

**ENVIRONMENTAL LEARNING AND HIGHER
EDUCATION: A STUDY OF LEARNING ENVIRONMENTS
USING PLACE-BASED AND CONSTRUCTIVE
PEDAGOGIES**

by

Carlos G. A. Ormond
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APPROVAL

Name: Carlos Gustavo Anthony Ormond

Degree: Master of Education

Title of Project: "Environmental Learning and Higher Education: A study of learning environments using place-based and constructive pedagogies."

Supervisory Committee:

David Zandvliet, Assistant Professor
Senior Supervisor

Milton McClaren, Emeritus Professor
Committee Member

Date Approved: November 1, 2007



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ABSTRACT

This project aims to examine environmental learning in higher education through the study of learning environments of three post-secondary environmental education courses that are characterized by place-based and constructive pedagogies. In addition the project attempts to validate a questionnaire to evaluate environmental education programs and their respective learning environments. The PLACES questionnaire has two versions: 1) Actual and 2) Preferred. The Actual-PLACES questionnaire has the students reflect on their experiences in an actual learning environment, while the Preferred-PLACES has the students contemplate what their ideal, or preferred, learning environment would look like. Current trends in learning environment research have noted that preferred and actual learning environments had a much closer fit in interdisciplinary, outdoor-based learning environments than single disciplined, classroom-based learning environments. The results from this project agree with the current trends in learning environment research, and validate the reliability of the PLACES questionnaire in assessing learning environments.

Keywords: learning environments, environmental education, environmental learning, place-based, constructivism

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CHAPTER 1: INTRODUCTION

Over the last decade, public interest in the environment has increased. With such threats as global warming, loss of biodiversity and the overuse of our natural resources some scholars have been led to predict that if nothing is done soon, we, humans, may bring about our own demise within the century (UNEP, 2002). Besides the human manipulation of the environment, the environment is also feeling the indirect effects of our efforts to solve current racial, ethnic and social inequalities. As Kahn (2003) suggests, "the destruction of the environment [should] be taken up and fought alongside the battle to end the terrorizing of the poor and powerless" (p5).

I think it is important that we clarify our use of the term 'environmental problems' when referring to current environmental issues such as climate change and loss of biodiversity, to name a few. As Mira, Sabucedo-Cameselle and Martinez (2002) point out, environmental problems, in fact, are not environmental in origin but rather human. The causes for problems with the environment are not natural or accidental but rather the consequences, most often, of intentional human actions. The poor condition of our environment is in fact a direct result of a global culture that has an insatiable desire for consuming and producing (Farrell & Papagiannis, 2002). Thus, it can be said that environmental problems are in all truth are "human problems in relation to the environment" (Mira et al., 2002, p. 13).

Environmental education has come to the forefront as a tool to establish a new world view to change our way of life to be more compatible with the natural environment we are a part of and in turn, improving the quality of life for all life on this planet. While there may be critics of environmental education and how it is to be integrated into education (McClaren & Hammond, 2005), there is a global need for an education whose epistemology is to equip students with creative, theoretical and critical reasoning abilities that foster the development of an ethos that has, as Orr (1994) put it, the 'earth in mind'. The way to approach creating a proper balance between humanity and nature, is through the idea of teaching 'in', 'about' and 'for' the environment. Since a majority of early human development is spent in the school system, it would seem logical that this is where we should begin incorporating the concepts of both environmental awareness and sustainability. Barraza and Cuaron (2004) agree with this by stating that schools with an environmental ethos allow children to "develop a better understanding of the current degraded state of the environment, [to] enrich their knowledge and to acquire positive attitudes towards the environment" (p22).

For years now environmental education has been discussed with reference to the sciences and ignoring the ecology of "human societies and cultures (and their technologies) within physical communities" (Zandvliet and Brown, 2006, p.207). Unfortunately, this has led us to ignore "the cultural behaviours now overwhelming the viability of natural systems" (Bowers as cited in Zandvliet and Brown, 2006, p. 207). Knowledge of the science behind nature

is important, but of equal value is knowledge of the socio-cultural values that we place upon or association with nature.

After reviewing much of the published literature on environmental education a large majority of the research has been centered on K-12 students and little on higher and adult education. While there are exceptions, Wright (2006) argues that universities produce students who are not capable of dealing with our current environmental issues due to the fact that universities do a poor job of illustrating the connections between humans and the natural environment that they live in. The importance of the planet's present health as well as its future is gaining ground in the political arena, and higher education is now being depended upon to aid society change to a more sustainable way of life (Chalkley, 2006). Universities and colleges most valuable contribution is to produce graduates who think sustainably so that they may take this knowledge into the workplace, and in turn into society as a whole (Chalkley, 2006). Unfortunately, "the overarching objective of creating an ecologically literate, motivated and engaged corps of graduates [in higher education] remains elusive" (Havlick & Hourdequin, 2005, p. 386). If environmental education is only emphasized in K-12 schools, and higher environmental education is ignored, we may have to wait thirty years for a sustainable movement to finally take into effect; the unfortunate thing with this plan is that we may not have thirty years to wait.

This project aims to shed some light on the aforementioned issues surrounding environmental education in higher education by attempting to understand the importance of the learning environment in education, and how

that can help environmental learning. This researcher proposes a learning environment characterized by a constructivist theory of learning, place-based, direct in experience and environmental in ethos will engage the learner- adding to the effectiveness of learning, instill critical thinking and create local community connections that could arguably give rise to the type of person that is needed to participate in a globalized society that is dealing with social, environmental and sustainability issues.

This project also attempts to validate an alternative methodology to evaluate environmental education programs. A common tool to judge whether a program has been a success or a failure tends to be based on simple measures of achievement, such as test scores. A major reason for the use of test results in program evaluations is 'top-down' in origin. While there is no argument that students must be tested on their skills learned, by paying particular attention to student achievement for evaluations you risk the chance of destructing "the human qualities that make education a worthwhile experience for students" (Fraser, 2001). This 'educational experience' is something that cannot be overlooked, if only for the fact that by the time someone finishes their university degree they have spent nearly 20,000 hours in educational institutions (Fraser, 2001). Therefore academic achievement should not be the only form of a assessing a program. The study of learning environments has the possibility of improving assessment norms by providing another aspect of the program that can be evaluated. A learning environment is not as simple in defining as one might think because the learning environment is not something inanimate but

rather created by all actors involved. What this allows for is a 'bottom-up' evaluation approach by quantifying, and qualifying, the student and teacher perspectives of a program's learning environment.

This leads to me pose three questions because there exists a problem in analyzing environmental education with field-based and classroom-based courses. At this moment in time there does not exist a reliable measure to describe learning environments in higher education. Therefore before we can understand the relationship between learning environments and environmental education, a number of questions must be answered:

- How might post-secondary learning environments using place-based and constructive pedagogies be characterized or described?
- Can aspects of the learning environment in post-secondary classrooms using place-based and constructive pedagogies be validly measured quantitatively?
- What differences exist between actual and preferred environments in post-secondary classrooms using place-based and constructive pedagogies?

CHAPTER 2: LITERATURE REVIEW

For the purpose of this study, the following chapter presents an overview of learning environment theory and the research surrounding it. In addition, it also discusses place-based and constructive pedagogies and their links to experiential learning and outdoor experience due to the fact that the learning environments under investigation in this research project are characterized by these aforementioned principles. First I document the development of learning environment research as a perspective and methodology, and then discuss aspects of the place-based and constructive paradigms. I then explore the theory of experiential learning as well as outdoor education which are most often a shared practices of place-based and constructive pedagogies. Lastly, an introduction to the place attachment theory is presented in an attempt to emphasize the importance of field-based learning.

Learning Environments

For the most part, educational programs have been institutionalized by top-down, politically driven movements that have dictated how and what learning should look like (Noble, 1998), with no regard for the learning environment. Fraser (1998a) makes the comment that students are an invaluable resource for learning environment analysis in schools and university classrooms because they have been exposed to many different learning environments throughout their schooling. While an observer's perspective is an important tool in studying a

classroom, the subjective and personal view of a student's is lost by direct observation alone. Thus, unknown influential factors of learning in the classroom environment can be lost or unobserved.

There is compelling evidence to suggest that the classroom environment has a strong effect on student outcomes (Fraser and Rentoul, 1980; Wang, Haertel & Walberg, 1993). Unfortunately, academic institutions tend to place an emphasis on student achievement rather than on the environment that influences it (Fraser, 2001). Fraser and Rentoul (1980) did a study on person-environment fit looking at cognitive achievement and preferred-actual classroom environment congruence. What their results showed was a strong fit between high achievement and students being in actual learning environment that matched their preferred learning environment. It is here where the true value lies in learning environment research; it gives a voice to the student, as well as the teachers, in showing what is most effective in the classroom. There is a need to find a happy medium between top-down politically motivated educational reforms and those that are bottom-up in origin, from teachers and students.

The development of learning environment research can be traced back to the work done by five people: Kurt Lewin, Henry Murray, Herbert Walberg, Rudolf Moos (Fraser, 1998a) and most recently, Barry Fraser (Tobin, 2000). Lewin's field theory stipulated that human behavior has two potent determinants: the environment and its interaction with an individual's personal characteristics. To illustrate this Lewin created the formula $B = f(P, E)$ which states that behaviour is a function of the person and the environment. Murray worked alongside Lewin at

Harvard, and shared similar ideas with him. Murray argued for a psychological model that regarded the person and the environment as analogous terms (Fraser, 1998a). Several decades later, Walberg and Moos began work on research programs that were built on the theories of Lewin and Murray. Moos' research developed social climate scales for different human environments, while Walberg developed the *Learning Environment Inventory* for his research and evaluation of the Harvard Project Physics. The work of both Walberg and Moos forever changed the field of learning environment research and gave rise to the work that is being done today in this field of study (Fraser, 1998a).

Learning environment research gained momentum in the 1970s with the work of Barry Fraser (Tobin, 2000). It was the opinion of Fraser (1998a) that learning environment research had the tools to effectively describe the classroom and predict student learning. His work still continues today investigating the "psychosocial dimensions of an expanding array of learning environments" (Tobin, 2000, p. 223). Fraser's greatest contribution to the field of learning environment research was the development of questionnaires to analyze perceptions of students and teachers on particular constructs that were viewed by scholars at that time as being important to the study of alternative teaching and learning styles (Tobin, 2000). While the constructs studied have changed and scholars like Fraser have insisted that both qualitative and quantitative methods should be practiced, questionnaires remain the primary tool to collect data in the field of learning environment research.

According to Roelofs, Visser and Terwel (2003, p. 80) learning environments can differ in six possible dualisms:

1. "Construction of knowledge versus transmission of knowledge"
2. "Learning in complete task situations versus learning by means of split tasks"
3. "Personal meaning versus teacher-led meaning"
4. "Professional or scientific contexts versus formal contexts"
5. "Cooperation and communication versus individual learning"
6. "Developing learning climate (growth in expertise versus momentary mastering)"

The two opposing extremes here can be associated with two specific types of learning environments; the right side being the transmission model and the left side being that of discovery learning. The transmission model is the traditional type we see today in our universities with teacher-led lectures and an emphasis on memorization. Discovery learning is one in which making errors is seen as part of learning and self-realization is the main tenet (Roelofs et al., 2003). Research into learning environments has an important role to play in many discourses of education, from pre-teacher to professional development programs, as well as providing information on an important aspect of the educational experience (Zandvliet, 2007). For this reason, it should be a valuable tool to analyze the learning environment created by the following the pedagogies and theories of learning.

Place-Based Education

The concept of place-based education is an evolving educational approach that over years has also been referred to as “community-oriented schooling”, “ecological education”, and “bioregional education” (Woodhouse & Knapp, 2000). Gruenewald (2003) states that place-based education does not have its own theoretical tradition; rather it is an assimilation of theories belonging to experiential learning, contextual learning, problem-based learning, constructivism, outdoor education, indigenous education, environmental education, as well as others that share in emphasizing the value of learning from one’s own community or region. Due to this multidisciplinary aspect of place-based education it is difficult to find a clear and concise definition for it (Zandvliet, 2007). David Sobel (1993; 1996) was one of the first to discuss the notion of place-based education and in a recent publication Sobel (2004, p. 7) best explained place-based education and its relationship with environmental education as:

“The process of using local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science, and other subjects across the curriculum. Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students’ appreciation for the natural world, and creates a heightened commitment to serving as active contributing citizens. Community vitality and environmental quality are improved through the active engagement of local citizens, community organizations, and environmental resources in the life of the school.”

As Woodhouse and Knapp (2000) suggest, place-based education returns to the instructing practices of those belonging to ancient cultures whereby you were

taught to 'listen to the land' and in doing so lived and learned in harmony with the earth and those around you.

As Sobel (2004) mentions in his definition of place-based education, there is an emphasis on creating community unity and becoming an active contributing citizen. These tend to be terms associated with social justice programs that place importance on critical inquiry. This is also analogous with critical pedagogy. With justice and equality in mind, it aims to transform society and empower the powerless. While curricula similar to this philosophy have been seen throughout human history, critical educational theory finds its true roots in Europe prior to World War II at the Frankfurt School of critical theory (McLaren, 1998).

The idea here is that teachers need to understand the role that schools have in addressing the link between knowledge and power, and how that can give rise to an active and critical citizen. It follows the notion that it is ethically correct to make critical reasoning, and self and social empowerment a priority in our schools, prior to technical skills. Critical theorists feel that our present school systems are institutions that produce uncritical, patriotic and compliant workers for a nation's marketplace and its economic success (McLaren, 1998), thus serving the interests of the wealthy and the privileged, which in turn continues the dominant status quo from generation to generation. This has led critical educational theorists, such as Paulo Friere and Henry Giroux, to distinguish between schooling and education:

"The former is primarily a mode of social control; the latter has the potential to transform society, with the learner functioning as an active subject committed to self and social empowerment." (McLaren, 1998, p. 169)

Currently, critical pedagogy aims to confront and challenge what we take for granted in schooling as well as in our dominant culture. One of these being how we have accepted the role schooling is playing to support competition in the global economy. This takes the form of 'teaching to test' in our schools, whereby learners are judged to have acquired knowledge through memorization and standardized test performance (Gruenewald, 2003).

Critical pedagogy, or rather critical theory, within environment education became quite popular during the mid-1990s, as did constructivism, with the need for interpretative lines of inquiry and humanistic approaches to research.(Palmer & Birch, 2005). Advocates of this critical paradigm argue that our subjective views of the environment are not solely constructed from within ourselves but affected by convincing cultural and social forces. What this means is that no one individual or group is completely unaffected by outside social influences, and in order to understand and uncover their interests we must critically analyze what positions they hold (Palmer & Birch, 2005). Bowers (2005) strongly suggests that the tool of critical reflection, that is so highly regarded in critical pedagogy, has enormous wealth to environmental education. As an example, critical reflection can allow us to realize which traditional self-sufficient cultures need to remain and be empowered to help us to replace our current Western minded industrialized culture that is degrading the planet.

The synthesis of place-based education and critical inquiry has been termed by Gruenewald (2003) as a critical pedagogy of place. The aims of critical

pedagogy of place are to assess the appropriateness of our relationships with not only one another but also with out socio-ecological places. In doing so, a critical pedagogy of place “ultimately encourages teachers and students to reinhabit their places, this is, to pursue the kind of social action that improves the social and ecological life of place, near and far, now and in the future” (Gruenewald, 2003, p. 7).

Constructivism

The term constructivism has also been associated with place-based education (Gruenewald, 2003). At its core, constructivism is a psychological theory on human creation of cognitive schemata (Boudourides, 2003) At the present moment constructivism has become a popular word in the Western intellectual community (Phillips, 2000). Unbeknownst to many, the term ‘constructivism’ has a number of different meanings. While they may not agree with one another at some levels, they all, in some way or another, suggest that the learner be allowed to work independently in order to construct their own personal view of the world, which is a shared belief with child-centered learning (Wardekker, 2002), and agree with the Piagetian theory that “knowledge is actively constructed in the learner and not passively transmitted by the educator” (Boudourides 2003, para. 1).

Constructivism and environmental education have been intertwined with one another for quite some time. In the mid-1990’s, due to a need for more humanistic and interpretative lines of inquiry in research approaches of environmental education, constructivism, also regarded as interpretivism, gained

momentum. The interpretivism paradigm focuses itself on wanting to understand how humans create environmental meaning, how language affects environmental understanding and how the environment is conceptualized by students and teachers (Palmer & Birch, 2005).

Both constructivism and environmental education approaches insist that the learner must take an “active role in learning and building factual knowledge to improve investigation and critical thinking skills” (Klein & Merritt, 1994, p. 13). It is a belief that the acquisition of knowledge comes from a change in a student’s understanding rather than simply an increase in information taken to be fact (Ballantyne & Packer, 1996). With a constructivist approach to environmental education, learners are made aware of not only their own personal conceptions of environment and its conservation but also alternative ones, which can agree or disagree with their own.

Experiential Learning

The theory of experiential learning is analogous with discovery learning. The experiential learning theory is based on the ideas of a number of 20th century scholars who believed experience had an important role to play in human learning and development. The most notable of these scholars are Kurt Lewin, John Dewey, Jean Piaget, William James, Carl Jung, Paulo Freire and Carl Rogers (Kolb & Kolb, 2005). There are six philosophies with regards to experiential learning that are shared amongst these scholars:

1. “Learning is best conceived as a process, not in terms of outcomes”
2. “All learning is relearning”

3. "Learning requires resolution of conflicts between dialectically opposed modes of adaptation to the world."
4. "Learning is a holistic process of adaptation to the world."
5. "Learning results from synergetic transactions between the person and the environment"
6. "Learning is the process of creating knowledge."

(Kolb & Kolb, 2005, p. 194)

Essentially, these six propositions outline what many have termed the 'learn by doing' method. According to this orientation, knowledge becomes practical in a number of ways.

Kolb (1984), building upon the ideas of those aforementioned pioneering scholars, created the *Experiential Learning Model* which is composed of four elements: "concrete experience, observation and reflection, the formation of abstract concepts, and testing in new situations" (Steffes, 2004, p. 46). Kolb (1984) theorized that the learning process starts off with an individual performing an action and then witnessing the effects of that action; the following step is to understand the effects of that action; the third step is to understand the action itself, and the fourth and last step is to modify the action when confronting a new situation (Steffes, 2004). This model thus defines learning as "the process whereby knowledge is created through the transformation of experience[;] [k]nowledge results from the combination of grasping and transforming experience" (Kolb, 1984, p. 41). This view of learning shares some similarity to the constructivist theory of learning, which believes that the learner should be

allowed to construct their own personal view of the world because as stated by Piaget "knowledge is actively constructed in the learner and not passively transmitted by the educator" (Boudourides 2003, para. 1). While this theory may hold true, most current educational institutions continue to follow the traditional transmission model of learning (Kolb & Kolb, 2005).

Outdoor Experience

Plato felt that outdoor experiences would "[develop] healthy bodies, which would lead to healthy souls" (Hattie, Marsh, Neill & Richards, 1997, p. 67). With regards to activities in the outdoors, Blenkinsop (2005, p. 303) asks, "[is] climbing a plastic structure in a gymnasium a qualitatively different experience from that of climbing a tree in an autumn forest?" (p. 303). I argue an approach to fostering a value system for the environment as well as an environmental ethic without advocating is by spending time outside in the environment; not with the purpose of studying it but by just "being" with it. With the use of the phrase of 'being with the environment' I am referring to Martin Buber's theory of "I and Thou". When we spend time studying the environment I believe we are in an "I and It" relationship with the environment because we are studying the environment, in most cases, to understand it better so we can use it more efficiently or learn how to conserve it. Both of these reasons are anthropocentric in all truth; we are studying the environment so that we can continue living on this planet. Thus, when we are outside specifically there to objectify the environmental "organism", we are in a sense learning how to control and manipulate it for our own benefit. This reductionist approach does little to

stimulate environmental understanding or appreciation (Wright, 2006). If we spend time in the environment just to be outside and “being”, I argue we will enter into an “I and Thou” relationship with the environment. Gadamer (1989) agrees, believing that by only treating nature as a “Thou” can we possibly have a genuine experience with nature. This relationship allows the environment to be a passive educator to the learner who tends to absorb knowledge, as Montessori believed, from their surroundings effortlessly. By creating more occurrences of the “I and Thou” between an individual and the environment, the educator can create a value and an ethic for the environment to the student in a way that traditional teaching methods cannot.

Place Attachment

The idea of the environment itself having a passive influence on someone who spends time in the outdoors is the basis for the theory of place attachment and its relationship to environmentally responsible behaviour. Research conducted by Vaske and Kobrin (2001) argued that environmental education or work programs that take part in local natural settings may in fact promote environmental stewardship in an individual's own community. Place attachment in this study was represented by place dependence and place identity. The definition here of place dependence is that of a functional attachment whereby a particular setting, over time, has become important resource to provide necessary amenities for specific activities. On the other hand, place identity is an emotional attachment that is a psychological investment with a setting that had resulted from numerous visits to that setting. Moore and Graefe (as cited in

Vaske & Kobrin, 2001) claimed then that place dependence leads to place identity), and in turn, place identity leads to environmentally responsible behaviour to that setting, such as picking up trash or helping to save a salmon habitat in a local park. Vaske and Kobrin (2001) also suggest that environmentally responsible behaviour for a local setting can then lead to environmentally responsible behaviour outside their own local periphery.

Purpose of Research

A learning environment that is characterized by the aforementioned pedagogical concepts and learning theories could potentially promote cognitive, behavioural or attitudinal changes in students related to 'the environment'. Mappin and Johnson (2005) believe that by integrating environmental education into the curricula of all other subjects, you are in effect attempting to create an environmental ethic, which follows the same lines of how the ethic of democracy was instilled. I have chosen to investigate learning environments with special attention given to outdoor experiential learning, place-based education and constructivism in an attempt to discover an effective pedagogical approach to integrate environmental education in higher education. It is believed that a learning environment characterized by a constructivist theory of learning, place-based, direct in experience and environmental in ethos will engage the learner-adding to the effectiveness of learning, instil critical thinking and create local community connections that could arguably give rise to the type of person that is needed to participate in a globalized society that is dealing with social, environmental and sustainability issues

CHAPTER 3: METHODS

This study utilizes a mixed methodology that incorporates both qualitative and quantitative research methods. There are strong arguments for and against both methodologies but historically, it has been the quantitative method that has been favoured in research (Guba & Lincoln, 1994). Its popularity comes from its precise ability to generalize about a population from a sample of the population. In education especially, quantitative methods have traditionally been used in research to evaluate or introduce a new pedagogical approach. Qualitative methods have always been second to quantitative ones because the data collected from them is believed to be subjective to the researcher recording the data and thus less quantifiable. Qualitative methods in education have been used to help answer broad educational questions that are not capable of being converted into a mathematical equation (Shulman, 1997). Therefore in an effort to structure my project around my research questions and not a research method or ideology, I decided on using both the quantitative and qualitative method; quantitative in analysis and qualitative in interpretation.

The selected participants for this study were three post-secondary environmental education courses at Simon Fraser University in Burnaby, British Columbia, Canada. Two of the courses were part of the Professional Development Program (PDP) and one was from the Learning Environments and Ecological Education Masters Cohort Program (LEEE) a comprehensive in-

service development program for in-service educators. These courses were selected by theory-based sampling, or also known as operational construct sampling, which entails selecting a group that are representative of a specific construct(s) in a theory. Within these three courses the environment is looked at either as a subject, an object or a topic, and educators are asked to consider the place for environmental issues across diverse curricula and practices. All students and teachers voluntarily participated in the study, and the relevant university research ethic protocols were followed.

The two PDP courses were both *Summer Institutes in Environmental Education* and each had 24 students; one took place in the Metro Vancouver Regional District, where all the students lived (semi-residential), and the other was held in Queen Charlotte City in Haida Gwaii, where every student was a visitor (residential program). The course descriptions for both of the *Summer Institutes in Environmental Education* were identical. Here is the description taken from the course's syllabus:

"This course will examine the educational problems entailed in developing human awareness and understanding of the environment. The course will explore environmental issues through a multidisciplinary approach and will relate historical and contemporary issues in human environment interactions to school curricula from the elementary to the secondary level."

The Learning Environments and Ecological Education Masters Cohort Program course was *Issues and Topics in Environmental Education* and from the course syllabus its description is as follows:

“This course will be of interest to educators interested in environmental /ecological education as it applies to both school-based, informal learning and working environments. As the course lends itself to a multidisciplinary approach, it is appropriate for educators of all subjects and grade levels and to informal educators of various persuasions. The course will explore a variety of different conceptual frameworks and societal perspectives on the environment and address a range of global issues in this regard. A general goal of the course is in reconnecting individuals with the natural and technological environments that sustain them in the emerging post-industrial society. Course activities will include laboratory and research sessions, seminars on important global environmental issues and independent opportunities for student lead research and guided inquiry both campus based and to other field locations in the region. Throughout the course, students will consider multiple perspectives on the goals, values and interdisciplinary nature of environmental education and obtain a grounding in models for learning and teaching environmental topics in both school-based and informal settings. Specifically, we will consider education ‘for’, ‘in’ and ‘about’ the environment and apply this knowledge to a variety of educational settings.”

The majority of the students in the LEEE were from the Greater Vancouver Regional District but there were a few who were not. In total, there were 14 students in the LEEE course.

Research Questions

One of the three questions being asked is ‘can aspects of the learning environment in post-secondary classrooms, using place-based and constructive pedagogies, be validly measured quantitatively?’. To find the answer to this question, an attempt was made to measure aspects of the learning environment in post-secondary classrooms using place-based and constructive pedagogies quantitatively by the use of a questionnaire. These were later augmented by

more detailed qualitative study. The questionnaire I selected for this project was one that had been tested and proven to be reliable in measuring learning environments in secondary classrooms (Zandvliet, 2007). As the questionnaire is not time or age sensitive, the questionnaire could be easily adapted for use in post-secondary classrooms. The questionnaire is known as the Place-based and Constructivist Environment Survey (PLACES). The PLACES questionnaire was created through a merger of the most salient scales for environmental educators from four previously established learning environment inventories: the Environmental Science Learning Environment Inventory (ESLEI) created by Henderson and Reid (2000), the 'What is Happening in this Class' (WIHIC) and the Science Learning Environment Inventory (SLEI) both validated by Fraser (1998b), and the Science Outdoor Learning Environment Instrument (SOLEI) developed by Orion, Hofstein, Pinchas and Giddings (1994). The eight scales incorporated into PLACES were adapted from the previously referenced inventories and were derived from data which emerged from a series of focus groups with environmental educators. PLACES is a compendium on constructs that were viewed by place-based and environmental educators as being most important for their practice (Zandvliet, 2007). These eight scales are listed in Table 1.

Table 1. Sample Statements from the Scales in the PLACES questionnaire

Relevance/Integration (CI)	I want my lessons to be supported with field experiences and other field-based activities.
Critical Voice (CV)	It would be ok for me to speak up for my rights.
Student Negotiation (SN)	I want to ask other students to explain their ideas and opinions.
Group Cohesion (GC)	I want students to get along well as a group.
Student Involvement (SI)	I want to ask the instructor questions when we are learning.
Shared Control (SC)	I want to help instructors plan what I am to learn.
Open-Endedness (OE)	I want opportunities to pursue my own interests.
Environmenta Interaction (EI)	I want to spend most of the time during field local trips learning about my environment.

The PLACES questionnaire also has two versions: 1) Actual and 2) Preferred. The Actual-PLACES questionnaire has the students reflect on their experiences in an actual learning environment, while the Preferred-PLACES has the students contemplate what their ideal, or preferred, learning environment would look like. As an example, the ninth statement in the Preferred-PLACES that students are asked to contemplate is: *'It would be all right for me to express my opinion.'*; the ninth statement in the Actual-PLACES that students are asked to reflect on is: *'It's all right for me to express my opinion'*. As you can see the statements are nearly identical but one is in the future conditional (preferred) while the other is written in the present tense (actual). These two forms of the PLACES questionnaire have value on their and when together. The Preferred-

PLACES can be used as diagnostic tool at the beginning of their course to understand the expectations from their students. The Actual-PLACES can act as an evaluation tool at the end of their course to see if their students had enjoyed their learning environment through the course. Together, these two forms of the PLACES questionnaire can be compared with one another to see if a student's preferred learning environment was actually the learning environment they were in, or better put they can aid in the research into person-environment fit interactions. For more information on the PLACES questionnaire please refer to Zandvliet (2007) *Learning Environments that Support Environmental Learning*.

On the first day of class each student was asked if they would complete the Preferred-PLACES questionnaire, and on the last day of class each student was asked if they would complete an Actual-PLACES questionnaire. To evaluate the questionnaires each statement was coded, following a Likert-type scale, from *never* (1) to *always* (5). If a student left a statement unanswered the statement was rated as equivalent to a neutral score (3).

Further data was collected qualitatively via focus groupa and followed a phenomenographic study structure. A phenomenography, as defined by Marton and Booth (1997), aims to document how people understand, experience and assign meaning to a phenomenon. By doing so, the researcher attempts to examine the relationships between the subject (participant) and object (phenomenon), therefore recognizing each person's perspective on their experience with the phenomena (Loughland, Reid & Petocz, 2002). The argument for this was that the information gathered from the students during

focus group sessions could be compared with the data gathered from the questionnaire to corroborate its findings and to deepen these descriptions of educational experience. By providing students the opportunity to personalize their experience through a focus group, there is an opportunity to find relationships or differences in the responses from both the questionnaires and focus group interviews, which then, at some level, adds to the reliability and validity to each of the methods (triangulation). To interview a sample that would be representative of the class, five students (approximately 20% of the class total) were asked to volunteer from each class to take part in a focus group. In order to remain random in my selection of the focus group, I took the first five students who volunteered. During interviews the researcher recorded detailed notes during the course of the discussion. The quotes from the students in this project are not the exact words but have been paraphrased while trying to remain as accurate to the students' original comments. Focus groups were conducted at the beginning of a course and again at the end. At the beginning of the course, I asked the focus group two open-ended questions:

- 1) What were your reasons for taking this course?
- 2) Do you have any expectations of this course?.

At the end of the course, I then asked the focus group two other open-ended questions:

- 1) Taking into consideration your expectations at the beginning of the course, did this course meet those expectations?
- 2) Is there anything else you would like to comment on with regards to this course?

These questions were selected based on their generality and openness, therefore allowing the opportunity for any of the 8 scales to be discussed in the focus group without having to be asked directly. This also follows the idea that phenomenological questions should be aimed at encouraging the participants to think about their experience with the phenomena in question (Loughland et al. 2002).

A second question being asked is 'how might post-secondary learning environments using place-based and constructive pedagogies be characterized or described?'. The results from the focus group interviews and my role as a participant observer in this research aimed to answer this question. The qualitative method was represented by the emic approach taken by the researcher and a phenomenographical study that was conducted. The emic approach, a term and descriptive methodology borrowed from cultural anthropology, can be explained as taking an 'insiders' perspective when studying a group. By doing so the researcher reduces the chances of misinterpreting observations of the group, which may occur more frequently if attempting to understand behaviour of a group as an 'outsider' (Erickson & Murphy, 1998). In reducing a cause for error, the emic approach creates for itself more reliability and validity. This was the reasoning for the researcher taking a participating-observer role in each class.

A phenomenography, as defined by (Marton & Booth, 1997), aims to document how people understand, experience and create meaning to a

phenomenon. By doing so, the researcher attempts to examine the relationships between the subject (participant) and object (phenomenon), and therefore recognizing each person's perspective on their experience with the phenomena (Loughland et al., 2002). With this study and this research question, the phenomenon is learning environments that use place-based and constructive pedagogies, and the participants are the both the students and the professors.

The third and last question asked is 'what differences exist between actual and preferred environments in post-secondary classrooms using place-based and constructive pedagogies?'. To address this question, both the PLACES questionnaire and the focus groups were used. In the first research question, the value of the two versions of the PLACES questionnaire provided two opportunities in each of the courses to quantitatively measure learning environments in post-secondary classrooms, using place-based and constructive pedagogies. Here, the Actual and Preferred- PLACES questionnaires value comes from the comparison of one with the other. As explained earlier the Preferred-PLACES has the students contemplate what their ideal, or preferred, learning environment would look like and the Actual-PLACES questionnaire has the students reflect on their experiences in their actual learning environment. This allows for a student's preferred learning environment to be compared with the actual learning environment they perceived themselves being in. The data for this research question was gathered from the same Preferred- and Actual- PLACES questionnaires that had been given out and explained in the first research question: on the first day of class each student was asked if they would

complete the Preferred-PLACES questionnaire, and on the last day of class each student was asked if they would complete an Actual-PLACES questionnaire. To evaluate the questionnaires each statement was coded, following a Likert-type scale, from *never* (1) to *always* (5). If a student left a statement unanswered the statement was given a neutral score (3).

While the use of the PLACES questionnaire allows for a quantitative analysis of preferred and actual learning environments, the focus group once again provided an alternative method of answering this research question through a qualitative approach. Once again by using both qualitative and quantitative approaches the validity of both would increase and therefore provide a better chance of reaching a detectable significance. Data was collected from the same focus group meetings that were explained earlier under the first research question.

Data Analysis

Means were then calculated for each of the eight constructs at the individual, class and group (all three classes together) level. The class mean does not have any value outside of the class in question; the questionnaire evaluated the learning environment for each course and was not created with the idea of using it as a comparative tool. The means for the eight constructs/scales were graphed for each class and one for the group together. Since the total sample size for the classes studied is comparatively small, differences between the quantitative scores on preferred and actual forms of the survey were to be described through qualitative descriptions of these experiences rather than by

statistical methods (such as T-Tests or other comparisons of means). However, the sample size was suitable to test for reliability and validity of the constructs in each form of the questionnaire. Calculated values for the Cronbach alpha demonstrate that for both forms of the questionnaire the eight constructs demonstrated acceptable within scale reliabilities and therefore no factor analysis was performed. Calculated values for the discriminant validity of each scale were also calculated for both forms of the survey and demonstrated that the PLACES survey measures eight distinct (though somewhat overlapping) constructs. A summary of these data are presented in Table 2.

Table 2. Calculated Values for Cronbach Alpha and Discriminant Validity of Each Scale.

	RI	CV	SN	GC	SI	SC	OE	EI
Cronbach Alpha	0.76	0.72	0.76	0.70	0.70	0.86	0.73	0.70
Discriminant Validity	0.14	0.21	0.38	0.23	0.38	0.29	0.24	0.30

CHAPTER 4: RESULTS

In this chapter I will present the results from observations as a participant-researcher in the three courses as well as the results from the administration of the PLACES questionnaire and for the focus group interviews. They are presented within the context and description of each course section studied to detail a concise case summary of each study location. I open each case study with a description of the learning environment from observations as a participant researcher, which is also supplemented by information from the focus groups. I will then present the results of the questionnaire and focus groups.

Vancouver-based PDP Summer Institute in Environmental Education

Description of the Learning Environment

The first day of class was in some way aimed to create a comfortable group dynamic among the newly introduced class. The instructors had asked students to bring in an environmental artifact, which was to be something that belonged to them, whether it be a story or an object, that was special to them and reflected their connection to the environment. Each student was given as much time as they wanted to talk about themselves and their environmental artifact. It should be mentioned that the room was organized in a way that everyone could see each other's face and did not place the instructors in an authoritative position.

The following activity had the students work in groups with the objective of deciding when their class assignments were due. For specific reasons a few exercises had been selected by the instructors because of specific activities that were dependant on them. For instance a presentation on their final project had to be on a particular day because there was an event that revolved around those presentations elsewhere. This example of sharing the control of the course structure took some students by surprise. From the feeling I received and from my own experiences, instructors giving students the opportunity to choose their own assignment deadlines is not at all common. Some students took advantage of this, while others did not care to participate, because to them it made no difference. After a set amount of time each group came back together as a class and the instructors asked each group what were the recommended deadline dates for the assignments. Not surprisingly, everyone did not come up with the same dates and then a discussion emerged in the course. While I am not sure if they instructors had foreseen this, this exercise in sharing the control of the course, also turned into a group exercise whereby students had an opportunity to voice their rational on their or their groups decision. We have to remember this was the first day of the course, and already by midday we have students who have already presented the personality that goes with their name by the use of the environmental artifact and working together for the common good of the group, the deadlines of their assignments.

The next activity was one that had the students working in groups again to take part in a scavenger hunt. The hunt had the groups find out information on

their local environment and surroundings. Afterwards each group was asked to present on what they had found on the scavenger hunt. From this researchers own experience, activities like the ones just mentioned do not occur in post-secondary classrooms. While it could be argued that in large two hundred student first year undergraduate classes these types of “bonding” activities are just not possible, this does mean that the activities are not practical. While there was some discussion on environmental educational theory, the majority of the first day of class had been used as a ‘get to know’ session as were the next few days. The course took a field trip together, learning about their local port on their way to a camp/lodge site where they stayed the night. At the camp/lodge site a number of learning activities took place. At the end of the three days of class, the course had emphasized the creation of a good group dynamic, encouraged discussion between students and their peers. Reflective of this, a student in the focus commented:

“After the field trips and their experiences I missed the people in our class and so I looked forward to each class to reconnect.”

The remaining weeks in the course seemed to follow the same format, an emphasis on group work and discussion whilst participating in outdoor activities. Other field activities included visiting local parks, water reservoir, sewer plant and garbage dumps, with each setting having its own associated lesson plan. It was one of these activities that had one of the students comment:

“The selection of experiences chosen by the instructors had a lasting effect. I had not expected to be as affected as I realize now at the end of the course. I plan to go back to the places we visited.”

From my perspective, the settings chosen to correspond to specific activities was effectively thought out by the instructors because of the apparent effect it had on the students. Even though some of these students had previously been to the selected outdoor settings, it was the context that they were put in by the instructors that seemed to stimulate reflective thought within the students. It seemed to have stricken a chord in some students, as this one student commented:

“Before this I was a consumer with little consideration for the environment; this class has now changed who I am, and how I view the planet. I was so affected by the experiences we had that I wish the class was longer so I could have time to absorb it all.”

The critique of needing more time to absorb the experiences was also voiced by another student in the course who also was quite affected by the activities:

“The course reminded me of the significance of each action. My only criticism is that I would make the class longer so we could have more reflection time.”

Reminding myself of my own reflections on the course, I must discuss the demeanour of the instructors in the course. The two instructors presented themselves as approachable and welcoming, as well as aiding students to find a solution rather than giving them the solution. The comfort with the teachers was quite apparent with students, by the visual evidence of the teachers being in discussion with students during breaks or at the end of classes. A level of humor

was also present, created by the two instructors, which can only be a plus for any type of learning environment. This was commented on in the final focus group:

“I appreciated the openness and freedom that the instructors created in the course, especially with the portfolio exercise. I also appreciate the resources the instructors used since it wasn't all about science but how to integrate the environment and that helps me with teaching.”

The reference to a portfolio exercise was example of the lack of strictness in the course assignments. The final assignment was a journal, or alternatively a portfolio, which was to be created by the students to embody what they had learned in the course. The portfolio could take any form, and while this freedom did intrigue some, others were lost by this opportunity. It seemed that some students struggled with the notion that they were allowed to present what they personally felt they had learned from the course, rather than taking the customary written exam, which would have demanded they present their learning by memorization. When all was said and done, the students' portfolios were as unique as each student's character. While this may seem like an exaggeration, let me remark that some students' characters were engaged in the course, while other characters were not. This was visible in the portfolios, and what was also quite startling was to see the same students who were struggling with the concept of a portfolio, at the end created some of the most memorable ones. The presentations of the portfolios took place at a camp/lodge at the end of course, much the same way the course had begun. One the last day, before the class

officially ended, I met with the focus and one profound and lasting comment by a student was:

“The environment created provided open learning and provided me with the freedom learn. I realized that environmental education has the potential to help children and adults understand where they are. I realize now that environmental education is my thing.”

I personally feel that this statement was representative of the majority of the students. Even if it were just isolated to this one student, a statement like that by one student alone, I think, is what we all teach for.

PLACES Questionnaires

In the Vancouver-based PDP Summer Institute in Environmental Education, 22 of the 24 students completed the Preferred-PLACES questionnaire, and 21 students, out of a possible 24, completed the Preferred-PLACES questionnaire. The results are summarized in Table 3. In the preferred learning environment students scale of Relevance/Intergation, Group Cohesion, Critical Voice and Environmental Interaction had means that had them closely grouped with one another and were the highest ranked, possibly indicating their importance to the students. The scale of Shared Control was the lowest rank inferring that students may find this scale comparatively less important than the other seven scales.

If we rank the scales in order by the results in the Preferred- PLACES, the data can be interpreted as such: the students in the course indicate that they prefer a learning environment that, in order:

- 1) selects its experiential learning settings specifically to reinforce classroom based learning,
- 2) has a good group dynamic,
- 3) is open to students to speak their mind and express themselves,
- 4) often incorporates a moderate number of field activities into the curriculum,
- 5) allows students the freedom to personalize their learning,
- 6) allows students to actively participate in learning,
- 7) provides opportunities for students to share and contrast alternative views of the learning content with one another,
- 8) and allows the student to share control, to some degree, with the teacher of what is to be learned.

In the Actual-PLACES questionnaire the students ranked Environmental Interaction and Critical Voice quite high, and therefore informing us that the actual learning environment to them had emphasized those two constructs. The lowest ranked scale was Shared Control indicating that this construct had not been highly regarded in the actual learning environment.

Taking the results and ranking the scales informs us that: the actual learning environment that the students felt that they were exposed to was in fact one that:

- 1) prioritized the importance of integrating field activities into the curriculum
- 2) created an open environment for students to speak and express themselves freely
- 3) always chose experiences that reinforced classroom based settings,
- 4) created a good group dynamic,
- 5) allowed students the freedom to personalize their learning,
- 6) often had opportunities for students to share and contrast alternative views of the learning content with one another,

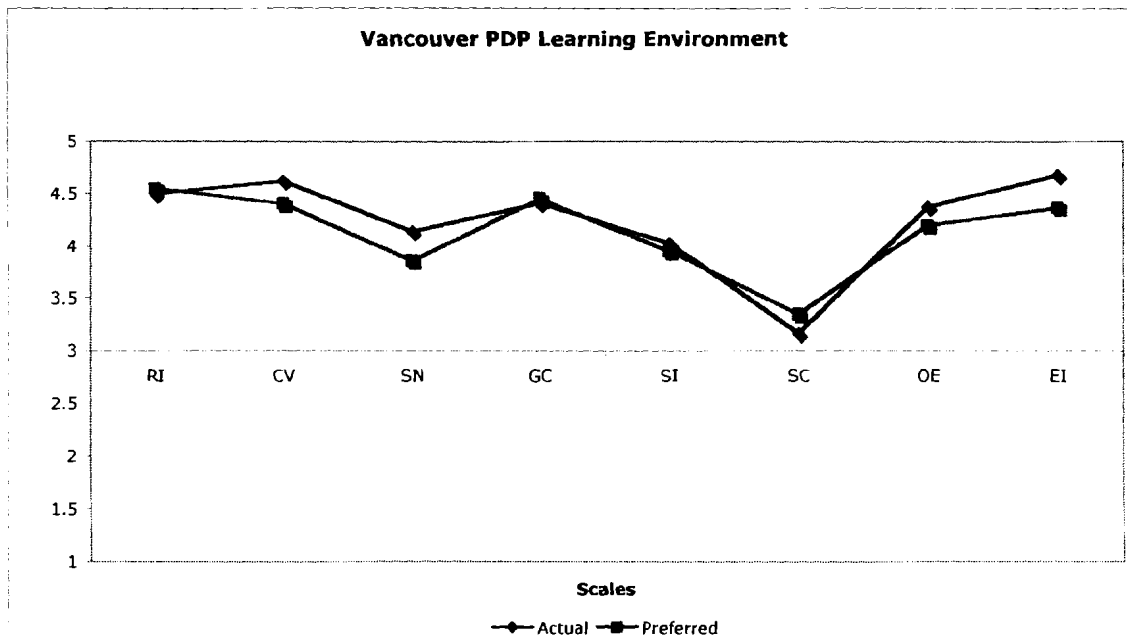
- 7) evidence of active student involvement in learning, and
- 8) opportunities for the student to share control, to some degree, with the teacher of what was to be learned.

Table 3. Preferred- and Actual-PLACES Mean Scores from the Vancouver-based PDP Summer Institute in Environmental Education.

	Preferred-PLACES	Actual-PLACES
Relevance/Integration	4.55	4.50
Critical Voice	4.40	4.62
Student Negotiation	3.86	4.13
Group Cohesion	4.45	4.41
Student Involvement	3.95	4.02
Shared Control	3.35	3.16
Open-Endedness	4.19	4.37
Environmental Interaction	4.36	4.67

If we compare the results from the Preferred– and Actual-PLACES questionnaires from the Vancouver-based PDP Summer Institute in Environmental Education we can see that the results in each questionnaire are a practically a near match. Looking at Figure 1 we see that three of the eight scales (Relevance/Integration, Group Cohesion and Student Integration) were almost identical, another four scales (Critical Voice, Student Negotiation, Open-Endedness and Environmental Interaction) were ranked higher in the actual learning environment than that in the preferred, and lastly only one scale (Shared Control) was slightly lower in the actual learning environment than that of the preferred.

Figure 1. Learning Environment Comparisons from the Vancouver-based PDP Summer Institute in Environmental Education



Focus Groups

In the Vancouver-based PDP Summer Institute in Environmental Education focus group there were a total of 6 students. The students had different academic backgrounds and outdoor experiences. Some had completed natural science undergraduate degrees, while others had social science degrees; a few were comfortable in the outdoors, and others were not. Here are the answers that were given to the two questions in the focus groups; beside them I have placed the scale(s) I believe that correspond with the student's statement:

1) *What were your reasons for taking this course?*

- I chose it primarily because it emphasized experiential learning (*this comment corresponds with the PLACES construct of Environmental Interaction*)
- Because it was an 8 credit course. Also, environmental awareness is a popular topic at the moment and I want to take advantage of the fad (Other).
- Social and environmental issues are important to me. I would like this course to provide me with the tools to educate about these issues. (*this comment corresponds with the PLACES construct of Relevance/Integration*)
- To study and work with like-minded socially conscious people ((*this comment corresponds with the PLACES construct of Group Cohesion*))
- I have done an undergraduate degree in Geography, and so I have always placed the environment as an important topic (*this comment corresponds with the PLACES construct of Relevance/Integration and Environmental Interaction*).

2) *Do you have any expectations of this course?*

- “That it will be mostly outdoors “ (*this comment corresponds with the PLACES construct of Environmental Interaction*)
- “That we will engage in experiential learning” (*this comment corresponds with the PLACES construct of Relevance/Integration and Environmental Interaction*)
- “To gain the tools to stimulate critical inquiry” (*this comment corresponds with the PLACES construct of Critical Voice*)
- “Feeling part of the change and not the cause” (Other)
- “To teach about it in my class” (Other)
- “To learn how integrate environmental education into other courses” (Other).

The final focus group at the end of the Vancouver-based PDP Summer Institute in Environmental Education was composed of the same 6 students that participated in the first focus group. I have chosen not to categorize student responses in the final focus to one of the eight scales in order to fully understand the comments given by the students on their actual learning environment.

1) *Taking into consideration your expectations at the beginning of the course, did this course meet those expectations?*

- “Yes, it provided the wake-up call I was expecting.”
- “No because I had no expectations, what it did do was change my outlook on life.”
- “Yes, it helped me find the happy median between anarchy and peaceful protesting.”
- “Yes, the course and how it was structured ‘moved’ me.”
- “Yes, it was an ‘awakening’.”
- “Yes, I looked forward to each class “

2) *Is there anything else you would like to comment on with regards to this course?*

- “The environment created provided open learning and provided me with the freedom learn “
- “I realized that environmental education has the potential to help children and adults “understand where they are.”
- “The course reminded me of the ‘significance of each action.’”
- “I appreciated the openness and freedom that the instructors created in the course.”

Haida Gwaii-based PDP Summer Institute in Environmental Education

Description of the Learning Environment

Similar to the Vancouver- based course, Haida Gwaii-based PDP Summer Institute in Environmental Education first class occurred in an educational institution. The only difference was that the Haida Gwaii-based course was busy during the first day setting up their sleeping tents in classrooms, while the Vancouver-based course was sitting in discussion. The reason for this was that for the duration of their course in Haida Gwaii the students were to share the secondary school as their home. Therefore, getting to know your fellow students was not an option but rather mandatory for the purpose of the course. The first day ended with a class get-together in the evening playing a name game for everyone to introduce themselves and a small discussion of the course’s syllabus. The next few days of the course incorporated similar activities and exercises to those of the Vancouver-based course. The environmental artifact

and the assignment deadline activity played a similar role in helping to create a good group dynamic. Of course in this setting, because they lived together these two activities were not the only way for students to get know one another at a personal level. For this reason it was not surprising to see that these students had scored Group Cohesion as their highest scale in the Preferred-PLACES questionnaire and led a couple of students, when reflecting back, in the final focus group to say:

“The living accommodations at the school created a type of community with everyone in the class. I felt it was a lesson in being tolerant and understanding of other people.”

“I learned a lot that I did not expect, things that I had not associated with environmental education, such as group dynamics through spending time together in our living accommodations at the school as well as on our camping trips.”

Although the students had got to know one another quite well after the first few days, they were still strangers; strangers to the very environment they were living in, Haida Gwaii. The activity that was chosen to remedy this was called ‘community mapping’. This exercise had also been an activity included in the Vancouver-based course, but with this course it had a different impact on the students, and in the author’s perspective a much more powerful one on the learning environment. This was another activity conducted in groups. I would like to make a point here that group membership was something that was watched by the instructors. While there were times when groups were allowed to be formed on their own, there were also some activities where groups were formed by the instructor in order to inhibit the emergence of cliques and for everyone to be a

part of a different group of people. The community mapping activity entailed groups collecting information on the socio, techno and ecosphere of a community. To do so the groups spent the whole day in their given community to collect information on the community whichever way they pleased. From the perspective of a participant-observer in this course, there was a visible change in the comfort zone of the students in their new environment before and after this activity. Students returned at the end of the day with stories, information and objects from their respective communities, and were energetic to present and recount how their day went. It was remarkable to see how excited these students were conducting and presenting on this activity. These post-secondary students in some ways bared resemblances to young elementary students with their energy for learning. Now while this activity was primarily place-based in theory and one of the reasons it was integrated into the course, this activity had a much more profound affect because these students were visitors to Haida Gwaii. This was mentioned by one of the students in the focus group:

“The community mapping exercise was the highlight for me of the course because I no longer felt like an outsider in the community, which made my stay in Haida Gwaii much more enjoyable and memorable.”

One result from this community mapping exercise was an invitation by the Haida Nation to the class to go out in their traditional canoe that had been created by Bill Reid, who is a well known First Nations artist of the Pacific Northwest. This invitation came about when a group went to the community of Skidegate for their exercise and began to interview people in that community. This invitation was by

no means something that happens regularly. The canoe had not been in the water in over six months and was about to be placed in the Haida Heritage Center. This was an honour not only to take the canoe out in the water but also to be one of the last few people to be able to do that. This was not something that was missed by the students in the course:

“On a personal level the bonuses in the course, such as canoeing in Bill Reid’s canoe and learning about the Haida culture, were experiences that were not expected and I am appreciative for them.”

Connecting to the people living in Haida Gwaii, especially the Haida Nation themselves, was one of the objectives set out by the instructors. When possible, the instructors referred to examples in the Haida culture or in Haida Gwaii when discussing course material. When talking about activities, every excursion that took place occurred in a place that held historic and present value to the Haida people. A two-day trip was organized through Naikun, which is also referred to as Rose Spit in Naikoon National Park. This excursion took place on the second week, and had been chosen by the instructors to develop a spiritual and ecological sense of place in their students. The second large outdoor activity was a five-day hike and kayak trip from within the Cumshewa Inlet to Gray Bay. The Cumshewa Inlet is named after the old Haida Cumshewa village which was a stop on the kayaking part of the trip. Another old Haida village site that was visited on this trip was one Skedans found just outside the Cumshewa Inlet on the Hecate Strait coastline. Due to complications with a tour company the class almost did not visit the Skedans village site, which for some became the highlight of this 5-

day adventure. Ironically, what was first a complication became a lesson to the group. The tour operator who was taking us by boat to the Skedans site had tried to convince the group that this site was very similar to the Cumshewa village in an effort, in my belief, to save their time and money. The tour operators attempt did not work on the class, and everyone visited the Skedans site the next day. While at the Skedans site and afterwards numerous comments were made to me by the students in the class regards to this site having a very spiritual and warming feeling, which has not been apparent at the Cumshewa village. In no way were the Cumshewa and Skedans villages the same. To this researcher, the actions by the tour operator illustrated the disconnection of someone who just lives 'on' Haida Gwaii and not someone who really lives 'in' Haida Gwaii. The tour operator had no sense of place even though they lived 'on' Haida Gwaii. This is a conclusion that I think many of the students came to as well from the remarks that were made to and around me. I would like to think this reaction by the students was visible evidence that the exercises during the course, and the extracurricular activities that came from them, had effectively created the sense of place with Haida Gwaii that the instructors had aimed to do. A comment by one student in course referred somewhat to this point:

“While I had taken courses on First Nations history and culture, I feel I gained a deeper understanding of the Haida people because of this course”

For some, this sense of place of Haida Gwaii and to the Haida people became so strong that they argued that the course could have been more place-based.

“I feel the class could have been more place-based, such as some of the assignments could have been more tailored towards Haida Gwaii”

While this comment by one of the students may appear to be a critique of the course’s structure, I feel that this comment came to fruition because of the same structure that is being criticized. The student that made this comment was also one of the students who, at the first focus group, had said that they had taken this course because it was an 8-credit course and their friend was also taking the course. Not once did this student infer that they were taking this course because they wanted to learn more about place-based education nor did they show interest in wanting to learn about the Haida people. It was only at the end of course, after the Haida-centered activities, did this student finally acknowledge place-based education and the Haida Nation. Therefore, the critical comment, in my belief, showed that this student had grasped the theory of a place-based pedagogy and now in some ways was ‘thirsty’ for more. A number of the students, reflecting on the above outdoor activities as well as the exercises in the course, commented positively on the courses structure:

“The exercises and activities chosen by the instructors helped me understand and learn about what environmental education and place-based education are.”

“The outdoor experiences we had put the environmental education theories we learned the first week into practice.”

The relationship between the students and the instructor was a close one because of the amount of time that was spent with another. That being said, being social everyday can be tiring but the instructors always appeared enthusiastic. As one student comment:

“I felt comfortable with the [instructors]. They were personable; they never lectured and always treated me as their equal.”

With regards to how this translated into how the class was taught, it appeared students felt free and comfortable. There was not a feeling that you were being judged or graded on every move you made or every comment or question you asked. This openness allowed for some great discussions not only at times when the class was indoors but also when they were outdoors. Personal freedom was also evident in the group and individual exercises of the course. As an example, one group assignment was to read over an article, and then present and summarize the article’s main points but no one was told how they were to present it. Students took advantage of this and came up with some memorable presentations, such as a rap song and a Shakespearean-like play. A few students commented on this flexibility in the class:

“I like how the instructors did not push students and did not act as an authority figure. They were supportive and I felt like they were more colleagues than instructors, and they allowed the students to figure things out on their own.”

“I liked how the instructors allowed the students to explore things on their own, were knowledgeable and were always accessible.”

While most students in the focus group were quite positive, the course was not left without its critics. Two students commented that they had wished there had been “more discussions about environmental education in the classroom around the campfire” and on “how to apply direct experiences and activities to our own classroom”. One of the students went into more detail, explaining why they felt this way:

“Maybe the creative people were able to grasp how to implement environmental education into the classroom but for the non-creative person there is a need for discussion on how to apply it.”

This comment, in some ways was countered by another student in the focus group who claimed that “I now see the other point of view. I am no longer seeing through the eyes of a student but now through the eyes of a teacher”. This same student then went into detail of what they had learned in the course:

“It seems much better to take a student out into the field first to experience things with little knowledge of what there is outside and allowing them to have their own personal discoveries and discover their interests in nature. I believe the student will come back to school and have an interest in learning more of the environment that they had just experienced.”

The student who had made the previous critique, made a comment to the researcher that because of this trip they appreciated camping at the beach more, and they plan to do more of it. This pre-teacher had already taken out a class of elementary school children to the mountains around Vancouver during their practicum. With that said, this pre-teacher may now pass on this new appreciation for the beach and ocean to their students, when before they might

not have at all. It can almost be said that this student's discovery of an interest in the beach was something personal and occurred by the same very way as the positive student above had rationalized.

The end project was also a portfolio that could take any form. Once again, there was some curious confusion with what exactly the portfolio could be. In the end this brought about unique and personal interpretations of what was it that they learned. Some in fact brought a number of students to tears, which should indicate to the reader the type of environment that had been created during this four-week course. A parting comment made to me by one the students in the focus group acknowledges this learning environment:

“The environment created by the instructors and Haida Gwaii epitomizes what environmental education is to me. Now that I think of it, this class exceeded my expectations.”

PLACES Questionnaires

In the Haida Gwaii-based PDP Summer Institute in Environmental education 23 students, out of a possible 24, completed both the Preferred- and Actual-PLACES questionnaire. The scale of Group Cohesion was ranked strikingly high by the students in their preferred learning environment, and was followed by Environmental Interaction and Critical Voice in rank. Shared Control was the lowest ranked scale indicating the students did not hold this construct in high regard in their preferred learning environment.

If we rank the scales in order by the results of the questionnaire, it would appear that: students preferred a learning environment that:

- 1) always has good group dynamics,
- 2) selects particular experiential learning settings specifically to reinforce classroom based learning,
- 3) provides the atmosphere for students to speak their mind and express themselves freely,
- 4) incorporates a moderate number of field activities into their learning,
- 5) often provides opportunities for students to share and contrast alternative views of the learning content with one another,
- 6) allows the freedom to students to personalize their learning
- 7) has students actively involved in learning and
- 8) has shared control, to a degree, with the teacher of what is to be learned.

In the actual learning environment, students ranked the scales Relevance/Integration and Open-Endedness the highest, and thus inferring their influence. The lowest ranked scales were Shared Control and Student Involvement. The results are summarized in Table 4.

To have a clearer interpretation of the results, if we rank the scales by their results in the Actual-PLACES questionnaire it informs us that: the student's actual learning environment was one that:

1. primarily emphasized the freedom to students to personalize their learning;
2. always had experiences that reinforced what they were learning in class;
3. provided a comfortable environment for students to speak their mind and express themselves freely;
4. incorporated field activities into the curriculum,;
5. had a good group dynamic;

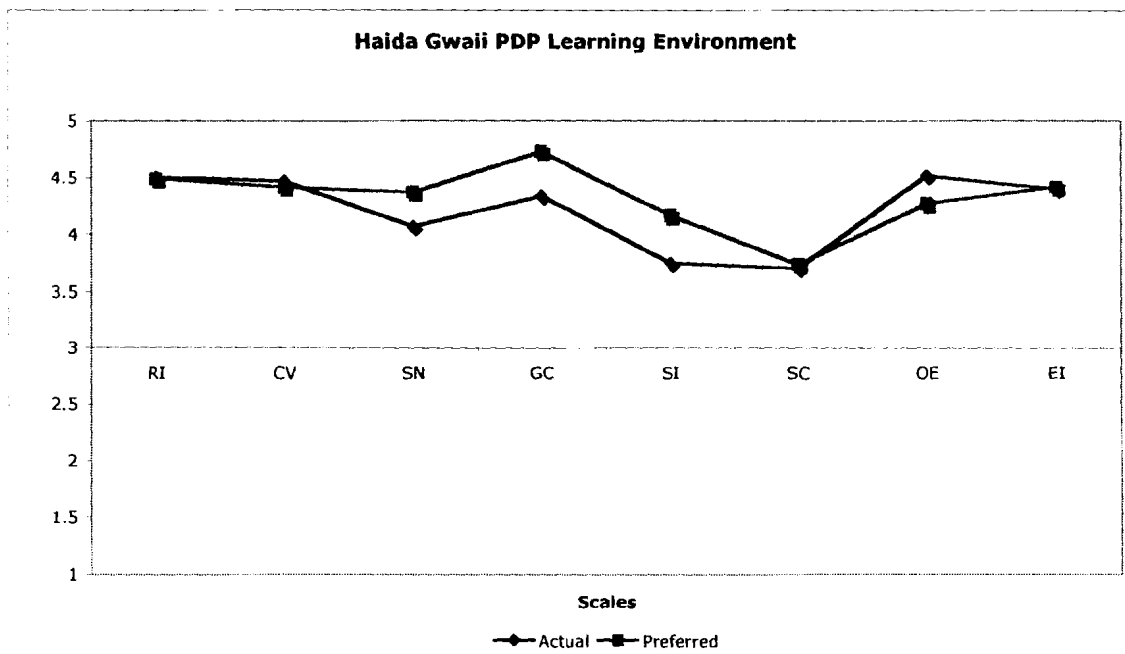
6. often provided opportunities to share and contrast alternative vies with one another on their learning content,
7. that had students actively engaged in their learning;
8. allowed the students to actively participate and control what they are learning.

Table 4. Preferred- and Actual-PLACES Mean Scores from the Haida Gwaii-based PDP Summer Institute in Environmental Education

	Preferred-PLACES	Actual-PLACES
Relevance/Integration	4.49	4.50
Critical Voice	4.42	4.47
Student Negotiation	4.37	4.07
Group Cohesion	4.73	4.34
Student Involvement	4.17	3.75
Shared Control	3.74	3.70
Open-Endedness	4.27	4.52
Environmental Interaction	4.42	4.40

If we look now to compare the results from the Preferred- and Actual- PLACES questionnaires, we can see in Figure 2 that they are a close match. The ratings for four of the scales (Relevance/Integration, Critical Voice, Shared Control and Environmental Interaction) are or near to identical to one another, one scale (Open-Endedness) has a higher rating in the actual learning environment than that of the preferred, and three of the scales (Student Negotiation, Group Cohesion, and Student Interaction) have lower ratings in actual learning environment when compared to the preferred.

Figure 2. Learning Environment Comparisons from the Haida Gwaii-based PDP Summer Institute in Environmental Education



Focus Group Interviews

In the Haida Gwaii- based PDP Summer Institute in Environmental Education there were a total of 7 students in the focus group. Similar to the Vancouver-based class, the students had a variety of academic backgrounds and environmental experiences. Here are the answers given to the two questions with, when possible, the PLACES construct(s) that corresponds with the answer.

1) *What were your reasons for taking this course?*

- “Because my friend was also taking it. Also the 8 credits made it appealing and that we were going to Haida Gwaii” *(this comment corresponds with the PLACES construct of Environmental Interaction and Group Cohesion)*
- “Because it was an outdoor course and I am not an experienced outdoor person. I was also looking for something different and that would be personally rewarding”. *(this comment corresponds with the PLACES construct of Environmental Interaction)*.
- “I heard about this course from my friend in the course and it has been a childhood dream to come to Haida Gwaii. Also the environment is dear to my heart”. *(this comment corresponds with the PLACES constructs of Environmental Interaction and Group Cohesion)*
- “Because it was a field course, and that it was at Haida Gwaii. I will say I was a little worried about the workload doing 8 credits in 3 weeks.” *(this comment corresponds with the PLACES construct of Environmental Interaction and Other- Personal Challenge)*
- “I have always been interested in environmental education. The reason why I chose to do the PDP program at SFU was because I could minor in environmental education”. *(Other-Pedagogical Action)*
- “I am in Interested in environmental education” *(this comment corresponds with the PLACES constructs of Relevance/Integration and Environmental Interaction)*

2) Do you have any expectations of this course?

- “I haven’t done anything like this before and I was interested in pushing my limits” (Other- Personal Challenge)
- “Well I was contemplating another field program in Lavalle and I wasn’t sure which one to choose. But as I thought it over, while the Lavalle program would be beneficial to me finding a job, I wanted to have personal growth first.” (Other- Personal Challenge)
- “Although I do have outdoor experience, I am hoping to learn more wilderness activities that I could do with the classes I will be teaching.” *(this comment corresponds with the PLACES constructs of Relevance/Integration)*
- “My future plans are to lead a field course and I am hoping to acquire the tools and necessary skills to conduct one.” (Other- Pedagogical Action)
- “I am hoping to gain the tools to teach environmental education to my students because I think it’s important.” (Other- Pedagogical Action)
- “I want to gain the tools, skills and to know the protocol to take groups outside in the environment but also to gain camping experience so that I can do the same with my students in the future.” (Other- Pedagogical Action)
- “I would like to be exposed to some current environmental issues as well as an opportunity to increase my outdoor experience.” *((this comment corresponds with the PLACES constructs of Relevance/Integration and Environmental Interaction)*
- “I don’t have a lot of expectations besides that I want to get ideas I can use in my teaching.” (Other-Pedagogical)

Haida Gwaii- based PDP Summer Institute in Environmental Education final focus group was made up of the same 7 students from the first focus group at the beginning of the course 4 weeks earlier. Below are the comments made by the students during the final focus group but this time I have not added the corresponding PLACES construct in order to full comprehend the answers given.

1) *Taking into consideration your expectations at the beginning of the course, did this course meet those expectations?*

- "Yes, I learned about experiential learning not from lecture but directly."
- "Yes it met my expectations academically."
- "Yes it exceeded my expectations because I expected this course to be biology and conservation oriented; I was awoken to the concept of direct experience and experiential learning. "
- "Yes it met expectations in wilderness experience but I feel that the course did not effectively show how to implement EE in the actual classroom. "
- "Personally it exceeded expectations, but professionally it met expectations.

2) *Is there anything else you would like to comment on with regards to this course?*

- "I liked how the instructors did not push students and did not act as an authority figure. They were supportive and I felt like they were more colleagues than instructors, and they allowed the students to figure things out on their own. I am sad to go."
- "I learned a lot that I did not expect, things that I had not associated with environmental education, such as group dynamics through spending time together in our living accommodations at the school as well as on our hiking/camping trips. "
- "I feel the class could have been more 'place-based', such as some the assignments could have been more tailored towards Haida Gwaii. "
- "While I had taken courses on First Nations history and culture, I feel I gained a deeper understanding of the Haida people because of this course. "
- "The exercises and activities chosen by the instructors helped me understand and learn about what environmental education and place-based education are. "
- "I know see the other 'point of view'; I am no longer seeing through the eyes of a student but now see through the eyes of a teacher. "
- "It seems much better to take a student out into the field first to experience things with little knowledge of what there is outside and allowing them to have their own personal discoveries and discover their own interests in nature; I believe the student will come back to school and have an interest in learning more of the environment they had just experienced."
- "I think most people took this course for outdoor/wilderness experience more than they did for environmental education ."

- “I enjoyed how the course was not lecture oriented and was mostly outside but I wish we had more discussions about environmental education in the classroom around the campfire. Maybe the creative people were able to grasp environmental education into the classroom but for the non-creative there is need for discussion on how to apply environmental education in the classroom. “
- “On a personal level the ‘bonuses’ in the course, such as canoeing in Bill Reid’s canoe and learning more about the Haida culture were experiences that were not expected and I am appreciative for them. On a professional level I wished there had been more conversations on how to apply direct experiences and activities to our own classroom. “
- “The outdoor experiences we had put the environmental education theories we learned the first week into practice. “
- “I liked how the instructors allowed the students to explore things on their own, were knowledgeable on the subject of environmental education, and were *always* accessible.”
- “I felt comfortable with the instructors. They were personable; they never lectured and *always* treated me as their equal.”
- “The environment created by the instructors and Haida Gwaii epitomizes what environmental education is to me. Now that I think of it, this class exceeded my expectations.”
- “The living accommodations at the school created a type of community with everyone in the class. I felt it was a lesson in being tolerant and understanding other people.”
- “The community mapping exercise was the highlight for me of the course because I no longer felt like an outsider in the community, which made my stay in Haida Gwaii much more enjoyable and memorable.”

Learning Environments and Ecological Education Masters Course

Description of the Learning Environment

The course for the LEEE students, *Issues and Topics in Environmental Education*, began as a field and camping trip to Vancouver Island to visit areas around the Campbell River area. The instructor had informed me that the purpose for starting the course in this manner was to

create better group solidarity. Although the students had just finished taking the first course in this masters cohort program, they were still only about two months into the masters program and were still getting to know one another. It should also be mentioned that there had been comments made by the students to the researcher that there had been some group tension in the other course. For this reason the decision by the instructor to start the course as a three day camping and field trip appeared to be a good idea to mend bonds and possibly to create new ones. When the group arrived at the meeting point in Nanaimo, the students seemed energetic and excited to start the trip.

Upon arrival in Campbell River, the group took a ferry to Quadra Island where we were to stay the evening and as well as the location of a few activities for the course. Similar to the course in Haida Gwaii, the instructor, in an effort to create a sense of place, took the students to the local museum on the island, which belonged to the First Nations culture from area named the Kwagiuth Museum and Artists and Carving Centre. Here the students were informed of the Kwagiuth history in this region, which I think many were surprised to find out. I myself, while being quite knowledgeable of the First Nations on the Pacific Northwest, knew little of the village on Quadra Island as well as the difficult struggle the Kwagiuth had to create the museum.

From here the group set up camp at a local campsite and then were taken to the house of friend of the instructors. Here at the house, the

students met the owner of the house as well as another gentlemen. Both of the people had been teachers at a local secondary school in Campbell River but what made them different from many other educators in the area is that both of the gentlemen were pioneers of environmental education in British Columbia in the early 1960s. Both these of these gentlemen had won awards for their environmental work in the educational system. The two teachers, around a campfire, retold their stories of the trials and tribulations that they went through during their years in the provincial educational system. The students were quite engaged by the confessions and memoirs of the two gentlemen. In some way, it felt as if we were being passed the torch of environmental education, so to speak, from these two educators. Knowing that these two gentlemen did a lot for environmental education in our province and paved the way for future environmental educators, such as these students, made you feel as if you were part of a larger community. As if you were a part of something bigger.

The next day the group went back to Campbell River on the mainland, accompanied by the two environmental educators, to visit a heritage site. The heritage site was the home of a respected member of the community but also internationally for his work in conservation. His name was Haig Brown, and he had also been a mentor to the two educators years ago. Again, this experience of getting to know the history of the environmental work that had been done years ago, a time when

Rachel Carson's Silent Spring was opening the eyes of people to environmental degradation, made me personally feel proud to be involved in continuing the push for an environmental ethic in our educational system. From here, the class then went to Strathcona Park Lodge and Outdoor Education Centre located at Strathcona National Park. Here we met the family that established this centre over 30 years ago, and they told us their story of how this all came to be. During the story, it was revealed to us that once again, the two educators accompanying us had been linked to this environmental educational center just as they had been with Haig Brown. The educators had worked and had been good friends with the couple that created the Strathcona Park Lodge and Outdoor Education Centre. It was quite astonishing to see how many of these people in the Campbell River area had been so progressive in the 1960s in the little forestry town and had all worked together. I think this was a feeling that was shared in the class. The class stayed the night at Strathcona. At the campsite the class got into groups and presented summaries of an article each was to have read. This exercise had no restrictions so the groups had the freedom to choose how they presented it. The class took full advantage of this with each group presenting differently. The day ended with a communal dinner, as they had the other night. The communal dinner activity, while it may have seemed as just a moment to eat the final meal of the day, appeared to mean more to some of the students. One student commented to me how nice it was that the instructor was having

dinner with everyone. The way the student made the comment, it felt as if they were talking for the whole class. Dinner seemed like family dinner as we all ate the same thing, and the group of people who had volunteered to cook the dinner, were of course not the same group who cleaned the dishes. Again, this may seem like a minor detail, but for the relationship between the instructor and their students I think these dinners brought them all closer.

The next week the course met up for two days at the Great Northern Way Campus. The first day the class was split up into groups to conduct the community mapping exercise, the same one I had explained in the Haida Gwaii-based course. This class did not spend the same amount of time that the Haida Gwaii-based course did, nevertheless there was still an effect. Of all the groups the one that appeared the most interesting was the group that went to Hastings and Main. One of the students in this group was not too excited of having to go there, so much so that they asked the instructor if they could change groups. What was memorable of this moment was the way the student asked. The student, understanding and knowing that the instructor aims to create a free and open learning environment, brought this point up when they asked to change to a different group. The instructor did not allow it stating that for this exercise the freedom was in the way they were presenting the knowledge they gather during this exercise, and not in the choice of which part of the city. I think this is an important point to bring up because it asks

how do you define 'freedom' in the classroom? This 'freedom' is reflective of a constructive pedagogy, and a common argument against it.

The last day of the course the students were asked to do a short presentation on an assignment they had. The assignment was an environmental autobiography, which asked them to write about their moments in their life that were influential in their caring for the environment and had led them to take this course. Similar to the portfolio exercises, the students could present their environmental biography in whatever form they liked. Again, some students had troubles grasping the idea of freedom in an assignment and in fact, prior to the presentations, some students had voiced confusion on writing about themselves and the environment. For some, I think this assignment led some to do some soul searching and others to moments of epiphanies. While this environmental autobiography was a work in progress and was not to end with this course, one student decided to make their environmental autobiography their first chapter in a book to be published that they hope to finish by the end of the masters program. The presentations of this assignment also seemed to take on another role. A few students took this opportunity when presenting their environmental autobiography to talk about the tension that had been present in the group during their first course together. The students were not trying to create friction, but rather the opposite. I am not quite sure you can single out this particular assignment as the cause of this or whether it was compounding effects of each assignment and activity, but by the end of the last day, this class was

comfortable with one another and ready to spend the next two years together as a cohesive group

PLACES Questionnaires

In the LEEE course there were a total of 12 students. There were 11 students who completed the Preferred-PLACES questionnaire and 12 who completed the Actual-PLACES questionnaire. The results are listed in Table 5. The scale with the highest rating in the preferred learning environment was Critical Voice, followed by Student Negotiation and Group Cohesion indicating their importance to the students. The lowest rating in the preferred learning environment belonged to Shared Control and Student Involvement thus inferring their lack of importance in the students' preferred learning environment.

If we rank the scales by the results in the Preferred-PLACES questionnaire we have an opportunity to possibly understand the data a bit better. The results indicate that: students prefer a learning environment that:

- 1) pays particular attention to creating an environment whereby students can speak their mind and express themselves freely;
- 2) contains a good group dynamic
- 3) often has opportunities for students to share and contrast with one another alternative views on their learning content.
- 4) selects experiences that appropriately reinforce what is being learned in the class;
- 5) Integrates a moderate number of field activities in the curriculum,
- 6) allows for students to personalize their learning;
- 7) encourages student engagement;

- 8) allows for the student to share control with the teacher of what is to be learned and how it is learned.

In the actual learning environment the highest rating belonged to Open-Endedness, which in fact was quite high, 4.77, and was quite separated from the other highly rated scales of Environmental Interaction, Critical Voice and Group Cohesion. The lowest rated scales were once again Shared Control and Student Involvement. If we rank the scales by the results, it would appear that: the actual learning environment that the students took part in:

- 1) prioritized the option for students to personalize their learning;
- 2) incorporated field activities in the curriculum;
- 3) created a comfortable environment for students to express themselves and voice themselves freely.
- 4) had a good group dynamic
- 5) allowed students the opportunities to share and contrast alternative views with one other regarding their learning content.
- 6) chose activities that reinforced classroom based learning
- 7) was one that students engaged themselves in
- 8) allowed the students to actively participate and control what they are learning.

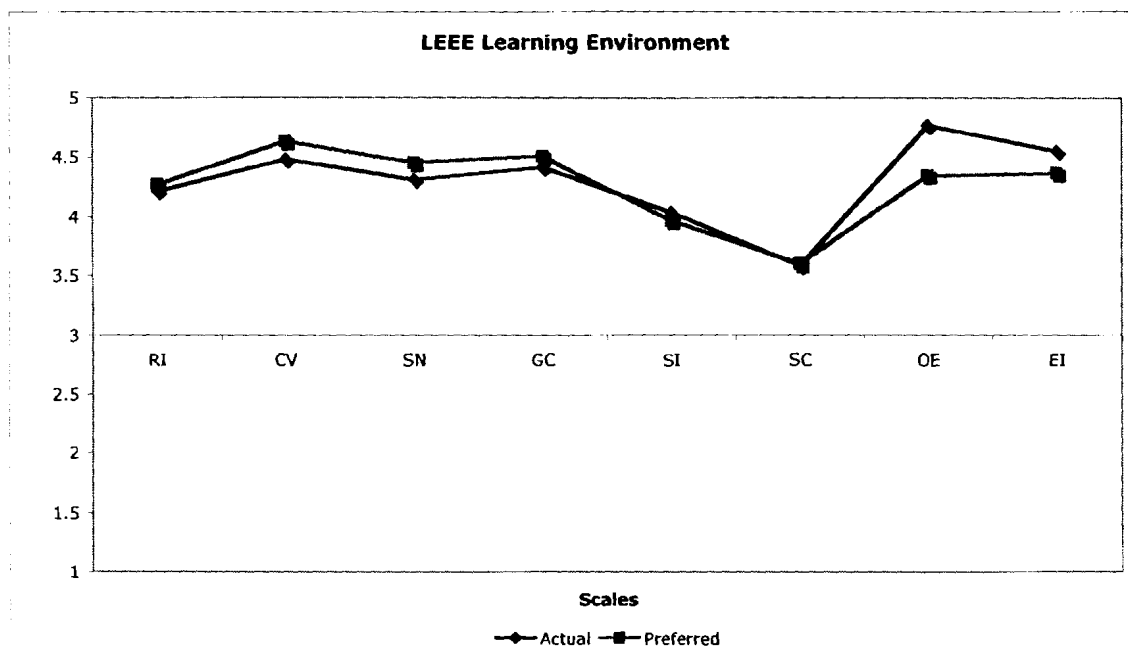
Table 5. Preferred and Actual-PLACES Mean Scores for the Learning Environments and Ecological Education Masters Course

	Preferred-PLACES	Actual-PLACES
Relevance/Integration	4.27	4.22
Critical Voice	4.64	4.48
Student Negotiation	4.46	4.32
Group Cohesion	4.51	4.42
Student Involvement	3.96	4.03
Shared Control	3.60	3.58
Open-Endedness	4.35	4.77
Environmental Interaction	4.36	4.55

Comparing now the results from both the Preferred- and Actual-PLACES questionnaire we once again see a close match. If we look at Figure 3, we can see that there is an obvious shared pattern in the mean ratings from the students in their preferred and actual learning environments. Three of the scales (Relevance/Integration, Student Involvement, and Shared Control) had nearly identical ratings in both preferred and actual learning environments. Another

three scales (Critical Voice, Student Negotiation and Group Cohesion) although having slightly lower ratings in the actual learning environment, were very close to their corresponding ratings in the preferred learning environment. Lastly, two scales (Open-Endedness and Environmental Interaction) had higher ratings in the actual rather than in the preferred learning environment.

Figure 3. Learning Environment Comparisons from the Learning Environments and Ecological Education Masters Course



Focus Group

There was no focus group for the LEEE Course

CHAPTER 5: CONCLUSION

The purpose of this study was to provide information on learning environments in higher education, with a focus on environmental education programs. Wright (2006) argues that universities produce students who are not capable of dealing with our current environmental issues due to the fact that universities do a poor job of illustrating the connections between humans and the natural environment that they live in. Learning environments, on the other hand, have proven to be influential on academic achievement when an actual learning environment matches the student's preferred learning environment (Fraser, 1998a) and therefore there is a need for more research into classroom environments in higher education.

This study investigated the preferred and actual learning environments of three post-secondary environmental education courses at Simon Fraser University in an attempt to understand the learning environment phenomena and to validate the use of the PLACES questionnaire to measure and describe higher education learning environments. Three research questions were asked and will now be discussed with reference to the results of this study.

Measuring and Comparing Learning Environments

One of the questions being asked in this research was 'can aspects of the learning environment in post-secondary classrooms, using place-based and constructive pedagogies, be validly measured quantitatively?'. After reviewing the data collected by the PLACES questionnaire and triangulating it with the information collected from the focus groups and participant-researcher observation I believe that the PLACES questionnaire can validly measure learning environments in post-secondary classrooms that use place-based and constructive pedagogies. Besides the commonalities between the responses from the questionnaires, their corresponding focus groups and participant researcher observations, there are also similarities between the responses to the Preferred-PLACES questionnaire in each course. Now while I did mention in Chapter 3 that this questionnaire was not created to compare learning environments between different courses, the results from the Preferred-PLACES can in theory be compared because at the time each course was taking the Preferred-PLACES questionnaire none of the courses had yet been exposed to their respective learning environments, thus they were all still representative of the same sample population, post-secondary students. With that said, the most striking similarity is that all three courses rated Shared Control the lowest of all eight scales, and the scales Critical Voice, Group Cohesion and Environmental Interaction were highly rated in all three courses. Another observation that can only be clearly seen by looking at Figures 1, 2 and 3; they all seem to share the same peaks and valleys in their data sets. These similarities in the results from

the Preferred-PLACES questionnaire indicated to me that this questionnaire has been accurately created to measure these eight constructs of a learning environment that uses place-based and constructive pedagogies. To add as well to the validity, while the total sample size was comparatively small to statistically compare preferred and actual scores, the sample size was suitable to test for reliability and validity of the constructs in each form of the questionnaire. The calculated values from the Cronbach alpha and discriminant validity indicated that that not only did the eight constructs in both of forms of the questionnaire demonstrate acceptable within scale reliabilities but also validly measured eight distinct constructs. With the strength of having statistical reliability and validity, and the commonalities between questionnaire, focus groups and observation, as well as the similarities between courses in their Preferred-PLACES results I am quite confident that the PLACES questionnaire does validly measure learning environments in post-secondary classrooms that use place-based and constructive pedagogies.

A second research question asked ‘ what differences exist between actual and preferred learning environments in post-secondary classrooms using place-based and constructive pedagogies?’. Current trends in learning environment research has noted that preferred and actual learning environments had a much closer fit in interdisciplinary, outdoor-based learning environments than single disciplined, classroom-based learning environments (Zandvliet, 2007). Having this in mind, it was believed that the results from these three outdoor-based courses would agree with this trend.

If we first examine the Vancouver-based course, the mean scale responses from the Preferred- and Actual-PLACES questionnaire were quite similar. Of the eight scales, only three of the scales (relevance/integration, Group Cohesion, and shared control) had lower scores on the Actual-PLACES questionnaire than those from the Preferred-PLACES, and their differences were only slight. The remaining five scales (Relevance/Integration, Critical Voice, Student Negotiation, Group Cohesion, Student Involvement, Shared Control, Open-Endedness, and Environmental Interaction) had higher mean scores in the actual questionnaire than that of the preferred. After looking over the results in Table 3 and Figure 1, it would appear there is no difference between the preferred and actual learning environment. The actual learning environment that the two instructors created using place-based and constructive pedagogies not only met the students' expectations of their preferred learning environment but in some aspects exceeded them. This is quite a stunning result.

In the results from the Preferred- and Actual-PLACES questionnaires, from the Haida Gwaii-based PDP Summer Institute in Environmental Education, five scales (Student Negotiation, Group Cohesion, Student Involvement, Shared Control, and Environmental Interaction) had lower scores in the Actual-PLACES questionnaire than those from the Preferred-PLACES, and three of the scales had higher scores (Relevance/Integration, Critical Voice, and Open-Tenderness). Lest it be said, that the range in the differences of these five aforementioned scales was minimal, 0.02 (Environmental Interaction) to 0.42 (Student Involvement). To give this some scope, there is a general trend in current

learning environment research showing substantially large gaps between preferred and actual learning environments in classroom-based courses (Zandvliet, 2007), much more than we see here in this field-based course. Taking this a step further, if we look at all eight scales they were on average 0.11 lower in the actual learning environment than in the preferred learning environment. This is not a large difference at all between the preferred and learning environments. These results paint us an interesting picture of a learning environment of an outdoor-based course that uses place-based and constructive pedagogies. As Figure 2 illustrates well, these results indicate that there was a near match in preferred and actual learning environments in the Haida Gwaii-based course, and little difference.

With the LEEE course, five scales (Relevance/Integration, Critical Voice, Student Negotiation, Group Cohesion, and Share Control) had lower mean scores in the actual learning environment from those in the preferred and three scales (Student Involvement, Open-Endedness, and Environmental Interaction) had higher mean scores in the actual rather than the preferred learning environment . While the scales Relevance/Integration, Critical Voice, Student Negotiation, Group Cohesion, and Share Control, from their results in the Actual-PLACES, may have not have met the bar set by the preferred mean responses, the range in their differences were slight, with a high of only 0.16 and a low of 0.02. To give you an idea how close these results were for this class, the scales measured in the actual learning environment were, on average, only 0.03 less than those from the preferred. What this tells us is that the this outside-based

course of the LEEE master program not only meet the expectations of the students preferred learning environment but it exceeded it. Again, there was little substantial evidence to show any difference between preferred and actual learning environment.

If we reflect now on the information recently provided on the results of the Preferred and Actual-PLACES questionnaires from all three courses, we can come to the conclusion that the results here indicate that no difference was strongly evident between a student-preferred learning environment and an actual learning environment that used place-based and constructivist pedagogies . In the focus groups this was also the conclusion. As can be seen in the results from the focus groups, every student either felt that the course had met expectations or exceeded them, and as it had with a number of the scales in the Preferred and Actual-PLACES questionnaire. These results agree with what is being currently found in other learning environment research. Outdoor-based learning environments, using place-based and constructive pedagogies, appear to strongly fit students preferred learning environments.

Describing Learning Environments

The third and last question posed in this research was 'how might post-secondary learning environments using place-based and constructive pedagogies be characterized or described?'. While I think that this question was clearly answered in Chapter 4, there are still a few things that are important to discuss with regards to describing the learning environments in the Vancouver-based and Haida Gwaii-based courses from the comments in the focus groups. Because there was no focus groups for the LEEE course my observations on the learning environment is clearly described in Chapter 4.

In the focus groups that took place at the end of course, a number of the students in the Vancouver-based PDP course made comments that could be perceived as referring to 'personal growth', such as "it provided the wake up call"; "what it did was change my outlook on life"; "[it] moved me" ; and "it was an awakening" . In contrast, the Haida Gwaii-based students made comments at the end of the course that referred to a type of 'pedagogical growth', even though a number of students at the beginning of the course had commented they had taken this Haida Gwaii-based course for reasons that could be construed as 'personal growth'. This is an important difference between these two courses especially since they were the exact same course but in different environmental settings. I think this is something that should be pointed out, the influence that a specific environmental setting has on a learning environment. The Vancouver-based course visited local water reservoirs, parks and dumpsites to name but a few. These environmental settings exposed the students to the sources and

discharges that are a part of their daily life. As if they had been given a new sense, a 'sense of awareness'. This is what I believe brought about the comments on personal growth in the Vancouver-based students. The environmental settings in the Haida Gwaii-based course, on the other hand, were most often wilderness settings in attempt to expose students to a foreign environment and in doing, so rather than giving rise to a sense of awareness as with the Vancouver-based course, these students were 'awoken' to outdoor activities. Activities they could do with their own courses once they finish their PDP program. It is possibly for this reason these students made a number of comments that referred to 'pedagogical growth'.

Recommendations for Future Research

Research on learning environments and environmental learning is still in its infancy. Thus there is a need to continue similar research to what has been conducted here but on a greater scale. Although having a comparatively small sample size the PLACES questionnaire was proven to be statistically valid and reliable, which has aided in establishing this questionnaire as an educational assessment tool. This opens up opportunities for future research to continue using the PLACES questionnaire in similar classroom environments, as well as the potential to adapt and evolve the PLACES questionnaire for other learning environment assessments.

With regards to environmental learning, the comments made by the students in the focus groups appear to indicate that they are serious about environmental education in their future classrooms. Unfortunately there is a

reality to working as a teacher whereby the pressures of expectations from educational government ministries suppress the innovation of environmental learning in the classroom. Therefore while students in teaching programs may show interest in environmental education, the question whether this interest is translocated to their classrooms once they graduate is something that needs to be asked. Currently, little research has been done on studying students, who have taken environmental education courses, before and after their teaching programs. An improved understanding of environmental education in teaching programs and their practice afterwards in classrooms not only has the potential to understand the effectiveness of environmental education programs but also the potential to understand the barriers new teachers may have in promoting environmental learning in the classroom.

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