it.

If, as it appears in the literature, it is through our experiences in nature that we begin to accumulate the knowledge that defines the nature-self, then it becomes important

for education to provide for those experiences to aid in that development of ecoliteracy. According to participants, there exists a disconnect between what they ‘know’, as in their own sense of ecoliteracy, and what education as a system is able to accommodate in regards to providing opportunities for the development of ecoliteracy among students.

Similarly British Columbia’s Ministry of Education, through its publications, *Environmental Concepts in the Classroom: A Guide for Teachers (1995)*, and *Environmental Learning and Experience: An Interdisciplinary Guide for Teachers (2007)* outline its guidelines to outdoor environmental education including provisions for deep extended opportunities to get to know nature as a part of oneself, yet it is clear there is limited opportunity for student teachers to experience that for themselves through their teacher education programme in it’s current format.

Experiential nature based education is at the very heart of developing ecoliteracy for students of all ages. According to participants, as well as the BC Ministry of Education, it would be hard to develop ecoliteracy without it.

In Search of Place: Ecoliteracy in Schools

I was just having this conversation before I met you on the phone with my husband, he’s 45, and he said, “when we were kids we always went out on field trips and all this stuff”, and he said that by the time he was in high school that changed and I know it’s changed and it’s changed like a big heavy kind of weight came down on it and now we’re trying to figure out , you know wow, how do you open up and get to doing it again and there are a lot of barriers and that’s a big topic of conversation and really important obviously.

The quote above was Kim’s response when asked to discuss her feelings on the role of nature in classrooms and schools today. Where playing outside as a child was once seen as just ‘natural’, considered simply ‘what you did’, the place of nature based

education within schools and to a certain degree society at large, is experiencing a disturbing lack of fit. Whether seen as a curriculum add on, an extracurricular option ‘if and only if there’s an opening in the schedule’, or left off the curricular agenda all together because of time constraints created by covering the so called ‘real’ academic subjects, outdoor education is often relegated to a marginalized status. Similarly, as some such as Louv (2008) suggest, children are not getting enough opportunity to spend engaging in unstructured nature play outside of school hours. Whether it’s convenience, time management or based on notions of risk, liability and fear of the unknown, the result is the same – the outdoors is increasingly being seen as an add-on, an extra curricular in and out of school, and the ‘naturalness’ of outdoor play that my participants report while growing up, is more and more becoming a rarity.

Schools, as social institutions are mirroring those same concerns and limitations that exist within society at large.

It’s About Time: Nature in Schools

Environmental sustainability is very important, that’s why it has been added to the national curriculum, but in these tough economic times the Government’s focus has to be on its core priorities for the education system of raising literacy and numeracy achievement, and increasing the number of students leaving school with qualifications. Programmes such as Enviroschools are nice to have but don’t contribute directly to these priorities. (Chapman, 2011)

That was a statement released by the New Zealand Minister of Education in a media release in 2009 justifying the stoppage of funding for the Enviroschools program which focused on development of ecoliteracy in grade schools. This example from New Zealand sheds light on the perceived role of outdoor experiential education as a fringe element,

easily pushed aside in order to focus on the important, 'real' learning that must go on in schools.

Puk and Makin (2006) describe a courtroom scene from the future where teachers are on trial for not heeding the warnings of the eco-crisis and adequately preparing students to face the challenges which were surely to come.

Student- "Why didn't you make the changes necessary to transform the education system before it was too late?"

Teacher (replies meekly) - "We didn't have time. We had to cover the curriculum."

They go on to state that "covering the curriculum is the leading reason given by Canadian teachers for not teaching our students what they need to know in order to face the 21st century realities of planetary climate collapse and an urgent need to switch to a renewable energy economy" (p.273).

It all sounds wonderful, but there isn't enough time, given the realities of today's schools. These realities are many: state-mandated testing, the wide diversity of students in school classrooms, the increasing demands placed on teachers over and above the demands of teaching, the sheer amounts of material that have to be "covered", the seemingly waning attention spans of 'kids these days' and so on (Jardine, Clifford & Friesen, 2003, p. 11).

Those examples represent an issue which was brought up by my participants in terms of lack of time provided as a reason why outdoor environmental education was not included in the curriculum.

The politics of time was brought up on a number of occasions during my interviews with student teachers. Some reported feeling torn between wanting to include experiential outdoor components for their students, but at the same time being faced with

the reality that there is simply too much to include in the school year, and not enough time to get it all done, in order to get outside.

For example, Amanda ponders how it would be possible to include outdoor education when it is not part of the curriculum.

How do you find activities that are close and that you can do within the time that you have? And like with the way the curriculum is right now, we don't have a large portion to dedicate to outdoor education, so how do we finish everything else while still having time to do the other things that we want?

Amanda's comment reflects the conventional approach of education as being too focused on breaking down teaching and learning into discreet categories, represented by subject and discipline. Education gets criticized for being too categorized, and in effect, dissected and specialized into pieces so that it is unable to incorporate a broader, transdisciplinary topic such as ecoliteracy (Pivnick, 2004; Steen, 2003; Orr, 1992).

Similarly, Leslie reflects on the lack of time within the grade 10 science curriculum. She questions the outcomes based approach, and wonders whether the emphasis on easily digestible and reproducible bits of information is suitable for optimal development of ecoliteracy.

The problem with the curriculum in some of these courses is there's no time. There's no time for a field trip. Creating enough time to do these things, it's just, I know the grade 10 curriculum, because you're going for a provincial exam. If you want to take that break and give kids time to reflect and things like that, you've already missed a week of lessons that you need to do to get them prepared for that exam. So I figure that time is one of those things—if you want to have a specialized unit, I would love to have a unit on salmon spawning or have that in my classroom and look at it as it develops. But you're already going on to the next unit.

Leslie goes on to state that she is conflicted between providing students an experience she considers valuable with fitting in all the necessary memorization and

required preparation for the exam. She concludes that the outdoor element would need to be left as a 'specialized unit'.

Similarly, Allison states that until it's incorporated into an IRP, outdoor experiential education won't stand a chance of getting included in her class schedule.

We have a hard enough time getting through all our curriculum in a year, much less, do I [care] about something that's not an IRP? I can't. I don't have time. So, unless as a teacher, I make a conscious choice to incorporate that into how I teach on a daily basis, I don't think that's going to happen. And if people don't care about it, they'll do nothing.

When asked where outdoor experiential activities exist within her science course, Allison replies that there is no time:

They're not planned, there's no time, they don't seem like there's time, so if there's stuff like that, we don't do it...definitely class based...we keep talking about learning through doing, but that never actually plays out in our classroom.

Payne (2003) suggests it is time to reconsider how we approach time in curriculum.

Most of us feel under pressure; we are 'too busy; there is a 'famine' of time poverty. Little wonder that many relations are fleeting and itinerant. Time and its enigma also has to be a problem for the environmental educator and researcher, particularly those who, in response to the questions posed in the introduction about the lived and re-embodied nature of environmental relationship might (re) consider how time is pedagogically deployed in environmental education practices (p. 177).

One focus group participant reflected on a rather glum perspective towards a possible inclusion within schools, noting that time would be a factor,

I have all these great ideas, and all these plans and I'm starting to think...but yet I've been told that it's not going to be as amazing as I picture it... and there's not going to be very much time which is a big factor.

Reporting on the science curriculum in Ontario public schools, Puk (2003) states that although teachers expressed an interest in teaching more environmental concepts, they were feeling under pressure to teach all non-environmental objectives which make up the classes first. This is in line with what Orr (1992) stated “what passes for environmental education is still mostly regarded as a frill to be cut when budgets get tight” (p. 83)

Similarly, Gough (2004) critiques the obsession with time in schools.

I live in hope that a curriculum scholar with equivalent clarity of embodied vision might one day produce a critique of the clockwork curriculum (timetables, times tables, time on task) with as real and as compelling a presences as the watches that melt and drip in the timeless melancholy of Dali’s *The Persistence of Memory*” (p. 152).

Jane provided the comparison of schools in Australia where outdoor education is prominent in the curriculum, to highlight the second class status that it’s afforded in BC,

Well even in Australia, it’s written right into the curriculum, every single school has an outdoor education program, every single school. Here it’s maybe one in twenty if you’re lucky, cause it’s funny, it’s kind of like French, it sort of gets put aside and you know well that’s a unit that if we cover it then we cover it, and if not then, we’ll spend more time in doing something else.

In reference to the issue of claims that there is not enough time to cover the required, important, topics in the curriculum, Stir (2005) calls for an effort to “uncrowd” (p. 834) the curriculum to make way for other learnings, other ways of knowing.

Payne and Wattchow (2008) promote what they call “slow pedagogy”, which “challenges the safety of predetermined easily definable parameters- celebrate the unexpected, considers imagination as a key piece to learning” (p. 24).

According to some, the notion of a sense of time which is linear in its approach, as opposed to cyclical, has added to the human-nature disconnect (Abram, 1996; Cajete, 1994; O'Sullivan, 2001; Berry, 1999).

Unlike linear time, time conceived as cyclical cannot be readily abstracted from the spatial phenomena that exemplify it – from, for instance, the circular trajectories of the sun, the moon, and the stars. Unlike a straight line, moreover, a circle demarcates and encloses a spatial field. Indeed, the visible space in which we commonly find ourselves when we step outdoors is itself encompassed by the circular enigma that we have come to call ‘the horizon’ (Abram, 1996, p. 189).

There are many barriers, both perceived and real, to implementing outdoor environmental education, especially for the new teacher. Whether it's a lack of funding, a lack of support, or a lack of time, the student teachers I spoke with demonstrated much pessimism regarding their ability to infuse their passion for the outdoors into their own classroom. Teacher education needs to play a role in preparing student teachers to face the *daunting* barriers to taking their classes out into the woods.

Best Fit: Ecoliteracy in Teacher Education

Focus group sessions generated much debate as to how the outdoor experiential component could be taught within a conventional teacher education programme. Some felt that it couldn't be “forced” but that it had to “be acquired naturally”. Instead of forcing student teachers to like it, “have them experience the outdoors...model that passion for the outdoors”. Some students begin their teacher education with a lifetime of outdoor experiences. From focus group discussions, there is no clear answer whether teacher education can play a role in developing ecoliteracy, or that passion for the natural world. Jane states “until I've had an experience that made that connection, I'm never

going to learn to love something”. It is important according to her therefore to provide the “opportunity for them to develop a passion for a subject or for being in nature”.

There were varying opinions from participants on how outdoor environmental education should be approached in a teacher education programme. Some participants reflected on a need for a separate offering within a specific department. For example, Amanda commented,

I don’t know if it would be just another class or touching on it in some of our classes, like a lot of our classes are about different activities and maybe including outdoor education as one of those activities? (Amanda).

Well it should be tied into a unit at least once a semester, not like one day, yeah, a unit, once a semester (Amanda).

It’s almost like we need a mandatory class in outdoor education to be able to have that experience...even if it’s just one class or two classes, where they can get that emotional connection. (Focus Group)

It shouldn’t be just a 0.5 EPHE 100 level course, it should be a 1.5 and then offer one in part two for those that are seeking more (Focus Group).

Allison starts off with saying another separate class will suffice, but then goes on to expand it to an entire program.

There’s a really big difference between teaching basketball and field hockey content than outdoor education, and experiential education, I think they almost need another class for that, separately, like I don’t know if they ever will because it’s more money, and I don’t think people see it as a priority, but I think making that a class, and then to dream big would be to have a whole program, but... I don’t see it happening.

For Jane, the connection between a class on outdoor environmental education and a notion of service becomes the key.

Well, I would hope that it would be part of the curriculum, so a course specific on outdoor education / outdoor leadership as well, and build it in there with service as well, it could be a well rounded course on ecoliteracy because I think all those will really work well together and how to incorporate them into the program would be really beneficial because

they're always related and you really create a really awesome community with the kids when you're working with a goal such as service and leadership and it's instilling in them a little bit more than just the curriculum, that you're trying to teach them.

Mandy expands the requirement from a single course; she suggests that outdoor experiential education should form the foundation of the first year in the teacher education programme, paving the way for experiences throughout the entire program.

“It should be part of the program requirement and not just one class. It should be something that [student teachers] build on and are exposed to throughout the degree”.

However, Mandy further comments on the need for ecoliteracy in schools, using her old high school as an example, to focus on only a certain portion of population, while justifying how ecoliteracy might work in the school,

Really target that the trips would include the part of the population who aren't physically active in team sports or competitive sports...I think that they would go along with it because I know now that they've brought in hairdressing programs and stuff, so there has been change...they're open to other ideas.

According to Allison, outdoor education must be incorporated and seen as encompassing more than just a curricular add on,

It's kind of interesting, because it's just given one day, and move on. And sure, we talk about wanting to include this in our school year, but really do we have time when we're trying to meet IRP's and all the curriculum?... it's added as a special thing; it's not the norm. And I think we're still dealing with a very limited perspective. That's the problem when you just look at it as an add on versus, this is normal.

What does she mean by 'normal'? Is it normal when we are connected to it? Or when we're used to doing it? Comfortable going out on the land? Is it normal when it's connected to our nature-selves? Allison considers the teacher education programme as the space for the inclusion of broader goals of ecoliteracy, as opposed to in-service education,

she refers to the opportunity to express our Earth story in teacher education “when they’re learning the foundations of teaching the philosophies of education”. She speaks of what would be considered the norm as she reflects back on her experience in the program and how it has been inconsistent in its approach, “because there’s two different agendas going on...I think if the entire program said, this is what’s normal, this is the expectation, and they taught like that consistently, that would change people’s perspectives”.

Once again the notion of normalizing the content of ecoliteracy within the program is suggested during a focus group. Suggestions span the continuum, going from one single mandatory course to laying the foundation to the entire program.

I think it has to be something that you have to be exposed to as a teacher, like a requirement almost... so that it just makes it seem like this is what we do, and this is how we do it...so it’s a foundation, building a foundation that a program can be built around. (Focus Group)

Puk (2003) states that an infusion approach to environmental education, fails to reach the goals of environmental education, and instead becomes “diluted” (p.226). Likewise, Knapp (2000) sees the infusion approach as “a delusion of substantial proportions” (p. 33). Van Matre (1990) called it a “supplemental approach” and considered it a “recipe for failure” (p. 13).

Puk (2003) opts for an integrative approach where a solid base of ecoliteracy is established, where environment education is taught as a separate subject and then once the desired depth has been reached, crossdisciplinary connections can be made. Knapp (2000) similarly warns against the “activity-guide mentality” (p. 34) in terms of incorporating broad goals of ecoliteracy within current curriculum.

For the most part, environmental education has taken the easy way out. Agencies and institutions associated with environmental education have

produced an amazing number of activity packets or curriculum guides...although well meaning...have created an 'activity-guide' mentality. They have offered trainers and trainees an easy way out by picking and choosing an activity here and there that will be considered the environmental lesson of the day – or week. (p. 34).

Jardine (1990) calls for an integrated curriculum which has at its heart an emphasis on the interconnections, interdependencies and interrelations as inherent within ecoliteracy and the broader human-nature connection as seen through education. He questions whether this approach can survive within the current educational climate as “a new slogan, exhausted and empty, as have so many others in the consumptive flurry in education in the newest and latest” or can it represent something “new, something vital and generative in the field of education?”(p. 109)

Gloria explains how it's about early experiences in the program which will hopefully lay the groundwork, enticing student teachers to learn more about ecoliteracy, seek out opportunities where they can with the hope of implementing ecoliteracy into their own practice

I think that it needs to be taught in the very beginning. It's going to be based on your values anyway, if you're someone who's not really particularly, doesn't care about much, you're obviously not going to be taking as much. So I think that it can either be a prerequisite to the course or in the first year, where you talk about ecoliteracy and the importance of teaching it and even to get the class, bringing them out to Sea to Sky for a few days, then hopefully get the teachers to challenge their beliefs a little bit about the importance of it all. Then maybe they'll want to seek out the opportunities to teach their students about ecoliteracy and the environment and things like that.

Gail describes what she feels are a series of courses which would best serve ecoliteracy within teacher education. Included for her would be a course on Aboriginal pedagogy, one on ecoliteracy, one on core beliefs behind ecoliteracy, one course on how

to teach in the outdoors, one course involving a culminating trip to Sea to Sky Outdoor School.

Referring to the role of developing ecoliteracy within schools, one focus group participant points to holism as directing efforts to infuse curriculum with nature. Her calls for cross curricular connections I feel are also relevant in terms of teacher education.

That connection is being lost, so if it's in the school, then I think it's part of the curriculum, it's not something that's novel, that you go out just once in a while, but a constant. Just being there, and then making curricular connections to those experiences outside, it's about holistic learning.

According to Gloria it may take magic to accomplish the change that she feels is needed in teacher education. "I think it would be a lot more difficult to do it throughout all the courses, I mean if you had a magical program, that all the teachers deeply cared, and all the instructors deeply cared for [ecoliteracy] then I think you could do it".

Some participants feel that there needs to be a more comprehensive and conscious approach, where connections get made between inside and outside the classroom.

It's part of the curriculum, its not something that's novel, that you go out just once in a while, but a constant, like a subject area, you know, just being there, and then making curricular connections to those experience outside, its about holistic learning...I don't think it should be mandatory either. Well it should be tied into a unit at least once a semester, not like one day, but a unit once in a semester, so the curriculum should encompass outdoor experiential education (Focus Group).

Kim reflects on the ability for 'the environment' to enter into many different subjects, yet what is missing is a unifying approach which would tie all the divergent pieces together.

What other subject do you have areas in every single subject that relate to that topic, because we did it in socials, I know environmental stuff came up with water, with resources, with social studies, it comes up in Drama, it comes up in Language Arts, it comes up in all these different subjects, so we teach

environment but we don't have anything that's actually "all right this is what we're trying to get at... nothing to pull it all together.

While there remains much debate as to what form and content the outdoor environmental education component would take in a teacher education programme, there was consensus in the need for it in some capacity. When seen from the lens of a conventional curricular landscape, the change that would be required to adopt a program built upon a foundation of ecoliteracy would require a paradigm shift of transformative proportions, if approached from a perspective of Aboriginal ways of knowing there is a natural fit which sees a deeply rooted connection between the tenets of Aboriginal education and the broader goals of an ecoliteracy agenda.

Some argue that there is no use in trying to squeeze outdoor environmental education into the classical frame of the conventional education model, and that doing so may even be a detrimental approach. There are calls that a transformative approach is necessary if there is to be any improvement in the amount of time students spend outside of the classroom.

Ecoliteracy: A Different Way to Know

We have to look at what's important in terms of, do we care exactly what facts the kids have memorised coming out of it? Or do we care about their attitudes toward science? Do we care about their critical thinking skills, things like that? So do we want our kids to know facts that they can look up in ten seconds in Google? Or do we want them to have the attitude and passion for science to want to get out there and do it? It's a lot of that and it goes all the way to the top with how we're designing our curriculum (Leslie).

Leslie questions what type of knowledge is valued in terms of students and the curriculum. She compares memorisable facts "that they can look up in ten seconds on Google" to the development of attitudes, critical thinking, and passion. This example

sheds light on the way participants themselves value knowing and knowledge in terms of their own ecoliteracy.

Allison speaks of her ecoliteracy as knowing which goes beyond simple “book smarts”,

I can read books, write unit overviews about outdoor education, but unless I’m living that more intentional...I think people who are ecoliterate, are passionate about it, and they live it, it’s not just head knowledge...I have to live it, not just talk about it.

Allison’s example of her intentionality through ecoliteracy is a good example of the deeper level of thinking that is possible with approaching a topic such as nature, and human-nature interconnectedness. This approach would incorporate what Inwood (2010) refers to as “deeper shades of green” (p.36), questioning simple and conventional relationships toward predetermined and taken for granted status quo positions on nature and human involvement.

Allison also provides a powerful example of how ecoliteracy can engage the spiritual in education.

You would learn the content, you’d learn how to teach math, science, social studies...there would be more of an outdoor component, it’s just connecting, I mean it’s holistic education right? It’s a spiritual thing too, regardless of your religious background if you look at children you look at yourself holistically, I think experiential education enables you to engage with all aspects of being human, like makes us up, cognitive, affective.

Allison highlights the difference between learning which emphasizes content and then ecoliteracy which goes beyond learning topic based information when she speaks of her spiritual connection as tying in notions of self identity.

In terms of connecting ecoliteracy to a different way of knowing, Allison discusses the ability for an Aboriginal cultural example to inform the way ecoliteracy could be approached within the classroom.

I don't want to appropriate a voice that's not my own, but I think Aboriginal, a lot of Aboriginal principles, you understand it's a different focus, I think it's an awareness of the environment, like the spiritual aspect and the connection to the earth you know is different...there's something to be said, to be learned from that, to live in an environment and not use it up...there's so much, that's where I see the connection.

Participants' Definitions of Ecoliteracy

Define ecoliteracy

it's a knowledge of the place
that's around you,

It's understanding the spaces in which you live.
you're part of this system or you're just (a)part

I don't want to say the environment
thinking about the 2 words that make it up,
ecological and literacy

not only about words and letters and text
really multifaceted
understand it,
and to communicate in it, within it, of it
that's a pretty broad title to give something

knowing what this tree is called
just knowing specific terms... what is a trail
having knowledge to talk about the outdoors
That was really terrible definition
... I don't even know

being aware of who we are
you try to teach kids.
But also just getting them out,
learn about the Earth,
and learn about themselves
also valuing it for what it is
core values in children as they grow up

Just having the basic knowledge

we're kind of removed from nature
and everything to do with it and we
don't really think about the impact
that we have ecoliteracy would be teaching
that connection again

having access to and knowledge of
the ability to access information
and manipulate ideas
being aware of some
of the vocabulary
being able to look at something
and identify what it is
ecoliteracy would mean the information
that you gain about nature

you have so many different
ecosystems right here
You go to the tide pools,
you go out to the lakes,
you go into your backyard
it's not something that can be defined
exposing students to an awareness of it
and giving them exposure to it
and experiences in it.
use your appreciation of the space
to look at things differently.

As the poem above demonstrates, participants described two very dissimilar approaches to knowledge when it came to the development of ecoliteracy in education. These variations connect to the notion of a disturbance to the 'way things have always been done' approach to schooling. For example Amanda describes ecoliteracy in a very conventional way focusing on the information gained (head knowledge)

"I think it probably encompasses knowing general stuff about the outdoors, like knowing what this tree is called, and just knowing specific terms as they apply to outdoor education"

Maddison and Leslie provide similar definitions which focus on more narrow concepts of ecoliteracy:

literacy is basically, break that down, just having access to and knowledge of and the ability to interact with and manipulate different ideas on any given discipline right? So ecoliteracy would probably be the ability to access information and manipulate ideas that interplay various aspects and levels of ecological systems, ecology, environment, things like that (Maddison).

Ecoliteracy. I guess it's being aware of some of the vocabulary that goes with outdoor education, ecology...and then there's awareness of the terminology and then there's also going outside and being able to look at something and identify what it is as well. I'm very ecoliterate in terms of my invertebrates. I look around at the plant life, though, and I'm illiterate (Leslie).

Others tap into a notion of ecoliteracy which goes beyond conventional teaching and learning in a classroom, for example Allison states:

[M]y definition wouldn't be directly tied to the classroom, but I think ecoliteracy I think it's being aware of who we are and the environment we live in, and, but also being aware of what the environment, like the physical environment for what it is, and not just how we interact with it. And I think with schools, getting kids to think and play outside and be outside, and enjoy... it's just about giving kids the opportunity to be outside to play and to learn, and learn about the earth, and learn about themselves and learn about the animals and what creates where we live and how we interact with that, but also valuing it for what it is, not just as a resource or something that is for human use.

Moving beyond narrow definitions of literacy, Allison incorporates a spiritual element when she refers to "what creates where we live and how we interact with that", grappling with notions of personal identity and morality through experiencing the outdoors.

Gail points to 'core values' as important in dealing with ecoliteracy amongst students:

Because it's so important we have those kinds of core values in children as they grow up so that they feel inclined to take care of the environment and to want to keep it going because if they don't have that connection and they don't really understand how much influence it is, that they have on it, then they're just going to keep going in the direction that we're going and not going to end very well, I think.

Gloria suggests that ecoliteracy's main purpose would be in re-connecting students,

Today's western nations, we've kind of removed ourselves from nature and everything to do with it and we don't really think about the impact that we have on our environment with our day to day practices. So, I think ecoliteracy would be teaching kind of that connection again...

Allison echoes those sentiments when she speaks of ecoliteracy as responding to the impact of technology on students,

In a lot of ways we're going back to when people were a lot more engaged in the physical environment because that's what their lives depended on...and we lost that with technology and we're having to re-teach ourselves, I think a lot of experiential outdoor education is essentially re-teaching and giving ourselves permission to get back outside...so we'll have to find balance now between modern convenience and the benefits of technology while at the same time acknowledging there are benefits to being connected to the earth.

For Jane, ecoliteracy goes beyond conventional subject boundaries and even resists definition according to her:

Ecoliteracy in the sense that you can combine so many of the different aspects of outdoor education, outdoor environmental awareness, environmental concerns, the ecology... You go to the tide pools, you go out to the lakes, you go into your backyard and all the different species and you can always explore the curriculum through outdoor education, whether it be through doing different projects you can combine it with language arts, you can combine it with socials, you can combine it with pretty much every single part of the curriculum. And being literate in ecosystems or eco-ness, ecoliteracy, means exposing students to an awareness of it and giving them exposure to it and experiences in it. But it's not something that can be defined, I don't think.

Nancy's definition of ecoliteracy involves a way of knowing which involves learning about yourself, your surroundings and the connection between the two,

It's a knowledge of the place that's around you. It's understanding the spaces in which you live, and how you're part of this system or you're just a part of the place and having an appreciation for that.

Tensions, Frustrations & Hypocrisy

are you ecoliterate?

I think I am. it's not a conscious thing, I still have a lot to learn but I think I'm going in the right direction; I'm a life long learner, this is my planet, my home so I would be in a sense; How can I interact with the environment, and expand on my own ideas and identity and development as a person, my values and everything I'm bringing to teaching; I would consider myself an ecoliterate teacher but...

there are definitely gaps in my knowledge, I have to look up and research the type of trees; No probably not...but I can read books and write unit overviews about outdoor education; absolutely not, I look at the plant life and I am illiterate at the moment; there's always more to learn.

Participants expressed feelings of frustration when it came to ecoliteracy and its place within education, including their teacher education programme. Indeed at times it came across that participants were lost when it came to incorporating their views on ecoliteracy, views which had deep personal ties to their own sense of self, with a system of education which they expressed as incompatible.

Participants who come to the program with vast amounts of personal experience and a high proficiency in the outdoors, express their frustration due to lack of attention afforded to outdoor experiential education as a method and purpose of teaching and learning in teacher education. On the surface, many reported feeling a sense of disappointment in what they see as a type of hypocrisy within their program. As students,

they see themselves as being taught about the benefits of experiential education, as well as relying on their own personal sense of its importance, namely the generating of a vibrant and engaged learning community, told of its role in meeting the needs of a diverse group of learners, yet opportunities to practice this method first hand were very rare, and cases where student teachers were actually themselves taught using this method in class were rarer still. Powerful experiences with the outdoors did occur, but occurred in what is deemed “alternative” practicum experiences or a half credit activity course offered through the physical education department. Allison takes aim at the teacher education programme as her frustrations come to the surface

I spent eight months in the classroom and a lot of it is not practical, a lot of it is not applicable, it's just busy work and that I think has been really difficult. So I've just become really convicted, like it needs to be more [experiential] and I pray to God that I can do that with my students, cause it's really easy to become burnt out as a teacher, overworked and underpaid, but somehow, I think experiential outdoor, not just in physical education is crucial but we don't do it.

Allison comments on the opportunity to model the outdoor experience in her teacher education programme so that when it came time to practice it herself, she could rely on that learning.

In the teacher education programme, my learning would be the same learning that I'm going to pass onto my students. If I was doing experiential education, I would have that experience in university, and be able to model that in my classroom.

Jane reiterates that the program has not helped her to become ecoliterate:

Well, there are a few of us in the program that are quite outdoorsy and we really want to integrate being outside and getting kids outside of the classroom and be able to teach environmental awareness and outdoor education and all that. But as far as the program goes, yeah, I haven't learned anything.

When asked whether there was opportunity within her teacher education programme to instil a sense of awareness and appreciation for using the outdoors as a place for developing ecoliteracy, one participant commented,

I don't think that there really is anything right now. Like we took an outdoor education class, a half credit course, optional. So there's very few that got that experience, and other than that, there's nothing really to prepare you for it. It's all basically all people that already have that interest outside of school and it happens that they want to be a teacher as well.

However, Gail provides a unique perspective on the issue of lack of ecoliteracy within the teacher education programme,

I think it has to do more with the [student] teachers than it has with the program. The program provides the opportunities for [student] teachers to challenge their beliefs.

It is this challenge which student teachers are responding to with such negativity as well as passion for ecoliteracy. As students who have become indoctrinated within a system of education since kindergarten, they are now faced with many unknowns. For student teachers, those who have continued on to this high level of education, and therefore are arguable very proficient with how the system works (or how to work the system), they are now faced with the ambiguity of the unknown in terms of how to begin to envision themselves as an ecoliterate teacher who can integrate these complex, and experientially based elements within a system that has a history of mechanistic, rational and instrumental ways of knowing, in other words, antithetical to a holistic perspective on ecoliteracy. I would argue that participants have become adept at fragmenting their own lives, resulting in a personal identity where ecoliteracy is relegated to something that is done during the summer, or outside of school-

time, outside of the school grounds. When it did occur, it was considered as an add-on, an easily segregated moment of discrete, yet powerful, experience.

Where nature was seen as just normal, “just what you did” as participants recall from their own childhood experiences, incorporating ecoliteracy within higher education, even beyond the early years of school, becomes complex, rife with barriers, notions of being “daunting” (Leslie), and overall problematic.

According to Payne and Wattchow (2009) too often outdoor environmental education initiatives are turned into a curriculum addendum, if they occur at all.

Conventional forms of environmental education often suffer from similar time constructions, constraints, and demands. Field trips, for example, are difficult to undertake due to a wide variety of timetabling, financial, staffing, safety and bureaucratic reasons. All too often, the alleged environmental or outdoor experience is squeezed in according to pre-determined learning objectives, and is unable to inform or reflect what occurs in the classroom, or school, or home, or in the everyday (p. 16).

When asked about barriers to getting outdoors in schools, participants responded with a variety of issues, for example concerns about liability, budgetary constraints, and transportation issues.

Regarding financial constraints, Amanda provides lots of variables which she considers could act as potential barriers to outdoor field trips.

Money, first and foremost, and so that includes everything, how you get them there, how you pay for the activity you go and do, how you get extra people to come along, if you’re doing an activity that you need more people, like do you get parent volunteers, or other teachers to come along, or do you join classrooms together, or how do you do that?

As schools are faced with increasing financial pressures, Allison worries there will be no opportunity to take her students out of the classroom when she becomes a teacher.

“I freak out because I’m like I don’t think it’s going to happen, there’s no money.”

In terms of the assumption of greater risk, participants saw liability born by the school, manifested as the threat of an accident, as a common barrier to implementing outdoor education in schools. According to one participant of a focus group session:

Like anything these days, the more it happens, then the more potential for something going wrong and if one thing goes wrong, you know you have the bus with 20 kids that goes off the side of a cliff, or, you know the accident type thing the one thing that goes wrong, the whole thing get shut down because of that incident.

Gloria highlights the complicated logistics that can cripple an attempt at bringing a class out into nature when combined with the constant threat of litigation should anything go wrong.

Even just with sports teams, getting a kid off the school grounds to a sport now that to take kids out into the wilderness and have the right level of certification with all the adults, right number of ratios, a back up contingency plan if something goes wrong, kind of just in today’s world everybody sues everybody and the American philosophy has come up to Canada as well. So, yeah, risk management and knowing that you have all of your bases covered.

In the case of a teacher bringing a class outdoors, one of those ‘bases’ would be the knowledge and experience of the teacher who is leading the class. Whether or not the teacher feels comfortable with the concept, and is willing to accept the inherent risk of bringing a group of students out into the wild unknown, will determine whether outdoor education happens or not.

The feeling of vulnerability in terms of risk assessment, and assumption of risk is not only plaguing schools, but is a symptom of a larger social issue effecting many facets of society. We live in a hyper aware society, where availability and frequency of sensational media can serve to cripple the best intentions of reconnecting with an outdoor

experience which can be easily be turned into a safety concern. The ultimate effect of our risk averse society is that nobody is willing to take risks, and therefore children may grow up not even having been required ed to learn how to assess risk properly.

Gail suggests that her practicum experience, deemed 'alternative' within the program as compared to a traditional classroom placement, went a long way to improving her comfort level in instructing outdoor education.

[I]t mostly has to do with my practicum. I think before that I would have felt just as nervous as I would have before. Like I said, my earth and ocean science course helped a lot because I learned a lot about how everything works, how the world works, how things interact. So that was really neat, all that information. But besides that, I think most of the stuff was in my practicum.

According to Maddison the school administration creates the barrier to getting her class outside. During her practicum she states that she has not been able to take her class outside for fear of defying school policies. She reported not feeling comfortable in questioning or going against the grain in terms of taking a class outside when it was not clearly stated that she could.

The students I interviewed all had a high level of experience and interest in the outdoors. They saw the benefit to incorporating it into their own education, and some took steps to ensure it was included in their teacher training.

A process of engagement with the findings has allowed me to begin to address the research questions which guide my study. It is through the direct experiences, both as part of the student teacher's memories, or through current experiences in the teacher education programme which has helped inform participants' perspective on education including their vision and self identity as teacher.

Definite tensions exist in terms of student teachers and their vision of what education should be able to accomplish in terms of including ecoliteracy. They're frustration and disappointment is a result of student teachers' coming up against a rigid, mechanistic system, one which operates as an element in the overall paradigmatic climate, and one which is at odds with a personal sense of ecoliteracy.

I remember climbing up Deadman's Cliff, a seemingly impassable wall of clay that formed the far bank of Soper creek, where it intersected with one of my favourite fishing holes. It was the closest thing to the quicksand I'd see portrayed on the tv, depicting some fictitious jungle and many a boot or shoe had been lost to the suction of the clay cliff. I remember thinking to myself, "I wonder why they call it Deadman's Cliff?...the big kids tell us that somebody tried to climb it and got stuck and never got out, and died in the clay". I remember the feeling of lying on my back in the field by the creek, making stories out of the passing clouds, and testing the well known theory that if you rub a buttercup flower on your nose and yellow rubs off, that means you like butter. I remember biking for what seemed like hours, with my fishing rod strewn over my back like a bow and arrow to get to our favourite fishing hole, and then fish for the whole day, swim, fish, swim, fish, bike home.

CHAPTER 5: RE-FOUND AGAIN

Threads into Themes

Listening to participants tell stories of their experiences growing up, going to school, and now in the process of ‘becoming’ a teacher, along with stories shared during focus group sessions, combined with my own story as lived, several threads emerge, all woven as part of a larger narrative fabric. What rose to the surface for me as I continually engaged with the transcripts, which read differently each time I sat with them, were three larger threads.

The first thread was the recognition of the essentiality of the experience for participants as they explored early manifestations of their own ecoliteracy. Memories were recalled with fondness around early childhood experiences with family and friends, early encounters in nature during elementary grades, and positive growth and development of ecoliteracy through work and volunteerism make up this thread. I will unpack and explore this notion of the experiential in terms of outdoor environmental education, and its importance to the continued development of ecoliteracy, paying particular attention to teacher education.

The second thread which emerged was one of palpable tension. This theme was made up of strong emotion, manifested through frustration, worry, insecurity, even anger. The vast majority of this strong emotional reaction to the topic of inquiry was (mis)directed towards the teacher education programme they are currently engaged with. This thread deals with the concept of self identity of the student teacher, and the

mismatch between a comprehensive and holistic ecoliteracy and a mechanistic, instrumental system of education. Although this tension represents a disruption and on some levels an inability for student teachers to experience, with meaning, alternative views of knowledge and teaching and learning, this also represents an entry point, an in-betweenness which may house potential for creativity through becoming open to a diversity of perspectives.

The third thread ties the previous two together and deals with the capacity of ecoliteracy as an example of knowledge which connects on many levels. Participants spoke of their own ecoliteracy in terms of a spirituality, a personal conviction, or an emotional attachment. I contrast this holistic perspective on ecoliteracy with examples that demonstrate the possible effects of non connectedness and its impact on the student teachers. At the same time, similarities can be drawn between the tension represented by participants anger and frustration at an educational system which fails to incorporate their nature selves, with the tension created when a complex and disruptive topic such as ecoliteracy is introduced into a rigid and disciplined system. Teacher education represents an opportunity to work towards responding to that dis-connect, providing chances for student teachers to learn to read the 'book of nature' once again.

As student teachers are taught how not to trust their own intuition, their own sense of self, they are reluctant to 'go forth and alter the frequency', rather they are more apt to follow suit, follow the river wherever it may lead them.

We aren't really taught how to create change, we're taught how to follow rules and follow directions and do this and do that and whatever...then we're going to go and 'this is how you would present a new idea or create a new class. ..So it's not something that I'm really comfortable with. (Allison)

Education as a system, including teacher education, is subjected to all the cultural norms which define a Western hegemony that values rational, instrumental and mechanistic modes of knowing and being over other. Within those limitations, tension is created as student teachers, rich with memories of intimate contact with a vibrant, wonderful, and mysterious natural world, experiences which define who they are as people, and who they see themselves as teachers-to-be, come head on against a rigid, outcomes-based system which resists bending in order to incorporate a complex, organic, and transdisciplinary topic that ‘teaching nature’ through ecoliteracy represents.

The Essence: The Experience in Nature as Defining

Listening to student teachers recall with such fondness and powerful feelings their early experiences tied to the direct immersion in the natural spaces of their childhood resonated on a personal level, confirming what I have known and lived myself, while referring to the literature into experiential outdoor education and its capacity for influencing the hearts of students of all ages. For example Greenwood (2010) refers to an “intense consciousness of land” as a perspective that “can only develop through direct experience of sufficient frequency, duration, curiosity and reverence, so that we may learn to listen and love” (p.15).

Value of Experiential – Memories Re-Learned

Memories as recounted through participant stories take on a level of importance toward the development of their ecoliteracy as student teachers. The way those memories are embodied and infused within their own identity becomes a powerful example of the

potential for the experiential outdoor element to manifest into heart knowledge (Holmes 2002; Aluli-Meyer, 2008).

Some describe the physical and even biological changes that occur within the student when in direct contact with the natural world. For example, according to Abram (1996) the essence of the experiential element in education begins and ends with the body.

The living body is thus the very possibility of contact, not just with others but with oneself – the very possibility of reflection, of thought, of knowledge (p. 45).

He goes on to suggest that despite being defined as a rational, codified “anatomized and mechanical body” we find “at the *heart* of even our most abstract cogitations, the sensuous and sentient life of the body itself” (p.45-46). Accordingly, the experience of the human with the more-than-human is at times boundaryless itself:

The breathing, sensing body draws its sustenance and its very substance from the soils, plants, and elements that surround it; it continually contributes itself, in turn, to the air, to the composting earth, to the nourishment of the insects and oak trees and squirrels, ceaselessly spreading out of itself as well as breathing the world into itself, so that it is very difficult to discern, at any moment, precisely where this living body begins and where it ends. (p. 46-47).

According to Suzuki (2002), his perspective on environmentalism as a field of study was transformed when he changed his point of view of the environment outside of the body, to environment as existing within the biology of the person on the inside.

With this realization, I also saw that environmentalists like me had been framing the issue improperly. There is no environment ‘out there’ that is separate from us. We can’t manage our impact on the environment if we are our surroundings. Indigenous people are absolutely correct: we are born of the earth and constructed from the four sacred elements of earth, air, fire, and water (p.7-8).

Davis, Sumara and Luce-Kapler (2008) question the narrow view of a cause and effect relationship where teaching causes learning to happen in the student. Rather, they refer to teaching as “triggering associations within the learner” (p.179). The outdoor experience provides context for that triggering to occur, as Kim states in her response to the power of learning outside, “even just the smell of being outside triggers memories”. Just as the moon pulls the waters in a flux of ebb and flow, experiential outdoor education can similarly pull the student through memories into the meaning making capacity, with the hope of triggering learning with purpose, learning tied to the individual student.

Abram (1996) speaks of the naturalness of the human body and it’s preference for experiences with the natural ‘otherness’ as represented through nature. My participants report a sense of naturalness as well in terms of early childhood experiences with the natural world. Kim reflects on our need as a society to “make nature natural again” in a discussion about the lack of opportunity in schools for getting outside in direct contact with nature. She states that “I’m an Earthling, so being outside feels natural to me”.

Making nature natural again ties into Davis, Sumara, and Luce-Kapler’s, (2008) notion of re-noticing. The authors suggest that it is the teacher’s role to assist students to “think freshly” about things they encounter everyday, things already natural to them:

In effect, good teaching is not just about introducing children to unnoticed and unfamiliar aspects of the world, but also about helping them to renote artifacts and practices that might have slipped into nonconscious familiarity (p. 214).

Payne (2003) presents a case for why the ‘experience’ lies at the very core of environmental education:

Many agree that experience is at the pedagogical *heart* and curricular soul of a great deal of learning in environmental education. underpinning this consensus about the importance of ‘real’, ‘direct’, or ‘authentic’ learning

experiences is, of course, tacit and, perhaps, naïve agreement that such experiences are enhanced by the ‘primitive’ engagement of the organic, corporeal or sensuous human body in the actual subject matter of that which is to be learned ‘environmentally’ (p. 172).

According to Allison she questions curriculum content around environmental education which is not connected, and thus not ‘normal’. She states that “we’re still dealing with a very limited perspective. That’s the problem when you just look at it as an add-on versus, *this is normal*”.

She goes on to explore what it means for her to feel comfortable in nature, what feels normal, when being connected feels normal. She suggests that “if the entire program said, ‘this is what’s normal, this is the expectation’, and they taught like that consistently, that would change people’s perspectives”. Allison is speaking of her experience in teacher education, but that same comment could easily apply to education as a system and the trend to approach ecoliteracy as an add-on or extra-curricular afterthought.

Kim expresses her sentiment of “Earthling first and foremost”, which relates to what Snyder suggests, recollecting the naturalness of our human-nature connection, which involves a task of “self-rediscovery” grounding what it means to be human “etymologically something like ‘Earthling’” (1999, p. 96). Through the outdoor experiential element, students are able to find themselves grounded in place, into a place of meaning, meaning which has impacts at the level of self identity, self hood (Basso, 1996).

Recently, researchers in environmental education have begun to place more importance on the time spent outdoors in relation to the development of ecoliterate students of all ages (Orr, 2004; Sobel, 1995; Pyle 1998; Louv, 2008). According to this perspective, the more time students spend outside, the more affective connection they

will develop towards the natural world, and it is that experience which leads to what is termed pro environmental behaviour. According to Gould (1994), “We cannot win the battle to save species and environment without forging an emotional bond between ourselves and nature as well—for we will not fight in order to save what we do not love. . . we must have visceral contact in order to love” (p. 44).

Chawla (1988) studied professionals in the field of environmentalism, and found that a significant amount cited experiences in the outdoors as influential in their attitudes toward nature, more than double the amount who claimed to have received that same influence through science education. That finding is relevant in terms of advocating for opportunities for students to engage in direct contact with the magic of the natural world, rather than simply experiencing nature as merely an outdoor laboratory.

Similarly, Palmer (1999) found that direct experiences with nature had far more impact on subsequent involvement in pro-environmental activities than did formal in-class education. One way of perceiving difference in terms of ecoliteracy and direct contact with the natural world, is to view the natural world as something to learn from, not just learn about, in and for.

Nature As Teacher

“one does not simply learn about land, we learn best from land”

(Aluli-Meyer, 2008, p. 219).

The experiential element of ecoliteracy involves the flourishing of a relationship between student and the natural world around (and within) them. Part of a holistic ecoliteracy is the notion of seeing the natural world as teacher for students. Experiencing nature as teacher challenges one of the foundational tenets of modern education, namely

that of teacher as expert (Steen, 2003). Therefore, it is not an easy task to ask student teachers to contemplate and to grasp a concept as foreign as allowing nature to become the expert in the class, to let nature teach. However, if indeed we are going to encourage students to become ecoliterate, to become fluent in the language of nature, there is no better instructor than nature itself.

Nature as teacher embodies the relationship which sees the human-nature relationship move from one of fragmentation and control/mastery to one of holism, connection and interdependence. By allowing nature to teach, the intimate connection between the human and the more-than-human is punctuated.

Greenwood (2010) cautions against forgetting the original teachings of the more-than-human-world. He states that environmental education as a field has become “culturally responsive, politically astute, and psychologically smart” yet we can’t forget “the teachers...What they teach us is irreplaceable, and endangered, unless we stop, look, and listen for a long time” (p. 16). He goes on to suggest that this relationship between what he calls ‘the teachers’ and the student is paramount:

How far gone are we now, here, today, from the teachers? Returning to the teacher, slowing to open to the more-than-human others, to the experience of habitat and biological diversity, to the interactions between land and people, this is the *heart* and soul of environmental education (not original italics) (p.15).

The poem “*The Teachers*” (Oliver, 2008) is an example of meditations on slowing and stopping to pay attention to the others and what our relationship to others might signify.

“The Teachers”
Owl in the black morning,
mockingbird in the burning

slants of the sunny afternoon
 declare so simply
 to the world
 everything I have tried but still
 haven't been able
 to put into words,
 so I do not go
 far from that school
 with its star-bright
 or blue ceiling,
 and I listen to those teachers,
 and others too—
 the wind in the trees
 and the water waves—
 for they are what lead me
 from the dryness of self
 where I labor
 with the mind-steps of language—
 lonely, as we all are
 in the singular,
 I listen hard
 to the exuberances
 of the mockingbird and the owl,
 the waves and the wind.
 And then, like peace after perfect speech,
 such stillness (p. 27).

I remember with vividness, it was early Fall, I had just emerged from a three hour doctoral seminar on the role of social discourses as it pertains to our work and study. I can remember feeling dizzy, I had just begun my doctoral coursework, and this one was on my first classes. I recall feeling particularly drained from that onslaught of unexpected challenges to some deeply held conceptions of my own experience in the world, not light topics indeed. I remember walking by an oak tree at the entrance to the education building, and thinking what it must be like to be that tree, solid, rooted, never questioning itself, never pushing beyond its capacities for being, never feeling the need to challenge assumptions about itself and its philosophy. As words such as epistemology and ontological orientation rattled through my head as I entered the parking lot, my world was shocked out of my subconscious meanderings as a flock of Canada Geese slowly approached overhead. At first I could begin to hear them rather faintly, they provided me a few seconds to question their arrival, before they were directly overhead, honking their existence as a caravan of Mac trucks floating effortlessly in 'v' formation. For that brief moment, watching those Geese continue along

their way, I assumed on some southern migratory journey, I couldn't help but put the past three hours into a new and creative perspective, helping me to see my own struggles and my own questioning within a context of something bigger, something more real.

During my research, I would stumble across the following poem by (Szyborska, 1995) which I feel illustrates what I was feeling that chilly early October evening.

No Title Required

Above me a white butterfly is fluttering through the air
 On wings that are it's alone,
 And a shadow skims through my hands
 That is non other than itself, on one else's but its own.
 When I see such things, I'm no longer sure
 that what's important
 is more important than what's not"
 (p. 176-177)

The Tension

One perspective on the tension that I witnessed through interviews and focus groups could be interpreted as a manifestation of a dis-connection between a system of teaching and learning and broader notions of ecoliteracy and the nature-self. I believe, and feel from my own experience, that a holistic connection to something bigger, i.e. an ecoliteracy which incorporates earth as part of the individual and the individual as part of the broader cosmos, is incompatible with the current conventional system of education. Broken down into subjects, distinct disciplines (Steen 2003) learning as dissected into prescribed learning outcomes and discreet teachable nuggets, there is an incompatibility which resides at the very core of our system of education. This dislocation resonates with the issue of memory, and a loss of connectivity. As Suzuki (2002) states: "our ancient understanding of the exquisite interconnectivity of all life has been shattered" (p. 3).

While he paints the picture of our entire species reacting to a primal disconnect on a planetary scale, I see this lack of wholeness as manifesting in the discontent of the student teachers I interviewed (Miller, 2005). In the following quote, where Suzuki (2002) speaks of science, I am reading education, and specifically capacity for ecoliteracy:

While we look to science to reveal the secrets of the cosmos, its primary methodology of reductionism focuses on parts of nature. And as the world around us is examined in pieces, the rhythms, patterns and cycles within those pieces are integrated are lost and any insights we gain become illusion of understanding and mastery (p. 4).

Therefore I consider student teachers as products of their environment, and consider the picture of mechanism, reductionism, quantification, separation, and fragmentation which I have forwarded as the systemic milieu in terms of education, and as Berry (1999) eludes to, it should come as no surprise that my participants are expressing their concern, confusion and frustration when discussing issues of ecoliteracy within schools. As discussed, the ecoliteracy of the student teacher is tied to a sense of nature-self, which is itself a reflection of the overall concept of self-identity of the student teacher. Berry refers to this as the “inner world” of the student teacher, and suggests that it reflects what is existing in its experience of the outer world. “Our inner world is a response to the outer world. Without the wonder and majesty and beauty of the outer world we have no developed inner world” (in O’Sullivan, p. xi). In this was the identity crisis as experienced by some participants is an expression of the eco-crisis and the response of education to the declining role of nature in the lives of students. As the curriculum is further fragmented, so to is the student teacher in response.

Although we are currently experiencing an ecocrisis at the level of the biosphere, it seems that social institutions such as education are not impervious to the effects of that pathology. According to Spinoza's "philosophy of organicism", our interdependency on nature means that if nature is sick, so are we. O'Sullivan (2001) responding to the illness afflicting our western mode of thought, states that "knowledge that does not heal...is not part of the consciousness this world needs right now" (p. 221). Orr (1992) similarly states there is a need for education that is "life-centered" and will work to "heal, connect, liberate, empower, create, and celebrate" (p.x).

As Berry (1999) suggests, what we do to our planet, we also do to ourselves. It is a fallacy to assume that we can separate ourselves (including our institutions) from the harm we are currently doing to the planet. That lack of awareness to the interdependency and interconnection between humans the rest of the natural world, is a symptom of a larger paradigmatic plague.

Caught within that social hubris is education, and teacher education specifically. There exists a distrust in forms of knowing which are considered tacit, or intuitive. This systemic distrust manifests into a personal distrust at the level of self identity of the student teacher. I feel that the anger that comes through in my interviews, the sense of being disillusioned, and disheartened through their educational experience at the pre service teacher level, is a result of trying to locate one's own deeply rooted sense of nature self within a system of teacher education which places little value on those ways of knowing.

Building on Carter's (1990) call for reconceptualising teacher knowledge in terms of it being "experiential, procedural, situational and particularistic" (p. 307), Borko and

Putnam (1996) suggest that “attending to the nature of experiential knowledge and how it is acquired” is important (p.667). Mirroring a call for questioning the same categorical abstractions in the way environmental education is approached within schools, Borko and Putnam (1996) warn against organizing teachers’ knowledge “into abstract, isolated, discrete categories” rather than approaching it as “richly contextualized and embedded in the practice from which it arose and in which it is used” (p.667).

In his work teaching student teachers in the field of early childhood education, Jardine (1990) shares his stories of tension as created through discussions around systemic culture and ecoliteracy with his students. He describes the difficulty some students experienced as

Painful...as they began to confront the fossilized residues and assumptions of their own schooling, more pointedly, as they began practice teaching in situations of profound disintegration (p.109).

Jardine (1990) contemplates that the further and deeper within a process of ‘unearthing’ an integrative curriculum one goes, it begins to

Disrupt our deeply held beliefs and images of understanding, self understanding, and mutual understanding, pointing to a sense of interrelatedness, interdependency, or interconnectedness that is belied by our analytic, definitional and frequently disintegrative approaches to educational phenomena (p. 110).

Throughout the interviews there seemed to be a misguided blame aimed at the teacher education experience the student teachers were reacting to.

For example, Jane states,

We really want to integrate being outside and getting kids outside of the classroom and be able to teach environmental awareness and outdoor education...but as far as the program goes I haven’t learned anything.

I feel that the feelings of frustration and tension expressed this way are a result of the mismatch of an ecoliteracy which resides within the student teacher, and a dissociated notion of education which does not seem to be able to accommodate a holistic concept such as ecoliteracy. Participants refer to what they call an inherent “hypocrisy” (Allison) of the teacher education programme, and frequently point out on a number of occasions what they see as the failings of the teacher education programme. For example they often blame the program for not doing enough to prepare them for teaching ecoliteracy in their own classes.

I see these expressions of tension and insecurity and ultimately blame as a result of the disruption caused by their attempts to locate their own sense of nature-self within their programme. This tension is manifested in attempts to incorporate a topic as unconventional as outdoor experiential education into a mechanistic system, a system within which the student teacher has learned to become the student/student-teacher/teacher-to-be that they are.

The reductionism and analytical instrumentalism acting as hallmarks within schools and curriculum necessarily work to negate the patterns and cycles, and thus meaning and purpose from the perspective of the ecoliterate teacher. Disconnected curriculum becomes illusion of understanding and mastery, lacking heart, lacking meaning.

Disruption

Through reading interview and focus group transcripts, two stories of disruption reflect student teachers’ response to difference in terms of challenges to their worldview.

Gloria recounts how despite the instructor's best efforts, her class had a difficult time relating to some of the concepts embedded within her Aboriginal perspectives on education course, namely the introduction to an Aboriginal perspective toward the human – nature relationship, an element inherent within ecoliteracy.

When asked if her Aboriginal education course had an impact on her ecoliteracy, Gloria replied

It didn't really change my perspective. I found that course kind of difficult because a lot of the people weren't really willing to view the nature as our instructor was trying to get us to see it that way so they found it was a bit silly, they didn't really understand, I find it kind of difficult to try and view it the way our instructor was trying to get us to see it which was really too bad.

She went on to suggest that her class wasn't able to appreciate messages that were being taught by her instructor. She provides the example of the concept of seeing the natural world as part of oneself.

And so it was just most of us had never been exposed to that kind of culture before, so it was really difficult for some of us to see the Earth as this whole holistic kind of thing and feel it and that kind of thing.

Gloria's story of disconnect with her Aboriginal course is representative of what Jardine (1990) calls "fossilized residues" where students are unable to see themselves as connected to land in that way, they believed "in essence that the last word had already been said, that there was nothing really left to say" (p. 115). In response to the disruption in Gloria's worldview Jardine (1990) proposes an integrated curriculum, which highlights a need for a "recovery of something archaic, and delicate, and difficult" (p.109). An integral part of that recovery is an active re-participation in the living world through experiential outdoor education.

Allison describes another story of how her class, divided into two camps are at odds over Ted Aoki's visioning of curriculum:

We read an article by Ted Aoki. And I remember reading it and going, this is hilarious. I loved this article, and it was, but it was very fearful, it was very out there, philosophical, feely. We've definitely got – there's two camps in our class. We love each other greatly, however it's very different perspectives. And it is a challenge, because it's almost, we've got people in our class who are very motivated by grades and competition and getting exceeding expectation on every assignment. And those are the people that had trouble with that Aoki article. And in our Aboriginal Ed class, those people really struggled with it.

Tension was also seen as a lack of trust, and a lack of confidence. For example Allison's opinion on her own lack of ecoliteracy. When asked if she felt she was ecoliterate, she replied:

No, probably not...I think people who are ecoliterate, are passionate about it, and they live it, it's not just head knowledge, it's got to be more than just a lesson plan that I teach my kids, I have to live it, not just talk about it.

Another example is despite Leslie's background in leading outdoor experiences, and along with her background as a marine biologist, she still insists that she isn't completely ecoliterate because she only knows invertebrates, and "when I look around at plant life, I'm illiterate"

Moore points to the reality of students who feel "comfortable" with the way things are normally done, with discipline-oriented curricula for example, and likewise "become uncomfortable when alternative models for learning are proposed in classrooms" (p.8).

Similarly, Jardine (1990) points to how familiarity can breed contempt "as a sort of ungenerative stasis, a desire to hold on to the boundaries already laid out" (p. 115).

The notion of a holistic ecoliteracy which includes concepts of self as part of nature, and values a multiversity of cultural perspectives toward knowledge has proven to be disruptive to some of the participants in my study. This is similar to the very act of teaching and learning outside of the classroom which can represent disruption to the status quo operation of the linear system of education. Discreet learning gained from experiences in direct contact with the natural world are often not immediately identifiable, and are not always easily measureable as compared with other more quantifiable learning outcomes. This can represent a challenge to a system which is built around a notion of scheduled testing, summative assessment and quantitative measurement of predetermined learning outcomes. As a microcosm, this mis-fit is a manifestation of the larger issue of an education system which is itself complex, resists pre-distinguished borders, and deals with the multilayered lives of students, which becomes at odds as existing within a broader social paradigm built around certainty, universality and rational determination of knowledge.

A representation of that notion of disruption is the element of the outdoor experience in schools. By taking students out into the rainforest, relying on them to use their senses to connect with their surroundings, asking nature to become teacher, they are disrupting what they know or believe to be conventional classroom routine, complacency and familiarity are challenged by powerful, potentially transformative experiences in nature. By situating students in surroundings that they are unfamiliar with and/or present ever changing variables unique to the outdoors, students become open to a new learning stimuli, they focus themselves amidst all the distraction. Teleported into an outdoor classroom, nothing reminds them of the indoor counterpart, they escape the usual pitfalls

of complacency and aren't able to ignore, as their surroundings become part of the learning process, requiring their constant attention.

In terms of eddy as metaphor, in this case the potentially disruptive experience may be unsettling and function to break the normal pattern of flow for that particular class or that particular teacher, or that particular teacher education programme, similar to how the boulder will interrupt the normal course of travel for the river. However, as in the example of a river, after the challenge of the obstacle comes the possibility of calm water, "a place to rest and plan your next move"

www.paddlenow.com/html/dictionary%20D-F.html. At that moment, it is possible to see things in a different light, and to notice things that possibly were not noticed before while engaged in the fast flow of the downward river. In this way, the disruptive event (obstacle in river) has been useful in providing opportunity to learn as in the calmness of the eddy.

According to Allison,

My most life-changing experiences have been in places where I've been out of my comfort zone, and I guess for me, that's what experiential education is, it's taking kids out of their comfort zone in the classroom or their comfort zone in a subject area and challenging them.

She goes on to state that the same transformative capacity is as salient as a focus for teacher education programmes.

Ecoliteracy, and at its heart spending direct time in nature has the capacity to disrupt students perceptions of the world, and their place within it. As Jardine (1990) states, spending time in the woods, or by the ocean, in close and intimate contact with the natural world involves listening "to the voice of the Earth, even if listening is difficult, perhaps painful, perhaps disruptive of the clear and distinct boundaries we have set for ourselves" (p. 114).

When considered as a mode of disruption within a rigid, linear and mechanistic education system, the potential for ecoliteracy to change the student, forming new connections, providing opportunities for new noticing, “re-noticing” becomes possible (Davis, Sumara and Luce-Kapler, 2008, p.214). As Dewey (1934/1954) wrote that “equilibrium comes about not out of mechanically and inertly, but out of, and because of, tension” (p. 14). Therefore the potential for the tension to open up possibilities is salient.

Ecoliteracy: Knowledge of Connection

Speaking of the need for a spiritual connection to something larger than ourselves, incidentally a feature that is difficult to manifest in a system which is built on what Steen (2003) refers to as “bastions of mechanism”, Steen (2003) considers the need for a spiritual connection to something larger, grounded in meaning. Suzuki (2002) places much importance that connection as a need,

But beyond physical and social needs, we have yet another need, one that is just as vital to our long-term health and happiness. It is a need that encompasses all the rest, an aspect of human life that is so mysterious it is often disregarded or denied. Like air or water, like the love and companionship of our own kind, we need spiritual connection; we need to understand where we belong (p. 184).

Through interviews and focus groups there came to be a pattern of student teachers’ incompatibility with the educational processes they were encountering along their journeys to becoming an educator. Many felt they could not see themselves as reflected in the teaching and learning in terms of their development of ecoliteracy. That they did not belong. Some participants had trouble envisioning themselves as teachers being able to deliver ecoliteracy to their own classes, despite reporting that they consider

themselves to be ecoliterate. Furthermore, participants such as Allison are unable to visualize themselves working within the current system, this despite being in the teacher education programme.

Environmental educator Laura Piersol (2010) describes her dilemma with deciding how to teach environmental education in her class. As she explains, through her journey, she decided to “track down some of the stories I was living, telling and making as an environmental educator:

I wandered into the large room belonging to the story of ecological science. I looked around the room in shock. I had spent a lot of time trying to keep things neat and tidy and in order in this room. Now the walls were covered in mould, and ants carefully crawled around tangled spider webs. In one corner, a scientist sat scribbling, documenting the change. Parts of the walls were crumbling, returning to the earth, and plants were peeking out of the cracks (p. 199).

Next she tried the social-political room, however, she didn't fare any better telling her students how they should feel and act towards the natural environment. “you should turn off the lights”, “you shouldn't litter”, “do recycle”, she began to feel that such a “top down approach” did not provide students with “a deep or felt understanding as to why the behaviour was important” (p. 201). Therefore she decided to stop telling students how to care for the environment, and instead “give them the opportunity to develop their own meaningful connections and hopefully a related environmental ethic” (p.201).

She began to wonder why she didn't feel comfortable telling either of those stories to her students. She realized that both the science and social-political advocacy stories were floating. They were “sitting on the land, instead of having roots within it” (p. 201).

Time after time, my version of environmental education consisted of a string of activities: running games, simple scavenger hunts, dusty bird mounts, and

the odd captive turtle, all of which contributed little or nothing to developing meaningful relationships with the natural place we are in (p. 202).

Piersol's (2010) dilemma was similar in many ways to the student teachers I interviewed who could not see their nature-self, which became engrained through early childhood experiences, as reflected within the landscape of their teacher education programme.

For example, according to Allison, she expresses a difficult time seeing herself in the reality of teaching in public school in BC:

I don't think I'll ever work in the public system in BC in a school where I feel like I can't—to me, it's a sacrifice for me to back off on what I think is important.

For Allison, her inability to reconcile the differences between her self identity as an ecoliterate student teacher and an education system which for her seems incompatible to spiritual capacities and personal convictions she refers to in her interview, becomes a real barrier for her as a future teacher.

Gail describes the Sea to Sky Outdoor School as an environmental education centre, which involved overnight camping, and was founded by a group of teachers who, according to Gail, “weren't happy with the BC IRP's”. Gail relates her experiences at the ‘alternative practicum’ as providing her with very valuable experience in terms of the possibility of engaging her ecoliteracy in her future career as a teacher. Piersol (2010) describes her move away from public school classroom to the Kananaskis Field House, and her subsequent discovery of the power of wonder. “I began to tap into the importance of wonder as a learning tool within my practice. The world is inscribed with tracks into wonder, but most of us as adults have forgotten how to read or even find them” (p. 203).

In both cases, the knowledge gained from those experiences, each falling outside of the mainstream education system, proved to awaken a sense of knowing which was not relegated to a narrow definition of intellectual know how, but instead tapped into the awe-inspiring potential of connecting directly with the natural world.

As Suzuki (2003) states, the connection between humans and the more-than-human-world serves a spiritual need.

[H]uman beings have needs that are more than just physical and social; we are spiritual animals. I believe we have a built-in need to experience wilderness and nature, a craving that can be fulfilled partially by knowing that there are such cathedrals to nourish the soul. In trashing wilderness areas that only time and nature create, we diminish ourselves with the loss of an integral component of our spiritual makeup (p. 81-82).

Consider Suzuki's point of view and apply it to the diminishment of the self identity of the student teacher, where by omitting nature from the curricular landscape, there is a very real loss to the spiritual realm of the individual.

As ecoliteracy becomes part of the student teacher's identity as teacher-to-be, it takes root inside them, residing within the heart, ecoliteracy becomes meaning-making at the most personal level. Suzuki (2002) refers to Haida artist Guujaaw, who describes the connection between land and identity from his peoples' perspective:

“the trees, the birds, the fish, the water, the wind are all parts of Haida identity” (p. 7).

In similar fashion, the living Earth is part of the nature-self of the student teacher.

New Knowledge Needed

<p style="text-align: center;">Listen tonight with all the Wisdom of your spirit – listen too with All the compassion of your heart – Lest there come another night – When there is only silence - Listen tonight a great</p>

And Total Silence.
(Abbott, 1999, p.161).

Just as the monopoly of an instrumental, intellectual knowledge is questioned, a form of knowledge, which Holmes (2001) and Aluli-Meyer (2008) have referred to previously as *heart* knowledge is sought in order to help connect students with the natural world. To provide learning about themselves (nature-selves), the world around them, and the inherent and intimate connection between them.

Gail distinguishes between these two seemingly opposite forms of knowing in her description of her alternative practicum at the Sea to Sky Outdoor School. On the one hand she explores the learning that takes place at the school as engaging the senses of learners, making that emotional connection. She contrasts this with a form of knowledge that could be termed 'head' knowledge, "all that information":

Speaking of where she encountered ecoliteracy within her program, Gail states:

[M]y earth and ocean science course helped a lot because I learned a lot about how everything works, how the world works, how things interact. So that was really neat, all that information. But besides that, I think most of the stuff was in my practicum.

Davis, Sumara and Luce-Kapler (2008) point to education and it's complicity in the promotion of a view of knowledge which prefers "instrumental competencies" to a more embodied, engaged and embedded notion, what they refer to as a focusing on *how* things are done and neglecting to consider *why* they are done in the first place, which they relate to "an emphasis on *knowledge*, not *wisdom*" (p. 212).

So do we want our kids to know facts that they can look up in ten seconds in Google? Or do we want them to have the attitude and passion for science to want to get out there and do it? (Leslie)

Kim demonstrates the same dilemma but from another angle. She states that she comes to the teacher education programme with an emotional connection and not enough ‘science’ to compliment that heart knowledge.

I had a really strictly sort of spiritual connection to nature, and haven’t really gained, and I’ve continued that, I’ve maintained that, but this program has given me kind of a different grounding in nature, and with this, a different kind of appreciation maybe, the more cognitive piece is for me also empowering.

Kim goes on to state that for her ecoliteracy involves love and respect

I just think that instilling a love and respect for nature in young people is a huge part of that process and that teaching.

Kim recounts the story of her experiencing a full moon near the equator for the first time.

As she describes it her perspective on the event was changed through her direct experience of it,

I heard about it through my class, you know through reading, but then when I lived it and watched it, I got it, and now it’s just on another level of being able to teach that, bringing both those things together.

As Kim illustrates, it’s not about one or the other, head or heart, what she refers to as “my love”, and “the scientific/information piece” , it’s about bringing both together, complimenting each other.

Heart Knowledge and Finding Your Nature-Self

“There is a rich kind of scholarship and a yearning to learn that knows knowledge is a way into a deeper relationship with things. But there is also a type of learning that accumulates knowledge solely in order to acquire a new power over things – a kind of scholarship that by its exercise hopes to avoid and indeed to vanquish the difficulty of ambiguity of relationship (Jardine and Abram, 2000, p. 174)

“Knowledge can change you” (Allison)

That statement from Allison emerged from a focus group discussion on the value of knowing in terms of spending time in direct contact with the natural world. The question we grappled with was what type of knowledge can change you?

Greene (1978) speaks of “horizons of understanding” and how teacher education may “open spaces where the shifting of emerging teachers’ landscapes of learning can take place” (p 245). She refers to the landscape in a literal sense when it comes to student teachers and experiencing their nature selves. “To be in touch with our landscape is to be in touch with our evolving experiences, to be aware of the ways in which we encounter the world (p. 2). How has the experience of their teacher education helped to open up that space for participants?

Unfortunately according to many of my participants, it hasn’t.

Heart knowledge represents a call for placing emphasis on a different form of knowing, as Davis, Sumara and Luce-Kapler (2008) suggest, what is needed is education which places emphasis on “knowing differently, rather than merely to know more” (p.8). A way of knowing which isn’t as concerned with the answer, but rather pays more attention to the question. A way of coming to know which is embodied, connected, seeks holism, and engages the learner on a ‘more-than-cognitive’ level (through the more-than-human world). Participants describe an educational experience which failed to reach them on that level. They spoke of missed opportunities, unfulfilled hopes, and feelings of disconnection from their experience.

Allison also refers to her ‘convictions’ as elements of change.

My convictions that I have, they come from my experiences. So I guess what I'm saying is that, if we actually taught teacher training programs through experiential education, I think we would foster conviction, because *what I do and how I feel is what changes me*.

A result of being put in a disruptive situation such as a wet rainforest in late October, is the emotional connection. Eliciting that emotional connection is a powerful element to the experiential component of being outdoors, as described by Gloria,

When you make an emotional connection to something, you learn it, and it has a much stronger connection in your mind. So any time that you can have an emotional connection, you're going to learn, it'll soak in more.

As one focus group participant stated: "it's definitely first about that emotional connection, because you're not going to want to save something if you don't care"

Similarly, Pyle (2001) states "What we know, we may choose to care for. What we fail to recognize, we certainly won't" (p. 18).

For some of my participants, the opportunity to make an emotional connection, to tap into knowledge which extends beyond the logico-scientific realm of empirically tested evidence is what makes learning happen. For example Nancy describes how that emotional connection contributed to a desire to learn more.

Until I've had an experience that made that emotional connection I'm never going to learn to love something. And I think if you can find the opportunity for them to maybe develop a passion for a subject or for being in nature, then that will promote learning, and then wanting to learn that subject".

Although Nancy is referring to her students in her class, the findings indicate that this same emotional connection was missing from her teacher education experience. I argue that a teacher education curriculum could use more heart in this case.

Participants describe an embodied, engaged way of knowing that forms the essence of what I refer to as heart knowledge, - knowledge which "endures", knowledge

which can work to alter the frequency or as one participant put it, provide that “spark” towards change.

Kim points to a spirituality that emerges as one adopts “a creative approach to teaching nature and asking questions like ‘how are we part of it? ‘How are we nature?’” She wonders how this line of thinking can be measured through tools available in our current system, “What are your PLO’s, how do you assess it?” she wonders.

The Need to Justify

Many participants provide anecdotes of the need to justify going outdoors based on current outcome measures, or being accountable to PLO’s in school settings. For example, one focus group participant relays the following story of her practicum experience,

I know in my practicum, my mentor teacher is all about being outdoors, so in PE...there was a hiking unit, and so we hiked to Walbran Park, or hiked to Anderson Hill, and it was all very, ‘this isn’t just a walk in the park’ this is hiking, you know you have to stay on the trail, you have to not put things, you know so she really incorporated this skill set for hiking as a way of assessing the kids.

What is wrong with “*just a walk in the park*”? One focus group participant stated,

I mean when you’re talking about nature, that’s different than science...for me just being, just bringing kids to the park, yeah you know you try to find a PLO that you can squeeze it into, but such an amazing place for them to be in, without teachers giving them a reason for being there.

Participants reported needing to justify their experiences in nature. No longer is nature, just a place where we were, something natural, something to be connected with, it was something that was out of the ordinary, and something that required special attention in order to justify being there. In a discussion on the ability to take a class out into nature, Mandy expressed concern about the need for justification. In planning a new outing to a

natural setting, she says it would be difficult to convince administration, but “I think they’d be open if you supported it with the *learning objectives*”. Once again, the need to tie a ‘walk in the park’ with a schema which associates external and abstract objectives for the experience to be of value, is a barrier to a holistic vision of ecoliteracy.

Kim questions the need for an externally justifiable reason to be out in nature, as she strives to “make nature natural again”. As a guest speaker I brought Kim’s class out into a forest for a class in October. She relates that experience to her desire to re-connect with purpose, but without an agenda.

[G]oing down to Mystic Vale that time and feeling it, was also, for me the most powerful experience, because I know we have to have activities and stuff but I really hope that what we can also do is just learn how to just be in nature for short periods of time...so just being and awareness, that metacognition thing about what’s happening and what is it doing to me right now, and how am I interacting with it, that’s ecoliteracy that’s developing that piece, so part of my goal is yeah, to take kids out and do stuff with them and hopefully not have to have everything organized all the time.....just allow them to be...to experience it without a structure, without an assessment without a rubric.

Along similar lines, I currently teach an activity course within the Exercise Physical and Health Education department called Outdoor Experiential Education. Part of instructing that course has always been the need to justify being out in the rainforest on the West coast of Vancouver Island over the Thanksgiving weekend as something more than “a walk in the park”. The first year I taught the course, we had a very eventful trip, which involved a black bear interrupting our dinner one evening, forcing us out into the rain for a sleepless night and a conservation office firing shots over our camp as a bear deterrent the next morning so we could pack up what was left of our belongings. When it came time to ‘grade’ my students, I chose to submit A’s for all of them. The administration promptly let me know that it wasn’t appropriate nor acceptable to do so,

and that in future I would need to incorporate more definitive measurables in order to justify giving grades for that experience. As an instructor I felt challenged by that, as I felt the experience of this type of course can stand by itself to a large degree, without requiring further justification. I wondered for a long time how to begin to grade an encounter with a hungry bear on a rainy beach at night.

In terms of the need to justify taking a class outside, perhaps our measurement device should be whether or not we are reaching O'Sullivan's (2001) suggestion of actions either working towards or against a flourishing, interconnected human-Earth relationship. Perhaps the yardstick for legitimacy should be aligned with what Holmes (2002) describes as knowledge "for the purpose of furthering relationship" which "surpasses the intellectual realm, and lodges itself in the emotional realm" (p. 41).

What about a focus on environmental outdoor education that values the experience as purveyor of wonder and awe on the part of the learner? How is this need to justify a hike in the woods representative of the broader educational focus on assessment? As one participant asked: "do you have to have a goal? ... You will learn something from being outside even if you don't understand what it is".

Piersol (2010) describes her own personal dilemma in a similar situation. While becoming disheartened with teaching environmental education in schools, passing on cultural lessons she didn't herself believe in, she sought a new approach. She began to "track down new stories, ones that were rooted in the complexity of space" (p. 202). Piersol (2010) describes how students "realized that they were active subjects in the story of place", through "a whole new way to approach ecological science by embedding it in the context, change and subjective experience of place" (p. 202).

Orr (1994) refers to “personhood” (p.11) as being negatively impacted by being exposed or institutionalized within our current education system with an emphasis on fragmentation, and reductionism. I see this as similar to my use of nature-self. One’s nature-self, the part of one’s being which is drawn to connecting and experiencing the self as interdependent on a planetary scale is at risk of atrophy given that inclination towards separation and dissection.

Inwood (2007) suggests that the nature of teachers’ relationships to the other than human world are based on “their values, assumptions, biases, and feelings, rather than on a rational, cognitive set of ideas and concepts” (p. 10). She provides the example of Heshusius & Ballard (1996) who propose that “the roles of somatic and emotional knowing are too often disregarded in knowing ourselves and our world” (p.10).

Questioning the importance of always having the ‘scientific’ name, and the notion of the unknown, Nancy is referring to one of her favourite natural places to be in when she says: “I’ve experienced this park for decades, but I don’t really know what the plants are, you know but does that matter?” What knowledge is being formed if not for ‘knowing’ the name of the plants, but for simply ‘experiencing’ the park in and of itself?

She continues on to point to a more “personal” connection to the Earth, perhaps hinting at a notion of nature-self? She suggests that there exists an ‘innate’ capacity of the human-earth connection

If you think of our connection to the Earth as being innate and part of being human then you’d think that people in that, even if they’re in an urban environment are, have a requisition to express that in some way, and so maybe it’s on a more personal level that people are discovering nature.

She makes the connection to her own self identity through place when she states, gesturing with broad arms at the forested parkland around her, “*this is who I am*”. When

Nancy's self-identity, her nature-self is not reflected in her perception of education, the result is a serious disruption.

In a similar way, Allison echoes Nancy's sentiments of nature-self when she ponders,

What is the purpose of incorporating nature in any way into a classroom? I think it's important because it teaches us about ourselves, and teaches us about the world that we live in.

Speaking to the potency of the outdoor experience in reaching that level of self understanding, she continues "...and I don't think we can effectively do that if you show a kid a powerpoint on a rainforest"

During a focus group session one participant points to the broader climate of our cultural milieu which overshadows the attempt to consider human as part of nature in a traditional classroom setting.

It's the culture right? We're very much about controlling our environment, and because we can overcome the large part of nature, we've just never been taught to live, as it's said, as if the earth was part of our family. I think that's a very, very important thing to teach.

Speaking of the foundational capacity of the outdoors, one participant noted "the whole power behind it is that it's so core to us as a species thriving and being healthy" She continues, expressing the essential necessity for teaching in the outdoors.

...I think the more you can get people outside, touching and smelling and hearing, that's what it's about...it terms of nature itself, teaching nature, it's outside and doing it...and so for me, you can't separate who we are as individual people from the fact that we live in the natural environment that influences who we are and shapes who we are, and shapes how we live. And we're supposed to take care of it. I think there's an aspect to being a part of it, we can't separate ourselves from that. That has to happen outside in nature.

What do these deeper emotional connections, personal convictions, concepts of the spiritual in education point to in terms of knowledge gained from teacher education?

They are in contrast to current practices, and they can all be referred to as elements of heart knowledge.

These experiences shared by participants also point to the discovery of one's nature-self, an element which recognizes and acknowledges the beauty and responsibility, the art and science, of an innate human-nature connection.

Therefore, a new way of looking at education is called for, one which recognizes the inherent need for connecting the 'whole' teacher through an interweaving of self identity (nature-self) with the curriculum as taught. For example, Tisdell (2008) calls for "knowledge construction process of the whole person...about engaging people's *hearts* and souls, as well as their minds" (p.188).

O'Sullivan (2001) states that we need to look no further than the opportunities provided through the cultural learnings of Aboriginal peoples in terms of reconnecting students, student teachers and teachers to the natural world.

Experiencing teaching and learning where nature becomes the teacher, and the student interacts with a living breathing landscape puts into focus the need for our current system, where this represents a foreign concept, to look to alternative examples of how best to approach this living, breathing, whole topic. In the words of The Center for Ecoliteracy (CEL) cofounder Fritjof Capra,

"We do not need to invent sustainable human communities. We can learn from societies that have lived sustainably for centuries."

Aboriginal Ways of Knowing

There has been a resurgence of interest in the world views of Native American peoples that suggest a cosmology very different from our traditional western scientific perspective. If we take away the romanticization of native cultures, there is much to be learned about a proper orientation to the earth community from the traditional wisdoms of the native peoples of the Americas. I say 'wisdoms' because there is a tendency to lump native cultures into a common soup while ignoring the incredible variety and splendour of differences that we see in the multiform presence of native peoples on this continent. One feature of sameness that seems to cut across these differences is that of a common understanding that the earth is not a dead resource for human consumption but a sacred community and web of life of profound intricacy. Another feature that seems to be present is a profound intimacy with the natural processes of the earth...finally, there is a mystical sense of the place of the human and other living beings (O'Sullivan, 2001, p. 67).

Coming to this study as a non-Aboriginal, I am respectful in an attempt to include possible teachings from other non-Eurocentric voices. Recognizing the impact that education has had on Indigenous cultures around the world, but particularly here in North America, I proceed with respect in terms of acknowledging the negative impacts of colonialism on Aboriginal peoples (Battiste, 2008; Graveline, 1998; Simpson, 2002; Tuhiwai Smith, 1999). Battiste (1998) states, "Aboriginal peoples throughout the world have survived five centuries of the horrors and harsh lessons of colonization. [However,] they are emerging with new consciousness and vision" (p. 16).

Lowan (2009) provides the following as key factors of considering Aboriginal education in terms of a decolonization process: "the revitalization of Aboriginal languages, epistemologies, and pedagogies; recognizing the importance of the land; and privileging Indigenous voices, the involvement of Elders in education, and Indigenous control of Indigenous education" (p.44).

As a non-Aboriginal I seek to create relationship through understanding and valuing Indigenous concepts of knowing, teaching, learning and interconnection with the Earth. As Cajete (1994) suggests, while these are concepts inherent within traditional Aboriginal cultural ways of being, “they are universal in their application, they reflect the nature of human learning as a whole” (p.21). Aluli-Meyer (2008) states that “we are all Indigenous” (p. 222) in terms of our shared interdependency with the Earth.

Aluli-Meyer (2008) discusses the importance of place to the Hawaiian Native

Peoples:

Indigenous people are all about place...(it) is the everything to our sense of love, joy and nourishment. Land is our mother... land/ocean shapes my thinking, my way of being, and my priorities of what is of value (p. 221).

In terms of the need for a new approach to knowledge in education as expressed for example by Orr (1992), O’Sullivan (2001), Berry (1999), Greenwood (2010), Davis Sumara and Luce-Kapler (2008), a questioning of the overly-scientific treatment of ecoliteracy in education, and a search for knowing which is essentially heart knowledge, able to weave student into a meaningful relationship with curriculum through direct experiences in a natural world (towards ecoliteracy), examples from Aboriginal cultures worldwide can help lead the way.

The *Accord on Indigenous Education* proposes a transformational approach to education for Indigenous and non-Indigenous students alike through questioning the status quo and providing ‘opportunities for all to think differently about the nature of education, their role as learners and teachers, and alternative ways of creating educational experiences for students’ (Sanford, Williams, Hopper & MacGregor, 2012).

A House Fit for Ecoliteracy

How can you buy or sell the sky, the warmth of the land? The idea is strange to us. If we do not own the freshness of the air and the sparkle of the water, how can you buy them? Every part of this earth is sacred to my people. Every shining pine needle, every sandy shore, every mist in the dark woods, every clearing and humming insect is holy in the memory and experience of my people...we are part of the earth and it is part of us. The perfumed flowers are our sisters; the deer, the horse, the great eagle, these are our brothers. The rocky crests, the juices in the meadows, the body heat of the pony, and man – all belong to the same family. Chief Seattle, 1854
(Arrowsmith, 1969, p. 462)

In terms of the argument described previous, where the universal, deterministic and analytical (modern Western Eurocentric) form of knowledge through Western science is questioned in its applicability to approaching a vital, complex and holistic capacity for ecoliteracy, Aboriginal ways of knowing serve to echo similar concerns.

Patriarchal Western science is presented as the only valid knowledge. Indigenous knowledges challenge Western science's commodification of values in the 'consumer cultural paradigm'....Western science enthuses over the dualistic/binary mode of thought and the hierarchical ordering of knowledge. It overglorifies 'quantification' and is sceptical of anything that cannot be quantified (p. 8).

In terms of ecoliteracy functioning as a curricular challenge to the positivistic, and scientific commodification of experiences in nature in education, the applicability of approaching the topic as seen through an Aboriginal lens is congruent. Rather than seeking control, dominance and mastery over the natural world, an Aboriginal conception of human-nature relations is rooted in notions of interconnectedness and balance which lies "at the heart of Aboriginal science" (Snively and Williams, 2008, p. 116).

Through its guidelines for BC teachers, the Ministry of Education has included Aboriginal cultural representations, through Traditional Ecological Knowledge (TEK) as a component towards the overall vision for ecoliteracy in classrooms. For example, it is stated that:

- First Nations practise of Traditional Ecological Knowledge can illustrate alternative views on how humans have interacted with their environment (p.10).

In terms of Suggested Practice:

- *Learning should acknowledge Aboriginal perspectives*
In learning about environmental issues, the First Peoples Traditional Ecological Knowledge (TEK) of specific landscapes, regions or ecologies can be an important component of culturally appropriate, and responsive, environmental education (p.6).

New Picture of Identity

As expressed in student teachers' stories, there exists a tension around their lack of connection with curriculum in terms of locating their nature-self within teacher education. This misfit with their self identity in terms of their role as a teacher-to-be may be informed by applying a Aboriginal lens. According to Basso (1986) who describes Western Apache mode of being where "selfhood and placehood are completely intertwined" (p. 114), there exists a possibility of rooting the student teacher through Aboriginal concepts of placehood through ecoliteracy.

Therefore in this way we begin to see through the transparent subject/object dualism and ground ourselves instead in a sense of "inter-being...deeply interconnected with the other" (Bai and Banack, 2006, p. 14). According to Piersol (2010) through this process we become "deeply inscribed in our relation to all others; whatever we do to the world, we do to ourselves" (Piersol, 2010, p. 204) . This approach, which is captured in

BC Ministry of Education's own guidelines to environmental concepts in the classroom (1995/2007), works to re-unite the placeless student teacher, rooting them with meaning and responding to their experiences of tension.

...if I am overflowing with life, am rich in experience for which I lack expression, then nature will be my language full of poetry, all nature will fable, and every natural phenomenon be a myth. The man of science who is not seeking for expression but for a fact to be expressed merely, studies nature as a dead language (Thoreau, 1927, p.112).

Piersol's (2010) stories as "born of the land" (p.202) which help to provide meaning through the student teachers' connection to learning through ecoliteracy, plays a defining role in terms of an Aboriginal approach to ecoliteracy. N. Scott Momoday (1999) refers to a spirituality inherent within an Aboriginal connection to land,

I think: Inasmuch as I am in the land, it is appropriate that I should affirm myself in the spirit of the land. I shall celebrate my life in the world and the world in my life. In the natural order man invests himself in the landscape and at the same time incorporates the landscape into his own most fundamental experience (p. 27).

As Sefa-Dei states, learning through a traditional Aboriginal lens would provide a transformative learning opportunity, in order to see ourselves as different learners.

Where we have largely lost the ability to read the book of nature on any grand scale, Aboriginal cultures can provide living examples in terms of maintaining that vital connection to land and the more-than-human world, it is through listening that this connection can be re-lived. Holmes (2002) refers to relationship through Hawaiian elders as one such way,

The Earth arrives to us as a presence and as a voice in relation to humans, who are constructed as listeners to this voice. In the coming years we will all

need to listen to indigenous elders, and through them, hear the voice of the land (p. 50).

Similarly, Snively and Williams (2009) refer to an Aboriginal concept of literacy which involves an active reading of the land, “for ocean people, their literacy is how to read the ocean; for forest people, literacy means to read the forest” (p. 114).

Including the voices of Aboriginal cultures necessarily involves taking responsibility, being accountable, entering with respect, and acknowledging the past in order to proceed into the future. As Sefa-Dei states, there is a need to

Challenge the continuing absence, erasure, and subordination of local people’s knowledge, history, and experience from academic texts, discourses, and material social and political practices, particularly in Northern societies (p. 8).

Holistic capacity for Ecoliteracy

I don’t want to appropriate a voice that’s not my own, but I think Aboriginal, a lot of Aboriginal principles, you understand it’s a different focus, I think of it as an awareness of the environment, they also include a spiritual aspect and the connection to the Earth you know um, it’s different, and like how did a culture that you know survived for thousands of years in Canada, with a huge population like the numbers keep getting bigger right and they lived for thousands of years and maintained a culture, how did they do that? There’s something to be said, to be learned from that. To live in the environment and not use it up like that. There’s so much, so I guess that’s where I see the connection (Allison)

When I prompted Allison to tell me more about how she sees the connection between Aboriginal ways of knowing and ecoliteracy, she responded with:

I really hate to automatically assume that any Aboriginal person is therefore an environmentalist. I think it’s really dangerous to necessarily equate Aboriginal people with environmental outdoor education, just based on their being Aboriginal. That said, I think there’s a wealth of knowledge and a wealth of opportunities, particularly in BC, to explore the outdoors with an Aboriginal take on it. We watched this video with this guy from Duncan, who died six years ago. He was an elder and he speaks, and the way he talked about nature and river and tree, I was like almost crying, because it’s

so hard – there’s no disconnect between them and the land. Not in the Aboriginal system.

Deloria Jr (1999) proposes an Aboriginal approach which is aligned with a holistic view of ecoliteracy.

A unified worldview acknowledging a complex totality to the world both physical and spiritual...the world is our social reality in which everything has the possibility of intimate knowing relationship because ultimately everything is related (p.2).

Considering the inclusion of Aboriginal education toward the development of ecoliteracy. Leslie relates her story of working with elders from local First Nations in Westbank, BC. She describes the lessons that are possible by adopting some tenets of Aboriginal education.

We talked about it as ways of knowing. Learning from elders – learning from experiences. Learn from watching people or making your own observations by doing rather than the typical lecture style – here you go take notes. More experiential learning...Interrelationships between organisms, about how everything on earth is connected, the environmental issues, there are huge connections there with Aboriginal education. Having an elder come in and talk about some of the traditions and how one species effects the others”

Leslie reiterates how she learned the importance of storytelling and Aboriginal ways of knowing, through stories of her own. She recounts how during her practicum, she decided to bring nature into her classroom, because as she stated “we did not leave the four walls of the classroom”. Relying on her previous experience as a scuba instructor, Leslie went diving and brought back organisms she collected for the class, she recalls:

The response was amazing...it was just outstanding as some of those kids had never seen any of the organisms...the interest level went way up. Kids were asking questions and all that kind of storytelling, I could tell a lot of stories about the organisms, so the stories rolled over into the lessons.

Education, teacher education included, needs to move beyond the conventional approaches to nature in the school. Education must move toward Jardine's (1990) "integrated curriculum" and away from a shallow instrumental approach to connecting students to their nature-selves. Education must adapt to allow for the disruptive, boundaryless and holistic capacities of ecoliteracy to take hold and engage not only the imaginations of students, but their own self identity as student teacher.

What is needed in order to reflect these disruptions, these dissonances which are demonstrated by participants' own struggles and tensions are ways that education can respond.

CHAPTER 6:
OUR PATH AHEAD: TO DWELL WITH A BOUNDLESS HEART

“A little too abstract,
a little too wise, it is time for us to
kiss the Earth again” (Jeffers,)

In terms of concluding, completing, finishing this thesis, I look to Cole and Knowles (2001) who state that “in research, as in life, as in art, there is no possibility for completeness, certainty or closure. Representations of life, in research and in art can only be partial” (p. 213). Just as I question the dominance of the motivations and purpose behind the closed, easily bound, categorized and dislocated curricular approach to ecoliteracy, I extend that question to the need for a neat and tidy closure to my study. As Cole and Knowles (2001) continue,

Research is about advancing knowledge however ‘knowledge’ is defined. As researchers, we make claims about what we have come to know through our work and we do this in a variety of explicit and subtle ways. Our stance rejects any notions about the possibilities of an absolute and objective truth, and relieves the researcher of any responsibility for making knowledge claims that are conclusive, finite and universal. Any knowledge claims made must reflect the multidimensional, complex, dynamic, intersubjective, and contextual nature of human experience. In so doing, knowledge claims must be made with sufficient ambiguity and humility to allow for multiple interpretations and reader response (p.217).

In terms of claims to knowledge, I am reminded once again about the need for difference in the face of quantity, as Davis, Sumara and Luce-Kapler (2008) state that “appropriate responses to the global crisis will necessarily involve knowing differently, rather than merely to know more” (p.8). The authors continue to suggest that the aim of

education “is not to guide learners toward completion, but to provide them with the experiences that challenge and enlarge their understandings” (p.101). I extend this thinking toward my participants’ experience with me as researcher and with their co-participants, as well as my research inquiry as a whole.

Piersol (2010) provides another angle on the issue of searching for an answer in the end:

When I began this process of tracking and guiding narratives in my life, I had initially thought that I could master and solve this problem of what it means to educate ecologically. I thought that the tracks would lead me to an end. Instead, the tracks of place-based education never lead me to an answer, *they* are the answer. (emphasis in original) (p. 206).

Jardine (1990) warns against educating as if we had all the answers as he suggests education move towards a deep sense of integration, accomplished through intimate connection with nature. He questions the need to “get the curriculum right...straightened out once and for all...rendering human life lifelessly objective under the glare of knowledge-as –stasis” (p. 110). Through ecoliteracy, education calls us forth to,

go beyond a mere mental exercise to glimpsing something about the world and our experience of the world, a previously unnoticed interconnectedness of things hidden beneath the surface (p. 107-108).

Jardine (1992) also states,

The language it (technical-scientific discourse) offers is already foreclosed (or at least, it longs for such foreclosure). It longs for the last word; it longs for...a world in which the droning silence of objective presentability finally holds sway over human life. The difficult nature of human life will be solved. (p. 118).

To Know the Dark
 To go in the dark with a light is to know the light.
 To know the dark, go dark. Go without sight,
 And find that dark, too, blooms and sings,
 And is traveled by dark feet and dark wings.
 W. Berry (1999, p. 158)

To dwell within a boundless heart means to accept the ambiguity and unknown mystery of the living planet. To not always seek the answer, and be okay with dwelling in the question. Stay a while in the eddy of the unknown. “this requires that we think not in terms of quick and simple answers, but instead revel in the multiplicity and plurality of relationships, processes, patterns, and context” (Piersol, 2010, p. 204). As difficult and painful as this may be, “spinning webs of wonder into an embodied connection to place” (p. 204). Scott (2006), in his dilemma to provide a definition to what it means to be spirit(ual), describes the tension of being uncertain,

I wrestle in my metaphoric ring, caught between a way demanding clarity and certainty and a way that is not a way, full of ambiguity and uncertainty. I become a site of intersection where contradictory forces meet, pulling in several directions, while I refuse to let go. I am caught in-between, resisting both idealization and simplification” (p. 94).

Leggo (2001) asks of educators and researchers to consider education which

[A]cknowledges even the muddled, mad, mesmerizing miasma that rises up as a kind of breath and breathing, connected with the pulsing and compelling rhythms of the *heart*...I want is to revel in the inexhaustible and the unembraceable, in the particularity of a drop of water, a ray of light, to know with my whole body, so that my body is rendered alive or lively (p. 188-89).

As discussed in the previous chapter, the student teacher exists as in an in-betweenness, a fertile space, an ecotone, where disruption abounds, yet dwelling within the proverbial eddy, the ability for the student teacher to see anew represents an opportunity. Similarly, we are currently in the midst of an in-betweenness on a paradigmatic level. As Berry (1999) suggests, as we move from the current Cenozoic era to the Ecozoic, as a society we are likewise stuck in a cultural eddy, and along with the disruption

(manifested in one form as the ecocrisis), the conscious knowing of our implication within the midst of the shift allows for creative potential.

Tanaka (2007) refers to the “fertile silence of uncertainty” (p.45), as a challenge to a positivist know-it-all mentality. In her exploration of how Indigeneity presents possibilities in teacher education, she states that education, “embedded in colonial traditions” fails to provide for the possibility of not knowing. She presents the concept of “cwelelep” the experience of “knowing that we don’t know” as a place of creative potential where “the value of being in a place of dissonance, uncertainty and anticipation...sets up an orientation towards a search for meaning. In this space we listen harder and are more motivated to seek out alternative ways of knowing” (p. 54).

As the kayaker (student teacher/western social order) finds her/him/itself lodged within an eddy, the space becomes one of creative silence where new possibilities through new awareness and new perspectives is possible. To the student, opening up to the possibility of perceiving a holistic sense of ecoliteracy through interconnectedness and interdependency on a natural world, by re-writing their own story within the larger cosmological narrative via extended deep and direct experiences with the natural world. To the teacher education programme, it becomes committing to creating possibilities for an integrated curriculum which expands current views and perceptions of knowledge as mere ‘know-it-all’ mental exercises. For a social-order dwelling deeply within a hubris of modernity, the transformation requires a multifaceted approach, including questioning all tenets of capitalist life, while keeping in heart and mind O’Sullivan’s call for all future actions fostering a human-earth connection.

All human institutions, programs, and activities must now be judged primarily by the extent to which they inhibit, ignore or foster a mutually enhancing human-earth relationship (2001, p. 44)

I propose that through the suggestions made in terms of developing and supporting ecoliteracy in education, that it must be contextualized within the broader goal of commitment to a shift toward an Ecozoic era.

In the move toward the Ecozoic, O'Sullivan (2001) states that

We are now living in a watershed period comparable to the major shift that took place from the medieval into the modern world. We are at another vast turning point and we are in need of a cosmological story that can carry the weight of planetary consciousness into where we are now moving... This choice for an Ecozoic vision can also be called a transformative perspective because it posits a radical restructuring of all current educational directions. The educational framework appropriate for this movement must then not only be visionary and transformative, but clearly must go beyond the conventional educational outlooks that we have cultivated for the last several centuries (p. 45).

In terms of how this might impact the student teacher, or the ecoliteracy of students., by encouraging connection to the natural world, promoting the move to the Ecozoic, the student begins to come to realize wholeness again. At one with their nature-self.

To educate ecologically is an ever-evolving story, the complex intertwining of self and place. As we merge with place, we learn to articulate the stories that give meaning to our lives. The power to share such stories means we are able to strike the deepest chords of being, uncover our buried melodies, and hum them back to the earth from which they came (p. 206).

Therefore if the student teacher is able, through direct and intimate connection to place, to begin to re-learn their own stories in relation to a vibrant and diverse natural world, then perhaps they are able to "hum them back to the Earth" in this case, the Earth is represented by a class full of children.

Building on O'Sullivan's suggestions, my hope is that through this research as a process opportunities to share stories which strike at deep chords, to build on insights into

self-identity and future practice, and for personal reflection as in uncovering buried melodies were created and have had an impact on those involved and yet to be involved. Through discussion and follow up conversations, this seems to be the case for some participants at least. The invitation for participants to dwell a while within the eddy of uncertainty and questioning has provided space for them to express and re-visit their own story, while questioning conventions, practices and behaviours perhaps otherwise gone unearthed.

Rather than seeking a conclusion or a solution to my research questions I hope the experience of participating in this research, spending time embracing “cwelelep” and moving forward from it has been (and can continue to be) transformative.

On Measuring Down

I like to walk alone on country paths, rice plants and wild grasses on both sides, putting each foot down on the earth in mindfulness, knowing that I walk on the wondrous earth. In such moments, existence is ... miraculous and mysterious. People usually consider walking on water or in thin air a miracle. But I think the real miracle is...to walk on Earth. Every day we are engaged in a miracle which we don't even recognize: a blue sky, white clouds, green leaves, the black, curious eyes of a child. All is a miracle.

Thich Nhat Hahn (1986, p.12)

How do we measure up? How does that school measure up to the others in the district? How does that student measure up against the test? Against her peers? I argue that education could use a little less measuring up, and a little more measuring down; down at ground between our two feet; down at the land which is meant to link us all to greater meaning in our curricular agendas.

Instead of “forwards, onwards and upwards (from things on Earth to things above)” (Stanley, 1863, p. 61) what would education look like if there were more time to

look down? Down at its feet; down past its feet and down at the ground beneath its feet;
planted firmly in place; rooted as a sapling.

The Unforseen Wilderness
and the world cannot be discovered
 by a journey of miles, no matter how long,
 but only by a spiritual journey,
 a journey of one inch,
 very arduous and humbling and joyful,
 by which we arrive at the ground at our feet,
 and learn to be at home.
 (W. Berry, 1999, p. 181)

While, as Jeffers proposes, we should look to our feet and kiss the earth again, there is something to be learned from those who have been to the stars. As Kelley (1988) states there is newfound appreciation of the unity of life on Earth that is unique to those who can call themselves space travellers. As Kelley (1988) states, the appreciation gained anew from experience in seeing planet earth from space was knowledge not of the mind, but of the heart:

For me, having spent ten days in weightlessness, orbiting our beautiful home planet...was that of a new relationship. The experience was not intellectual. The knowledge I had when I returned to Earth's surface was virtually the same knowledge that I had taken with me when I went into space....what took no analysis, however, no microscopic examination, no laborious processing, was the over-whelming beauty....the stark contrast between bright colourful home and stark black infinity...the unavoidable and awesome personal relationship, suddenly realized, with all life on this planet...Earth, our home (preface).

Roberta Bondar (2000) states in her book *A Passionate Vision* that her experience looking down on planet Earth, similarly left her with a new appreciation, a new perspective:

My first flight left me with a whole new view of my science, myself and my future. Medicine now seemed to encompass more than my specialties of neurology and space medicine; it included the health of the environment, and thus I decided that the planet would be my focus (p. 18).

Leonardo da Vinci was credited with stating “we know more about the movement of celestial bodies than we do about the soil underfoot”. Jardine (1990) reminds us of the dualistic importance of being “down to Earth” (p. 113), while Gough and Gough (2003) refer to planter societies who knew what “centering downward” meant.

It means going not outward, like the hunter societies with their aim and kill approach, but downward, tending soil in such ways as watering, cutting, pruning, pinching, digging, sniffing, and watching. What the Earth gives forth is the flesh of the Earth blooming in the vine substance of which we all partake. What the older societies taught was a watching, and learning from the natural cycle of life-death-life (p. 49).

“Our Promised Land has always been over the next ridge or at the end of the trail, never under our feet” (Sanders, 1999, p. 82)

Poetry: Transformative Possibility

Poetry engenders another cultural way of knowing. It is a dissident minority tradition within my own colonized and colonizing culture...poetry helps me to recover...my possibilities, my empathy, in a domesticating competitive culture that makes me feel loss and lost (Greenwood, 2010, p.13).

Davis, Sumara and Luce-Kapler (2008) discuss an activity of imagination through poetry where “the familiar was rendered strange” (p.214). They suggest that “these sorts of inventive activities can serve to interrupt entrenched habits of thinking (or, perhaps more accurately, habits of not thinking”) (p. 214).

Where education as system seeks certainty and framing, revelling in answers and in the quantitative, eco-peotics provides no certitude, no answers, it serves to disrupt by asking more questions than it gives answers to. Eco-poetics by its contextual ambiguity is a textual reflection of a wildness in nature, of a vibrant plurality, Capra’s biodiversity. The reader (experiencer) of eco-poetics is asked to develop their own meaning from the

words that are presented for them. Look past the words, the definitions, at what lies beneath the feet and within the heart.

Poets have long been activists of the written word, calling attention and problematizing through their poems (OSullivan, 2001; Owen, 1999). O`Sullivan (1999) provides the example of William Blake who he calls a “mystical poet” he states that he was one of the “first voices to see the underside of the Industrial Revolution” (p.65).

Howard (2010) points to the power that poetry has in shaping social identity and “moral imagination”. He states that poetry:

Offers the opportunity to interrupt, to defamiliarize the familiar in ways that challenge the clichéd, the stereotypical, and the status quo. In poetry, life stands still for a moment, and we can take time to examine it, to have conversations about values, ideas, and insights (p. 52-53).

The poems ability to ask life to “stand still for a moment” is also the function of the eddy. The usual fast flowing river is encouraged to slow down when it enters the eddy, similarly, the kayaker enters the eddy to slow down, re-assess and pay attention.

As Greenwood (2010) stated that “stopping for poetry is an antidote...to the super-sure academic argument, to the voice of reason that governs research methods and reports findings with caution and restraint. Poetry revives me, helps me to recover my *wilder* self...poetry does not argue for truth, it burns with it” (p. 13)

Blandy and Hoffman (1993) refer to “an art education of place” as a “means to engage individuals in social and political issues in ways that empower them, create alliances, and establish community...to teach students about art in a way that promotes an understanding of the interdependence and interconnectedness of all things” (p. 28-29).

I refer to art in reference to the poems used within this thesis.

Inwood (2007) suggests that it is “art education’s long history with experiential, affective, and embodied approaches to learning which can be used effectively to support the call for the incorporation of a wider variety of perspectives in environmental education” (p. 8)

According to Palmer (1969)

When we watch a play, or a game, or read a novel, we do not stand above it as subject contemplating an object, we are caught up in the inner movement of the thing that is unfolding – we are seized.

Art is art when it brings a world to sand before one; and great art has such a fullness of the truth of being that one finds his own horizon negated (in part) and a freshness of understanding occurs that can only be understood in terms of the category ‘experience’ encountering a great work of art is always an ‘experience’, in the deepest sense of the word.

Haines (1999) speaks of the potential of the language we use, in his case poetry, to make a difference:

So it is a matter of language also, of words common and uncommon, that with something of their original freshness and power have the ability to restore a much-needed sense of reality and reveal to us a few essential things with clarity (p 62).

In that way, experiencing a morning fog in a rainforest is always seen as an experience in the deepest sense of the word.

The poetic view of nature gravitated towards its wild and mysterious aspects, the felt qualitative rather than measured quantitative dimensions of experience, known through immediate contact rather than through experimentation (Abram, 1996, p. 99)

So I am not the artist, but rather the landscape becomes the art...nature is art. I am walking through an art gallery every time I go out into nature, every time a teacher brings students out into contact with nature. If you can see art in nature, then you are an artist. I am an artist not by what I create, but by what I see, what I perceive, what I notice, what I

appreciate, what I can imagine. I am passionate about art and the ability for art to transport, to awaken, and to transform. I see therefore, great possibility in the creative and aesthetic appreciation of the natural world through eco-art toward the development of ecoliteracy.

The BC Ministry of Education provides the aesthetic appreciation of nature as one part of their metaphor for C.A.R.E.

Aesthetics deals with beauty, artistic expression, and our physiological responses to these. Environmental education helps students to develop an aesthetic sense of respect and appreciation for the natural world through study, physical challenges, and other experiences in nature.

As Cezanne once said “art is a harmony parallel to nature”.

Sumara (1994) confirms the ability for poems to change the reader, transforming perception,

It is a relational space, a Gadamerian fusion of horizons of sorts, in which the reader’s world becomes re-woven, and it is the re-weaving of the reader’s self that alters the reader’s interactions with the world (p. 49).

Masturzo (2000) explores the process of estrangement as she suggests art’s ability to “describe it as though for the first time” (p.132).

In Between

In terms of student teachers dwelling with/in the ecotone, teacher education represents that fertile in-betweenness where a transformation from student to teacher is occurring. As student teachers begin to envision themselves as teachers, enter into conversation with self and others about what that might look like, further disruption is occurring. Faced with the reality of becoming a teacher, student teachers may have their comfortable slow moving river disrupted, and it may never be the same. They are

disrupted in the teacher education programme, asked to question the way things are, and perhaps that calm period which occurs directly after, while recuperating in that eddy, they are able to re-notice, and re-evaluate the way things can and should be done in terms of including ecoliteracy.

Payne and Wattchow (2009) refer to the concept of “edge” as “that in-between and often unknown or othered zone of human experience in nature” (p. 17). Sammel (2003) refers to it as a “discursive nexus” (p.158).

For Jardine (1990) that in-betweenness is an invitation for student teachers to “re-experience the world” as if it were new again, a process of re-newal.

As potential educators of young children, my students have the excuse to re-experience the world. The children they will be teaching are in the process of learning what they, as adults, not take for granted, and as teachers, they can allow their experience of the world to become new again. They can begin to have anew a conversation with the Earth, to notice anew what has gone unnoticed under the rubric of familiarity and ordinariness (p. 114).

This is an approach towards a re-entry of sorts for ecoliteracy within teacher education, an excuse to re-experience the Earth once again.

LOVE

All men have the stars,” he answered, “but they are not all the same things for different people. For some, who are travelers, the stars are guides. For others they are no more than little lights in the sky. For others, who are scholars, they are problems... “the stars, the desert – what gives them their beauty is something that is invisible!

And now here is my secret, a very simple secret: it is only with the *heart* that one can see rightly; what is essential is invisible to the eye (Saint Exupery, 1999, p. 157).

In his book *Sacred Balance: Rediscovering Our Place in Nature*, David Suzuki devotes an entire chapter to what he calls the “law of love”. In it he refers to the law of love as “fundamental, and as universal, as any other physical law. It is written everywhere we look, and it maps our intimate connection with the rest of the living world” (p. 176). E.O. Wilson (1993) coined the phrase “biophilia”, which has its roots in the Greek words for ‘life’ and ‘love’. Wilson defines biophilia as “the innate tendency to focus on life and life-like processes”. He states that from this tendency flows an “emotional affiliation of human beings to other living things...multiple strands of emotional response are woven into symbols composing a large part of culture”. According to Suzuki, this response manifests as a formative relationship, one which shapes both the giver and receiver, and that can only be described as love “the knowledge that we are, like all other forms of life, children of the Earth, members of the same family” (p. 177). According to Wilson:

The more we know of other forms of life, the more we enjoy and respect ourselves...humanity is exalted not because we are far above other living creatures but because knowing them well elevates the very concept of life (p.26).

Heart knowledge becomes a manifestation of the learner’s ability to love. In relation to (w)holistic ecoliteracy, heart knowledge reflects the diverse readings of literacies that are possible. Ecoliteracy in this way represents one facet of that multiliteracy capacity for which heart knowledge is the conduit. Ecoliteracy can be perceived as one side of a many sided crystal, all of which provide a unique version of literacy, yet all are interconnected and vital to a thriving ethical and ecological existence.

Maynard and Waters (2007) state that “lack of knowledge means that educators may place little value on the time spent outside” (p.3). However, the question remains

“what type of knowledge is needed?” As Allison stated, “knowledge can change you”.

Many of my participants spoke of the emotional connection to the natural world as involving an act of compassion, caring, and love. For example, Kim says

Ecoliteracy for me involves love and respect...I just think that instilling a love and respect for nature in young people is a huge part of that process and that teaching...I have to feel the love, I have to have the passion that is going to fuel me, and yes I understand there's the curriculum and there's you know there's the PLO's and there's the stuff that we're required to deliver...

As Miller (2005) states “education has tended to focus on the head to the exclusion of the rest of our being” (p.5). I argue that it is only with a conscious and deliberate attempt at re-integrating education with more heart knowledge, i.e. more love, that we, as individuals, families, communities, species, have a chance at making a difference in re-situating our current trajectory. It is through a re-enchantment with the magic, wonder and awe of the Earth, that our hearts and minds will be capable of great things in the lives of others.

We know enough of our history by
now to be aware that people exploit
what they have merely concluded to
be of value,
but they defend what they love
(Berry, 2000, p. 39).

The law of love will work, just as the law of gravitation will work, whether we accept it or not...a man who applies the law of love with scientific precision can work great wonders...the men who discovered for us the law of love were greater scientists than any of our modern scientists...the more I work at this law, the more I feel the delight in life, the delight in the scheme of this universe. It gives me a peace and a meaning of the mysteries of nature that I have no power to describe.

- Mahatma Ghandi

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APPENDIX A

POSTER/FLYER FOR SEEKING PARTICIPANTS

Nature as Teacher: Experiential Outdoor Education
and the Emergence of Ecoliteracy in a Teacher Education Program

I am a doctoral student in the department of Curriculum and Instruction at the University of Victoria and you may contact me if you have further questions via or 250-xxx-xxxx. It is being conducted under the supervision of Kathy Sanford. You may contact her at 250-xxx-xxxx.

The purpose of this study is to explore how student teachers develop their own sense of ecoliteracy through their teacher education program. Faced with the important and possibly daunting task of teaching children skills around environmental education, as outlined by the BC Ministry of Education, reflection on and discussion around student teachers and teaching nature, as well as your teacher education program and its role in cultivating this sense in students.

PARTICIPATION INVOLVES ONE INDIVIDUAL INTERVIEW LASTING APPROXIMATELY 45-60MINS FOLLOWED BY A SERIES OF 3 FOCUS GROUPS LASTING EACH APPROXIMATELY 90 MINS.. The INTERVIEWS AND focus groups may take place in the outdoors, participants may be asked to suggest venues for meetings.

Dates: The dates will be determined by the researcher, but may change depending on participants' availability and/or weather.

For More information, please contact Chris Filler.

APPENDIX B

INTERVIEW QUESTIONS

What role did outdoor recreation/education play in your childhood?

What previous experiences have you had with outdoor education in both formal and non-formal settings?

Have you experienced nature in your teacher education program? Explain.

Where do you see nature fitting within your practice as a teacher?

Read the following excerpt from the BC Ministry of Education document: *Environmental Learning and Experience: An Interdisciplinary Guide for Teachers (2007)*:

It is generally recognized that teaching could be described as both art and science. Environmental learning considers multiple models for teaching and learning, as well as teachers' own pedagogical content knowledge to form a unique blend of disciplinary knowledge combined with teachers' knowledge about specific learning contexts. While some guiding principles can be helpful, they are only a starting point. New and experienced teachers will develop their own 'teaching style' that reflects their current experiences and ideas about teaching and learning.

What are your thoughts on this statement?

The Ministry promotes the use of the Experiential Learning Cycle Model which includes components such as direct experience followed by critical reflection and negotiation. Also included in the Ministry's recommendations is to acknowledge contributions of Aboriginal Traditional Ecological Knowledge (TEK) as well as to foster an aesthetic appreciation of the environment in combination with a scientific understanding of the natural world.

Do you feel as though you could meet these Ministry recommendations in your classroom? Explain.

APPENDIX C

FOCUS GROUP DISCUSSION QUESTIONS

Do you feel prepared to teach 'nature' in your classroom? Why or why not?

How should 'nature' be approached within a TEP?

What value does 'outdoor' education play within schools?

What value does 'outdoor' education play within TEP?

What are schools doing right in terms of ecoliteracy?

What could schools do better in terms of ecoliteracy?

How should 'nature' be approached within a TEP?

How does experiential education play a role in TEP?