

**Factors Influencing Learning Environments in  
an Integrated Experiential Program**

**by**

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## **Abstract**

The research conducted for this dissertation examined the learning environment of a specific high school program that delivered the explicit curriculum through an integrated experiential manner, which utilized field and outdoor experiences. The program ran over one semester (five months) and it integrated the grade 10 British Columbian curriculum in five subjects. A mixed methods approach was employed to identify the students' perceptions and provide richer descriptions of their experiences related to their unique learning environment. Quantitative instruments were used to assess changes in students' perspectives of their learning environment, as well as other supporting factors including students' mindfulness, and behaviours towards the environment. Qualitative data collection included observations, open-ended questions, and impromptu interviews with the teacher. The qualitative data describe the factors and processes that influenced the learning environment and give a richer, deeper interpretation which complements the quantitative findings. The research results showed positive scores on all the quantitative measures conducted, and the qualitative data provided further insight into descriptions of learning environment constructs that the students perceived as most important. A major finding was that the group cohesion measure was perceived by students as the most important attribute of their preferred learning environment. A flow chart was developed to help the researcher conceptualize how the learning environment, learning process, and outcomes relate to one another in the studied program. This research attempts to explain through the consideration of this case study: how learning environments can influence behavioural change and how an interconnectedness among several factors in the learning process is influenced by the type of learning environment facilitated. Considerably more research is needed in this area to understand fully the complexity learning environments and how they influence learning and behaviour.

**Keywords:** learning environments; integrated experiential programs; environmental education

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## List of Non-Printing (Hidden) Symbols

·	space
→	tab
↵	line-break
¶	paragraph marker
▪	this square box indicates that a specific type of paragraph formatting has been applied to the paragraph—which also relates to page-layout

## List of Acronyms or Glossary

LoT	List of Tables
LoF	List of Figures
ToC	Table of Contents
PLACES	Place Based and Constructivist Environment Survey
RI	Relevance/Integration
CV	Critical Voice
SN	Student Negotiation
GC	Group Cohesiveness
SI	Student Involvement
SC	Student Control
OE	Open Endedness
EI	Environmental Interaction
LSI	Learning Style Inventory
CE	Concrete Experience
RO	Reflective Observation
AC	Abstract Conceptualization
AE	Active Experimentation
TTM	Transtheoretical Model
FMI	Freiburg Mindfulness Inventory
MEAK	Measurement of Ecological Attitudes and Knowledge Survey

# Chapter 1: Introduction and Background to the Problem

In a single day we [humans] will add 15 million tons of carbon to the atmosphere, destroy 115 square miles of tropical rainforest, create 72 square miles of desert, destroy between 40 to 100 species, erode 71 million tons of topsoil, add 2,700 tons of CFCs to the stratosphere, and increase the world population by 263,000. (Orr, 1992, p. 3)

Not much has changed since Orr cited these statistics in 1992. Eighteen years later, in a *Science Matters* article, Suzuki (2010) wrote that scientists are warning, “We are facing a human-caused catastrophic wildlife crisis. Some 17,000 animals and plants are facing extinction, including 12 per cent of birds, nearly a quarter of mammals, and a third of amphibians” (para. 5). I believe that until the population changes its behaviours, this trend will continue. The challenge “is more than simply an engineering problem of improving efficiency; it is the problem of reducing the rate at which we poison ourselves and damage the world” (Orr, 2002, p. 21). Therefore, educators must educate the populous, not only with knowledge, but also with the skills, values, attitudes, and behaviours needed to address this crisis. There is no single answer to reverting this crisis; regulation, enforcement, and incentives could be part of the solution, and I would suggest education is a critical one. The type of education needs to be more than the current model.

Perhaps it is time that educational learning environments begin to model the kind of social structures people wish to see in the world, rather than just focusing on content. A positive learning environment develops group cohesion and gives students an opportunity to voice their thoughts and ideas, which ultimately allows them to grow personally. It also supports students in making changes in their attitudes and behaviours that are socially, morally, and ethically responsible. Fraser (1998) described a positive learning environment as one in which the students’ preferred learning environment matches their actual experienced environment.

This “education should prepare them [students] for living and working in a global society. The issues affecting our planet, such as climate change and global poverty, require an innovative generation that knows how to find solutions” (Learning and Teaching Scotland, 2010, p. 8). Students will need to look at these problems from a different perspective, with increased awareness and attitudes that are focused on resolution, not just through technology. Unfortunately, even the school system has fallen into the technological trap, where the answer is more technology.

The United Nations General Assembly has recognized this challenge and has adopted by consensus a resolution establishing The International Decade of Education for Sustainable Development 2005–2014 (DESD).

Thus, education is the primary agent of transformation towards sustainable development, increasing people’s capacities to transform their visions for society into reality. Education not only provides scientific and technical skills, it also provides the motivation, justification, and *social support* for pursuing and applying them. The international community now strongly believes that we need to foster—through education—the values, behaviour and lifestyles required for a sustainable future. Education for sustainable development has come to be seen as a process of learning how to make decisions that consider the long-term future of the economy, ecology and equity of all communities. (UNESCO, 2002, p. 5)

The objectives of the DESD are to encourage changes in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations. Another important note is that change in behaviour is a key factor of the strategy. A great deal of research has been done in the education field on how people learn in a variety of disciplines, with the focus on cognitive knowledge. Leeming, Dwyer, Porter, and Cobern (1993) concluded that this focus is not solving the issue, because behavioural change is ultimately the solution. Research has shown that one of the most effective ways to create behavioural change is through direct experience (Bandura, 1982; Haas & Gregory, 2000; Markus & Nurius, 1986; Shah & Gardner, 2008). Direct experience means hands-on, real-life, meaningful experiences that have some value to the student (Borden & Schettino, 1979). For example, reading a book about marine life is not a hands-on, real-life experience. The book is a very limited experience, because the author decides what the students see or do not see (in pictures) and read (details about specific creatures). If students are to

learn about low tide marine life, then a direct experience would be to go to the ocean during low tide and get a hands-on experience with the creatures that exist in that habitat.

The concept of direct experience is also a key component of the *Environmental Learning and Experience (ELE): An Interdisciplinary Guide for Teachers* (British Columbia [BC] Ministry of Education, 2007). The BC Ministry of Education (2007) adapted an experiential learning cycle model, which emphasizes direct experience during learning, into this guide. The model within the ELE document incorporates four interdependent stages: direct experience, critical reflection, conceptualization, and negotiation. As previously mentioned, direct experience ideally means hands-on, real-life, meaningful experiences with the environment that have some value to the student. In the critical reflection stage, the student analyzes the direct experience. Reflection in this case is an internal process. In the conceptualization stage, the student develops a conclusion about the reflections of the experience. Finally, negotiation is described as a discussion amongst the participants, during which they explain their experiences and evaluate their ideas against the other participants' conclusions, as well as their direct experience (BC Ministry of Education, 2007).

This experiential learning cycle model was influenced by the writings of several theorists, but predominantly by Dewey (1900, 1902, 1916, 1933/1960, 1938/1963), Piaget (1977), Vygotsky (1978), and Kolb (1984). Kolb incorporated his philosophy into an elaborate model. He was very explicit in his book entitled *Experiential Learning*, in which he suggested that learning is the act of transforming experience into knowledge. The central premise in this research is that experiential learning programs foster a unique and supportive learning environment, which in turn is seen as conducive to deeper forms of student learning and the attitudinal and behavioural outcomes the environmental movement hopes for in future.

Thus, my research relied on the conceptual framework of learning environment theory and connected this to further literature and theory from other areas that were supporting factors to the learning environment. For example, much research has supported that experiential learning is an effective mode of learning (Brooks & Brooks, 1993; Lieberman & Hoody, 2000; Henderson, 2004) and my research focused

specifically on how the learning environment is influenced by a program that puts such a model into practice. My research focus was a detailed case study of the processes that influenced the development of a positive learning environment within an experiential program.

I chose a very specific program to study, because I believed it to embody the ELE (BC Ministry of Education, 2007) experiential learning cycle in practice. The program, called Experiential Studies 10 (ES 10) uses real-life, hands-on experiences to teach the grade 10/11 curriculum. ES 10 is a curriculum-integrated experiential program that utilizes field experiences to deliver the explicit curriculum. The program was a good candidate for this research, as I had been involved with it before its inception in 2003. At the start of my master's program, Mr. G, a good friend and colleague, came up with the vision for the program. He had three main concepts in mind for the program: first, it would be experientially focused; second, the experiences would deliver the explicit curriculum; and third, the focus would be on academics. The experiential component was the overall theme within the program, where the students, as much as possible, would use primary resources to acquire information, reflect on the information, conceptualize how this information fits into their world view, and present the information to other students. The second concept was that the experiences would deliver the explicit curriculum, as opposed to the curriculum dictating the types of experiences. This meant that the experiences would be focused on engagement and interest: creating a unique learning environment for the students. The last concept, academic focus, referred to the primary focus of this program, where most of the accreditation is in academic coursework (in the case study, Science 10 & 11 and Social Studies 10). I was particularly interested to study this program because of its academic focus. While most experiential programs (integrated environmental/adventure-based high school programs) focus on hard skills and personal development, often the academic credits granted are minimal. This is elaborated on in detail later in this chapter, with direct examples.

The ES 10 program was also a good choice for this study because of my personal involvement during the program's development and inception. With my help (and others), Mr. G implemented the program. In that first year, Mr. G ran the program on a minimal budget with limited resources. He hired me as the outdoor specialist to help with the outdoor adventure experiences (it was more of an honorarium than a salary, but

I was not doing it for the money). Having worked in the adventure tourism/eco-education field for 15 years (raft guiding, whitewater kayaking, canoeing, heli-skiing), I had the hard and soft skills necessary for the job. I was more than happy to be part of the program, because my interest in an integrated experiential education outdoor-based program was piqued. This proximity to the program put me in a unique position to document the development of the learning environment within it and to also observe the more qualitative aspects of the program as they developed.

After completing my master's degree, I was left with more questions than answers. Therefore, when I began my PhD studies, the obvious program to study was ES 10. To my knowledge, it was fundamentally different than most other programs. The majority of outdoor-based programs in the Lower Mainland of BC focused on personal development, such as leadership, communication, and problem-solving skills, or hard skill development, such as kayaking, canoeing, skiing, rock climbing, and mountain biking. Personal development is also sometimes referred to as soft skills (Priest, 1986). The focus of ES 10 was on academics that were delivered through an experiential focus. This makes the ES 10 program unique. The adventure programming within ES 10 also helps in creating a unique learning environment, and that is why I chose this program. I also knew that I would have full access to the program and total cooperation from the teacher because of our previous working relationship. This would allow me to gain insight into the deeper, richer understandings relevant to this study.

## **My Experience in the Field**

The following section outlines my own independent experiences with similar programs. It is important that I outline my developing conception of the value of experiential programs prior to this study. As a portion of this research was qualitative, it is important to identify my own perspectives and bias regarding the value of such programs, so that the reader may fully consider the perspectives I took in the interpretation of data in this study.

My experience in the field dates back to the early 1980s, but the more pertinent experience was working with five different private schools, all of which focused their

programs on personal and hard skills development. I also worked for two integrated programs that gave credit for academic courses. One of them, TREK, is a long-standing program that has been operating since 1986 and has antecedents dating back to the 1970s. Most of these integrated programs operate as semester-long, cohort- and outdoor-based programs. One area of division within these programs is in the academic credits that they offer. TREK, for example, gives half credit for English 10, Social Studies 10, and Planning 10, and full credit for Physical Education (PE) 10 and Outdoor Education. The ES 10 program gives full credit in Science 10, Earth Science 11, Social Studies 10, Planning 10, Leadership 10, and PE 10.

My experiences with the ES 10 program saw me consider a philosophy that utilizes field experiences as the delivery tool for the explicit curriculum. For example, the goals of ES 10 during one of the canoeing trips was to learn about the ecosystem in the area. During a bike trip down the Kettle Valley Railway, it was to learn about British Columbian and Canadian history during Confederation. Other examples of experiences included gathering weather data for an international organization called the Global Learning and Observations to Benefit the Environment program (The GLOBE Program, 2013), helping university professors collect data on a low tide research study, and practicing sustainable logging on a private logging farm.

## **Overview of the ES 10 Program**

The ES 10 program is based out of the Coquitlam School district in BC. Coquitlam is a suburb of Vancouver; this entire region is referred to as the Lower Mainland, which has a total population of about 2 million people. The high school has a population of about 1,800 to 2,000 students (grades 9–12), and the ES 10 program operates with two teachers and 24 students. It is situated in a portable classroom on the school grounds.

Each student has to go through an application process. This process includes submitting a letter of interest, providing two references from past teachers, and going through an interview. Each year there have been about 30–40 students applying for 24 spaces. The application process is used to identify student maturity. Mr. G wanted to

know from previous teachers if students would be comfortable on a multi-day overnight trip. Grade point averages and outdoor skills played no role in the selection process.

The program conceptually was inspired by a program that operates in the city of Whitehorse, Yukon, Canada. The Yukon program has been running since the early 1990s. The Yukon and ES 10 programs operate as cohorts, with the focus on academic experiences. The students get involved with activities that connect to the explicit curriculum and are situated in primary source gathering; they also get involved with actual research. Most of the research initiatives were partnered with other organizations, such as universities, and international organizations, such as the GLOBE program. The ES 10 program tried to integrate Science 10, Earth Science 11, Social Studies 10, Planning 10, Leadership 10, and PE 10 within field/outdoor experiences. Only about one third of the time was spent in the classroom.

Another reason I selected the ES 10 program for this study was that it has no set environmental agenda; it does not try to indoctrinate an environmental ethic or create an activist. "Indoctrination is the planting of beliefs, generally as parts of an ideological system" (Barrow, as cited in McClaren & Hammond, 2005, p. 8). The indoctrinator is not trying to deceive the learner as to the facts about the subject matter or deliberately manipulate the material. Unlike propaganda, coercion, or deception, the indoctrinator truly believes that his or her ideologies are true (Kazepides, 1989, p. 392). Nevertheless, this can affect not only what an individual knows, but also what that individual *can* know. The focus of the ES 10 program was to deliver as much of the explicit curriculum as possible in an experiential way in order to develop a unique and supportive learning environment that in turn would support students in developing a deeper understanding of that content, along with the development of the individual student as a self-reflective learner.

Eisner (1994) has suggested that there are three components in all curricula: the explicit, which is the stated, published material; the implicit, which is the way things are done, the books used, the experiences to be had, etc.; and the null, which is what is not mentioned at all and is either ignored or avoided. Within this research, I was interested in the process of the implicit curricula. I was interested in the way things were done specifically with regard to the development of a positive learning environment. In the

case of ES 10, the design of the learning environment was very purposeful and carefully planned. Very few aspects of the program delivery were done without some direct reasoning.

Even the name of the program, Experiential Studies, was strategically planned so that the focus would be on students' experiences during their learning, not just on the content delivered during their academic coursework. Mr. G purposefully did not call this program Environmental Studies or Ecology Studies. There was no preconceived outcome for the students to become more environmentally or socially aware. Mr. G's hope was that the students would develop a greater awareness of what was going on around them and how their actions affected their surroundings; this included relationships with people and the environment (Mr. G., personal communication, February 15, 2007). He therefore wanted a neutral name that would attract all types of students. Names using the words *environment* or *ecology* may attract only those students interested in the environment or biology. Names like *adventure* or *outdoors* might exclude those students unfamiliar with outdoor or adventure activities. It is of course impossible to have a completely neutral name. Experiential studies may attract students who like to learn through doing as opposed to those who might like to listen and read. This, however, was not the case, as the students' results on the learning styles inventory (Kolb, 1984) indicated otherwise. In Chapter 4, I discuss some of the learning styles of students and their rationale for selecting this program.

One of Mr. G's fundamental concepts was that the experiences needed to be engaging and that the explicit curriculum would not dictate the type of experiences. The explicit curriculum would be pulled out of the experiences. If the explicit curriculum is not covered sufficiently, then additional experiences would be added. These additional experiences could be one-day or half-day field trips, or in-class projects. Although the program did provide a number of adventure activities (rock climbing; winter camping, including snowshoeing and sleeping in snow caves; mountain biking; caving; canoeing; and low ropes activities), Mr. G never focused on these activities as specific skills development. In other words, he did not focus on perfecting canoe strokes, for example, grading or testing that skill acquisition. Instead, these activities were used as a vehicle to deliver the academic curriculum. These activities were the central focus of the program and the focus of explicit curriculum delivery.

The program ran in the second semester from February through June. There were five major outdoor field experiences, which varied in length from three to six days; each had specific social and/or academic goals. These outdoor trips were not covered by the school, so each student had to pay additional fees for transportation, camping, equipment rental, food, and entrance fees. The class also spent one or two days a week outside of the classroom, participating in short field experiences. One of the first trips was an overnight ski trip; other trips included a six-day trip to Salt Spring and Vancouver Island, a four-day trip to Squamish/Whistler, a two-day canoe trip, and a five-day bike trip on the Kettle Valley Railway, which is part of the Trans Canada Trail. Each trip helped to develop the unique aspects of the learning environment under study, while also covering some portion of the explicit curriculum: on the ski trip, for example, the students measured snow depth, density, and water percent and performed a snow crystal analysis (all part of the science curriculum), while learning about avalanche prediction (not part of the science curriculum). During the climbing trip to Squamish/Whistler, they discussed geoformations, glaciation, and erosion. On the Kettle Valley Railway trip, the students learned about the railway and how the building of it was influenced by Confederation (part of the Social Studies 10 curriculum). Throughout the range of student experiences, a variety of social learning outcomes would also be realized and described as they contributed to the developing community. These are only a few examples of how these trips engaged students in both the explicit curriculum and social processes.

## **Experiential Learning**

The ES 10 program uses an experiential learning teaching methodology. Experiential learning theory (Kolb, 1984) assumes that “ideas are not fixed and immutable elements of thought, but are formed and re-formed through experience” (p. 26). Kolb’s “emphasis on the process of learning as opposed to the behavioral outcomes distinguishes experiential learning from the idealist approaches of traditional education and from the behavioural theories of learning created by Watson, Hull, Skinner and others” (1984, p. 26). Kolb believed that experiential learning is a “function of dialectic tensions between basic modes of relating to the world” (1984, p. 31). This tension and conflict-filled process, similar to Piaget’s (1977) assimilation and accommodation, occurs

within his experiential learning cycle. New knowledge and skills are developed through confrontation among concrete experience, reflective observation, abstract conceptualization, and subsequent active experimentation (Kolb, 1984). The ES 10 program employed the ELE experiential learning model (BC Ministry of Education, 2007), which is similar to Kolb's (1984) model and gets its foundational ideas from that model. I elaborate on this in Chapter 2.

The ELE (BC Ministry of Education, 2007) learning cycle differs from Kolb's (1984) learning cycle most substantively in the fourth stage of the cycle. The ELE cycle has the term *negotiation* replacing active experimentation. The concept of student negotiation assumes that students will be encouraged to discuss, debate, and negotiate their own (shared) meanings for new knowledge, thereby clarifying the new knowledge to the collective, in this case the ES 10 class. This difference moves the ELE cycle into the realm of constructionist theories, because for constructionists, "human cognition is diffuse, distributed and collective. In this frame, 'mind' is understood not as an individual possession but as a product of shared human interest that arises in an environment that is both social and physical" (Davis, Sumara, & Luce-Kapler, 2008, p. 102). In general, constructionists are interested in coherences of small groups and the shared understanding that is developed within those groups. Vygotsky (1978) was one of the most influential theorists in this line of thinking. These points support the importance of taking a learning environment approach for this research, in that students' perceptions of their social, cognitive, and behavioural experiences informed and influenced each other. In short, development of a positive learning environment can support or enable these other educational (cognitive and behavioural) outcomes.

Prior research in experiential education has been largely descriptive and qualitative in nature, as described by Brooks and Brooks (1993) and Lieberman and Hoody (2000), or on effects/outcome measures (Henderson, 2004). Some of the outcome measures (quantitative research) investigated academic standings in reading, writing, math, and sciences. The majority of these findings indicated that these programs are positive experiences for students and are successful in helping students achieve intended learning outcomes. "Success" in these cases is measured in terms of academic outcomes, which is the most common schooling approach.

The next question, then, is, “How do educators make those descriptions and outcomes happen?” Henderson (2004), in her keynote address at the 2003 Symposium on Experiential Education Research, stated, “More theory driven and evidence-based research is needed” (p. 188). She also stated that evidence-based research requires more than documenting outcomes. Future research requires identifying and describing how those outcomes were achieved. This type of information could then be used to design programs in a well-informed, intentional, and purposeful way.

In my study, I looked to identify how those descriptions and outcomes were achieved. Being a pragmatist, my study utilized a mixed-methods design approach (Creswell & Plano Clark, 2007). Quantitative measures were used to measure students’ perceptions and preferences in their learning environment. Qualitative data describe further how these perceptions developed and were observed during the program, and how different learning environment constructs were developed within the integrated experiential program. Other quantitative measures documented changes from inception to completion of the program. This mixed-methods approach fit with the pragmatist ontology. As well, learning environment research has utilized a mixed methodology approach for almost two decades. As Aldridge, Fraser, and Huang (1999) pointed out, “The combining of quantitative and qualitative methods has been a feature of recent research” (p. 49). Utilizing both qualitative and quantitative methods has become common practice in the field of learning environments (Aldridge et al., 1999; Fraser & Tobin, 1991; Tobin & Fraser, 1998). This approach has been successfully utilized “in studying the classroom learning environment at different ‘grain sizes’ to show how individual students and the teacher can be investigated at the class, school or system level” (Nix, Fraser, & Ledbetter, 2005, p. 115). “Grain size” refers to the level of detail being investigated. The quantitative measures described above are the large grains, while the qualitative data describe the fine grains. This is described in greater detail in Chapter 2, Learning Environments Research section.

## **Purpose of the Study**

The purpose of this study was to identify and describe key processes in the development of a unique learning environment within the integrated experiential program

ES 10. In order to facilitate the process, I first needed to identify the key learning environment constructs that were most important to students in such a program. Key constructs were identified by the students themselves within the program. Students' perceptions of their learning environment were established through the use of a quantitative questionnaire followed by detailed qualitative work. The quantitative methods involved administration of a new learning environments instrument, the Place Based and Constructivist Environment Survey (PLACES; Zandvliet, 2007, 2012), which measured their perceived learning environments in the program. Further qualitative data were collected to identify and richly describe the processes that contributed to those measures. Qualitative data were also used to identify key processes, program dynamics, and a recounting of actual events or operations. The study was not focused on learning outcome measures (e.g., test scores), but instead on the social and pedagogical processes occurring within the ES 10 program. Quantitative measures were used primarily to identify students' perceptions. Triangulating quantitative learning environment data from PLACES with further qualitative data was also useful in providing a richer account of the learning environment and was a novel use of the PLACES instrument. The instrument had not been used previously in the context of an integrated experiential education outdoor-based program.

As a pragmatist, part of my rationale for the study was due the BC Ministry of Education's adoption of the new ELE learning model, which was intended to integrate environmental concepts into teaching and learning (BC Ministry of Education, 2007). The ES 10 program put that model into practice. I intended that as a result of this research, other teachers in the province would be better able to understand how to implement the BC Ministry of Education learning model through a detailed recounting of this individual case study.

## **Data Sources and Brief Overview of Methods**

The mixed methodology approach for this study utilized both qualitative and quantitative methods to enable a deeper understanding of the process occurring in an integrated experiential outdoor program. A triangulation-transformation model design (Creswell & Plano Clark, 2007) was used first to identify students' preferences in

learning environments (quantitative measures), then highlight and richly describe the events or processes occurring to facilitate those learning environments (qualitative data). The quantitative methods also included the learning environment and contributing factors such as mindfulness and attitudinal/behavioural questionnaires (pre and post program). The qualitative methods included a variety of ethnographic observational techniques such as observations, open-ended questions, and community mapping (Letts et al., 2007). Video recordings were used to document activities, along with teacher impromptu commentary or discussion. I further analyzed the qualitative data to demonstrate a theory of how learning environments influence behavioural change, using the transtheoretical model (TTM). I expand on these measures in Chapter 3.

## **Research Questions**

I sequenced the data collection to answer four specific research questions, which follow in their respective order.

### ***Question 1***

Are students' perceptions of their learning experience in ES 10 (as represented by the PLACES scores), a school-based experiential learning program, more positive than their perceptions of their experience in regular classes, and how do these perceptions compare to those of their preferred learning environment? What influencing factors and/or instructional practices contribute to these perceptions?

### ***Question 2***

Exploring the process within ES 10 that may influence mindfulness. Are their practices within the ES 10 learning environment that are specifically contributing to the development of mindfulness? What is the relationship between mindfulness and students' perceptions of the learning environment?

### ***Question 3***

If attitudes and behaviours change over the course of the ES 10 program, how might those changes be affected by students' experiences or perceptions of the

program? What role does mindfulness play in those changes? Which constructs or factors within the learning environment of ES 10 contribute to those changes?

#### ***Question 4***

Do students consider their classmates as part of their personal community? What instructional measures or approaches in the learning environment contribute to the development of students' sense of community within ES 10?

#### **Outline of Dissertation**

Chapter 1 includes an introduction to the problem, my experience in the field, an overview of the ES 10 program and some of its philosophy, a brief description of the theoretical underpinnings, the purpose of the study, data sources and a brief overview of methods, and the research questions.

Chapter 2 examines the literature pertaining to this study, terminology, and a description of the theoretical underpinnings. This chapter begins with some key terminology, and then I describe my conceptual framework for this study. An explanation of learning environment theory is followed by the consideration of other related factors important in the framing of the ES 10 program. These include experiential learning theory, mindfulness, and behavioural change theory. This chapter concludes with some necessities for ecological education and a description of a pragmatist world view.

Chapter 3 describes the research phases, includes additional information about the research setting not found in Chapter 1, and the research methods. The three quantitative instruments are described, along with explanations of their administration. The qualitative research methodologies are then described. The chapter concludes with a note on researcher bias.

Chapter 4 presents the quantitative results and qualitative trends. This chapter is organized into three main parts based on the three different questionnaires used. Within each category, I show the quantitative results in a graph format, while supporting

qualitative data are added to give a richer description of the results. This chapter concludes with qualitative trends.

Chapter 5 discusses the four questions posed in Chapter 1 and interprets the research findings in the light of these original questions. In order to answer question 1 thoroughly, I systematically review all eight constructs from the PLACES questionnaire. Questions 2 and 3 are discussed with respect to the results from the other two questionnaires. I introduce a flow chart to describe the integrated connectedness of the factors that influenced the development of the unique learning environment within ES 10. The flow chart is intended as a conversation starter. This chapter also includes recommendations and key questions for further research.

## **Chapter 2: Review of Relevant Literature and the ES 10 Program**

In this chapter, I provide an overview of the influential theories and models pertaining to the research focus of this dissertation: definitions of terminology, my conceptual framework, a summary of learning environment theory, a description of relevant learning environment instruments, an experiential learning model along with constructivist learning theory, a concept of mindfulness, a behavioural change model, a description of my pragmatist worldview, and an idea of community mapping.

### **Terminology**

Some terminology needs to be clarified: experiential learning, experiential education, placed-based learning (PBL), outdoor education, adventure-based learning (ABL), environmental education (EE), and ecological education.

### ***Experiential Learning***

Experiential learning is the process of making meaning from direct experience (Itin, 1999). Reflection on the doing (the direct experience) is required and is in direct contrast to rote or didactic learning. Experiential learning is related to, but is not synonymous with, experiential education, PBL, ABL, and EE. A definition of experiential learning is acquiring new or modifying existing knowledge, behaviours, skills, values, or preferences, and may also entail synthesizing the above. Experiential learning is a type of learning process that follows the constructivist theory of learning.

### ***Experiential Education***

Experiential education is a body of education philosophy that describes the process between a teacher and a student, where the teacher uses direct experience

within the learning environment (Itin, 1999). The Association for Experiential Education (2010) regards experiential education "as a philosophy and methodology in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values" (Who we are section, para. 2). Not all experiences are necessarily educative; this is described later in this chapter in the section on Dewey. In part, this is due to the underlining premise that education has a positive overtone, so if the learning is not positive, it is not educative.

### ***Placed-Based Learning (PBL)***

PBL has been described by several different theorists (Orr, 1992, 1994, 2002; Sobel, 1996, 2005; Thomashow, 2002), but they do not agree on one definition. My working definition of PBL describes the learning approach as using all components of the local environment, which include local culture, history, sociopolitical situations, and the natural and built environment, as settings for learning and instruction. One example would be focusing on civic engagement on projects in proximity to the school. PBL projects need to have some obvious relevance to the school and adjacent community, where community partners usually get some benefit from this relationship. An example of this would be a stream clean-up day, where the students get involved with a local fish hatchery and clean up all the garbage in the local stream. PBL can also occur in the town hall, where students might engage in some type of social issue, like homelessness, getting involved in policy change for social housing. These are just some examples of PBL experiences that students may get involved with.

### ***Outdoor Education***

Outdoor education follows the experiential learning philosophy of learning through direct experiences (Priest, 1986). It primarily, but not exclusively, takes place within the outdoor environment, and the emphasis on learning is placed on the relationships between humans and nature. Priest (1986) identified four relationships in outdoor education: interpersonal, intrapersonal, ecosystemic, and ekisitic. Two types of outdoor education are ABL, which is primarily concerned with the interpersonal and intrapersonal relationships, and EE, which is primarily concerned with ecosystemic and ekisitic relationships.

## ***Adventure-Based Learning (ABL)***

ABL is based on a philosophy “which in essence states that individuals are usually more capable (mentally, emotionally and physically) than they perceive themselves to be, and if given the opportunity to TRY in a supportive atmosphere, can discover this excellence within themselves” (Rohnke, 1989, p. 21). The designing of ABL consists of a sequencing of concrete problem solving or experiences that are set in the outdoors. Some experiences in ABL may include such activities as low and/or high ropes courses, caving, rock climbing, or games and activities that require teamwork and communication skills. ABL can be used to enhance or develop the cognitive domain (the acquisition of facts), the kinesthetic domain (skills development like kayaking, rock climbing, etc.), or the affective domain (emotional or social development; Priest & Gass, 1997). “We can generally classify affective learning as two interactive products: development of the individuals through improved intrapersonal relationships (emotional development), and development of groups through enhanced interpersonal relationships (social development)” (Priest & Gass, 1997, p. 20).

According to Priest (1986), the development of intrapersonal relationships increases or improves self-confidence, self-concept, leadership skills, logical reasoning skills, reflective thinking skills, and the willingness to take risks. Meanwhile, the development of interpersonal relationships increases or improves cooperation, effective communication skills, trust in others, sharing of decision making, problem-solving skills, and conflict resolution skills. ABL also presents opportunities for individuals to deal with fear and uncertainty within a controlled and supportive environment. It provides individuals with opportunities to explore problems or issues through authentic learning experiences within collaborative learning environments. It is anchored in experiential learning theory.

## ***Environmental Education (EE)***

EE is procedurally similar to ABL but ideologically different. The primary difference between EE and ABL is that instead of using the outdoors as a resource, environmental education seeks to re-establish a learner’s understanding of human interconnectedness with the biotic. A philosophical approach to EE is that it is in, about,

and for the environment. EE's primary concern is with ecosystemic and ekisitic relationships (Priest & Gass, 1997). Ecosystemic relationships deal with the interdependence of living organisms in an ecological system, while ekisitic relationships specifically deal with the interactions of humans with the environment. EE has been equated with natural history, environmental science, and ecology, which is not legitimate. It deviates from them through its interdisciplinary and issues orientation, which includes some aspects of social transformation or social reconstruction. During the first International Conference on Environmental Education in Belgrade, in 1975, six proposed objectives for environmental education were put forth:

Awareness: to help individuals and social groups acquire an awareness of and sensitivity to the total environment and its allied problems;

Knowledge: to help individuals and social groups acquire basic understanding of the total environment, its associated problems and humanity's critically responsible presence and role in it;

Attitudes: to help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement;

Skills: to help individuals and social groups acquire the skills for solving environmental problems;

Evaluation ability: to help individuals and social groups evaluate environmental measures and education programs in terms of ecological, political, economic, social, esthetics, and educational factors; and

Participation: to help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to solve the problems. (UNESCO-UNEP, 1976, p. 26-27).

Outdoor education programs provide students with the opportunity to embark on an educational adventure by learning through experience (Priest & Gass, 1997). Courses are designed to develop each student's understanding of the skills needed to solve problems and the opportunity to practice those skills. Students confront challenging activities and learn how to use individual and group skills to reach goals successfully. These experiences foster learning outcomes such as self-reliance, confidence, self-esteem, and time-management and communication skills (Priest, 1986). The willingness to challenge oneself physically and emotionally are also integral components of such programs. Outdoor education helps to build a core support group of

friends, promotes taking responsibility for oneself, and assists with the transference of new interpersonal skills, ideas, and philosophies to other aspects of life. Students are motivated by the successes that emerge from the challenges that are inherent in outdoor education.

The key point to this last statement is that an appropriate level of challenge is necessary. This concept was described by Csikszentmihályi (1990) as *flow*, the balance between skill and challenge necessary to experience successes. Many programs use a challenge by choice philosophy, whereby the individual can decide if the challenge is beyond his or her scope. The integration of the explicit curriculum with the activities also gives students greater understanding of the connectedness of academic knowledge and their world. A positive and successful attitude transfers directly to the student's academic self-confidence. In summary, there are three ways that outdoor education affects the learner: the learner's cognitive structures are altered, the learner's attitudes are modified, and the learner's repertoire of behavioural skills are expanded (Priest & Gass, 1997). These three elements are interconnected and change as a whole, not as separate parts (Johnson & Johnson, 2003). This philosophical understanding of changing the individual as a whole is critical, and it corresponds with the desire to create a holistic educational philosophy, as stated in the ELE document (BC Ministry of Education, 2007).

### ***Ecological Education***

The term *ecological education* was introduced rather than *environmental education* because of its broader scope of philosophical, epistemological, and social justice issues. The name environmental education has been seen by some (Sauvé, 1996) as being too narrowly focused, and not encompassing social injustice and economic issues. More recently, *education for sustainability* has become a popular term. Proponents of education for sustainability have argued against ecological education because it focuses too much on the sciences (ecology). Others (Jickling, 1994) have argued that “for” anything resembles indoctrination. I believe that regardless of the terminology, teachers need to ensure that the experience is educational rather than indoctrinative and that students are able to perform critical reasoning and logical inquiry.

One concept that all of the above terms have in common is that they all are grounded in experiential learning.

### **My Conceptual Framework for This Study**

My conceptual framework for this study was based on the premise that learning is conducted by the student, which results in the construction of knowledge (Kolb, 1984). The student's ability to learn effectively is directly related to the qualities of the learning environment and educational experiences (Fraser, 1998). Wang, Haertel, and Walberg (1993) identified 28 categories of learning influence they conceptualized as comprising the learning environment of students. Of the 11 most influential domains of variables, eight involved social–emotional influences, including classroom management, parental support, student–teacher interactions, social–behavioural attributes, motivational-effective attributes, peer group, school culture, and classroom climate. Classroom climate (Wang et al., 1993) is synonymous with *construct*, defined here as the learning environment (Fraser, 1998). Learning environments are directly influenced by the teacher, other students in the class, and, to a lesser degree, the school administration (Fraser, 1998). My conceptual frame underpinning this study was that effective learning experiences are founded in (and predicated by) the facilitation of a positive learning environment.

Research on learning environments was first initiated by Walberg and Anderson (as cited in Fraser, 1998) in 1968 at Harvard University. Since that time, the field has seen a remarkable development of the use of both qualitative and quantitative research methods (Tobin & Fraser, 1998). As Fraser (1998) pointed out, “Few fields in education can boast the existence of such a rich array of validated and robust instruments which have been used in so many research applications” (p. 8).

Zins, Weissberg, Wang, and Walberg (2004) recognized the influence of three domains: motivational orientations, self-regulation learning strategies, and social/interpersonal abilities in facilitating academic performance. These domains also relate closely to my conception of a positive learning environment. The motivational orientation occurs when students have and experience real-world connections. Self-

regulated learning refers to the amount of control students have over their learning processes, and the social/interpersonal domain deals with how comfortable students feel in their learning environment.

I define a positive learning environment as having three key components: comfort level, control level, and connection to the real world. These three components relate to the three types of human learning environments Moos (1979) described:

Relationship Dimensions (which identify the nature and intensity of personal relationships within the environment and assess the extent to which people are involved in the environment and support and help each other), Personal Development Dimensions (which assess basic directions along which personal growth and self-enhancement tend to occur) and System Maintenance and System Change Dimensions (which involve the extent to which the environment is orderly, clear in expectations, maintains control and is responsive to change). (Fraser, 1998, p. 22)

Comfort level, for example, falls into Moos' (1979) relationship dimensions and is related to how students feel about asking questions. Students need to feel comfortable asking questions in class: if they do not feel comfortable they will not ask, and if they do not ask, they will not get clarification. Questions could be directed specifically at the explicit curriculum content or generally at the greater meaning. Anxiety about asking questions, therefore, can lead to a lack of learning for the student.

Control levels are within the personal development dimensions (Moos, 1979) and are based on how students can have input on decisions around the explicit curriculum delivery and pedagogy. Students need to have some control over their education in order for them to buy into the process. If this buy-in is not created, then students are "just going along for a ride." This is associated with mindlessness, which is defined later in this chapter.

Connection to the real world is based on how students' learning is related to their life experiences. Realism helps in showing how assignments or projects can connect to their lives. Learning can then be self-identified and meaningful. Therefore, the development of a positive learning environment is an important first step for a teacher to create before introducing the explicit curriculum. In this study, in order to understand the development of the learning environment process, it was important to assess the

students' perceived ideal learning environment. An ideal learning environment leads to a more effective learning process; in this case, the process of the experiential learning cycle (BC Ministry of Education, 2007). The outcomes of the learning cycle include knowledge, skills, attitudes, and behaviours. Embedded in the process of learning environments and the learning cycle is the development of mindfulness. However, mindfulness influences the process of the learning cycle and to some degree the development of a positive learning environment. Mindfulness therefore also influences knowledge, skills, attitudes, and behaviours. This is a complex web of influencing factors, which is why I used a mixed-methods approach to get the answers to my research questions.

## **Learning Environments Research**

Research conducted on classroom learning environments (otherwise known as classroom ecology or classroom climate) has expanded on previous work related to organizational climate and its application to educational settings. Learning environments research can be described as both descriptive of classroom contexts and predictive of student learning. The study of learning environments has an important role to play in pre-service teacher training, professional development, evaluation of new curricula, and generally as an important field of inquiry in its own right—the study of psychological and social components of an educational experience.

My research was focused on understanding the factors that contribute to the constructs within learning environments, because one of the major influences on the effectiveness of the experiential learning cycle is the overall learning environment. Learning environments can be one of the strongest predictors of learning (Fraser, 1998). From the late 1960s through the early 1970s, Moos (1974, 1979) and Walberg and Anderson (1968) did the foundational work on educational learning environments. With over 40 years of dedicated research, Fraser (1998) pointed out no other field within education has such a rich history. The use of both qualitative and quantitative methods has become common practice in the field (Aldridge et al., 1999; Fraser & Tobin, 1991; Tobin & Fraser, 1998). The use of mixed methodologies has been gaining acceptance within other fields (Creswell & Plano Clark, 2007) and has been successfully utilized, as

mentioned above, in studying both large grain and fine grain levels of detail (Nix et al., 2005, p. 115). The large grain data gives researchers a general, quantitative understanding of patterns or preferences, while the small grain data gives specific, qualitative examples and/or detailed understanding of those patterns or preferences.

Walberg and Anderson (1968) explained that in order to evaluate the learning environment, teachers must get the students' perceptions of that environment. I was interested in students' perceptions of their learning environment for this dissertation. A number of learning environment instruments have been developed (Fraser, 1998) using scales that identify specific constructs. These constructs are divided into four main categories: the individual, the group, the teacher, and the external. Each construct has several different scales that measure specific items within that construct. Examples of some scales include personal relevance, critical voice, open-endedness (individual construct), student cohesion, cooperation, shared control (group construct), consistency, integration, teacher support (teacher construct), and models, leadership, and community (external construct).

In addition, a number of instruments have been developed to evaluate specific types of learning environments, such as labs vs. classrooms. Some examples that Fraser (1998) described are the Science Laboratory Environment Inventory (SLEI), the What Is Happening In this Class (WIHIC), and the Constructivist Learning Environment Survey (CLES). These instruments have been validated and tested for a variety of different countries and age groups (Fraser, 1998). The PLACES questionnaire (Zandvliet, 2007) was developed to assess students' perceptions of their actual learning environment and/or their preferred learning environment. My research utilized the PLACES questionnaire along with qualitative methods as a novel approach to studying an experiential program.

### ***Measuring Learning Environments***

PLACES (Zandvliet, 2007, 2012) was created through a series of focus groups with environmental educators. The result was an eight-scale questionnaire that included Relevance/Integration (RI), Critical Voice (CV), Student Negotiation (SN), Group Cohesiveness (GC), Student Involvement (SI), Student Control (SC), Open Endedness

(OE), and Environmental Interaction (EI). Each one of these scales was adapted from existing instruments: the RI, CV, SC, and SN scales came from the Constructivist Learning Environment Survey, while the SI and SC scales came from the Environmental Science Learning Environment Inventory. The OE scale came from the Science Laboratory Environment Inventory, and the EI scale came from the Science Outdoor Learning Environment Instrument. The role of the EE focus groups was to determine which scales were relevant to environmental educations.

### **Experiential Learning Model and Constructivist Learning Theory**

This section demonstrates the ongoing evolution of experiential learning models and how these models are influenced by constructivist learning theory. I included this section because the provision of experiential learning was a key component in the formation of the unique learning environment of ES 10. Learning environment theory was the grounding aspect for almost every aspect of this research, including the ES 10 program philosophy, experiential learning, and the primary instrument used—PLACES. Therefore, understanding the development and application of additional educational factors such as the experiential learning cycle is fundamental to understand the process of developing the learning environment within the ES 10 program. Specifically, I describe three major learning models and how they overlap with the BC Ministry of Education (2007) model.

The *ELE: An Interdisciplinary Guide for Teachers* (BC Ministry of Education, 2007) builds on an earlier BC Ministry of Education document, *Environmental Concepts in the Classroom: A Guide for Teachers* (BC Ministry of Education, 1995), which was published in 1995. These documents were intended to be support frameworks to help guide teachers in their education planning and implantation of the explicit curriculum. The framework was developed by several key authors in consultation with teachers and other stakeholders. I participated in some of those consultations and played a minor role in editing a draft of the document. Within the 2007 ELE framework, there is an experiential learning model that is very similar to Kolb's (1984) model, with one major distinction. In the 2007 ELE framework, the final step of the model is negotiation. The

origins of the model can be traced back to Dewey's (1938/1963) theoretical structures of learning.

The ELE framework (BC Ministry of Education, 2007) is based on the social-constructivist theory of learning. Constructive theorists have the basic belief that the learner actively constructs personal knowledge by mentally reflecting on concrete experiences (Kolb, 1984). The learner does not passively absorb already existing concepts through the interaction with the environment. Fenwick (2003) described the process as follows:

The learner is believed to construct, through reflection, a personal understanding of relevant structures of meaning derived from his or her action in the world. In contrast to earlier views, constructivism shifts from the assumption that learning is "taking things in," to a view of learners continuously adapting—in their interpretations and perceptions as well as actions—to the situations around them. (p. 23)

### ***Influential Theorists***

Three early influential theorists include Dewey (1938/1963; philosophical pragmatism), Piaget (1977; cognitive-developmental), and Vygotsky (1978; social-constructivist). There are others, but I review the theoretical frameworks from only these three. Another theorist, Kolb (1984), is also examined due to his contribution in developing a learning cycle model that influenced the learning cycle model that is used in the ELE framework document (BC Ministry of Education, 2007).

### ***Dewey***

Dewey's published works on his education theories include *The School and Society* (1900), *The Child and the Curriculum* (1902), *Democracy and Education* (1916), *How We Think* (1933/1960), and *Experience and Education* (1938/1963). Several reoccurring themes can be found throughout these writings; he repeatedly suggested that education and learning are social and interactive processes, and that schools themselves are social institutions through which social reform can and should occur (Reese, 2001). In *Experience and Education*, Dewey (1938/1963) challenged the contemporary learning theories of his time. He advocated for a balance between

delivering knowledge while taking into consideration the interests and experiences of the student. He proposed a new pedagogy based on learning by doing. He explained, “There is an intimate and necessary relation between the processes of actual experience and education” (Dewey, 1938/1963, p. 20). He wanted to create education for democracy, and he was interested in the social nature of learning and internal growth. He greatly influenced the academic world by incorporating experiential learning into academia, therefore giving rise to experiential education. Part of the rationale for the failure of Dewey’s ideas to transform the educational system in the U.S. can be attributed to his assumption that schools exist to promote the students’ maximum potential. Rather, more often than not, schools produce what parents and administrators really want: happy kids who do not cause trouble (Reese, 2001).

Dewey (1938/1963) emphasized that an individual could experience a situation and not learn from that situation. For learning to occur, he believed that two key dimensions must be included in the experience. One is continuity: the learner must be able to make connections with the experience and current knowledge, in ways that modify that knowledge. Two is interaction: the learner must be actively interacting with his or her environment by testing out the lesson developed in that environment. He described how learning transforms the impulse (feelings and desires) of concrete experiences into higher-order purposeful action. He stated:

The formation of purpose is, then, a rather complex intellectual operation. It involves: 1) observation of surrounding conditions; 2) knowledge of what has happened in similar situations in the past, a knowledge obtained partly by recollection; and partly from the information, advice, and warning of those who have had a wider experience; and 3) judgment, which puts together what is observed and what is recalled to see what they signify. A purpose differs from an original impulse and desire through its translation into a plan and method of action based upon foresight of the consequences of action under given observed conditions in a certain way. . . . The crucial educational problem is that of procuring the postponement of immediate action upon desire until observation and judgment have intervened. (Dewey, 1938/1963, p. 69)

Dewey’s (1938/1963) learning process, though different from the one in the ELE framework (BC Ministry of Education, 2007), has some key similarities. The first three steps in both cycles are similar; the ministry framework uses negotiation instead of

judgment as the fourth step. Dewey’s (1938/1963) experiential learning cycle emphasizes that the nature of experience is of fundamental importance and concern in education.

Another Deweyian assumption was that people learn experientially and that some experiences are educative while other experiences are miseducative. All experiences are understood to be continuous, meaning that every experience influences all future experience. Dewey (1938/1963) believed that it was the teacher’s responsibility to structure and organize the experiences in a way that would positively influence each student's potential future experiences. In other words, positive experiences motivate, encourage, and allow students to have valuable learning experiences, whereas negative experiences tend to lead towards a student shutting down from potential positive experiences in the future. The underlying philosophy is that the learning environment is semi-structured, meaning that it is student-centred and the teacher guides the process but not the outcome. The students have the ability to “experience” the activity in their own way, but the teacher interjects with guiding questions. These questions help the students reflect on their experience. The teacher’s role in this case is to facilitate the students’ individual experiences.

This type of learning structuredness is considerably different from a “structured education” style where the focus is knowledge oriented, competency driven, and normative. On the other side of the spectrum, there is the “free education” style, which is permissive, learner driven, and practically oriented. Table 2.0 shows how these philosophical approaches to learning fit on a spectrum.

***Table 2.0 Structuredness of Approaches to Learning***

<b>Free education style</b>	<b>Semi-structured style</b>	<b>Structured education style</b>
practically-oriented	reflective-oriented	knowledge-oriented
learner-driven	subjectivity of learning experience is recognized	competency-driven
permissive	explanatory	normative
unstructured or “free”	semi-structured	structured

Dewey's (1916, 1933/1960, 1938/1963) influence even had some effect on Piaget (1977). In the book *The Development of Thought: Equilibration of Cognitive Structures*, Piaget stated, "Before seeking to justify this conception, let us again note that it represents a possible syndissertation of genetic structuralism, all our previous work, and the functionalism evident in the work of Dewey" (1977, p. 83).

### ***Piaget***

Piaget (1977) was the major contributor to the cognitive-development viewpoint of learning. His viewpoint suggested that a child's mental abilities undergo a series of qualitative changes and stages that are age related. The mental activities include attending, perceiving, learning, thinking, and remembering. Piaget believed that children are neither driven by instincts nor molded by their environment. He saw children as curious, active explorers who respond to their environment according to their understanding of that environment; play is the work of the child (Piaget, 1977).

Piaget's background in biology (he received his PhD in Zoology in 1918) influenced his perspective and his fundamental belief that "intellectual activity is undertaken with one goal in mind: to establish equilibrium—that is, a balanced or harmonious relationship—between one's thought processes and the environment" (as cited in Shaffer, 1989, p. 58). His notion of cognitive structure (or schema) is an organized pattern of thought that is used to interpret one's experience, and he suggested that mental schema evolve from behavioural schema. Mental schema can be described as mental structures of pre-conceived ideas or frameworks representing some aspect of the world. They are a system of organizing novel information. A behavioural schema is a mental representation of a physical action. The goal of this type of organizing is for adaptation or for an individual's tendency to adjust to the demands of the environment (finding equilibrium).

According to Piaget (1977), adaptation occurs in two ways: assimilation and accommodation. Both assimilation and accommodation are part of the learning cycle in the ELE framework (BC Ministry of Education, 2007). For Piaget, the intellectual product results from the function of incorporating new experiences into existing ones (assimilation) and altering existing schema to fit in new experiences (accommodation).

This leads to adaptation—a state of equilibrium between the individual’s cognitive schema and his or her environment. “Piaget was the first major developmental theorist to stress that children are active, adaptive creatures whose thought processes are very different from those of adults” (Shaffer, 1989, p. 61). Children think differently due to their experiences or lack thereof: younger children do not have as many experiences as older children, and they have even fewer experiences compared to adults.

Piaget (1977) identified four different stages of development. These stages, according to Piaget, are age specific, flow in sequential order, and increase in higher order thinking. A major criticism of Piaget’s work is the age-specific stages he described and the fact that a child must pass sequentially through all of the stages. It is now generally believed that these stages are not age related. Rather, they are influenced by sociocultural experiences (Berger, 1988; Isik-Ercan & Golbeck, 2006; Papalia, Olds, & Feldman, 1998; Rogoff, 1990). Although sociocultural influences were not explicitly expressed in Piaget’s model, there was an understanding that the learner brings previous experiences that are socioculturally influenced (Kolb, 1984).

### ***Vygotsky***

One of the major contributing sociocultural theorists was Vygotsky (1978). Vygotsky recognized sociocultural and historic influences on learning and developed a social developmental theory with a fundamental concept that he called a zone of proximal development (ZPD). His definition of the ZPD is “the distance between the actual development problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Vygotsky, 1978, as cited in Berk & Winsler, 2002, p. 86). Vygotsky believed that learning leads to development, through collaboration and interaction with teachers, parents, and peers. He also believed that cognition is always situated in activity. The learning cycle in the ELE framework (BC Ministry of Education, 2007) emphasized this process and stated that “choosing a concept and appropriate experience to be taught” (p. 9) is the first step in the process for teachers.

A metaphor used to describe effective teaching and learning interactions in the ZPD is that of scaffolding. Students are the “building,” actively constructing themselves,

and the social environment is the scaffolding supporting the building. An essential element to scaffolding is the social interaction between participants negotiating for a shared view of the situation. This is very similar to the language in the BC Ministry of Education (2007) document under “Experiential Learning Cycle,” which stated the importance of “having students explain their experience and evaluate their ideas against others’ conclusions, as well as with their direct experiences” (p. 9). In both statements, the objective is peer negotiation or evaluation that leads the individuals to a greater or higher understanding of the experience or problem.

It is interesting that Piaget (1977) and Vygotsky (1978) knew one another and corresponded. The connection is described by Berk and Winsler (2002), who stated:

Later in his career Piaget addressed the impact of social context on development, commenting that he regarded variations in social experiences as contributing to (but not as the sole determinant of) the child’s construction of knowledge. Similarly, Vygotsky proposed a biologically based, natural course of development as on two major lines of change, the other being the cultural line that transforms biologically determined structures in complex, reflective forms. (p. 109)

Both of these major perspectives are embedded within the ELE document (BC Ministry of Education, 2007). However, the major contributing view for the Ministry learning cycle framework is derived from the work of Kolb (1984).

### ***Kolb***

Kolb (1984) developed an experiential learning cycle to explain how different individuals learn by integrating their concrete emotional experiences through reflection. Kolb believed that experiential learning is a tension- and conflict-filled process that occurs in a cycle; the BC Ministry of Education (2007) document model describes a similar tension. For Kolb, new knowledge and skills are developed through confrontation among concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and subsequent active experimentation (AE). This is his four-stage learning cycle, which is very comparable to the Ministry’s framework learning cycle.

Kolb’s (1984) cycle begins in the lived concrete experience, which could be a simulated experience developed especially for a learning outcome (e.g., case studies or

role playing) or a real-life encounter. In the second stage, the learner takes some time for reflective observation. The learner asks, What did I observe? What was I aware of? What does this experience mean to me? How might this experience have been different? In the third stage, the learner develops an abstract conceptualization with the insights gained through reflective observation. The learner asks, What principle seems to be operating here? What general rule of thumb have I learned? What new understanding does this experience reveal about me, or people, or how things work in particular situations? Finally, in the last stage, the learner applies the new learning through active experimentation. The learner asks, What will I do next time? How will I adopt this knowledge for other contexts? The new knowledge is tested in similar settings and then in different settings. The knowledge is revised and reshaped by the learner depending on what happens through the experimenting phase.

Along with the learning cycle, Kolb (1984) developed the Learning Style Inventory (LSI). Kolb set out four distinct learning styles (or preferences) based on the four-stage learning cycle. The four styles are Diverging (CE/RO), Assimilating (AC/RO), Converging (AC/AE), and Accommodating (CE/AE). The abbreviations represent the preferred learning style: Concrete Experience = CE, Reflective Observation = RO, Abstract Conceptualization = AC, and Active Experimentation = AE. The set of abbreviations represent the preferred method of learning. In the LSI 4.0 (the latest version), Kolb described what he termed *learning flexibility*, which explains that learning styles are not fixed traits but dynamic states that can *flex* to meet the requirements of different learning settings. This means that students may have a preferred learning style, but they can and will change their style according to what they are learning.

Kolb (1984), much like Piaget (1977) and Dewey (1938/1963), believed that learning is a process of tension between dimensions. Kolb stated, “In this model concrete experience/abstract conceptualization and active experimentation/reflective observation are two distinct dimensions, each representing two dialectically opposed adaptive orientations” (1984, p. 43). The structural basis of the learning process lies in the transactions among these four adaptive modes and the way in which the adaptive dialectics get resolved. The ELE document (BC Ministry of Education, 2007) also has two distinct dimensions, although one of them is somewhat different. The ELE document has negotiation opposite to the reflective step in the cycle. The tension is then between

group thought and the individuals' internal processes. As mentioned previously, this allows for a multiple perspective orientation. The group collectively negotiates its understanding of the new knowledge.

Kayes, Kayes, and Kolb (2005) have introduced a team learning cycle, which cycles through four constructs: creating, planning, deciding, and acting. These four constructs match well with Kolb's (1984) original four-cycle learning model. I believe this indicates that Kolb recognized group learning as an important and major part of the educational process. Teamwork has potential pitfalls such as social loafing, groupthink, overdependence on a dominant leader, over commitment to goals, and diffusion of responsibility (Kayes et al., 2005). Such negative impacts can be minimized and team effectiveness improved when teams intentionally focus on learning.

The ELE model (BC Ministry of Education, 2007) is very similar to Kolb's (1984), with one major distinction: the last step in the cycle replaces negotiation for experimentation. The negotiation is between the students and the teacher as well as between one another. The concept is that through negotiation, learners get better clarification of the new knowledge (Vygotsky, 1978). The cycle, as with all the previous models, starts with a direct experience, moves to critical reflection followed by conceptualization, and finishes with negotiation. The direct experience ideally occurs in an environmental setting, making this experience more meaningful and relevant, from which students can develop a deeper understanding. The reflection and negotiation give the students the opportunity to evaluate their internal ideas (individual experiences) with the external ideas of the group (others' experiences).

### ***Lewin***

Another theorist, Lewin (1947), also had a great impact on experiential learning. His learning cycle was similar to the above models and was elaborated by 12 principles of experiential learning:

- 1) Effective experiential learning will affect the learner's cognitive structures, attitudes, values, perceptions, and behavioural patterns.
- 2) People will believe more in knowledge they have discovered themselves than on knowledge presented by others (an approach to learning based on inquiry

and discovery increases students' motivation to learn and their commitment to implement their conclusions in the future).

- 3) Learning is more effective when it is an active rather than a passive process.
- 4) New action theories, attitudes, and behavioural patterns cannot be accepted with piecemeal approach: one's whole cognitive–affective behavioural system has to change.
- 5) It takes more than information to change action theories, attitudes, and behavioural patterns.
- 6) It takes more than first-hand experience to generate valid knowledge: for thousands of years humans experienced falling, yet no one developed a correct theory of gravity.
- 7) Behavioural changes will be temporary unless the action theories and attitudes underlying them are also changed.
- 8) Perceptions of oneself and one's social environment must change before changes in action theories, attitudes, and behaviour will take place. Learners must perceive themselves as capable of doing the needed behaviours and must see the behaviours as being appropriate to the situation before they will engage in them.
- 9) The more supportive, accepting, and caring the social environment is, the freer a person is to experiment with new behaviours, attitudes, and action theories. As the need to justify oneself and protect oneself against rejection decreases, it becomes easier to experiment with new ways of behaving, thinking, and valuing.
- 10) In order for changes in behaviour patterns, attitudes, and action theories to be permanent, both the person and the social environment have to change.
- 11) It is easier to change a person's action theories, attitudes, and behavioural patterns in a group context than in an individual context. The discussion and consensual validation that take place within a group provide a personal commitment and encouragement for change that is not present when only one person is being changed.
- 12) A person accepts a new system of action theories, attitudes, and behavioural patterns when he or she accepts membership into a new group. (Johnson & Johnson, 2003, pp. 51–53)

These principles guide practitioners towards effective pedagogy, and I used them as benchmarks for analyzing some results and generating discussion in this study.

In this section, I have outlined the broad ideas of major experiential learning theorists. These theories have influenced the development of the learning cycle proposed within the ELE framework document (BC Ministry of Education, 2007). These models focused on the learning process and not specific learning outcomes related to the environment. The next section shows what other principles need to be integrated within the learning cycle in order to achieve the desired learning outcomes of the ELE document.

## **Mindfulness**

Mindfulness is both an outcome and a process. Being mindful can play a role in the development of a positive learning environment, and the development of mindfulness can be influenced by the experiential learning cycle (Kolb, 1984). Therefore, I propose that it is critical to understand the process of developing mindfulness and its subsequent influence on the learning environment.

In the current research literature, there are roughly two major mindfulness theories, referred to as meditative mindfulness and social–psychological mindfulness (Good & Yeganeh, 2006). The former is derived from Buddhist philosophy and practice. Kabat-Zinn (1994, 2003) characterized this kind of mindfulness as an awareness of being aware. The latter was defined by Langer (1997) as follows:

When we are mindful, we implicitly or explicitly (1) view a situation from several perspectives, (2) see information presented in the situation as novel, (3) attend to the context in which we are perceiving the information, and eventually (4) create new categories through which this information may be understood. (p. 111)

This second conception of mindfulness is contrasted with mindlessness, which is like running on autopilot, or as Langer (1997) described it, automatic behaviour entrapped in old cognitive categories. This auto-behaviour is fundamentally problematic, because individuals then behave in a way that is not positive towards the environment. My opening argument in Chapter 1 outlined how over the last few decades environmental degradation and social injustice issues, for the most part, have not decreased, despite efforts of certain individuals and organizations. I believe there is

ample evidence that humans are destroying the planet, and that, therefore, people must drastically change the mindlessness behaviour. If people do not change, things will deteriorate even more.

Kabat-Zinn (2003) suggested that mindlessness severely restricts the individual's perspectives on how people are connected to the rest of the world. Orr (1994) stated that society in general, especially in developed countries, is disconnected from the biotic world. Kabat-Zinn (2003) defined the problem of mindlessness as the mind being preoccupied by having too many things to think about, and hence not being able to pay attention to itself, its processes, or its manifestation in behaviours. Mindful practice is the antidote to this situation. If one is mindful, one can focus on something, process one's attitude and behaviour, and realize how one is affecting things.

I believe that society in general is operating in a manner that is self-destructive, because most of the time people operate in a mindless state. I suggest that it is this lack of inner awareness that can lead to the affliction of destructiveness to the planet, others, and ultimately oneself (Kabat-Zinn, 2003). "If we don't really know where we are standing—a knowing that comes directly from the cultivation of mindfulness—we may only go in circles, for all our efforts and expectations" (Kabat-Zinn, 1994, p. 15). The circle metaphor seems appropriate for the environmental movement. There seems to be immense effort to change, but there is little evidence of this change occurring. Social-psychological mindfulness explains this pattern of behaviour as settling on static cognitive categories, which are connected to specific behaviours. Static cognitive categories mean that individuals do not change their thinking about something: if driving a car to the corner store is an acceptable behaviour, people continue to drive their cars to the corner store. In this way, the specific behaviours just continue.

The concept of social-psychological mindfulness (also referred to as social-cognitive mindfulness) stems from social psychology and emphasizes cognitive categorization, context, and situational awareness. Langer (1997) explained the development of mindfulness as a process in which individuals create categories to help manage the phenomena that they experience. With those categories, they create a view of the world, so that they can explain and understand those experiences by creating a set of mental models or cognitive schema. The most developed of categories are

referred to as ideologies, the system of justification and rationalization of one's attitudes and actions. Some examples of ideologies include communism, existentialism, Christianity, Buddhism, and environmentalism, which provide people with identities, rules of engagement, and explanations as to why things happen. All of these are social constructs, which are adopted by individuals. When ideologies become dogmatic, the individual no longer sees the initial intention, and, in Langer's terms, behaves automatically, entrapped in old (meaning static) cognitive categories. This is referred to as operating in a state of mindlessness. Both theories of mindfulness would agree that this must be avoided.

Although Dewey (1933/1960) used different terminology, he described similar states of mind. He used the expression *open-mindedness* instead of mindfulness and *mental rut* instead of mindlessness. Dewey (1933/1960) described open-mindedness as an attitude that

may be defined as freedom from prejudice, partisanship, and such other habits as close the mind and make it unwilling to consider new problems and entertain new ideas. But it is something more active and positive than these words suggest. . . . It includes an active desire to listen to more sides than one; to give heed to facts from whatever source they come; to give full attention to alternative possibilities; to recognize the possibility of error even in the beliefs that are dearest to us. (p. 30)

Dewey (1933/1960) described a mental rut as a "path of least resistance and least trouble" (p. 30) that is already made. Like Langer (1997) and Kabat-Zinn (1994, 2003), Dewey saw these two states of mind as contrasting one another, the latter being the negative of the two and operating in an automatic, non-thinking mode. Dewey (1933/1960) stressed that in order to have reflective thinking, one needs to have open-mindedness. I believe that mindfulness practice and the reflective process embedded in experiential learning complement each other.

When meditative mindfulness and social-psychological mindfulness are placed on a continuum, they sit on opposite ends of the focus of attention: meditative mindfulness is situated on the internal, and social-psychological mindfulness is situated on the external. However, they do have several converging ideas. Both theories stress cognitive flexibility and awareness, as well as being purposeful and intentional

(Yeganeh, 2006). They also both agree that mindlessness is an automatic state in which rigid biases and predetermined rules control behaviour and thoughts. Yeganeh (2006) explained that he and his colleagues are working on a definition that incorporates these two theories, getting the best of both into one.

I believe that there are components of both meditative mindfulness and social-psychological mindfulness that are important and useful to educators. Meditative mindfulness uses various modes of meditation to achieve a state that allows an individual to become mindful. Yeganeh's (2006) findings indicated that mindful experiential learning is linked to "sensory contextual process that involve engaging in novel experiences through awareness of the senses, emotions and people around us" (p. 74).

Meditation (Kabat-Zinn, 2003) is a practice in releasing judgment and focusing attention on the body's experience, such as through breathing or tasting. I achieve this state of focus when I am doing sports like rock climbing or whitewater kayaking. For example, when I am surfing on a wave, I become one with my kayak; I feel the kayak as if it is an extension of my body. In this state of mind, I am not thinking about anything other than what my body and boat are experiencing. I am not thinking about work, school, or other issues in life. After the activity, I feel a sense of relaxation and rejuvenation that allows me to focus on other aspects of life with full attention but without tension. There is growing research on how this type of attention focus helps people regenerate in order to perform better. Braver (as cited in Richtel, 2010) was one of five neuroscientists who experimented with whitewater rafting getaways (week-long wilderness vacations) and studied how participants' thinking and behaviour changed during the trips. Their hypothesis was that people's brains may need down time from hectic lives in order to function well. I believe that meditation on a daily basis, sports on a weekly basis, and periodic vacations may all function in a similar manner by allowing the mind some down time. Individuals may have other activities that do the same thing for them; for example, painting, playing music, or woodcarving may be activities that allow them to find that down time. I believe that without this down time, people cannot function mindfully. Instead, they function mindlessly.

## ***Measuring Mindfulness***

To measure mindfulness, I used the Freiburg Mindfulness Inventory (FMI) (Walach, Buchheld, Buttenmuller, Kleinknecht, & Schmidt, 2006). The FMI focuses on paying attention in a specific way: on purpose, in the moment, and non-judgmentally (Kabat-Zinn, 1994). Research has suggested that mindful experiential learning is composed of sensory and contextual process (Yeganeh, 2006). I used the FMI because it focuses on the affective domain (internal senses or emotions) and the contextual process. Contextual learning theory focuses on learning that occurs when students process new information or knowledge in a way that makes sense to them in their own frames of reference. This follows the constructivist theory of learning, so it made sense to me to try to measure change in this area.

Mindfulness occurs during the concrete experience phase of the experiential learning cycle (Kolb, 1984). My belief is that when students experienced the field trips within the ES 10 program, they would practice mindfulness and would possibly increase their practice of mindfulness. Similarly, by introducing students to the outdoors (front country or back country) and having them experience those settings, along with the integrated curriculum about those settings, I believed their attitudes and behaviours towards the environment would change (Orr, 1994).

## **Behavioural Change**

The unique learning environment within ES 10 directly influences behavioural change. Therefore, identifying which constructs within the learning environment influence behavioural change is critical in facilitating that change. The behaviour model I used in this study needed to fit the situation and individuals involved, keeping in mind that “health behavior and the guiding concepts for influencing it are far too complex to be explained by a single, unified theory” (Glanz, Rimer, & Viswanath, 2008, p. 29).

There are numerous behavioural change theories; Glanz et al. (2008) identified over two dozen different theories or models. However, in their review of 104 intervention studies, they found that only one theory and two models had been used in more than three studies. These were Social Cognitive Theory (SCT), the Health Belief Model

(HBM), and the Transtheoretical Model (TTM) or Stages of Change. While SCT and HBM have their merits, neither has a proactive strategy imbedded in the theory. Having a proactive approach was required to deal with the issues outlined previously in Chapter 1, and that was one of my main rationales for choosing to use the TTM. Glanz et al. (2008) pointed out that “to have a public health impact, increasingly it will be necessary for practitioners to use proactive strategies that reach out to people, rather than relying on reactive strategies that ultimately reach few individuals” (p. 43).

The other rationale for using the TTM was that it has been used in health promotion and has shown to be effective in changing health-related behaviour (Glanz et al., 2008; Prochaska, DiClemente, & Norcross, 1992). The issues outlined in Chapter 1 are directly related to either human health or the planet’s health. The TTM focuses on changing behaviour by promoting informed decision making and supporting changed behaviour through social support, empowerment, and personal growth. All of these traits are developed or promoted in the ES 10 program.

The TTM has been applied to a broad range of health issues, including alcohol and substance abuse, anxiety and panic disorders, bullying, delinquency, depression, eating disorders and obesity, high-fat diets, HIV/AIDS prevention, mammography and other cancer screening, medication compliance, unplanned pregnancy prevention, pregnancy and smoking, radon testing, sedentary lifestyles, sun exposure, and physicians practicing preventive medicine. Researchers around the world have applied, validated, and challenged the constructs in the TTM (Hall & Rossi, 2004, 2008; Noar, Benac, & Harris, 2007; Prochaska, Wright, & Velicer, 2008).

Health-related behavioural change research may shift from individual personal issues to broader social or environmental issues. Glanz et al. (2008) stated, “We expect that, over the next decade, more behavior change interventions will be directed at changing individual and community behaviors related to water consumption and to behaviors that may affect global climate change” (p. 4). My research was supported by this statement, along with using the TTM, to show how behaviours are changed during the ES 10 program.

Research on the TTM has shown that individuals go through five stages of behavioural change before they reach the sixth stage, termination (Prochaska et al., 1992):

Stage 1: Pre-contemplation (unaware that their behaviour is problematic);

Stage 2: Contemplation (recognize that their behaviour is problematic);

Stage 3: Preparation (taking small steps toward behaviour change);

Stage 4: Action (acquiring new, healthy behaviours);

Stage 5: Maintenance (sustaining healthy behaviours for 6 months); and

Stage 6: Termination (will not return to their previous unhealthy behaviour as a way of coping).

Cognitive processes that accompany these stages include increasing knowledge, being aware of risks, caring about consequences to others, comprehending benefits, and increasing opportunities. This is why knowledge alone does not lead to behavioural change. Awareness is required in stage 2 in order to move to stage 3. In order for individuals to move from stage 2 to stage 3, they need to be mindful of the consequences and the options available to them. Caring is required at the third stage, in order to be successful through that stage to move on to the next stage. In this case study, the caring was about the environment and the students' long-term health effects related to environmental concerns. The ES 10 program also makes the students aware of social justice issues. Caring is developed during place-based education (Orr, 1992; Sobel, 1996, 2005, 2008).

The behavioural strategies that are used through the five stages are substituting alternatives, enlisting social support, rewarding oneself, committing oneself, and reminding oneself. The strategies in stages 2 to 4 are all incorporated into the development of community or group cohesion. This is one of the constructs in the learning environment instrument, which is examined in greater detail in Chapter 5.

## ***Measuring Attitudes and Behaviours***

To measure attitudes and behaviours, I used the Measurement of Ecological Attitudes and Knowledge Survey (MEAK), which measures an individual's attitude, behaviours, and knowledge towards the environment (Maloney & Ward, 1977; Maloney Ward, & Braucht, 1975). Although this instrument was developed several decades ago, it has been used continuously (Benton, 1993, 1994; Borden, 1985; Sheane & Shei, 1995). The instrument measures attitudes, and as Lewin's (1947) principle #7 stated, behaviour changes will be temporary unless the action theories and attitudes underlying them are changed. So I wanted to be able to measure attitude change. The original instrument measured verbal commitment, actual commitment, affect, and knowledge on a 130-item questionnaire, which later was reduced to 45 items by the authors of the questionnaire (Maloney et al., 1975). I reduced the instrument to 20 items by removing the affect and knowledge items. Not only did they did not play a role in this research, but shortening the questionnaire also reduced the possibility of questionnaire overload.

## **Necessities for Ecological Education to Occur**

Orr (1992) stated that one of the key elements of developing ecological literacy (his terminology for ecological education) is the ability to "observe nature with insight" (p. 86). Creating insight in students is not a simple task, and it involves developing skills that cannot be taught in classrooms. The experiential learning model used in nature provides the experiences needed to create that insight. Ecological education emphasizes the embeddedness of individuals and their technologies in nature. This perspective involves seeing individuals as one part of nature and societies or cultures as an outgrowth of interactions between humans and specific places (Smith & Williams, 1999). This relationship with specific places is one of Orr's (1992) key necessities for ecological education.

Orr (1992) outlined three necessities for ecological education to occur. The first was to experience nature on a real level (engaging or connecting with it). Nature for Orr (1992) was anything outside the human world. The experiential learning model focuses on the experience, in this case connecting with nature, which Orr (1992) noted as a

primary necessity. This involves taking the class outside and allowing the students to listen, feel, taste, observe, and smell nature without structured worksheets or preconceived categorizations. It means allowing the students to explore their innate curiosity and develop a sense of wonder about nature. Wilson (1996) referred to this sense of wonder as *biophilia*, as opposed to the classical Cartesian classroom model of dissection and categorization of nature.

The second necessity of Orr's (1992) was having a role model or mentor to guide the individual, which is fulfilled by the teacher, other instructors or experts, and peers. The third necessity was the development of a sense of belonging, which can be created by experiencing natural aspects of a place, with soils, landscape, and wildlife.

This means having intimate knowledge of your place (your surroundings). This sense is lost as we move down the continuum toward the totalized urban environment where nature exists in tiny, isolated fragments by permission only. (Orr, 1992, p. 89)

Thomashow (2002) concurred with Orr (1992) that

sense of place is at the core of many environmental learning initiatives. It comes from an eminently practical premise. People are typically interested in understanding who they are in relationships to where they live. By exploring the places that are most important to them, they are more likely to take an interest in the human and ecological communities of those places. Exploring sense of place involves thinking about home and community, ecology, and history, and landscape and ecosystem. In essence, it is a search for your ecological roots, and a way to link your ecological identity to lifecycle development. . . . The tacit knowledge of environmental educators presumes that achieving a reflective sense of place contributes to an ethic of caring about habitats and communities. (p. 76)

The ELE document (BC Ministry of Education, 2007) emphasized that in

the preamble to the proclamation of the United Nations Decade of Education for Sustainable Development (2005–2014), it states unequivocally that there is no universal model of education for sustainable development. There will be nuanced differences according to local contexts, priorities and approaches in how sustainability will be taken up. (p. 7)

These “local contexts” (BC Ministry of Education, 2007, p. 7) are supports for the development of a sense of place. In order for the student to have a real learning experience with nature, the student must embody that identity through a sense of place and a sense of responsibility for nature.

“Learning is the journey we go through as we make our own changes to our identity in response to need or to change in circumstances” (Falk, 2001, p. 315). The current education system does not create these identities. In fact, it creates a disconnection from nature through Aristotelian, Christian, and Cartesian influences; a loss of place through globalization; and a type of competitiveness that promotes anthropocentrism (Bowers, 1993). Identity is individuals’ perception of themselves, who they see themselves as being and acting. This is a cognitive map by which individuals design their actions (Argyris, Putnam, & McLain-Smith, 1985). Action theory states that people’s identity guides their actions, and internal turmoil occurs if the two are not congruent (Hovelynck, 2001). Therefore, if individuals identify themselves as disconnected from nature, not belonging to a specific place, and not responsible for others or the environment, they will act accordingly. A connection with nature, a sense of place, and a sense of responsibility are all identities that are created through ecological education. I believe that the development of mindfulness is pertinent in the process of first understanding one’s identity and ultimately developing an ideology to help guide one’s actions.

Another concept that needs to be addressed is the idea of community mapping, which I used in my research process. Community mapping can be defined as groups or individuals coming together to write, mould, draw, or express some aspect of local knowledge and experience (Lydon, 2000). The term has been applied to a variety of different procedures and has been used by environmental psychologists and human microgeographers to assess people's mental maps of their immediate environments (neighbourhoods). For example, capacity focused development is based on maps of neighbourhoods identifying community assets, abilities, and capacities (Kretzmann & McKnight, 1993). Amsden and VanWynsberghe (2005) used community mapping as a visual and relational data-gathering technique to document geographical and other forms of abstract data. My use of this process was very similar. Amsden and VanWynsberghe stated that “community maps are able to capture emotional and other abstract

connections experienced by the mapmaker. . . . Community mapping needs to begin at a place of trust” (2005, p. 358). What I was looking for in this process was the ES 10 students’ concepts of community and how the class fits into that map, either by inclusion or exclusion.

## **Pragmatist Philosophy**

The pragmatist worldview is one of four major worldviews used in research as identified by Creswell and Plano Clark (2007). All research is founded in some type of worldview, and all researchers need to understand which view they believe in and the set of beliefs or assumptions that influence their inquiries. Being a pragmatist, my research is problem centered, pluralistic, and oriented in real-world practice. Of primary importance is the questions being asked, not the methods being used (Creswell & Plano Clark, 2007). A mixed methodology approach fits with the pragmatist view, and it also follows current practices within learning environments research (Tobin & Fraser, 1998).

It has become evident to me that the processes of learning, knowing, and understanding are very complex and organic. Therefore, my approach to research in this area needed to have a wide perspective using mixed methods. If the approach to research is narrowed too much, researchers cannot understand the complex system. Outlined in Chapter 5, I have created a flow chart of one part of the learning process, which is learning through the experiential learning cycle (BC Ministry of Education, 2007). I did not set out to develop a flow chart, but doing so helped me to understand the relationships within my research. I present it as a point for discussion and possible additional research. The empirical data in Chapter 4 may not suffice to produce such a chart if viewed from a strict empirical perspective. However, approaching the data heuristically allows for such possible insight.

Groner, Groner, and Biscof (1983) described heuristic theory as an “adjective in the sense of guiding discovery” (p. 1). Heuristic processes of discovery rely on some basic general principles. Two important notions outline heuristic research:

First it is the idea that intelligent behavior can be characterized as a search, the search for solutions to problems posed to the system.

Second, it is the idea that the search space associated with problems requiring intelligence is typically so large that any system must use heuristics to reduce it to a manageable size given the system's limited resources of time and space. 'Time' here refers to the number of operations the system must perform to find a solution, whereas 'space' refers to the number and size of symbolic descriptions of intermediate solutions the system produces on the way to a solution. (Groner et al., 1983, p. 15)

In more basic terms, heuristics relies on experience-based techniques for discovery and problem solving where an exhaustive search is impractical due to time and space constraints (as noted above). This method is used to speed up the process of finding an acceptable solution. Some examples of this method include using a rule of thumb and intuitive judgment. The flow chart I created in Chapter 5 was produced in part using heuristic methods of intuitive judgment and extensive experience.

This chapter explained some of the major concepts that were instrumental for my research and showed the reader some evidence to support my rationale in the research. The literature review of prominent theorists influencing the ELE learning cycle is by no means exhaustive, but it shows the evolution of the learning cycle. The learning cycle is only one part of the equation; the learning environment plays a major role in the learning process. Mindfulness was explored as an intertwined process and outcome that affects and is influenced by both the learning cycle and the learning environment. The overall complexity of learning within an integrated experiential program is evident with all the concepts and constructs that have been identified in this chapter. The next step is to measure and identify the constructs and influencing factors. I measured the former using quantitative measures and the latter using qualitative methods. The next chapter outlines these processes in much greater detail.

## **Chapter 3: Research Methodology**

This chapter describes the time frame overview, the research setting, the research methodology, and specific research methods.

### **Time Frame Overview**

#### ***Phase 1: Literature Review and Groundwork***

The first phase of the project included a literature review, development of research questions, selection of research questionnaires, and obtaining ethical permissions for conducting this research.

#### ***Phase 2: Data Collection***

On the first day of the semester, the informed consent for minors forms were distributed to all the students and collected the following week. I used a mixed-methods approach. I administered the pre-program questionnaires to the class involved in the study at the beginning of the semester (February 2007). I observed in the classroom for one day each week throughout the semester and did some video recordings. I accompanied five out of six field experiences. Other qualitative tools were utilized through the semester as well. At the end of the semester, the post-program questionnaires were administered to the class. This mixed-methods approach is well suited for identifying students' preferences for their learning environment (quantitative measures) and then describing the process that helped to develop those constructs (qualitative data).

#### ***Phase 3: Data Analysis***

Preliminary analysis of the quantitative data was done and presented at an Environmental Education and Communication (EECOM) conference. All of the

ethnographic data collected in this study were analyzed through routine procedures: becoming familiar with the data set, coding, making observations and provisional interpretations, frequency counting, and looking for disconfirming evidence. I began writing the first three chapters of my dissertation (Introduction, Literature Review, and Methods) and continued reviewing more literature. I then wrote the final two chapters (Results and Discussion of Results) and completed the literature review.

## **Research Setting**

This research focused on one specific program, ES 10. The individuals involved in the research included primarily the teachers and students within the program. The detailed description of the program and the process for students getting into the program are outlined in Chapter 1. I also had some discussions with the developer of a similar program based in Whitehorse, Yukon, and had an opportunity to visit with the students and teachers of the Whitehorse program that year. The primary research focus was to investigate the processes of developing a positive learning environment and the nuanced behaviours that teachers applied to facilitate the process. A positive learning environment was described by Fraser (1998) as one in which the students' preferred learning environment matches their actual experienced environment. A secondary objective of this research was to develop an understanding of the factors that influence mindfulness and behavioural change within the above process. The behaviours that I was looking for could possibly create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations, addressing the problems outlined in Chapter 1.

## **Overview of Methods**

I systematically selected each method in this dissertation to address the objectives of the research in the most timely and efficient way. Although each method came with its individual shortcomings, individual biases were reduced and validity improved by triangulating these multiple methods. Both qualitative and quantitative methods were utilized to increase the validity and reliability of the data. The data

collection methods included a variety of ethnographic techniques. I started by keeping notes of observations, but I later used a tape recorder to record my observations and transcribed those recordings into text. I made video recordings to document pedagogical approaches Mr. G used in the various settings. Other qualitative data used to strengthen the quantitative measures and the observational data were a self-evaluation feedback form given to each student after every field trip, a mind mapping assignment presented at the beginning and end of the program, and student reflective journaling throughout the program. One last question was posed to the students at the final retreat: "How have you changed during this term?" Each of the above procedures is discussed in greater detail in this chapter. Quantitative methods included a number of questionnaires including those assessing learning environment, mindfulness, and attitudinal/behavioural factors. These were administered at the beginning and end of the semester (pre and post).

I followed proper ethical procedures in accordance with Simon Fraser University's (2006) ethical guidelines. Ethics approval was granted from Simon Fraser University and the participating school district. The school district superintendent, the principal of the secondary school, and the teachers of the ES 10 program also granted approval. Prior to the start of the semester, the students took home a parent consent form and a letter explaining the purpose of the research; all 24 consent forms were signed and returned. A copy of the consent form is attached (see Appendix A). The letter informed parents that if they had any questions or concerns they could contact me directly (none did). I had a discussion with the students about my research. I explained that I would be asking them to fill out forms and do some tasks, and that I would be video recording activities. I made it clear that they did not have to participate in this research and that at any time they could choose not to take part. I also explained to them that their responses in the questionnaires and tasks would be confidential and would in no way affect their marks in the class.

I chose the quantitative pre- and post-semester questionnaires so that students' perceptions of their learning environments could be measured, validated, and interpreted. Other questionnaires measured levels of mindfulness, attitudes, and behaviours towards the environment. These measures were taken to find out whether there were changes from the start of the semester to the end of the semester. The qualitative methods (direct observation, video recordings, impromptu interviews with the

teachers, community importance mapping assignment, post field experience self-assessments, and reflective journaling) were chosen to identify the effects of traits or practices in potentially reinforcing or lending themselves to the quantitative measures.

Having been involved with the ES 10 program since its inception gave me considerable insight into the program's procedures. However, I had only been directly involved with the students on the field/outdoor activities (as the outdoor guide/instructor). Conducting this research allowed me to gain great insight into the classroom setting, and it gave me an opportunity to observe the frontloading and debriefing of activities and trips. I had never been privy to this prior to doing the research. This directed my attention to the process of developing a positive learning environment. As a participant-observer within the ES 10 program, I was also able to document interactions between the students and teacher on specific constructs (e.g., learning environment, mindfulness, and attitude and behaviour towards the environment). As a participant-observer, the students saw me as another teacher or resource person. My role in the program was strictly as a resource: I did not teach any lessons or run any sessions. I just helped out where I could and participated in the activities. This helped in decreasing students' awareness of the fact that I was observing what was happening within their program.

The structuring observational frame I used focused on the eight constructs within the PLACES instrument (Zandvliet, 2007, 2012): Relevance/Integration (RI), Critical Voice (CV), Student Negotiation (SN), Group Cohesiveness (GC), Student Involvement (SI), Student Control (SC), Open Endedness (OE), and Environmental Interaction (EI), along with behaviours that pertained to environmental interaction and awareness. This allowed me to look at the creation and maintenance of those constructs. I was also observing for disconfirming evidence of those constructs. For example, one construct from the questionnaire is termed "group cohesiveness" and refers to the group's strength or affiliation with each other. During qualitative research, I observed that the teacher did specific activities (e.g., low rope course activities) at the start of the semester to help the development of group cohesiveness. Throughout the semester, the teacher continued to build on the group cohesion (e.g., taking students rock climbing). The teacher reported to me that he specifically selected these activities to help build the group's cohesiveness. I also observed in the development of group cohesiveness a negative aspect of this dimension I describe as "exclusion." I discuss this in detail in Chapter 4.

## **Instruments**

### ***Quantitative Data***

The key instrument utilized in my research was PLACES (Zandvliet, 2007, 2012), a questionnaire for addressing students' perceptions of their learning environment. This tool examined the students' preferences for their learning environment (the environment in which the students would like to learn, also called the classroom climate), and it measured specific constructs that exist within an integrated experiential outdoor program. It was compatible with the theoretical underpinnings for the program: integration of curriculum, experiential learning cycle, and constructivist learning theory. I used the instrument to measure students' preferred and actual perceptions of their learning environment. The eight scales in the PLACES instrument were constructed or adapted from other earlier instruments (Science Outdoor Learning Environment Instrument, Environmental Science learning Environment Inventory, What Is Happening In Class, and Constructivist Learning Environment Survey). PLACES has been employed in six countries, translated into four languages, and administered to over 3,000 students (Zandvliet, 2007, 2012).

The final version of the PLACES (Zandvliet, 2012) instrument has two variations of the questionnaire: version 1 asks students questions about their preferred learning environment and is written in the present tense. The statements have the form of, "I want my lessons to be supported with field experiences and other field-based activities." Version 2 of the instrument is written in the past tense, so that students are responding to statements about a learning environment (or environments) that they have actually experienced. These statements have the form of, "My lessons were supported with field experiences and other field-based activities."

The intent of version 1 was to help teachers assess their students' preferred learning environment in order to meet their needs. Version 2 was intended for teachers to assess whether the students' needs were being met about midway through the program. I used these questionnaires in my study to assess the similarities and/or differences between the students' preferred learning environment and their actual

experience in the ES 10 program. I also wanted to compare the students' perspectives between a regular classroom setting and the ES 10 learning environment.

### ***PLACES Instrument***

The PLACES instrument (Zandvliet, 2007, 2012; see Appendix B) is divided into eight primary constructs or scales:

Relevance: refers to the students' understanding of the relevance of the subject content to their current lives/situation.

Critical Voice: relates to the amount of input students perceive they have in the learning process and curriculum.

Student Negotiation: deals with the students' perceived ability to discuss their ideas with other students.

Group Cohesiveness: deals with the group dynamics and support that students perceive they give and get from one another.

Student Involvement: relates to the amount of interaction the students feel that they have with the teacher during instruction time.

Shared Control: deals with the amount of say the students believe they have over their learning relevant to time and topic.

Open Endedness: deals with the amount of say the students believe they have over when and what they learn.

Environmental Interactions: looks at the amount of interaction students perceive they have with the outside environment.

Table 3.0 gives examples of the questions that are related to each scale (Zandvliet, 2007).

**Table 3.0 Statements from the Selected Scales for PLACES Questionnaire**

<b>Scale</b>	<b>Statement</b>
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.
Environmental Interaction (EI)	I want to spend most of the time during local field trips learning about my environment.

All the questions ask for responses on a 5-point Likert scale. The most positive response to each question (“always”) is scored with 5 points, the least positive response (“never”) is scored with 1 point, and the middle response (“sometimes”) is scored with 3 points.

### ***PLACES Administration***

I obtained four different assessments using this questionnaire. The first asked students to “CIRCLE the dot which best reflects your feeling or experiences in last semester’s class.” This I called the pre-actual (using version 2), because it represented

students' actual perceptions on experiences in their previous semester before joining the ES 10 program. I then asked them to complete the questionnaire again, but this time indicate their preferred learning environment (this I called pre-preferred, using version 1). Both of these questionnaires were administered on the second day of the ES 10 program, to ensure there was no influence from the teachers or program on the students' preferences. In the last week of the program, I administered the final two questionnaires. At the beginning of the week I asked students to complete the questionnaire as it related to experiences in the ES 10 program (I called this the ES Actual, using version 2), and at the end of the week I asked them what their preferred expectations would be (I called this the post-preferred, using version 1).

### ***Mindfulness Instrument***

The second instrument was a mindfulness inventory questionnaire using the FMI (Walach et al., 2006; see Appendix C). This was intended to assess perceived changes in mindfulness that may have occurred during the ES 10 program. Sample statements from the FMI questionnaire include, "I am open to the experience of the present moment," "I pay attention to what's behind my actions," and "When I notice an absence of mind, I gently return to the experience of the here and now." All the questions had answers on a 4-point scale. The most positive response to each question ("almost always") was scored with 4 points, the next most favourable response ("fairly often") was scored with 3 points, the next less favourable response ("occasionally") was scored with 2 points, and the least positive response ("rarely") was scored with 1 point.

### ***Ecological Attitudes Instrument***

The last instrument was a modified version of the MEAK questionnaire (Maloney & Ward, 1973; Maloney et al., 1975; see Appendix D). This instrument claims to measure an individual's attitudes towards the environment and sustainable living practices or behaviours. It has two parts. The first asks questions regarding attitudes towards the environment and has a 5-point Likert scale response structure. The second part asks questions regarding sustainable living practices with a true or false response pattern. Sample statements from the MEAK questionnaire include, "I'd be willing to ride a bicycle or take the bus in order to reduce air pollution," "I would donate a day's pay to a

foundation to help improve the environment,” and “I would be willing to pay a pollution tax if it would considerably decrease the smog.”

The questions with the 5-point Likert scale response format were scored as follows: the most positive response to each question (“strongly agree”) was scored with 5 points, the next most positive response (“mildly agree”) was scored with 4 points, the middle response (“no opinion”) was scored with 3 points, the less positive response (“mildly disagree”) was scored with 2 points, and the least positive response (“strongly disagree”) was scored with 1 point. Questions 2, 4, 5, and 9 in the first section were reverse items, so they were reversed scored. In the second section, “True” responses were scored 1 and “False” responses were scored 0. Questions 1, 3, 5, 8, and 9 in the second section were reverse items, so they were reversed scored.

Both of the instruments, the MEAK (Maloney & Ward, 1973; Maloney et al., 1975) and the FMI (Walach et al., 2006), were administered pre and post, in close proximity, similar to the procedure for the PLACES instrument (Zandvliet, 2007). I attempted to spread them out as much as possible in order to avoid instrument fatigue. The pre-questionnaires were administered in the first week to minimize the program effect on the outcomes and the post-questionnaires were administered in the last week to determine if outcomes were discernible. Before administering any of the instruments, the students were reminded to keep this in mind that their opinions were most important. As well, they were advised that their answers would not affect their marks in the program. In fact, the results would not be made available to the teacher until after the end of the program. I did not make the responses anonymous because I wanted to be able to compare each individual with his or her other scores. The analysis of the scores is described in detail in Chapter 4.

### ***Qualitative Methods***

Qualitative data collection occurred over a five-month term. The type of collection methods included field observations, informal interviews, self-evaluations, journals, and a final debriefing question. I spent a minimum of one day per week observing and recording data in the classroom. Observations were also made in five out of six of the field experiences: a three-day canoe trip; a four-day climbing/geology trip; a six-day

biology/paleontology/geography/social studies/ history trip; a four-day biking/history/geology trip; and a two-day wrap-up trip.

Observations were made continuously and consistently throughout the day in each of the field experiences. The observations I was looking for coincided closely with the eight constructs identified in the PLACES (Zandvliet, 2007) questionnaire. Since I spent a large amount time with the class, the students did not view me as a researcher but as one of the teachers. This helped to reduce observer bias with respect to their behaviour around me.

I kept my observational notes on a voice recorder and created an inventory of these notes as they accumulated. This proved to be more convenient than attempting to make written notes while I was engaged in the program, because the field experiences were full of activities and nonstop action. I also recorded numerous discussions and impromptu interviews with the teacher, mostly during the field trips. Occasional video recordings of discussions in class were conducted while the teacher was setting up lessons or debriefing activities or trips. The teacher structured these discussions, and I captured the conversation.

After each trip the students filled out a self-evaluation reflective assignment (see Appendix E). There were four questions, each valued at 10 points, asking the students to reflect on their participation, responsibility, learning opportunities, and personal growth. They needed to evaluate each item and give themselves a total score out of 40. This assignment was not intended to answer any specific research question, but it did provide some very insightful qualitative information (this is described in Chapter 4). Along with some insights into the students' self-assessment, this ongoing self-reflection was one of the contributing factors that helped students become more aware of the contributions and actions within the group (change in behaviour). This explicit reflection process helped students become more mindful (Langer, 1997).

At the beginning of the term, I asked students to draw a picture of their community; I called it community mapping. The definition of community was "anything or person that is important to them personally." Each student was given a 1 x 1.5 m piece of paper and access to a number of different writing and drawing utensils. The premise

of this assignment was to explore what each of the students valued as important. At the end of the program, each drawing was returned to the student. They were given the opportunity to add or change the drawing in order to see if things had changed for them through the program. I also asked all the students at the beginning of the term, “What was your reason for joining the ES 10 program?”

In the final days of the program, I posed a question to the students: “How have you changed during this term?” Prior to asking this question, I prompted the class about how each individual experiences things differently and how ideas, beliefs, and values may be influenced by those experiences. What I wanted them to write down was the changes within themselves, if they had changed. The intent of this question was to provide an opportunity for students to offer a final self-reflection, in written form, on their thoughts and feelings. This proved to be very insightful. In hindsight, it would have been beneficial also to ask what they thought had influenced those changes.

As an ongoing assignment for the program, the students were asked to keep a journal. There were two journal components: data and academic knowledge, and personal observations. The teacher assigned journaling as part of the program process, to provide practice in reflection and gain ongoing insight into students’ mindfulness.

After collecting all of the qualitative data (excluding observational data), I coded everything into themes using words that had similar meanings. For example, one theme related to groups such as family, with words like *tight group*, *brothers*, and *sisters*. Another theme was related to personality traits, such as *outgoing*, *extravert*, *risk taking*, and *risk taker*. I examined the data for disconfirming evidence of these themes. My final step was to look for relationships with the constructs (quantitative data) and the themes. In reporting these qualitative data, I used pseudonyms for all of the students.

## **Researcher Bias**

In this study, researcher bias was of concern with the subjectivity involved in both quantitative and qualitative research. Researcher bias or subjectivity is commonly understood as inevitable when doing any kind of research, be it qualitative or quantitative (Roth, 2005). For example, even the selection of research subjects and

instruments can reflect biases. This research was not conducted using an experimental design; issues like subject selection and experimental error did not play a role. However, the likelihood of strong demand and/or experiment expectancies affecting the research was possible. These biases related to the students attempting to please the researcher and telling the researcher what he wanted to hear. In order to minimize those effects, I used both qualitative and quantitative methods. Because I spent so much time with this group of students (30 classroom days and 18 field experience days), it would be less likely for students to behave in a manner that was not normal for them. I also situated myself as a participant–researcher, whereby the students viewed me as a teacher resource, not as an observer–researcher. They were made aware that I was conducting research (I disclosed this), but by being a participant-researcher, I minimized the reinforcement of them being observed.

The pre- and post-questionnaires were administered almost five months apart, so there was limited possibility that the students would remember what they had written, therefore increasing the reliability of the quantitative results. To minimize my own observational biases, I discussed them with the teacher and sought clarification regularly. My bias for integrated experiential programs would also tend for me to expect that the results for the students would be positive. My research was primarily focused on the processes that influence the results, not proving or disproving results. The basis of inquiry, according to Hart (2000), is “not rooted simply in matters of epistemology but in ontological relations of power, influence, and control within communities of inquirers” (p. 542). I have presented my worldview in order to expose those biases.

This chapter has outlined the research setting, the research methodology, and specific research methods. As stated in Chapter 2, my conceptual framework outlines why I believe that learning environments influence the learning cycle, which in turn impacts attitudes, behaviours, knowledge, and skills. Embedded in this process is the concept of mindfulness. I used a mixed-methods approach to explain what was happening within the ES 10 program—that is, what factors were related to the development of the program’s unique learning environment. The quantitative data focused on student perspectives on constructs of learning environments, mindfulness, and behavioural change. Using qualitative data, I tried to identify the key factors that influence those constructs. The next chapter outlines these findings.

# Chapter 4: Research Study Results

## Overview of Chapter

In the first part of this chapter, I review the quantitative results of the learning environment measures and the other questionnaires administered to measure or describe factors related to the development of the ES 10 program's unique learning environment. In the second part, I review the qualitative results of the observations, interviews, open-ended questions, and mind mapping exercises (Letts et al., 2007). I strive to present the data best suited to answer the four research questions outlined in Chapter 1.

Both qualitative and quantitative methods were utilized to increase the validity and reliability of the study by triangulating the qualitative results with the quantitative results (Creswell & Plano Clark, 2007). The data collection methods included a variety of ethnographic techniques: direct observation, video recordings, impromptu interviews, post field experience self-assessment, community importance mapping assignment, and reflective journaling, coupled with quantitative measures of the learning environment, mindfulness, and attitudinal/behavioural questionnaires (for detailed information on these see Chapter 3). Throughout the semester, I spent a minimum of one day a week observing the program and five out of six field experiences were attended. During the first three weeks of the program, I spent three days a week with the class. In the last three weeks I spent two days a week with the class. In the beginning of the semester, video-recordings were done, and the impromptu interviews occurred mostly during field experiences. The self-evaluation feedback forms were given to each student after every field trip, the mind mapping assignment was presented at the beginning and end of the program, and journaling was done throughout the program. I posed one last question to the students at the final retreat which was, "How have you changed during this term?"

## **Quantitative Results**

The quantitative results are displayed in charts and graphs in this chapter. The qualitative data were used to triangulate results with the quantitative data and trends in the qualitative data are discussed later on in the chapter.

### ***PLACES Questionnaire Pre and Post***

I divided the quantitative PLACES (Zandvliet, 2007, 2012) results into three comparison categories: pre-actual vs. ES 10-actual, pre-preferred vs. ES 10-actual, and pre-preferred vs. post-ES 10-preferred. The PLACES questionnaire was employed to assess students' perceptions of their actual, experienced learning environments and their preferred learning environments. I gathered these data to answer research question #1: Are students' perceptions of their learning experience in ES 10 (as measured by the PLACES scores), a school-based experiential learning program, more positive than their perceptions of their experience in regular classes, and how do these perceptions compare to those of their preferred learning environment? What influencing factors and/or instructional practices contribute to these perceptions?

### ***Mindfulness Questionnaire Pre and Post***

The instrument I used to assess mindfulness in this research was the FMI (Walach et al., 2006). The FMI focuses on the participant's ability to pay attention in a specific way, on purpose, and in the moment (Kabat-Zinn, 1994). Yeganeh (2006) suggested that mindful experiential learning is composed of sensory and contextual processes. Both of these concepts are related to place-based education (which is a key concept in the previous instrument, PLACES). Research by Yeganeh has indicated that there is some connection between mindfulness and experiential learning. By using this quantitative instrument, I wanted to explore if there was a change in mindfulness and then answer question #2, exploring the processes within ES 10 that may influence mindfulness: Are there practices within the ES 10 learning environment that are specifically contributing to the development of mindfulness? What is the relationship between mindfulness and students' perceptions of the learning environment?

### ***Ecological Attitudes Questionnaire Pre and Post***

I used the MEAK (Maloney & Ward, 1973; Maloney et al., 1975) in the research to measure attitudes, behaviours, and knowledge towards the environment. This quantitative instrument was used to answer question #3: If attitudes and behaviours change over the course of the ES 10 program, how might those changes be affected by students' experiences or perceptions of the program? What role does mindfulness play in those changes? Which constructs or factors within the learning environment of ES 10 contribute to those changes?

### **PLACES Questionnaire**

I used the results for the PLACES questionnaire (Zandvliet, 2007, 2012) to compare student perceptions of their actual and preferred learning environments. Students were asked to respond based on their perceptions of the actual learning environment experienced in their previous year's class and for the ES 10 program (pre-actual and post-actual, respectively). The students also responded to the PLACES instrument based on their ideas about their preferred learning environment prior to the ES 10 program and after attending the program (pre-preferred and post-preferred, respectively). Table 4.0 illustrates the four questionnaires for clarification.

**Table 4.0** *Places Questionnaire – Actual or Preferred Version*

<b>PLACES Questionnaire</b>	<b>Previous Year</b>	<b>Pre-ES 10</b>	<b>Post-ES 10</b>
Actual Learning Environment (version 1)	X		X
Preferred Learning Environment (version 2)		X	X

The pre-actual questionnaire was administered at the beginning of the ES 10 program and was based on the students' experiences in a regular or traditional classroom setting prior to the ES 10 program. To ensure consistency, students were

asked to base their results on an academic class they had attended in the previous semester. The ES 10 students did not all respond to this question reflecting back on the same class, because they did not all have their classes together. All of the students were from the same high school in the previous year, which minimized any school culture effect. The results of the ES 10 actual were based on completion of the PLACES questionnaire (Zandvliet, 2007) at the end of the program. The pre-preferred questionnaire was administered at the beginning of the ES 10 program and gathered the students' preferences on what they would like the learning environment to look and feel like. The post-preferred questionnaire was administered at the end of the ES 10 program.

PLACES has exhibited exceptional reliability and validity in a range of settings (Zandvliet, 2007, 2012). For this study, the reliability and validity of the four different administrations of the questionnaire are displayed in Tables 4.1, 4.2, 4.3, and 4.4, respectively. Internal consistency was measured using Cronbach's alpha (CA) and the validity was measured using discriminant validity (DV). The CA is used to measure internal consistency of the items within each scale or construct, meaning that all the questions within the same construct are responded to similarly. The higher the number (1 being perfect), the better the internal consistency; in other words, all the questions within the scale are measuring the same concept. Values of .6 or less are considered poor or unreliable (George & Mallery, 2003). Low values also indicate that the participants are not scoring all the questions within a scale similarly. The DV is used to show that each one of the eight constructs is measuring a different concept. A value of .4 or less is an indication that each construct is measuring something conceptually different than other scales. In each results table, the mean scores for each scale are also displayed (Revelle & Zinbarg, 2009).

Almost all the scales in all four tables are above .7, the standard acceptance for the CA measure; only six are in the .6 range, which is within the questionable value range. These six questionable CA results can be attributed to the small sample size ( $N = 24$ ), because the CA is calculated on each questionnaire individually. The measures overall would indicate good reliability in the PLACES instrument in this context. On all four tables the DV measures are within acceptance values (below .4), with the exception of the last three scales shown in Table 4.4. Those values are only slightly above the

acceptable value. Again, the small sample size contributed to this, as well as the fact that the actual values are all nearing the max value on the Likert scale (5 out of 5). This is referred to as the ceiling effect: when the measures on a scale all score high, it is difficult to show DV. However, only 3 out of 32 possible measures were slightly high, meaning that there is good validity in this instrument. This is consistent with other research using this instrument (Zandvliet, 2007, 2012).

In Table 4.1 (pre-actual), the overall mean score was 2.85 (sum mean of all data), indicating a generally negative perception of the traditional learning environment by the students. In contrast, Table 4.2 (ES-actual), with an overall mean score of 4.32 (sum mean of all data), indicates a generally positive perception of the ES 10 learning environment by the students.

**Table 4.1** *Pre-Actual Results*

<b>Scale</b>	<b>Mean</b>	<b><math>\sigma</math></b>	<b>CA</b>	<b>DV</b>
Relevance/Integration	2.6	0.59	0.6	0.29
Critical Voice	3.6	0.82	0.7	0.32
Negotiation	3.2	0.79	0.8	0.32
Cohesiveness	2.8	0.70	0.8	0.39
Involvement	3.2	0.73	0.7	0.27
Control	1.7	0.74	0.8	0.21
Open Endedness	3.0	0.50	0.6	0.32
Environmental Interaction	3.5	0.55	0.7	0.17

**Table 4.2** *ES-Actual Results*

<b>Scale</b>	<b>Mean</b>	<b><math>\sigma</math></b>	<b>CA</b>	<b>DV</b>
Relevance/Integration	4.2	0.64	0.8	0.30
Critical Voice	4.8	0.26	0.8	0.09
Negotiation	4.3	0.53	0.8	0.37
Cohesiveness	4.7	0.53	0.8	0.21
Involvement	4.2	0.50	0.6	0.41
Control	3.7	0.76	0.8	0.24
Open Endedness	4.4	0.52	0.6	0.37
Environmental Interaction	4.4	0.42	0.7	0.17

**Table 4.3 Pre-Preferred Results**

<b>Scale</b>	<b>Mean</b>	<b><math>\sigma</math></b>	<b>CA</b>	<b>DV</b>
Relevance/Integration	4.2	0.42	0.6	0.16
Critical Voice	4.7	0.35	0.7	0.33
Negotiation	4.1	0.57	0.7	0.40
Cohesiveness	4.6	0.41	0.7	0.32
Involvement	4.1	0.60	0.7	0.35
Control	3.8	0.75	0.8	0.47
Open Endedness	4.3	0.56	0.7	0.44
Environmental Interaction	4.0	0.67	0.7	0.37

**Table 4.4 Post-Preferred Results**

<b>Scale</b>	<b>Mean</b>	<b><math>\sigma</math></b>	<b>CA</b>	<b>DV</b>
Relevance/Integration	4.6	0.47	0.7	0.26
Critical Voice	4.9	0.19	0.8	0.14
Negotiation	4.7	0.43	0.7	0.44
Cohesiveness	5.0	0.16	1.0	0.42
Involvement	4.6	0.43	0.6	0.46
Control	4.7	0.49	0.7	0.59
Open Endedness	4.7	0.39	0.7	0.58
Environmental Interaction	4.6	0.39	0.7	0.53

Comparing the previous year's class to the ES 10 class (first comparison, see Figure 4.1) shows the students' ranking of each learning environment and how the ratings differ between the two classes. Figure 4.1 demonstrates visually the difference in

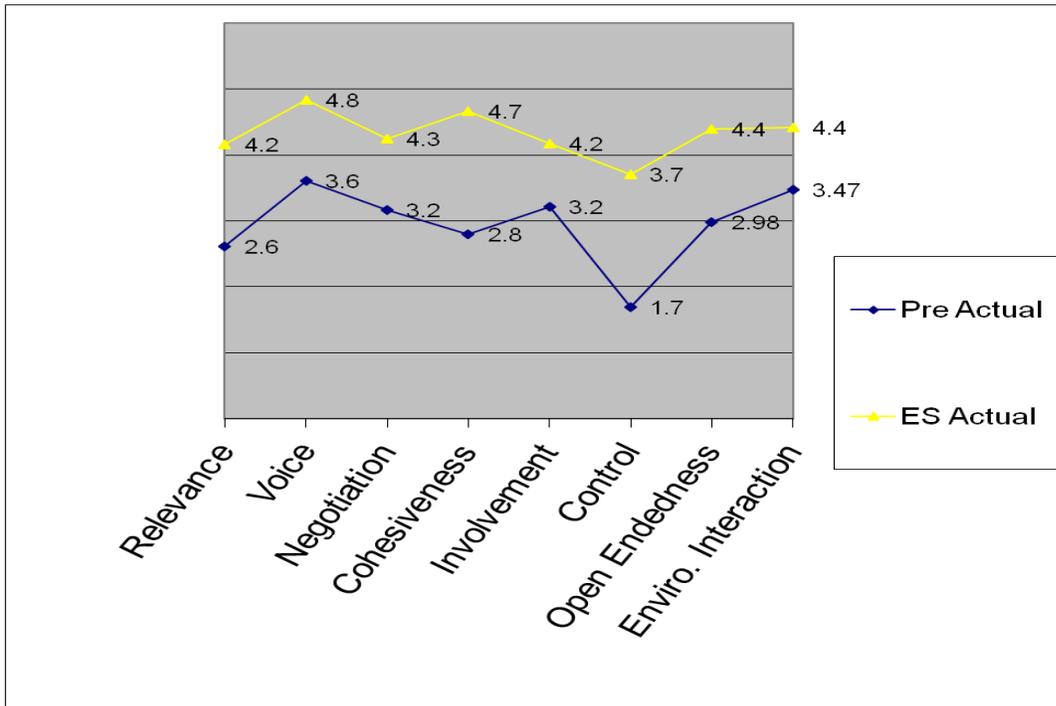
student satisfaction with the learning environment between the traditional class in the previous term and the ES 10 class. The second comparison (see Figure 4.2) shows how the ES 10 class closely matched the students' preferred learning environment. According to Fraser (1998), the closer the match between these learning environments, the greater the learning. The third comparison (see Figure 4.3) shows that the students' expectations of their learning environments had also increased. It also shows what the students identified as being personally important with respect to what they wanted their learning environments to look like in the future. The last comparison shows all four data sets (see Figure 4.4). This illustrates that the pre-preferred, post-preferred, and ES-actual have very similar values, whereas the pre-actual values are considerably lower.

### ***First Category: PLACES Questionnaire***

#### ***First Comparison: Pre-Actual and ES-Actual***

One of the most significant findings in this research was found in the comparison between the pre-actual (student perceptions of the learning environment they had experienced in the previous term) and the ES-actual (student perceptions of the learning environment they experienced in the ES 10 program). The PLACES scores on the ES actual were consistently higher (see Figure 4.1) than those for the pre-actual. The greatest difference was in the shared control scale (2.0 points) and the smallest difference was in the environmental interaction scale (.94 points). This clearly shows that the students perceived their learning environment in the ES program more positively than their previous classroom experiences.

**Figure 4.1 Pre-actual vs. ES actual comparison**



With respect to scoring on each scale, anything below 3 is unsatisfactory, 3 to 4 is good, and above 4 means the students are very satisfied (Zandvliet, 2007). As shown in Figure 4.1, results indicate that the students did not perceive their regular classroom (pre-actual) as having a positive learning environment with respect to four out of eight scales (relevance/integration, cohesiveness, student control, and environmental interaction). The remaining four are slightly above satisfactory. In the ES 10 program, all scales are above 4, with the exception of one at 3.7 (shared control scale), which is in the satisfactory range.

*Relevant Qualitative Data*

Qualitative data support the students’ higher satisfaction with the ES 10 program versus their previous traditional classes. These data were retrieved from the statements students wrote for the final debriefing question, “How have you changed during this term?” Examples of these students’ answers are listed below:

- “My attitude towards learning has changed. Before this class I used to think of school as a burden. This program has made me want to come to school every day” (Liam).
- “I want to learn. I remember stuff better” (Caitlyn).
- “Before this class, school hadn’t been fun or interesting since grade 2” (Celeste).
- “I like coming to this class. . . . ES isn’t a slacker class. [It] made school enjoyable” (Bob).
- “I’ve become more responsible in my schoolwork and trying to learn, not just for the grades” (Carmen).

#### *Additional Supporting Data*

Additional data that support greater satisfaction with the ES 10 program were the attendance records. These were attained directly from the teacher. The attendance scores in the ES 10 program indicate an almost perfect attendance record for all the students. The expectation of attendance in this program was the same as any other class in the school.

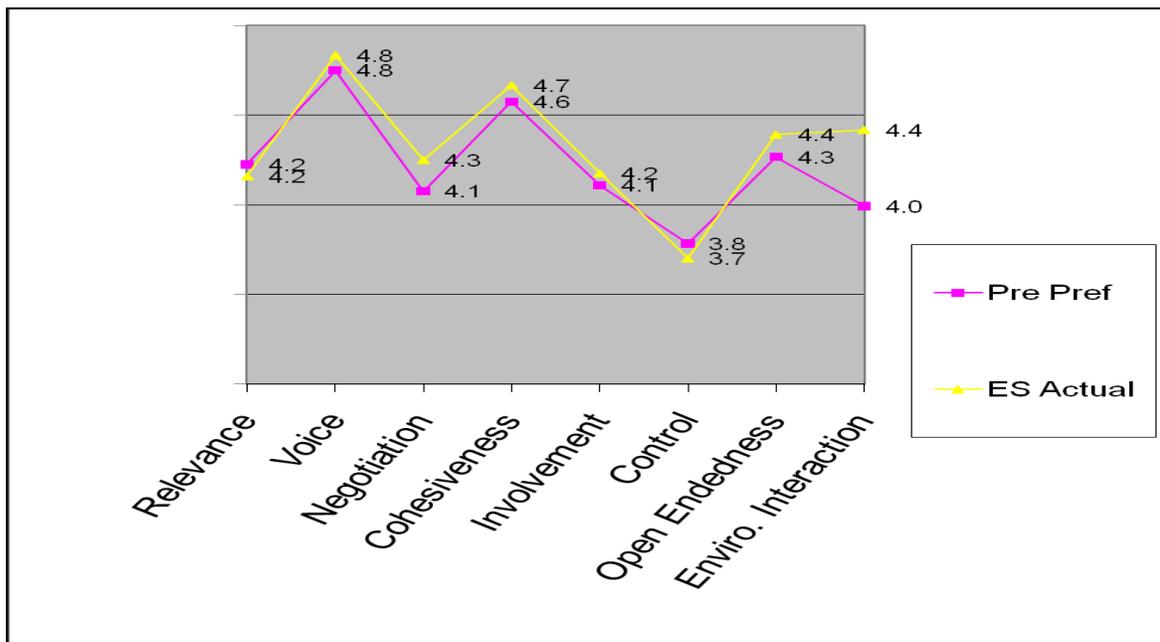
#### ***Second Comparison: Pre-Preferred and ES-actual***

The next comparison, shown in Figure 4.2, is the students’ ratings on the PLACES scale prior to their participation in the ES 10 program (pre-preferred) and their ratings on PLACES after attending ES 10 (ES-actual). The difference between these two categories was minimal. The greatest difference was in environmental interaction (.43) and the least difference was in the relevance/integration and student involvement scales (-.07 and .07, respectively). The environmental interaction difference was actually in the positive direction, meaning that the students’ ratings indicate that they received more interactions than they preferred.

This type of discrepancy can be negative (getting too much of something or more than one wants), but in this case, it is because prior to the program, the students could not imagine having that much environmental interaction. Two factors support this theory. First, students did not complain about going on field experiences. Second, on the post-preferred instrument, the scores matched closely to the ES-actual scores (4.6 and 4.4, respectively). These results may indicate that students were more aware of the possibilities regarding environmental interaction and wanted even more exposure in this

area. On six out of eight scales, the ES-actual scores were higher than the students pre-preferred scores. Although the scores were higher, they are very close. According to Fraser (1998), as the actual learning environment scores approach the preferred learning environment scores, a higher level of learning and interest in learning should be observed. This validates the results shown, because the actual and preferred scores were similar and the student results indicate greater interest in learning.

**Figure 4.2** *Pre-preferred vs. ES 10 actual comparison*



*Qualitative Supporting Data*

The above observational data coincide with students' written responses. These data were retrieved from direct observations of student behaviours and discussions with the teacher about the students' behaviour. For example, the students spent more time in the classroom working on assignments. The majority of students would arrive before the start of the class to work on projects. They would also work during lunch and after school. As the semester progressed, more students participated in this pattern of behaviour. Discussion with the teacher determined that this was not required; it was the students' choice. In fact, towards the end of the semester, I observed the teacher insisting that the students leave the classroom at the end of the day, so that he could go home. In the mornings, I observed large numbers of the students waiting at the door to

get into the classroom. It was also common to observe students doing work on professional days. During the field experiences, I observed all of the students voluntarily working late into the evening on journals and assignments. By the second and third field experiences, the general social expectation was to work on class studies without distractions.

#### *Additional Supporting Data*

Through discussions with the teacher, I discovered that the quality of work in all students had increased over the same time period. The academic results support that the ES 10 program assists in a greater understanding and knowledge of material, because students scored higher on provincial exams (about 4% better than the school average: 68% vs. 72%). In the pre-selection process for students into the ES 10 program, grade point average was not a determining factor. In fact, it was mandated by the school administration to take in one student at risk of dropping out of school. Therefore, the higher averages cannot be attributed to having a select group of students with higher grade point averages.

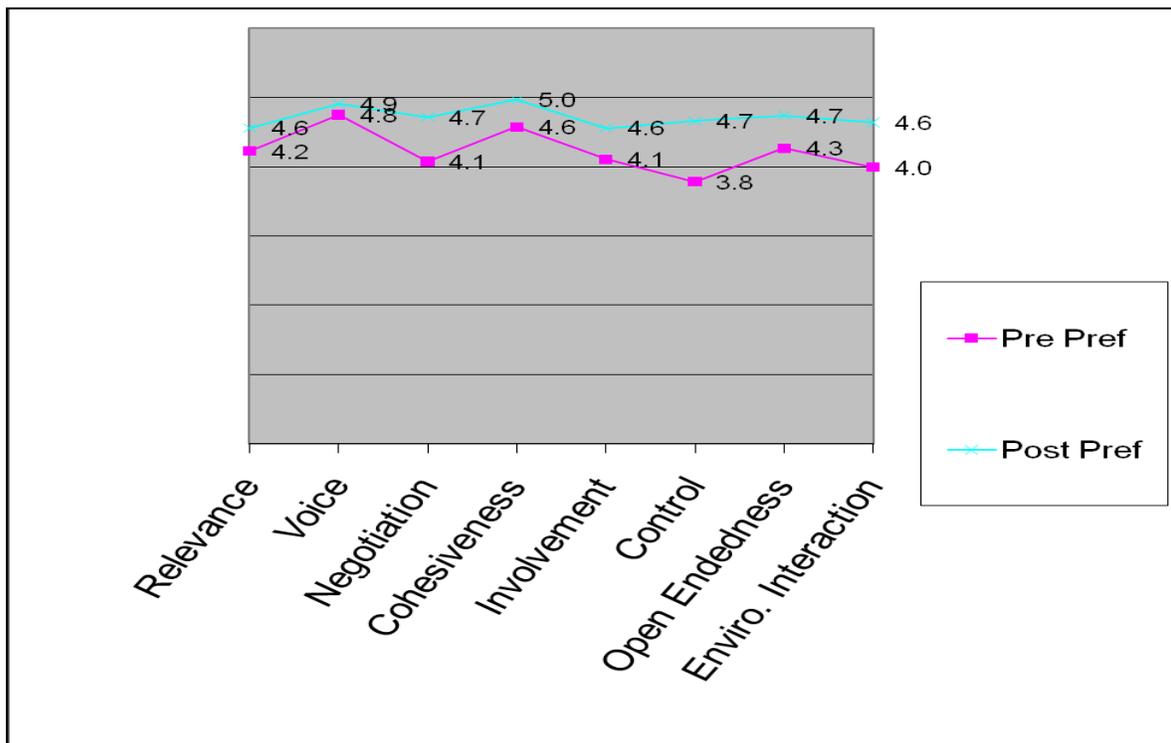
Discussions with parents also revealed supporting evidence for change. During drop-off times at the beginning and end of school hours, the parents commented on an observable change in their children relating to better study habits, including the willingness to study and motivation to initiate study groups. The parents' comments included such statements as, "What have you done with my child? They actually are studying—thank you!" Therefore, the qualitative data strongly support the hypothesis that when the students preferred and actual learning environments match, they show an increase in their desire to learn and understand the material.

#### ***Third Comparison: Pre-Preferred and Post-Preferred***

The next comparison was between the students preferred learning environment ratings on the PLACES instrument prior to and following their experience with ES 10 (see Figure 4.3). From these results, one can postulate that the level of expectation (preference) the students had for their learning environments had risen because their post ES 10-preferred scores had increased. Once again, there was an increase across all scales. The greatest amount of increase was in the shared control scale (.87) and the

least amount of increase was in the critical voice scale (.16). The critical voice scale increased minimally because it was already at its maximum, 4.9 out of 5. However, the shared control scale increased significantly, indicating that the students wanted more control over future learning. The quantitative evidence (scores on the pre-preferred shared control scale) suggest that students found having this much control prior to the ES 10 program to be unimaginable.

**Figure 4.3** Pre-preferred vs. post-preferred comparison



*Qualitative Supporting Data*

At the beginning of the ES 10 program, I observed Mr. G giving students control over the explicit curriculum delivery, content, and timelines. The students were involved in mapping out a timeline on a large piece of paper (3' x 10') with field experiences as the core entity. Learning outcomes were added by the students in sectional pieces on sticky notes to each of the field experiences. The learning outcomes for Science 10, Earth Science 11, Social Studies 10, Planning 10, Leadership 10, and Physical Education 10 were all situated on the BC Ministry of Education website (<http://www.bced.gov.bc.ca/irp/plo.php>).

Extension activities developed from this to address the missing learning outcomes. These activities were special one-day field trips that usually put closure to lessons. For example, a trip to West Vancouver was organized to view rock formations for Earth Science 11 and to view the Fraser River delta (relating to depth positional weathering). The lesson began with a canoe trip, during which these concepts were introduced, and finished with the trip to West Vancouver. On a week-to-week basis, the teacher would post the week's learning objectives on the board, and then the class would map out the week's agenda. Chalk was used for the purpose of changing the schedule with ease. For example, at times the class would rearrange the schedule around one person if that individual had a previous commitment (e.g., a sporting event or drama performance). On other occasions, the schedule was altered due to unforeseen opportunities. After experiencing this high level of control, the students wanted more control, as their post-preferred results indicate.

On the post-preferred questionnaire, the group cohesion scale mean was 4.97. This scale had the highest score rating. With the exception of one student, all students scored 5 out of 5 on all the questions within that scale. There are three major observed behavioural indicators (qualitative data) that reflect the high level of cohesion within the group. The first was the tendency for students to exclude other students that were not involved in the ES 10 program during lunch and after school. For example, during the first two weeks of the program, some students had friends from the previous semester visit in the ES 10 classroom or would visit with these friends elsewhere. Although some change was observed before the first field trip, after the first field trip a dramatic shift was observed: most non-ES students stopped visiting, while most ES students remained in the classroom for lunch. However, segregation within ES 10 into groups continued while eating lunch (e.g., sporty group, at-risk group, academic group, etc.). Following the second trip, there were no longer any distinguishable subgroups and no visitors to the classroom at lunch times. It was apparent that the students were more comfortable blending with each other during social times and in academic work groups. At around the same time, a shift in attitude towards learning and studying occurred.

The second indicator of group cohesion was the community mapping project. This project was initially done in the first week of class. The students were asked to draw their community (what or who they considered important to them) on a large piece of

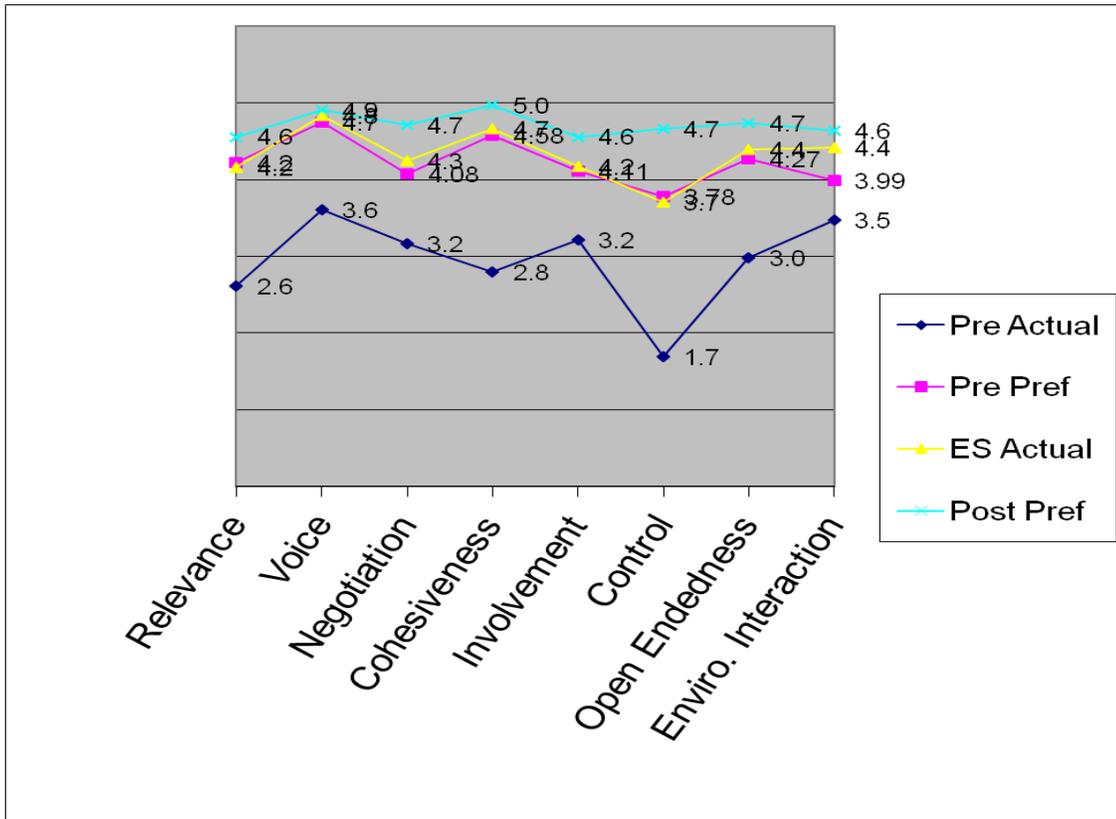
paper. At the end of the program, they were given an opportunity to update or change their map. When the students had the opportunity to update their map, 90% of the students added the class as an important part of their community; the other 10% already had it as part of their community.

The last major indicator of cohesion was found in the comments the students either wrote in their reflections or stated verbally. Comments listed below are some examples of how students perceived cohesiveness within the class:

- “It’s almost like a second family” (Peter).
- “Our class is like a big family and we get along well with each other” (Lucie).
- “The class was a large group of friends” (Liam).
- “I came into this program with a friend, and came out with a family” (Noah).

This concept of “family” was constantly used throughout the semester during many conversations and in the yearbook. All the students at one time or another either wrote or mentioned this family concept. Upon reflection and discussions with colleagues, this high level of cohesiveness or hyper-cohesion is something that I have witnessed within this type of program on numerous occasions. It is on some levels very exclusionary to non-ES 10 participants, but I believe that this cohesion is the key to success for this type of program. I discuss this more in Chapter 5.

**Figure 4.4 Comparison of all four PLACES questionnaire results**

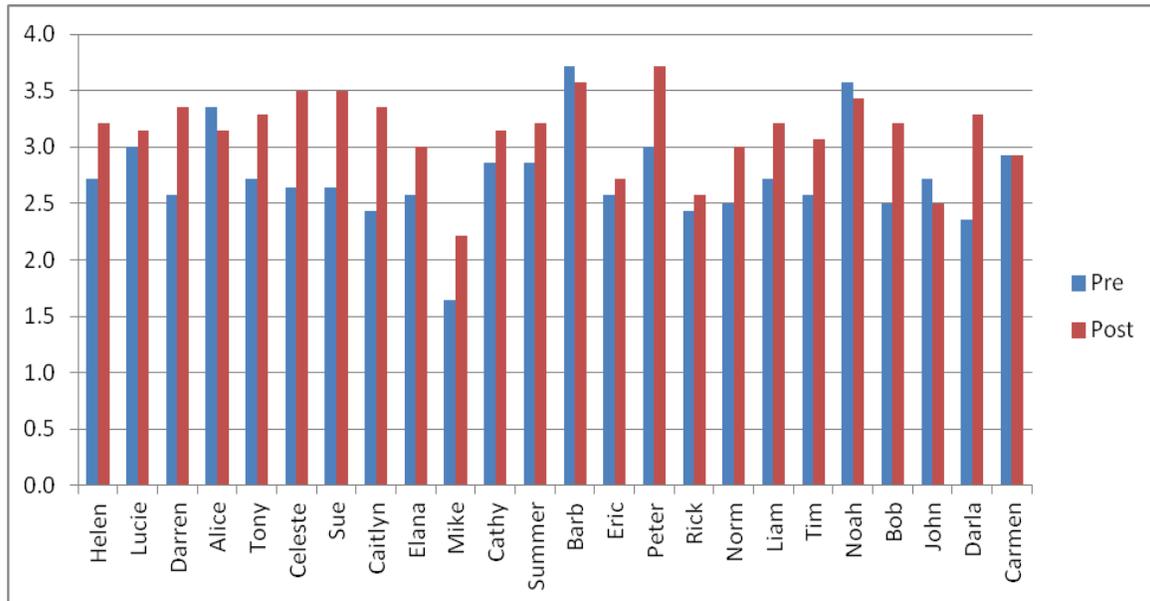


This comparison indicates that the pre-preferred and the ES-actual have very similar values, and the pre-actual values are considerably lower.

**Second Category: Mindfulness Questionnaire**

The data from the mindfulness questionnaire (pre and post) showed an overall increase in mindfulness scores with a mean increase of 0.4 (from 2.7 to 3.3). This translates to a 10% increase in the class mean. Individually, the greatest increase a student had was 0.9 (23%), and there were four students who scored lower in the post-ES 10 instrument by 0.2 (5%). The standard deviation for the pre-mindfulness results was .42 and the post-mindfulness results was .35. Figure 4.5 shows the distribution of the data.

**Figure 4.5 Mindfulness pre- and post-ES 10 comparison**



### **Qualitative Supporting Data**

The qualitative data that complemented the measured increase in mindfulness included students' comments, observed student behaviours, and post-trip self-evaluations. Some of the comments students made in their closing reflections and journals included the following:

- “I’m more focused and in tune better with my listening” (Caitlyn).
- “I have become much more aware” (Noah).
- “I am more open to any situation” (Sue).
- “I am able to pay attention a lot more easily” (Liam).
- “I’ve become more caring, . . . more aware of my environment. . . . I realize what’s wrong around me & am more conscience [*sic*] to litter, pollution etc.” (Summer).
- “I’ve learned to be more observant about things, situations, news, environment etc.” (Mike).
- “I have become more open” (Alice).
- “[I] look at different situations, with different perspectives” (Carmen).
- “I see things differently now, I now see what goes on around me” (Rick).

- “Normal school made me close minded” (Helen).

The behaviours that were observed and inferred as indicators of mindfulness included the students being more aware of other students’ needs (for example, I heard students say, “Do you need help with that?” and “Does that make sense to you?”—referring to academic understanding); being more responsible towards the environment (picking up garbage that did not belong to them, recycling other people’s bottles, arranging carpools, stopping use of non-reusable water bottles); and trying to make other people environmentally aware (students and parents told me that the students were making changes in the home, such as setting up recycling, consuming less water, and turning off lights and appliances that were not being used).

The teacher used post-trip self-evaluations to help students develop their own evaluation skills in regard to their interactions with others. These evaluations provided an outlet to self-reflect and learn from lived experience. The process involved each student completing a post-trip evaluation following which the teacher would provide feedback on how well they evaluated themselves. There were four categories in the self-evaluation: participation, responsibility, learning opportunities and personal growth, and commitment to the group. I believe that by learning to evaluate themselves with regard to their actions, the students became more aware of their impact on others and became more mindful of their actions towards others.

In the beginning of the term, most students were generous with their self-evaluative remarks. A couple of students stated, “I picked up some garbage around the camp site,” or “I helped someone,” leading to a self-evaluation of full marks for being responsible or committed to the group. What most students missed initially was the act of being responsible or committed throughout the trip. With feedback from the teacher, the students began to realize that responsibility and commitment were important aspects of daily activities. By the last few trips, self-evaluations were more accurate, and positive behaviour changes occurred. Comments such as, “I helped anyone that needed help,” or “I always made sure the camp/kitchen was cleaned up well” were more prominent. Since the teacher was reviewing these self-assessments, the students would have noticed the expected language, and it could be argued that they just learned how to answer the self-

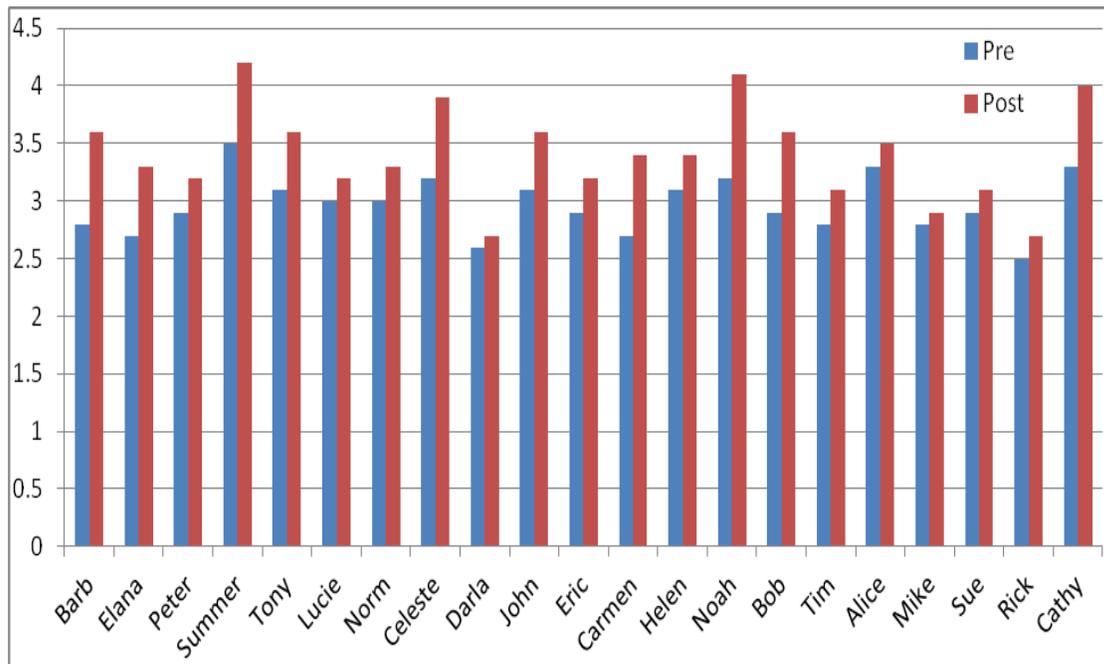
evaluation forms. However, observed behaviours concurred with the written assessments.

Having students keep personal journals helped them reflect on their activities as well as on their actions throughout the day. The student journals were not typical blank-paged books; they were custom made for the program with specific documents embedded in them. The journal had sections for each trip with questions, and it also had blank pages for personal journaling. This type of practice helps one learn how to reflect and become more mindful (Langer & Bodner, 1995). I believe that the language the teacher used also contributed to the students becoming more mindful. He would give the students information and preface it with, “This is the perspective of \_\_\_so \_\_\_ and \_\_\_so\_\_\_,” or he would make comments such as, “It could be that way.” These two techniques of perspective and non-absolutes allow the students to be more creative and mindful of all possibilities (Langer & Moldoveanu, 2000), again helping the students develop their mindfulness. The results from the final debriefing question support these findings. Comments made by the students included, “I’ve learned to be more observant about things, situations, news, environment etc.” (Mike), and “I have become much more aware of our planet and the need to protect it” (Noah).

### ***Third Category: Ecological Attitude Questionnaire***

The data for the Ecological Attitude Questionnaire (pre and post) showed an overall change in attitudes towards the environment with a mean increase in a positive direction of 0.44 (the pre-class mean was 2.97 with a SD of .25, and the post-class mean was 3.41 with a SD of .41). All students showed a positive change in attitudes and behaviours towards the environment. Individually, the greatest increase shown by a student was 0.9 and the smallest change increase was 0.1. Figure 4.6 shows the distribution of the data.

**Figure 4.6** *Ecological attitude questionnaire pre- and post-ES 10 comparison*



### **Qualitative Supporting Data**

Observable behaviours toward the environment coincided with students' comments on the attitude questionnaire. Behaviours changed as the semester progressed. Observations were made during field trips and in class. Student behaviour towards cleaning up, recycling, and consumerism were the most obvious and prominent. First, the packing and unpacking of camp and the bus became faster and easier as individuals pitched in and made sure that everything was cleaned up and put away (not just dealing with their own belongings). Reminders for cleaning up were no longer necessary, and general garbage clean-up was done by all the students. The campsites and bus were left spotless after the trips. Food brought on later trips was healthier and more environmentally friendly (e.g., recyclable packaging, in-season fruit, bought from socially responsible companies). Recycling became essential, and students reduced their environmental impact (e.g., brought their own water bottles that could be refilled). More students began riding their bikes to school, and there was discussion among the students to increase their positive environmental awareness. Students started recycling

at home, changing their parents' behaviours; this was both self-reported and validated by parent comments.

Basically, most of the students shifted from just looking out for themselves to helping one another and looking out for the environment. Beyond the environmental attitudes, there was a change in their attitudes towards school. One of the biggest changes was seen during class time, where the students helped one another academically. Students willingly helped other students without being asked to do so, and the help was always appreciated. Their comments on the final debriefing question also acknowledge their changes in attitude and behaviour. Some of the comments included the following:

- “I have a greater understanding and more care for the environment. . . . I feel like I should take action” (Caitlyn).
- “[I’ve] become more aware of my surroundings and the impact I have on it (environment & people)” (Carmen).
- “I was never really that interested in what was going on in my community, but now I feel like becoming more of a part of it” (Celeste).

These comments hint that some of the students had changed their attitudes and that they are wanting to change their behaviours. It also shows that their awareness is not solely focused on the environment.

### ***Qualitative Trends***

The next part of the chapter focuses on the qualitative trends revealed in the data. These data come from my direct observations, post-trip evaluations, journals, and final reflection question.

One of the most compelling observations throughout the program was the development of the group itself. From the onset of the program and throughout the remainder of it, the group continued to grow closer and closer. On the first day, I observed the teacher employing strategies that directly influenced the development of group dynamics. These included introductions; name games; ice-breaker activities, such as finding three things in common with other students; trust activities, such as the human conveyer belt (see Figure 4.7) or a three-person trust fall, where the person in the middle

pretends to be a pendulum and trusts the other two to catch him or her; and group cooperation activities.

**Figure 4.7 An example of the human conveyer belt.**



This photo is an example of the human conveyer belt. One person at a time is passed along. Everyone gets passed down the belt and everyone participates as the belt.

For example, in the human knot, a small group of 6 to 12 people reach across and hold hands with two other people. Then they try to untie the knot, by stepping over, under, or around one another. Throughout the first week these activities continued, as well as low ropes course activities (see Figure 4.8).



**Figure 4.8 Ropes course.**

This photo is an example of a low ropes course problem. In this situation, the group needs to move from one stump (the start) to the end without touching the ground. They can use only two crossbeams to walk on. These types of problems require communication, teamwork, and cooperation

in order to succeed. Low ropes courses also pose minimal physical risk to the students, as opposed to high ropes courses.

The observed behaviour in the group showed increased friendliness among the students and towards the teacher. The students were joking around with and supporting one another. Comments like "Well done," "Good job," or "Nice effort" were used by most of the students. Other types of activities were added throughout the program that increased the group cohesiveness including high ropes course activities, rock climbing, higher risk trust activities, group problem-solving activities, and overnight trips.

Discussions with the teacher indicated that these were specifically planned to contribute to the group cohesion. As student post-trip evaluation comments indicate, the overnight experiences had some of the greatest impacts on the group. Below are some of the comments expressed by the students after the first trip.

- "No one wanted to leave on Thursday [to go home]. I heard at least 5 people say that this is their second family—I feel that way now" (Summer).
- "I really got to know many of my classmates" (Alice).
- "I now feel a lot closer to everyone in the class" (Cathy).
- "Have gotten closer to the class" (Elana).
- "I feel everyone is a lot closer as a group" (Mike).
- "I found out things about others I never thought I would know" (Sandra).
- "I learned a lot about my group members" (Noah).
- "I think I am closer to the people around me now" (Helen).
- "I feel a lot closer with people since the trip" (Darla).
- "We created a better group relationship for the next trip" (Norm).

After the last trip, the comments included,

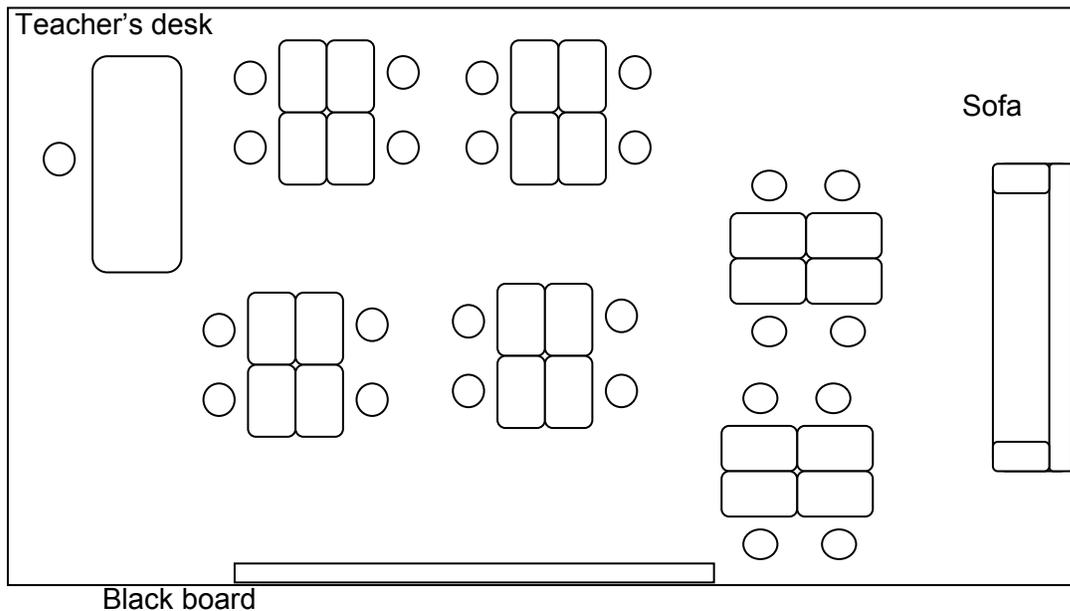
- "With each trip we get closer" (Alice).
- "I did however grow in friendships through this trip" (Rick).
- "I personally felt that I've grown more during this trip, I trusted my classmates more" (Mike).
- "My personal growth in relationships, to my commitment, to the group and others around me increased" (Noah).
- "This trip I committed to the group 100%" (John).

- “I think our whole class got closer over this trip. Everyone was supporting each other” (Peter).
- “Now all of us are much more family like” (Barb).
- “[I] was very committed to the group” (Sue)
- “I feel I grew a lot with the group. I really committed to the group and made sure whatever I did was beneficial to everyone” (Cathy).
- “I believe that my relationship with the group has strengthened throughout this trip” (Elana).
- “I think that every time the group does an activity, big or small, it grows and becomes a better functioning system altogether” (Norm).

The initial trip comments reflected feelings of getting to know one another through gaining insights into one another’s lives and becoming closer as a group. By the last trip, the comments dealt with personal growth through group relationships and commitment. During the field trips, I also observed the amount of quality time the teacher was able to give individual students. The field days started at 7 am or 8 am and went through until 9 pm or 10 pm, which is much more time than regular school hours. The students and the teacher had much more time to get to know one another.

Another factor contributing to group cohesion was the physical arrangement of the classroom itself. The classroom seating arrangement was made up of pods, and each pod had four tables (see Figure 4.9). Note the sofa in the classroom; this added a different ambiance. As well as the layout of the classroom, the fact that it was actually a portable building separate from the main school was important. This gave the program greater autonomy from the main school and the culture within it; as Mr. G commented, “It’s a school within a school.” This made it easier to operate outside the regular school hours, as was often the case.

**Figure 4.9** ES 10 classroom layout.



The majority of observed class time the students worked in groups, and the evaluations were done in a group format that consisted of projects, presentations, and oral exams. The projects and presentations were partly evaluated on the quality of the teamwork. The students rotated through the pods every three weeks in order for each student to have the opportunity to work with everyone. This was mandated by the teacher. However, for some of the projects, the students were allowed to pick their own partners. Time restraints were imposed on some assignments, making it almost impossible for any one individual to complete the assignment alone. The idea behind this tactic was to make sure all the students were contributing to the assignment and that this stress of limited time forced them to work efficiently. The comments on the final debrief indicate that this helped in group work:

- “I learned to trust others and give up my control” (John).
- “I work a lot better in a group” (Barb).
- “This group has made me more people friendly like working or while under pressure. I’m now more able to let other people choose their own decisions. I guess I’m less controlling” (Barb).

However, other types of time restraints were not observed. For example, class time did not run on 50-minute or 90-minute blocks. The teacher would teach until the unit or topic was covered. If the students appeared disinterested, then he or she would change subjects. This was the first year for Mr. G to be co-teaching with Mrs. O. Prior to this, Mrs. O had no experience in teaching within an integrated experiential program, so she was getting a lot of direction from Mr. G, almost being a participant more than a teacher in some situations. She taught the social studies and some of the planning and PE. During a conversation with her, she told me that it was difficult not to do things for the students; at times; Mr. G would have to remind her not do the work for them. She understood why she needed to stop aiding the students, but it was difficult to change her past habits.

Another interesting observation regarding group dynamics was the amount of free time the students spent in the classroom. After the first trip, there was a dramatic increase in the amount of free time students spent in the classroom. Within the first two to four weeks, the amount of free time spent in the classroom went up considerably. Initially, there were only three or four students remaining in the classroom during lunch. Within three to four weeks, almost all of the students were spending their lunchtime in the classroom. By the middle of the program, a vast majority spent time in the classroom before and after school as well. I also observed that friends not enrolled in ES 10 were excluded from spending time in the classroom, although initially some friends of the ES 10 students were spending their lunchtime in the classroom. However, almost immediately after the first trip, those friends no longer came by at lunch. I never raised this point for discussion during the program, because I did not want to interfere with the natural consequences of the program. Towards the end of the program I did, however, have some general conversations with a number of students about their after school programs and friends. In general, the ES 10 students did some activities together after school, mostly school-related studying or project work, with some extra-curricular activities, but they still did things with their other friends as well. However, during school time, the ES 10 group stayed together, with little interaction with outside members.

I video recorded a number of the large group class discussions throughout the program and observed the others. The discussion topics for these sessions included global warming—what is it, what causes it, how does it affect our weather; sewage

treatment plants or lack of treatment (interconnectedness); forestry practices; and parliament and our legal system. Initially I noted that some students were not participating in those discussions. As the school term went on more and more of the students contributed to the discussions. By approximately mid-way through the term, almost all of the students were contributing. At about the same time, I also noticed that students were having small group or paired discussions about the same topics. Toward the end of the program, I noticed that all the students were talking to one another regardless of their personal interests, hobbies, or friends. There appeared to be no subgroups within the class.

During the first week I observed the teacher explaining to the class, "This class is not 24 students and two teachers; it is 26 individuals that will go through a process of learning over the next five months" (Mr. G, personal communication, February 6, 2007). He explained to the class the need for individual responsibility relating to their education and that he was a resource and a learner as well. Initially the students did not really understand what he meant by this, an observation confirmed in conversations with the teacher. However, as the semester progressed students' began to understand how they could take responsibility and direct some of the learning towards their personal interests. They began requesting topics of interest, such as astronomy, specific natural history, marine biology, forestry practices, and paleontology. As the teachers accommodated these requests, more students added their ideas for topics. During that first week Mr. G also gave the students Kolb's (1984) learning styles inventory (LSI) survey. Interestingly most of the students were divided up between the second and fourth quadrant (22). With eight in quadrant 2, seven in quadrant 3, and six in quadrant four. Only two students were in quadrant 1. Appendix F shows the detailed distribution within the four quadrants.

The students were allowed to study while sitting on the sofa instead of their desks (not all the time). This was interesting because the sofa could only accommodate a few students, so it was first come first serve, but there seemed to be an understanding that they needed to share so that everyone had a turn. There were no rules set in place but it seemed to work, only on occasion did the teachers have to intervene and this was only early on in the program. During a conversation after the program with Mr. G, he said that there was a communal understanding regarding the sharing of the sofa and that there was a level of mindfulness of other students. He also said that there was an

understanding of personal responsibility towards the overall functioning of the classroom and other rules. For example cleaning up after themselves, returning equipment and supplies to the proper places. It also included expectations of behaviours in class and on trips. For example, lights out and no alcohol on trips. Mr. G never had to do bed checks or search bags for alcohol. The students would not jeopardize breaking any of the rules because they did not want to be removed from the program (self-reported by the students in a conversation after the program). There were no issues of this sort during the entire program (or they were extremely good at keeping it a secret—which is highly unlikely).

Students were allowed to listen to music (on personal devices) while doing independent study and were allowed to go to the library to work on projects. I never observed the students abusing these freedoms or classroom arrangements. They appeared to respect the responsibility for getting their studying done and they worked hard at getting it done. I heard the students say, “I’m not doing it for marks, I’m doing it for me” (Tony), and “I don’t want to disappoint Mr. G. I am going to try extra hard” (Peter). Comments on the final debriefing question included the following: “I’ve become more responsible in my schoolwork . . . not just for the grades” (Carmen); “I like coming to this class” (Eric); “I have been looking forward to coming to school” (Darren); and, “I work harder in school” (Summer). Discussion with the parents also supported the students' increased enthusiasm towards learning. These comments included, “My son/daughter was actually studying”; “On Sunday night my son was excited, because ES-10 was the next day”; and, “What have you done to my child? They are interested in school!”

Related to this idea of responsibility for learning, the teacher would say, “Raise the bar.” This became a motto within the program, and the students began saying it to one another frequently. This motto was applied to everything the students did, from academic to physical activities. It appeared that all the students embraced this because they all were saying it and they would try harder if someone said it to them. A very good example of this was during the field trip to Squamish, one of the days involved rock climbing and a high ropes course challenge. The challenge was getting a rope across a ravine and then getting the whole group to the other side. The second group on the challenge course (they did the climbing first) appeared tired and disorganized. The

challenge was not going well, when one of the students said, “Raise the bar people.” Within seconds the group livened up made a plan and implemented the plan successfully. The motto seemed to influence not only the motivation but also the level of expectation.

The expectations in the class were high. For example, Mr. G’s policy in the program was that students needed to achieve at least 70% on any written test (the bar standard). If this was not achieved, then the student needed to develop a learning strategy (identify shortcomings and outline a plan) which always included peers as tutors to help them succeed. Students were given an opportunity to re-write exams, when they were ready. On the other side of this was the mulligan concept. A mulligan, a term from golf, is a do-over. If a golfer hits a bad shot, he or she can take a mulligan and replay that stroke. (Mulligans are never legal under the rules of golf tournament play. They are most often employed during friendly rounds with golf buddies or during charity tournaments, where they are sometimes sold.) Mulligans were given to students who somehow enriched the learning experience by adding something that went beyond what was expected from them. This could be information from extra reading, being extra prepared for a particular study, offering innovative ideas, etc. In the ES 10 program, if students received a mulligan, they could assign it to the subject of their choice. Mulligans represented a percentage point they could use towards any subject as bonus marks.

A trend I discovered during the initial coding of the written material was the students’ development of self-esteem and self-confidence. The self-concept is how we think about ourselves; self-esteem, is the positive or negative evaluations of ourselves, this is an overall evaluation of how one feels about oneself. Self-confidence relates to assuredness in one’s personal judgment, on specific abilities. Each time the students went on an adventure activity they appeared to have more self-confidence and self-esteem. This is supported by the students’ journal entries and final debriefing question comments.

- “I am more confident in myself and others—my self-esteem has gone up” (Helen).
- “I have learned that if I put my mind to it I can do anything” (Alice).
- “I’m now able to put more trust into myself” (Cathy).

- “I am more confident in meeting new people” (Bob).
- “I sometimes need to take a role in a situation” (Tim).
- “I’ve been more outgoing than ever” (Norm).
- “[I have] a higher level of self-confidence” (Celeste).
- “Now I try to take chances and I’ve been more outgoing than ever” (Norm).
- “I am more open to try new things. . . . I am more confident in myself” (Caitlyn).

The majority of students commented that they had increased their self-confidence and that they wanted more adventure in their lives. They also said they were willing to take more chances and try new things.

### ***Discussions With Mr. G***

Throughout the entire research project, Mr. G and I discussed the program and the students. I have included most of those discussions in the previous chapters, but there were some that have not been included. Therefore, I include them here. One of the first discussions was on the selection of candidates for the program. Mr. G said,

The five questions I ask the candidates are: 1) What is the number one reason why they wanted to become part of the experiential studies program? A lot of them talk about the social interaction because they are together for one semester. 2) What is it about school they like and what they don’t like about school? One of the things they like about school is the social component and the things they don’t like about school are getting up early and a few other things. 3) Because it is such a big team concept, we are always doing tasks in a team environment and working within a group setting, being able to put aside their difference for the sake of the group is huge, its important. So one of the questions I ask them is, “What is one good quality or asset they can bring to the group that everyone could benefit from?” Then I also ask them what is one thing they need to work on, or something they need to improve on? (everyone has things to improve on). 4) Then I ask them a big thinking question. 5) I also ask them about their extracurricular activities, things they are involved in outside of school. I want to find out what they’re involvements are, what they’re status is, are they volunteering here and there, how active are they, what are they doing, what are their passions? These are important things! Then I ask them the big thinking question in the end, I ask them—If you had the power to change anything in this world, it could be anything, to make the world a better place to live in, it could be global, it could be local, it could be community, it could be at school, it could be anywhere, but you had the power to do and you would make a difference

What would that one thing be? That's a tough question for some of these kids. Then I rank it.

Me: What are you looking for?

Mr. G: What I am looking for, sort of like selfless things, things that are not just about me, me, me, me (referring to the student). More about, I want to be a part of something bigger, not just about me, something outside of myself. So if I see an indication of that in their description, then that helps me determine that this kid is a really good candidate.

Me: During the first week you spend a lot of time on group activities. Why?

Mr. G: We spend a lot of time on group dynamics because we spend a lot of time working in groups throughout the year. Most of the academic work is done in groups. In the first week, we actually spend more time developing the group than we spend on academics. The trust activities are also very important. However, you have to continually develop or nurture the community feeling, it is not just something you do at the beginning of the program and then forget about it. I specifically do things like rock climbing, caving to continue to foster that community feeling. In that first week I get the students to fill out Kolb's learning styles so that I can get them to understand their styles but also to understand how they work with others. Again trying to make sure that the group dynamics are successful. I use that information from the learning styles to make up the first working groups.

This chapter described the pertinent data directly related to answering the four major research questions outlined in Chapter 1. Both quantitative and qualitative data were presented. The qualitative data supported the quantitative results, but more importantly provided some insights as to what helps to make a positive learning environment. This is discussed in the following chapter.

## **Chapter 5: Discussion of Results**

The purpose of this chapter is to answer the four research questions posed in Chapter 1, present future recommendations, and explain the learning process flow chart I created specifically to describe the ES 10 program. The focus of this chapter is on answering the primary question for this dissertation, “What influencing factors and/or instructional practices contribute to students’ perceptions of their learning environment?” I also show how other factors either contributed to or influenced that learning environment. The flow chart provides a visual interpretation of the interactions of the learning environment, the experiential learning cycle, and the learning outcomes. All the recommendations relate to developing a positive learning environment based on the description and analysis of the practices and factors that contributed to the results presented in Chapter 4.

### **Question 1**

Are students' perceptions of their learning experience in ES 10, as measured by the PLACES scores, a school-based experiential learning program, more positive than their perceptions of their experience in regular classes, and how does their experience compare to their preferred learning environment? What influencing factors and/or instructional practices contribute to their perceptions?

The questionnaire results presented in Chapter 4, Figure 4.1, indicated that overall, students did perceive the ES 10 classes as a more positive learning environment than their previous classroom experiences in a selected course. Their preferred learning environment matched closely to their actual ES 10 learning environment. In order to explain this result, I examined all of the scores of the eight different scales from the PLACES questionnaire. The scales included are Student Cohesiveness, Critical Voice, Open Endedness, Student Negotiation, Relevance Integration, Shared Control, Student Involvement, and Environmental Interactions (Zandvliet, 2007). The ES 10 students

rated their previous experience in the selected class with a mean overall score of 2.9/5 ( $\sigma = .8$ ) and the ES program with a mean overall score of 4.3/5 ( $\sigma = .5$ ). According to Fraser (1998), the closer the students' perceptions of their actual learning environment to their preferred learning environment, the more predictive their learning outcomes become, and the better their learning outcomes will be overall. Table 5.0 summarizes all the scales within the PLACES questionnaire and then triangulates these with qualitative data observed as confirming or disconfirming the constructs in the PLACES instrument.

**Table 5.0 PLACES Scales Constructs Strategies Overview**

<b>PLACES Scale</b>	<b>Supportive Instructional Activities or Strategies by ES 10 Teacher</b>	<b>Other Supportive Features of the Learning Environment</b>
Social Cohesiveness	Group processing & adventure-based activities: trust games, low ropes course, problem-solving activities. Overnight experiences.	Placement early in the program sequence. Reinforced throughout the program.
Critical Voice	Teacher explicitly gives students permission to use their critical voice.	Discussed early in the program.
Open Endedness	Group processing & adventure-based activities, problem-solving activities. Debriefing.	Assignments designed to reinforce OE.
Student Negotiation	Group discussions, debriefing sessions, group projects.	Applied throughout the term.
Relevance Integration	Field experiences all relate to curriculum and person relevance.	Applied throughout the term.
Shared Control	Teacher explicitly gives students control over curriculum integration & assignment delivery.  Challenge by Choice	Began early in the program. No time restraints (e.g., 50-minute classes).
Student Involvement	Experiential learning format, with real-world connections.	Cohort format, overnight trips offer more interaction.
Environmental Interactions	Field experiences.	Being outside the classroom.

Fraser (1998) identified the teacher and other students as influencers on the students' perceptions of their learning environments. I discuss the eight scales in order

of importance to the students (based on their highest average score rating) and discuss how the teacher may have influenced the students' rating on the scales.

### ***Student Cohesiveness***

The Student Cohesiveness (SC) scores were higher on average than the scores on any other PLACES scale on both the pre-ES 10 and post-ES 10 preferred questionnaires. This implies that the students perceived group cohesion in a learning environment as being of considerable importance. In ES 10, a cohesive group was developed and nurtured using adventure-based (AB) techniques (Priest & Gass, 1997) and group processing activities (Cain, Cummings, & Stanchfield, 2005). Initially the ES 10 program structure concentrated on students developing group cohesion rather than on the academic curriculum. Activities to create group cohesion consisted of group name games, icebreaker activities, trust games, low ropes activities, problem-solving activities, and group cooperation activities. As Mr. G pointed out, "You have to continually develop or nurture the community feeling. It is not just something you do at the beginning of the program and then forget about it" (personal communication, February 27, 2007). Throughout the program, other activities contributed to group cohesion, which included high ropes course activities, rock climbing, higher risk trust activities, group problem-solving activities, and overnight field experiences. Table 5.1 shows the ratings of the pre-actual, pre-preferred, and ES 10 actual scores. The scores show a considerable difference between the pre-actual and the ES 10 actual.

***Table 5.1 Learning Environment Ratings SC***

<b>Pre-Actual (regular class)</b>	<b>Pre-Preferred</b>	<b>ES 10 Actual</b>
2.8 $\sigma$ =.70	4.6 $\sigma$ =.41	4.7 $\sigma$ =.53

Field experiences early in the program also played a major role in community building by requiring group cooperation and organization of active daily living skills, including sharing meals, working together, and playing together for extended periods of time (greater than the typical class time of 50 minutes). An observable difference in

classroom cohesion was prevalent after the first few field experiences. The class developed into a true cohort as those shared experiences made the group more cohesive, even at the expense of non-ES 10 students.

Some student comments expressed the strong dynamics that were occurring among students, as previously mentioned in Chapter 4. “No one wanted to leave on Thursday [to go home]. I heard at least 5 people say that this is their second family—I feel that way now [too]” (Summer). Helen wrote, “I hung out with people on this trip that I didn’t before and I learned a lot about their personalities, so I now feel closer to the group.” Peter commented that “our whole class benefitted and learned a lot about each other.” The bond was partially developed while socializing during meals and around the campfire, which allowed for insight into one another’s lives. One of the students stated that “now I see that we have more similarities than differences” (John).

There was an observable decrease in non-ES 10 student visits to the ES 10 classroom after the first field experience. On one level, this new dynamic created an exclusionary atmosphere for the non-ES 10 students. However, within the program, the atmosphere was inclusive for all the students. Comfort levels between the ES 10 students increased; they became more at ease with one another and were open to new learning opportunities. The level of willingness to explore and try new experiences may not have occurred otherwise (Priest & Gass, 1997). These new experiences can contribute to growth in students’ knowledge.

Another strategy the teacher used to help build group cohesion was based on the classroom seating arrangement. The tables were in pods of four, so that students faced each other rather than the front of the class. During class time, students mostly worked in groups. They were also evaluated in a group format, which consisted of projects, presentations, and oral exams. The groups rotated every three weeks in order for everyone to work together. Time restraints were included on some assignments to compel the group to divide up tasks. This was intended to help the group build trust and work more efficiently. The students’ comments supported this theory: Mike commented that “I’m now able to put more trust into myself and my classmates, we’re able to work together as a team. This seemed to have built up from all those trips and team initiatives tasks/games.” Darla said, “I work better in groups now, because I learned to trust their

abilities.” The one contributing factor to group cohesion that was not planned by the teacher was that the students would spend their lunch hour in the class socializing and/or working on group projects.

Cohesiveness in the group is extremely important in developing a positive learning environment. The ES 10 students’ scores on the pre-actual questionnaire (the third lowest mean score) indicate that the teachers they had in the previous semester seem to have spent minimal time on developing group cohesiveness or did not develop cohesion effectively. These results suggest that teachers might profitably devote more time to developing group cohesion by utilizing some of the AB activities, especially early in the sequence of events in a given class or program. Many of these AB activities are very easily done in any setting, with minimal time and equipment needed (excluding the low and high ropes courses). These are not the only way to produce group cohesion, but they are a very effective means (Priest & Gass, 1997).

The intention of the AB activities was to develop group cohesion, communication skills, critical-thinking skills, and leadership skills, which are vital in helping students become effective learners (Bastable, Gramet, Jacobs, & Sopczyk, 2011). Communication and critical-thinking skills are key parts in the experiential learning cycle (negotiation and reflection, respectively). If students cannot communicate effectively, they cannot negotiate the meaning of new knowledge. If they cannot critically assess what they are learning, then they cannot reflect on the meaning or purpose of the new knowledge. The cognitive skills developed in the AB activities may be applicable in other situations, because the AB process of do, reflect, and debrief is similar to the experiential learning cycle (BC Ministry of Education, 2007) of experience, reflect, conceptualize, and negotiate.

The process of debriefing the AB activities is the last step in the learning cycle (negotiation). Debriefing is an essential component in the learning process for various learning styles (Bastable et al., 2011). The students were introduced to the experiential learning cycle at the beginning of the program and continued to apply the cycle throughout. One of the important outcomes of this approach is that it provides the students and teacher with a common language with which to talk about their learning.

Johnson and Johnson (2003) stated, “An essential aspect of group effectiveness is developing and maintaining a high level of trust among group members” (p. 124). Trust is a dynamic state that needs continual reinforcement. Group effectiveness is dependent on all the members sharing resources, giving and receiving help, dividing the work, and contributing to the completion of mutual goals (Johnson & Johnson, 2003). Group members articulate their thoughts, feeling, reactions, opinions, information, and ideas when there is a high level of trust. The AB activities help in the development of trust, and they also reinforce it. When students discussed their thoughts, feelings, opinions, and ideas, they trusted other members to do the same. When they did, the trust was reinforced. This was practiced during the debriefing stage within AB activities. Mr. G also practiced this debriefing during non-AB activities, so there was constant reinforcement of trust throughout the program. This practice is built into the fourth step within the ELE learning cycle, negotiation (BC Ministry of Education, 2007).

### ***Critical Voice***

Student ratings on the pre-preferred and ES 10 actual were also high on the PLACES instrument items dealing with the construct of Critical Voice (CV). The CV scale relates to the students’ ability to review critically the learning process and curriculum (see Table 5.2).

**Table 5.2      *Learning Environment Ratings CV***

<b>Pre-Actual (regular class)</b>	<b>Pre-Preferred</b>	<b>ES 10 Actual</b>
3.6 $\sigma=.82$	4.7 $\sigma=.35$	4.9 $\sigma=.19$

As mentioned in Chapter 4, Mr. G explicitly explained to the class, “This class is not two teachers and 24 students; it is 26 individuals that will go through a process of learning over the next five months.” He elaborated on this by explaining that students needed to take responsibility for their education and the process involved, and that he, Mrs. O, and I were resources and learners as well. By explicitly discussing this with the students, he allowed them to take control and use their critical voice. As the semester

progressed, students began requesting topics of interest. Examples of this were astronomy, specific natural history, marine biology, forestry practices, and paleontology. As the teachers accommodated the requests, more students requested ideas. This coincides with the CV scale category as being important to the students (second highest rating on the preferred scoring).

CV also means that the students have the right to mitigate distractions that interfere with their learning. In this case, for example, the teacher allowed students to listen to music on personal devices while doing independent studying or allowed them to go to the library to work on projects.

The program elements that contributed to the students' perceptions of CV provided them with an increased sense of security in asking for more clarification about confusing topics and in asking questions, such as "Why are we learning this?" The students apparently had the confidence that the ES 10 learning environment was accepting of such questions. I believe that this is directly tied to group cohesion: If the students had not felt safe in the classroom, they would not have asked these questions about the explicit curriculum content and program in the fear of ridicule from others (or from the teacher). Therefore, it is vital that the class has good cohesion in order to have a psychologically safe learning environment.

As confidence levels increased among group members, students began to apply their CV not only to general program content or process issues, but also to their colleagues. Sharing of the explicit curriculum content began to occur amongst the group, which led to knowledge transfer through negotiation (Mason & Santi, 1998). As the program progressed into the fourth week, the teacher explicitly told the students to seek other means before asking him questions related to course content within specific assignments. With this in mind, it became common knowledge among students which peers would be most helpful for specific topics. Students were relying less on the teacher's input and guidance and more on the expertise of peers' strengths. They openly discussed one another's strengths and weaknesses and could therefore give and receive help when needed.

The fourth step in the experiential learning cycle adapted by ELE incorporates negotiation (BC Ministry of Education, 2007). In the case of ES 10, negotiation was evident through students seeking clarification from the teacher and their peers. Reciprocation is a necessity for negotiation to be successful. For instance, early on in the program, it became evident that everyone had knowledge to contribute to the group, and often students would seek help from one another. When students freely negotiate the meaning of new knowledge, everyone develops a greater understanding of the material. One of the critical aspects of developing understanding is the ability to put concepts into one's own words. That process can be enhanced through peer teaching, because to teach is to learn twice (Goodlad & Hirst, 1989). Peer teaching can take different forms; for example, students can give a presentation to the class (direct teaching) or work one-on-one (tutoring). The negotiation step is a group form of peer teaching. There is considerable literature on peer teaching, and one of the theories that supports it is Vygotsky's (1978) ZPD.

The students also asked critical questions of the explicit curriculum, questions of the form, "Why are we doing this?" At times, other students answered those questions, not just the teacher. The students usually understood the relevance of the content because of the way the experiences were frontloaded (explained in advance). Most of the fieldwork experiences, if not all of them, had real-world connections outside the school and classroom. Examples included weather data collection for The GLOBE program, low tide species sampling for the University of Victoria's marine biology department, snow depth and quality analysis for avalanche predictions, and watershed volume calculations. Weather analysis also contributed to snow accumulation predictions that then allowed further avalanche analysis. The explicit curriculum was delivered in an interconnected, interrelated manner in which students could develop greater understanding of its relevance (Zandvliet, 2007, 2012). These connections were the concrete experiences (step one in the ELE learning cycle). When an activity is related or connected to real-life situations, the experience becomes more meaningful, and there will be greater learning from the activity (Kolb, 1984). By critically analyzing why they were doing things, students increased their mindfulness of the activities, and their learning was potentially enhanced (Yeganeh, 2006).

## ***Open-Endedness***

The Open-Endedness (OE) scale on the PLACES instrument contains questions such as, “I am encouraged to think for myself.” Students’ ratings are listed in Table 5.3.

**Table 5.3**     ***Learning Environment Ratings OE***

<b>Pre-Actual (regular class)</b>	<b>Pre-Preferred</b>	<b>ES 10 Actual</b>
3.0 $\sigma$ =.50	4.3 $\sigma$ =.56	4.7 $\sigma$ =.39

At the start of the semester, the AB problem-solving activities helped in developing skills such as communication, cooperation, and leadership. More important, they also helped in solidifying problem-solving, logical reasoning and reflective thinking skills (Priest & Gass, 1997). These skills most likely would have transferred into the academic setting, fostering students to think for themselves.

The OE scale also explores the amount of say a student has over his or her own learning experience. Most assignments were designed for students to develop comprehension, solve problems, and begin a process of critical thinking. Avoiding the possibility of memorization was an important aspect in the learning process. The teacher would provide problem-solving techniques that related to the learning activities but would not provide direct answers to the particular problems. The teacher's questions would be in the form of prompts that were designed to motivate students to think critically and find answers on their own. Another method employed by Mr. G to accomplish OE was allowing students to choose the method of delivery. For example, some students would write essays, while others would do PowerPoint presentations.

Mr. G also used different types of evaluation methods; one that was very different from traditional methods was the oral exam in partners. A pair of students would be asked questions on the specific subject matter, and they would be allowed to elaborate on each other’s answers. This type of evaluation method tests the ZPD zone (Vygotsky, 1978). As the two students elaborated on each other’s knowledge, they expanded on the content and probably went beyond what just one of them could have answered. It was a

very interesting process to observe. Both students would receive the same communal mark. Mr. G used a wide variety of evaluation tools, including self- and peer evaluations.

OE is also an essential part of the experiential learning cycle, wherein the students need to participate in the learning process and extrapolate the answers for themselves. This concept relates to constructivist learning theory, because building or constructing new knowledge is based on previous knowledge and is done through active participation by the learners (Bastable et al., 2011). An active participant is a learner who is engaged with the learning and constructs his or her own knowledge. The students can receive help, instruction, and resources, but ultimately they have to do the work of learning. An example of this process was seen during a science lab, where the students had to identify different types of solutions (acids and bases). Mr. G did not tell them what any of the solutions were, nor did he tell them which indicators they had. He did explain the basics of acids, bases, and indicators, but the students had to identify which ones were what. They went through a process of mixing the solutions to see the reactions; they were able to make a chart of which solutions reacted to other solutions. Then with some additional research about colours of indicators, they were able to deduce which were acids and which were bases. Mr. G then showed them how to make an indicator from red cabbage. Using this homemade indicator in the next experiment, they tested household products to find out which were acids and which were bases.

### ***Student Negotiation***

On the PLACES instrument, the Student Negotiation (SN) scale measures students' opportunities to be heard and hear others' ideas and opinions. The students' ratings are listed in Table 5.4.

**Table 5.4      *Learning Environment Ratings SN***

<b>Pre-Actual (regular class)</b>	<b>Pre-Preferred</b>	<b>ES 10 Actual</b>
3.2 $\sigma$ =.79	4.1 $\sigma$ =.57	4.3 $\sigma$ =.53

An example question asked within the SN construct is, "I ask other students to explain their ideas and opinions." The ES 10 teacher created a number of learning opportunities that involved student negotiation, such as group discussions, debriefing sessions, and group projects. Group discussions were facilitated by the teacher and focused on issues such as global warming, forestry practices, fish farming, land use, urban sprawl, and social injustices. These issues may or may not have been directly related to the explicit curriculum. The discussions occurred in class and during field experiences. In-class discussions were more structured and pre-planned, whereas the field experience discussions were based on student interest and had an element of free flow and teachable moments.

The importance of this type of learning experience was to create links between human experience and education, rather than to focus on the structured (prescribed) curriculum material. Because students' questions were based on what they actually experienced during various activities, the discussion was relevant to them; it was a concrete experience. For example, students had been collecting weather data for the GLOBE program, and they learned how those data were being used to study weather patterns around the world. During the second week of the program, the class discussed global warming and each student had an opportunity to contribute to the dialogue. Some of the students stated that they were not sure if global warming was an issue, while others did not contribute to the conversation. Later on in the semester, they watched the documentary *An Inconvenient Truth* (Bender & Burns, 2006) and discussed current events such as Hurricane Katrina, coral reef depletion, glacial earthquake activity on the Greenland ice sheet, and the release of trapped methane gas associated with permafrost melting. The non-believers were beginning to change their minds, and all of the students contributed to the discussion. I believe that those students who did not contribute during the first discussion were not yet comfortable enough with their classmates in the second week to provide input. The first global warming discussion occurred before the first field activities, and therefore, development of group cohesion was limited. However, during later discussions, student contributions increased as the level of group cohesion increased. These discussions were also good examples of the fourth step in the learning cycle, negotiation, where students discuss their ideas about new knowledge.

Debriefing sessions provided students with added opportunities to express their own ideas and opinions. These occurred after all activities and most lessons. During debriefing sessions, it was essential that all students participate. Within a debriefing circle, everyone took a turn talking about the experience. This technique comes from the AB style of teaching and correlates with the negotiation step in the ELE experiential learning cycle (BC Ministry of Education, 2007).

The purpose of group projects was to incorporate small group discussion opportunities and then bring that knowledge to the whole class. Groups usually consisted of three to four students who shared ideas and explored leadership roles. These projects were done during regular class hours, and each group was required to present findings to the whole class. For example, before going on the canoe trip to Pitt Lake, a group of students did some research on the current land claims issues in the area. They were allowed to pick the topic, but they needed to tie it into the location they were visiting on the field experience. Another topic studied was the history of Salt Spring Island, pre-Confederation. The students researched the underground railway and presented to the class. This tied the Social Studies 10 curriculum to the field trip to Salt Spring Island.

During the activities in the first week of the program, a considerable amount of time was spent on group processing and discussing the process itself. There were also discussions on leadership skills and styles. Assigning peer-led leadership roles within these groups allowed for student leadership skill development, which included leading negotiations among peers. Time limits were essential to reinforce task equality and collaboration with all group members. The time limits on these tasks were so short that it was impossible for an individual to do all the work, forcing the students to divide the task amongst the group members. The leader was responsible for the division and the gathering of all the information, and usually delivered the new knowledge to the larger group. This new knowledge brought to the larger group filled in the important pieces and set the stage for the negotiation to clarify the newfound knowledge within both the small groups and the larger class.

## ***Relevance/Integration***

The Relevance/Integration (RI) scale explores how the learning environment is supported with field experiences and other activities. All of the field studies activities were designed to be directly related to the explicit curriculum and were either in the immediate proximity of the school or were part of the overnight trips. Table 5.5 shows the students' ratings in RI.

**Table 5.5**     ***Learning Environment Ratings RI***

<b>Pre-Actual (regular class)</b>	<b>Pre-Preferred</b>	<b>ES 10 Actual</b>
2.6 $\sigma$ =.59	4.2 $\sigma$ =.42	4.2 $\sigma$ =.64

The field studies activities added greater value to the explicit curriculum, because the students could spend much more time engaging with the content in the field than they could in the classroom. “The more students study or practice a subject, the more they tend to learn about it” (Carini, Kuh & Klein, 2006). In the field, there were minimal time restraints compared to a typical 50-minute class. Several of the field experiences involved collaborating with external organizations. These organizations had strict procedural protocols that needed to be learned before data collection was instigated. Working with external organizations increased the level of relevance by making the research real. Some examples of these studies are discussed next.

## ***Weather Data Collection***

Weather data were collected every day and sent to the GLOBE program, which is an international organization that collects data from schools around the world (The GLOBE Program, 2013). Scientists use these data for global warming research. A class discussion occurred around the importance of gathering weather data and global warming. During that discussion, some of the students did not understand the relevance of gathering data; other students explained the connection, not the teacher.

### ***Low-Tide Shoreline Biodiversity Study***

The students participated in a low tide shoreline biodiversity research project, working with a professor at the University of Victoria. This project involved transect studies on a low tide zone on Salt Spring Island. The students mapped areas of a beach to identify living things within a one-by-one metre plot. These data were consolidated by the marine biology professor to assess the impact of sewage run-off on the living organisms in the low tide zone. The students came to understand the effect urbanization has on organisms living in the low tide zone. The class went to a marine field base to observe and learn about marine animals and other aquatic life. This project was not only based on a student-centred curriculum, but also allowed for hands-on experience not otherwise offered in a regular classroom setting. As well, these students were given an opportunity to learn about organisms in their own environment. A discussion about Victoria's lack of a sewage treatment plant brought to light the effect this was having on the marine life in that area.

### ***BC and Canadian History***

During the visit to Victoria, BC, a history tour of the parliament was provided for the students; this history time frame is outlined in the Social Studies 10 curriculum as it covers the time of Confederation within Canada. Another trip that made a connection to Confederation was the Kettle Valley Railway bike trip. The class spent four days riding the railway, delved into its history and politics, and learned about the hardships of building it.

### ***Geology of BC***

On the trip to Victoria, students visited the Horne Lake Caves and learned about the formation of the limestone caves and other geological features in the area.

### ***Geography and History of BC***

During the last ES 10 trip on the Kettle Valley Railway, students learned about the history of the railway and the geography of that area of BC. Along the ride, there were numerous information signs, artifacts, and evidence, such as rock ovens, water stations, and the Chute Lake Museum, that added to the history of the railway, enriching

the experience and again giving it relevance. The Science 10 and Social Studies 10 curricula include geography.

### ***Water Cycle***

The winter trip placed students in the high alpine of the local Vancouver area mountains to collect data on snow depths and densities, which helped explain the water cycle. The students learned first-hand about water flow in creeks and rivers, landscape change from erosion, and the effects of water quality. This led to a class discussion on the consequence of snow packs and our drinking water, and how global warming affects the snow pack. The students began to understand the connection of how they contribute to global warming and how that in turn affects them.

The intention was to provide students with a much greater learning experience than reading from a textbook. These field experiences encompassed all four steps of the ELE learning cycle (BC Ministry of Education, 2007). The first step of the learning cycle relates to concrete experience. The real-life learning situations provided for the students (as listed above) are directly comparable to the concrete experience stage of the learning cycle. The second step of the cycle occurs during and after the activities, when students reflect on what they have seen, heard, and experienced. The third step relates to the students' abilities to bring reflection into conceptualization of knowledge principles. The fourth step occurs at either the end of the activity or at the end of each day in a discussion or debriefing session, to consolidate newfound knowledge and review what the students have learned and observed. The four steps, especially the fourth, reinforce the relevance of the explicit curriculum to the students' lives.

### ***Shared Control***

The Shared Control (SC) scale explores how much control students have over their learning relevant to time and topic. Interestingly, this had some of the greatest ranges in ratings, as shown in Table 5.6.

**Table 5.6 Learning Environment Ratings SC**

<b>Pre-Actual (regular class)</b>	<b>Pre-Preferred</b>	<b>ES 10 Actual</b>
1.7 $\sigma = .74$	3.8 $\sigma = .75$	3.7 $\sigma = .76$

The pre-actual score for SC received the lowest rating of all the scales. Several key factors contributed to high SC in the ES 10 program: no time restriction, development of promotion material, choosing topics of interest, and a challenge by choice philosophy. One of the main contributing factors within this scale was giving students control independent of the school time frame. For example, the program was not restricted to 45-minute or 60-minute blocks per subject. They did not function on the proverbial Pavlovian bell; instead, they operated on the students' interests. When the teachers sensed students had lost interest in a subject, they moved on to something else. However, if the class was fully engaged in a topic, students did not stop working because class time had come to an end. On several occasions, I observed the students running into their lunch hour or after school because everyone was so engaged in the material. As mentioned previously, the teacher at times had to encourage students to leave at the end of the day.

Development of the ES 10 program website and yearbook were also ways to provide students with control of the course content and layout. This website was to be presented at a school open house for parents and potential students interested in the program for the next year. The students produced a website that was both interactive and informative, including photographs and descriptions of the program. Development of display boards and activities were also created for the open house. This prompted students to develop a yearbook, which was planned, organized, and implemented by the individuals in the program. I received a copy of this yearbook, and it was done very professionally.

Another strategy Mr. G employed to give students control was to allow them to choose topics when frontloading activities. For example, he proposed that students investigate the history, geology, geography, and any other significant topic about the

area before going on the canoe trip. The students could pick which topic they wanted to explore, and at times they would find other topics that Mr. G did not specify. The students did this work in groups and presented their findings to the other students. In this particular example, a group of students presented on First Nations land lease renewals. Even though this went beyond the explicit curriculum, it was still accepted by Mr. G. In the end, the entire class had a major discussion on First Nations' land claims and treaties, which was a part of the explicit curriculum.

Mr. G also allowed for SC by responding to student requests to learn about other subject areas not related directly to the prescribed curriculum (for example, astronomy). Students interested in astronomy provided a lesson one evening during a camping experience that led to increased student interest in this subject. A routine developed in which during every camping trip, a student would contribute to the initial astronomy lesson. In this example, the students requested the topic. SC was mentioned previously in the open-endedness scale, which explored information delivery types and evaluation tools. Students collaborated with the teachers on time lines and due dates for assignments.

The purpose of SC in the design of a learning environment is to help students take an interest in their own education and assume responsibility. Group dynamic theory, espoused by Jones, Carter-Sowell, and Kelly (2011), suggests that everyone must have input into the development of the task at hand so that they are committed to the task. If students have no input, they are not as committed to the learning process; if they have input, they buy into the process and are more committed. Part of committing to the learning process involves understanding it. Thus, early in the ES 10 program, the students did Kolb's (1984) LSI, so they could begin to understand their learning preferences and develop a common language about group processes. Appendix F is a copy of the class results from that assessment.

Along with the learning style assessment, the teacher also explained how groups evolve and the stages of group formation (storming, norming, forming, performing—and even mourning in some models). By understanding the group processes, students could understand their learning process better. And because most of the learning occurred in a group environment, this group development awareness was critical. Listed below are

some of the comments students made in regards to their own learning in post-reflective debriefs:

- "I just seemed to care more, and felt obligated to hand in all assignments to achieve my full potential" (Peter).
- "I have a better appreciation and understanding for learning" (Cathy).
- I am now more open to learning in a classroom or the field" (Rick).
- "I work harder in school" (Summer).
- "I've become more responsible in my schoolwork and trying to learn" (Carmen).

An inference that might be made here is that by giving the students control over their learning, they engaged with the content with greater interest and therefore had more meaningful reflections and deeper conceptualization. They also had more interest in discussing their ideas and knowledge.

The challenge by choice philosophy also gave the students control over participating in activities. During an activity like a high ropes course, the students had the choice to say no if they felt the activity was beyond their ability. This was extremely important, because it empowered the student to make the choice. During other activities, like debriefing circles, students had the choice not to divulge personal information if they did not feel comfortable. This practice of SC, I believe, led to students taking more control of their lives and education.

### ***Student Involvement***

The Student Involvement (SI) scale asked questions such as, I pay attention during this class? This scale measures the level of involvement during instruction time and how this influences the level of engagement the students have during each lesson. Students' ratings are listed in Table 5.7.

**Table 5.7      *Learning Environment Ratings SI***

<b>Pre-Actual (regular class)</b>	<b>Pre-Preferred</b>	<b>ES 10 Actual</b>
3.2 $\sigma = .73$	4.1 $\sigma = .60$	4.2 $\sigma = .50$

When activities are engaging, students learn more about the material than when they are not engaged. An intense level of engagement often occurred with various activities throughout the program. For example, when students participated in the low tide shoreline biodiversity research project, they became so absorbed that they needed to be persuaded to stop to have lunch. Another example of SI occurred in the classroom: students were so captivated in their studies, they needed to be reminded to go home at the end of the school day. The most engaging tasks were the activities that had the most relevant and direct learning activities and therefore were the most meaningful. This meaningfulness took precedent over marks in assignments. Similar to SC, the students appeared to demonstrate greater engagement when reflecting and conceptualizing meaningful learning from the field experiences. This led to a greater interest in discussion relating to the explicit curriculum.

SI also relates to the amount of interaction the student has with the teacher during instruction time. The ES 10 program focused on an experiential learning format that involved hands-on experience, group work, and few lectures. The teachers were able to spend more quality time with students, because they were not lecturing. As well, the overnight field trips gave more interaction opportunities, because more hours of the day were spent together than during a normal class.

### ***Environmental Interaction***

Environmental Interaction (EI) measures the amount of interaction students have with their environment. In the ES 10 program, students had high ratings of EI, as would be expected (see Table 5.8).

**Table 5.8      *Learning Environment Ratings EI***

<b>Pre-Actual (regular class)</b>	<b>Pre-Preferred</b>	<b>ES 10 Actual</b>
3.5 $\sigma = .55$	4.0 $\sigma = .67$	4.4 $\sigma = .42$

ES 10 field experiences included five overnight trips and one or two experiences on a weekly basis outside the classroom. For example, a pair of students was responsible for collecting data for The GLOBE program every day. This required them to

go to the weather station outside the classroom and record the readings. Other examples of EI included going to a nearby park and conducting water quality samples or surveying tree diversity. On a daily basis, students would all go out and do some type of physical exercise, such as sports and games. The teachers developed a partnership with a local seniors' centre. The seniors would teach the students different activities, like ballroom dancing, curling, and woodworking, or the students would go there to play chess.

Another example of EI was the major issue analysis projects, for which the students had to go out into the community and interview a member of an organization that dealt with their chosen issue. For example, Celeste interviewed the person responsible for low-income housing projects. She later commented to Mr. G and Mrs. O that she was amazed that an adult would spend time talking to a student.

Other students got involved with different community groups outside of school hours, such as shore clean-up programs, but they did these as a group, organized by the students themselves. These field experiences were step one in the ELE learning cycle, concrete experiences (BC Ministry of Education, 2007). As mentioned above, all four steps occurred each day or in each activity of those field days. The purpose of the EI scale is to measure the students' perception of the amount of time spent in the field. The results on the PLACES questionnaire show that the students felt that they received more EI than they had hoped for (the ES 10 actual ratings were higher than the pre-preferred). This was not an issue, because their post-preferred ratings increased to match the ES 10 actual.

Anecdotally, this increase in students' preferred involvement with the environment caused some issues for the ES students as they moved to grade 11. Discussions with Mr. G revealed that previous ES students had difficulty readjusting to the regular classroom. This is an area of potential research. Another question embedded within EI stated, "I put a lot of effort into the learning activities during our community field trips." An example of this effort by the students was their journaling well into the night. They were journaling not simply because they had been told to do so, but because they wanted to write without forgetting any of the details. They knew that if they didn't write

everything down, the next day would be filled with more learning, and there would be a chance of forgetting important facts in their day.

## **Question 2**

Exploring the process within ES 10 that may influence mindfulness. Are the practices within ES 10 specifically contributing to the development of mindfulness? What is the relationship between mindfulness and students' perceptions of the learning environment?

The mindfulness questionnaire results, the students' comments, and their actions all indicated that they indeed did become more mindful. The mindfulness questionnaire showed a class mean increase of 0.4, which is about a 10% increase (from 2.7 pre-ES 10  $\sigma = .42$  to 3.3 post ES 10  $\sigma = .35$ ). Their actions showed awareness and caring for one another and the environment. Their comments indicated that they realized that they were more aware, observant, and concerned about international stability, the environment, world news, and other social issues (see Chapter 4 for specific quotes).

The development of mindfulness is linked to experiential learning through sensory contextual processes that engage students in novel experiences and create an awareness of senses, emotions, and other people (Yeganeh, 2006). Students need to be aware of their own emotions and surroundings in order to be cognizant of what is going on around them. This increases the relevance of, and engagement with, the learning process. Marra (2004) described five basic strategies for developing mindfulness. These include being mindful of one thing at a time, being nonjudgmental, being mindful of the moment, focusing on one's senses, and describing one's experiences. All five of these strategies were practiced in the ES 10 program. Being mindful of one thing at a time occurred frequently when the teacher would pose specific questions, which required the students to focus on the one thing. Being nonjudgmental was explicitly discussed in the class. The class had discussions and assignments about experiencing or seeing things without judging and about the importance of considering all sides to a story or issue. Mr. G discussed with them different epistemologies. Two examples of this were the scientific method and First Nations story telling. This was also

intentionally modeled by the teacher through the choices he made on presenting information, planning field experiences, and choosing guest speakers. The students' comments illustrate nonjudgmental attitudes with comments related to looking at situations from different perspectives and becoming more open to any situation.

Being mindful of the moment was practiced during debriefing sessions and through reflection questions. Mr. G would specifically ask questions that would focus the attention on the moment and have the students reflect on that moment. For example, during the caving activity, he asked a student to focus on her emotional state (internal focus) and practice relaxation techniques. Getting the students to focus on their senses was practiced through various activities associated with AB activities (seeing, hearing, and smelling). An example of such an activity was the blindfold walk through the woods. The students had to walk through the woods with a partner guiding them. The blindfolded students would experience the walk in a completely different way. The journaling and self-evaluations had the students focus on their feelings; this also was part of describing their experiences. During debriefing sessions, the students practiced describing their experiences as well.

Therefore, factors contributing to mindfulness in the ES 10 program included field experiences, journal writing, self-evaluations, AB activities, and debriefing activities. Field experiences were novel experiences for the students, and the journal writing, self-evaluations, and debriefing activities fostered the awareness of their senses, emotions, and other people. Journal writing contributes to a reflective learning process for students and highlights important feelings. Self-evaluations create individual self-awareness of interactions with others and the environment. Debriefing sessions assisted in reflection on senses, emotions, and other people's feelings. Combined, the continual practice of journal writing, self-evaluation, and debriefing helped in the improvement of student mindfulness (Bastable et al., 2011). As the question indicated, this was just an exploratory view into the process of mindfulness and how the ES 10 program may influence the development or expansion of mindfulness. I strongly believe that this is a very important concept within education, and I am still in the process of trying to fully understand mindfulness myself. This is another area of potential research.

### Question 3

If attitudes and behaviours change over the course of the ES 10 program, how might those changes be affected by students' experiences or perceptions of the program? What role does mindfulness play in those changes? Which constructs or factors within the learning environment of ES 10 contribute to those changes?

The answer to this question was that there was a change in attitudes and the change was in a positive direction. The questionnaire results and observed behaviours of the students both indicated a positive attitude and behaviour change. Lewin's (1947) 12 principles of experiential learning may explain why these changes occurred. Principle #9 stated, "The more supportive, accepting, and caring the social environment, the freer a person is to experiment with new behaviours, attitudes, and action theories" (Johnson & Johnson, 2003, p. 53). The development of group cohesion creates the supportive, accepting, and caring social environment that allows the students to move towards new behaviours and attitudes. However, group cohesiveness alone will not necessarily have positive results; for example, gangs have group cohesion with negative outcomes. Therefore, other contributing factors must be part of the answer. I believe that the other factors are creating relevance/integration (RI), critical voice (CV), student negotiation (SN), student involvement (SI), shared control (SC), open-endedness (OE), environmental interaction (EI), mindfulness, and self-esteem.

Lewin's (as cited in Johnson & Johnson, 2003) principle #8 stated that "perceptions of oneself and one's social environment must change before changes in action theories, attitudes, and behaviour will take place" (p. 53). The reflective practices imbedded in the experiential learning cycle created the opportunities for students to analyze critically their perceptions of themselves and their environment. The practice of mindfulness also helped the students in understanding their impact on their immediate environment (which includes other people). Along with the group discussions, the students started to see how their actions impacted their social and external environments, and, more important, how they could make a difference. This is the second part of principle #8: learners must perceive themselves as capable of doing the needed behaviour and must see the behaviours as being appropriate to the situation before they will engage in them. The best example of this was Celeste coming to the

realization that adults do listen to teenagers. She has since become involved with an international organization that works primarily out of Africa. She has also helped organize several conferences on empowering women. I believe that her realization that she can make a difference came during her major issues assignment in ES 10.

Principle #11 (Lewin, as cited in Johnson & Johnson, 2003) explained why the cohort model (such as the ES 10 program) is critical: "It is easier to change a person's action theories, attitudes, and behavioural patterns in a group context than in an individual context," (p. 53) because "the discussion and consensual validation that take place within a group provide a personal commitment and encouragement for change that is not present when only one person is being changed" (p. 53). However, a cohort of individuals that does not have good cohesion will not generate meaningful discussions and will not permit consensual validation. Once again, this reflects the importance of creating a positive learning environment where there is good cohesion within the group.

#### **Question 4**

Do students consider their classmates as part of their personal community? What instructional measures or approaches in the learning environment contribute to the development of students' sense of community within ES 10?

Unequivocally, this was easiest question to answer with Yes. All the ES 10 students drew their classmates as part of their personal communities on their closing community mapping activity and all of the students referred frequently to the class as family. This was documented in various ways: journals, reflective questions, group discussions, the program yearbook, and individual conversations. The concept of group cohesion was very important to the students of the ES 10 program and was quantified through their responses in the PLACES questionnaire. The observational data also reinforced the importance of group cohesion. The term *hyper-cohesion* was introduced as a concept to explain the development of group cohesion within the ES 10 program. This cohort became so cohesive that it became exclusionary to non-participants. This shift toward exclusion occurred over a very short period of time, approximately one week, in the early phase of the program. Because of the speed and strength of the

development of the group's cohesion, the term hyper-cohesion seems appropriate to describe the process.

I would suggest that this quick development of cohesion is vital for the success of this type of program. Due to the short duration of school semesters, just three to four months, it is essential that group cohesion develops quickly. Because most programs of this nature tend to be one or two semesters in duration, they need to have the students bond together quickly. Group cohesion plays a vital role in the development of one's attitudes and behaviours. As Laumann (1973) noted:

Intimate face-to-face interaction, whether in dyadic or larger group relationships, has long been recognized to be of crucial importance in the formation of an individual's basic personality or self-conception, . . . the development and maintenance of myriad attitudes towards the world, the determination and social control of "appropriate behavior," . . . and the maintenance of a "motivational commitment to participate." . . . Indeed, the intimate face-to-face group is often held to form the critical "primary environment" by which an individual is related to the larger society. (p. 111)

I would concur that cohesion may be a product of integrated experiential programs as previous research has indicated, but I would suggest that for these programs to be successful, they need to develop cohesion. The development needs to be intentional and instigated at the onset of the program. A cohesive group is vital in contributing to other aspects of the program, directly relating to the students' learning and ultimately influencing their behaviour.

## **Program Flow Chart**

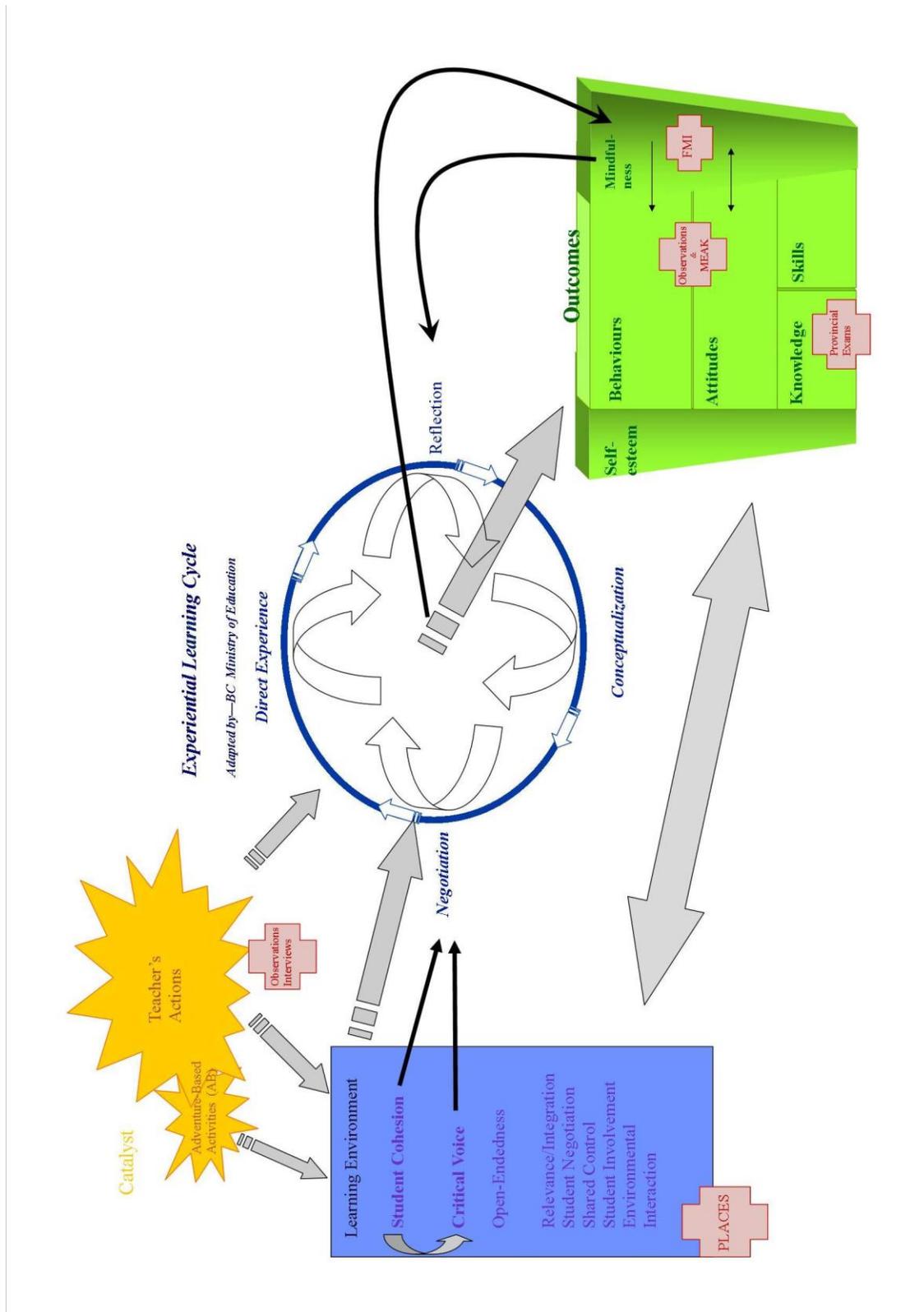
While I was writing this chapter, I drew a flow chart of the concepts and constructs to show the relationships among them. Originally, I drew this chart to help me get a better understanding of the process involved with these concepts and constructs. After discussing the chart with colleagues and my committee members, they encouraged me to present the chart with my findings. I used heuristic methods to develop the chart. With my extensive experience in running programs of this type and the greater understanding of theories pertaining to learning and experiential education, I believe the

chart has some merit in describing the process within the ES 10 program. This chart is a starting point for discussion on the process and influential factors within such a program. More specific research needs to be done to confirm or deny those connections. In this section, I explain the chart and how things interact and influence one another.

I developed the flow chart (see Figure 5.1) to visualize the relationships between learning environments, the experiential learning cycle, learning outcomes, and the complex range of factors that affect these constructs. By developing this chart, I found that I could understand and therefore better explain these relationships. It made me realize that the sequence of the facilitation process for such attributes as group cohesion and critical voice had a great impact on outcomes. I believe that the diagram also illustrates how outcomes are not just basic knowledge and skills, but also higher order attitudes and behaviours. This may explain why information alone does not change behaviour. Finally, I hope it shows how mindfulness is related to all of the outcomes.

Something that occurred to me with regard to the experiential learning cycle was that the assimilation and accommodation processes are between the internal and external focus: direct experience to conceptualization and reflection to negotiation, respectively. This focus is similar to the mindfulness spectrum of meditative mindfulness to social-psychological mindfulness. The practice of assimilation and accommodation therefore may contribute directly to the development of mindfulness.

**Figure 5.1 Program flow chart.**



The red crosses in Figure 5.1 represent the tools I used to assess the specific item in which the cross is imbedded. The colours have no particular significance, but the arrows obviously have directionality. The major concepts that I want to get across is that (a) the learning environment enhances the learning cycle and (b) there are sequential phases within the diagram. An example of this is the learning environment construct of cohesion. If the group has good cohesion, it will more readily contribute to the fourth step in the learning cycle—negotiation. If there is poor cohesion within the group, then students will be less likely to contribute to that negotiation process.

The learning environment in this study was enhanced by the AB activities. This is by no means the only way to enhance a learning environment, but I do believe it is one of the best and fastest ways to do so. In this case study, the building of group cohesion was started on the first day; by the third week into the program, the class was hyper-cohesive. In some of the activities, students' well-being and safety were in the hands of other students, which quickly reinforced them to trust others. The overnight trips contributed significantly to group cohesion as well. Other skills that I believe are developed through AB activities include communication, problem solving, leadership, and cooperation. These skills enhance the group's cohesion and functioning. I propose that group cohesion is the foundation to having a positive learning environment, because without it other constructs (critical voice, open-endedness, student negotiation, and shared control) may not develop or develop only partially. The flow of the chart moves from the development of learning environments to the experiential learning cycle; on the other side of the map, or at the end of the flow chart, are the learning outcomes. The learning cycle and outcomes are a continuous feedback loop. As Dewey (1933/1960) pointed out, learning is a continuous, ongoing process.

Figure 5.1 shows behaviour on top of the outcomes, and this is intentional. As well, there are no specific boundaries between knowledge, skills, attitudes, and behaviours. I contend that students first build knowledge and skills as outcomes. The knowledge influences their attitudes, which in turn affects their behaviours. (The cycle probably goes around again in a virtuous spiral). As Lewin (1947) pointed out, attitudes need to change before behaviours will change. It may not be quite as rigid a sequence, but more interactive; behaviour and attitude change is a very complex topic in

psychology. I would suggest that in this case study, the TTM (Prochaska et al., 2008) may explain why students do have behavioural changes.

At the start of the ES 10 semester, several of the students did not believe or were completely unaware of the environmental issues facing the world today. This condition would represent the first stage of the TTM of change, pre-contemplation. In this stage, the individual has no idea that there is a problem and requires others to point out the problem. The remainder of the class was in the next stage, contemplation. In this stage, individuals want to do something but have no idea what to do or how to do it. The field experiences in the ES 10 program provided opportunities for students to learn about environmental issues, moving them from the pre-contemplation stage to the contemplation stage. During the debriefings and the social negotiations, the fourth step in the learning cycle, the students learned about options for addressing the environmental issues, moving them from contemplation to preparation. In order for the students to move to the next stage, they needed not only the knowledge of what to do, but also a social environment that was supportive of the change. Lewin (as cited in Johnson & Johnson, 2003) stated,

The more supportive, accepting and caring the social environment the freer a person is to experiment with new behaviours, attitudes, and action theories. (As the need to justify oneself and protect oneself against rejection decreases, it becomes easier to experiment with new ways of behaving, thinking and valuing). (p. 59)

As discussed previously, the learning environment in the ES 10 program was very supportive and cohesive, so the students could comfortably move to the next stage, action. In the action stage, individuals practice the strategies they have learned, but they also need intrinsic and extrinsic motivation to maintain those behaviours. During this stage, people need to be very cognizant of their behaviour or they may relapse to the undesirable behaviour. Usually this stage takes six months (Prochaska et al., 1992), after which they move to the maintenance stage.

This concept raises a number of questions for future research. First, does this behaviour change transfer to other settings? If students behave a certain way in the ES 10 program (e.g., being environmentally conscious, social responsible, and socially just),

do they behave in the same way at home or when they are out with their friends? Another question to investigate is whether the students from the ES 10 program move to the next two stages (maintenance and termination). Research could explore if those behaviours have become permanent, because the program does not last six months, which is what is needed, according to Prochaska et al. (1992), to move through to the next stage.

In the flowchart I have self-esteem as an outcome, paralleling mindfulness. Self-esteem was one of the identified themes from the qualitative data. The theme was not something I was looking for, so I have no other data to review. Increased self-esteem was an outcome as reported by the students, but it is not something I can comment on at this time. This would require further study. A potential area of research could be the relationship between self-esteem and learning environments. Priest (1986) identified self-esteem as an outcome of AB activities, so the increased self-esteem could be a result of those activities. I believe, however, that the non-AB experiences in the ES 10 program also contributed to the increase.

It became obvious to me that the processes within the ES 10 program are very complex and organic. However, despite the complexity, I believe that given similar circumstances, a teacher who artfully employs similar experiences, under relatively similar conditions, should expect similar results with students. The results will never be the same because of the complexity and dynamics within the class, but there should be some similarity. For example, I expect that the majority of students from this ES 10 class have an increased level of motivation to learn, an increased understanding of their impact on the environment and others, an increased belief in themselves, and an increased belief that they can make a difference. With this in mind, I make the following recommendations.

## **Recommendations**

### ***To Teachers***

The importance of group cohesion is highly evident from the data in this study of the ES 10 program. Therefore, my first recommendation is that teachers should use

activities at the beginning of a semester to help create group cohesion and should periodically engage in reinforcing group cohesion. AB activities are my first choice of tactics for building group cohesion, but other types of activities can also create the same outcome. In any activity chosen or developed to foster group cohesion, the critical elements include getting the students out of their comfort zones and creating challenges that involve some difficulty but ultimately enable success. At some point in the activity, the entire group needs to work towards one specific goal or desired outcome, and it should be fun.

The second recommendation is to create an atmosphere in the class wherein the students have shared control of the planning and implementation of the explicit curriculum. Allowing students to decide how best to match explicit curriculum and experiences will give them a sense of control. As well, giving students a choice in the evaluation methods will give them a sense of control. Teachers should maintain student-centered openness in the classroom, meaning that students' needs are heard, their interests are met, and they are encouraged to use their critical voice. Making time explicitly to do this means that learning may go outside the explicit curriculum, which is needed at times.

One critical factor that I am not sure how to address is the time schedule of high schools. Most experiential programs like ES 10 have broken free of the constraints of the typical school timetable. Not being constrained to 50- or 90-minute blocks of time allows non-disruptive engagement with the content and allows for a more natural or organic (as Mr. G calls it) flow of teaching. Topics are changed according to engagement with the material or when connections are made to other topics when an opportunity presents itself. For example, after cycling on the Kettle Valley Railway one day, a couple of the students were complaining of headaches. A discussion ensued about the importance of hydration and replenishing electrolytes. This covered parts of human anatomy, the thirst control system, cellular balance, and minerals involved in that balance. This moved onto sources of electrolytes and food planning; meanwhile, during most of the conversation, the students were preparing dinner. The meal planning, which had been done in a lesson in the previous week, was just reinforced with a real experience. The conversation continued on about food preparation and cooking and how this influences the nutrient value in the food. This went on until everyone sat down for dinner, at which

point the subject changed. As mentioned above, it is difficult to make recommendations to teachers facing time restraints, but two important things do stand out. First, topics should be made highly engaging. Second, topics should be meaningful or relevant. As in my example, the students wanted to find out how to get rid of their headaches as well as understand how to avoid them next time.

Another recommendation is to use time restraints on assignment to foster group cooperation. Time restraints create challenge and some discomfort for students. In order to finish the assignment, the group must divide the tasks. This forces group members to communicate, organize, and trust one another. If they do not do these things, they will not be successful. Frontloading this activity is critical, because if the students do not have the skills to communicate and organize, they will get frustrated and disillusioned. Thus, teaching them those skills is more important than teaching them the content of the assignment.

In order to evaluate how the learning environment is developing, I recommend using the PLACES questionnaire (Zandvliet, 2007, 2012). At the beginning of the semester, teachers can use the questionnaire to get a sense of what the class wants in regard to the learning environment. When used again midway through the semester, teachers can see if they are on track in delivering the desired learning environment. I have given examples of how to address each one of the constructs within the PLACES questionnaire; these are by no means the only way to address the learning environment constructs. My skills are in the outdoor adventure field, so I use those skills to my best ability to address these constructs. Each teacher has his or her own skills to use to address those constructs.

I recommend teachers take the initiative to start programs like ES 10; it is teachers who will make this happen. This is especially important at the high school level, where there appears to be disengagement with school (Cardwell, 2012). The task of starting a program like ES 10 is not difficult if the administration is supportive. The rewards of such a program far outweigh the costs, financially and emotionally, in my opinion and experience.

My last recommendation to teachers is to experience an adventure program like a high ropes course or a low ropes course with fellow teachers to live the experience. If teachers have never tried such an activity, they should at least once. Once they have, they will know what I am talking about.

### ***To Education, School, and District Administrators***

In view of Cardwell's (2012) findings that grade 9 and 10 students have decreased engagement in school, I suggest that more integrated experiential programs be set up in those grades. As my findings indicate, students in the ES 10 program had very high engagement. More important, they enjoyed school and became responsible for their own learning. Grades 9 and 10 also fit a cohort model where individual course selection is not as critical as in grades 11 and 12.

One of the primary concerns of administrators is costs of such programs. Admittedly, they have higher operational costs than standard classrooms, but what is the cost of disengagement of grade 9 and 10 students? The main costs of these programs are equipment and transportation. If each school district had a number of these programs, the equipment could be shared, and those costs would be divided amongst the schools, thereby lowering operational costs substantially. For example, canoes are used for short periods of time in a program, so each program could schedule trips such that the canoes would be utilized throughout the school year.

For administrators in BC, these types of programs meet the guidelines set by the Ministry of Education (2007) ELE document, so school districts that have multi-programs would have more students meeting the guidelines. These types of programs will not operate without the support of administration, so it is vital that superintendents and principals are supporting teacher initiatives in this area. My hope would be that all grade 9 or 10 students would have an opportunity to participate in such a program.

### ***To Researchers***

Despite a rich history of research in the field of learning environments, there is still more research needed in specific areas like integrated experiential programs. With the newly available PLACES questionnaire (Zandvliet, 2007, 2012), research can be

conducted on such programs. The importance of certain constructs such as student cohesiveness or critical voice can be better understood. The relationships with these constructs and other factors (e.g., the experiential learning cycle or self-esteem) need more in-depth research. Research needs to move beyond just identifying constructs and relationships to having deeper understanding of the interconnectedness of those relationships.

Another recommendation is a study that would investigate students that have been in this type of program in their adulthood, minimum six years post-program, to see if they have maintained their behaviours, attitudes, and action theories. Some aspects to look at could be the types of social capital these students are contributing and the type of citizens they have become, because there are a lot of data on citizenship. Within this study, it would be interesting to compare students from different types of programs. For example, would there be a difference between programs that emphasize environmental education and programs that focus on AB activities? Within this research, one could also look at the students from this study to compare their current preferred learning environments to data I collected, to see if their preferences withstand the test of time. It would be very interesting to see if they still feel that group cohesion is as important as it was to them in my study. If they did, that would reinforce the need to develop group cohesion in schools. The difficulty in this type of research would be in proving that it was the program in high school that contributed to their adult behaviours and attitudes.

### **Limitations of This Study**

Regardless of the care and preparations taken in preparing research, there will always be limitations and shortcomings. First, this study has limited generalizability, because it was a case study with a small same size. The second limitation was the amount of time spent with the program, especially at the beginning. The first three weeks of the semester would have been useful to study more closely, observing every day. The third limitation was the limited access to the journals and interviews with students. Both of these relate to getting even deeper insight into specific individuals and the outliers that might be identified through quantitative methods. Finally, I asked the students how they

had changed, but I did not ask the students what they thought might have contributed to that change. This would have been interesting data to have gathered.

## **Conclusion**

The processes within the ES 10 program were very complex and organic, requiring a theory that can explain all those complexities, possibly along the lines of ecological theory. Therefore, much more research needs to be conducted before teachers and researchers have complete understanding of the dynamics of such programs. However, despite that complexity, this research has demonstrated a greater understanding of the processes that help develop a unique and positive learning environment. The progression of group cohesion appears to play a key role in the sequencing of that development. Adventure-based activities can foster that development, but by no means are they the only way. The experiential learning process coupled with field experiences further enhances the positive learning environment. In conclusion, there is no one major contributing factor to the success of programs such as ES 10, because the processes are embedded and organic. However, the teacher's ability to take the temperature of the learning environment helps in understanding that climate. By utilizing the PLACES questionnaire (Zandvliet, 2007, 2012), teachers can get a better understanding of the students' preferred learning environment and better match the actual learning environment.

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## **Appendices**

## Appendix A

### SIMON FRASER UNIVERSITY

#### INFORMED CONSENT FOR MINORS BY PARENT, GUARDIAN AND/OR OTHER APPROPRIATE AUTHORITY TO PARTICIPATE IN A RESEARCH PROJECT.

Background information: We would like your child to participate in a research project concerning the Experiential 10 program at Centennial High School. The research is focused on factors that contribute to students' behavioral change specific to sustainable living practices. The research will consist of 4 surveys and observation during class time. The purpose of the survey is to get students' input in order to measure attitudes towards sustainability, community development (within the class room), mindfulness and behavioral change. We project it will take students 15-30 minutes to complete each survey. Participation is voluntary and confidential, and students may withdraw at any time or choose not to participate without penalty. Information obtained during this research will be kept confidential and results of our findings will be available to interested parties by contacting Mr. Sturrock at Centennial High School.

Note on ethics: The University and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and well-being of subjects. This form and the information it contains are given to you to ensure your full understanding of the procedures involved. Your signature on this form will signify that you have read the above information regarding this project, including the possible benefits of participation, and that you have had adequate opportunity to consider the information, and that you voluntarily agree to allow the student for whom you are responsible to participate in the project.

As (parent/guardian) of (name of student)  
\_\_\_\_\_, I consent to the above named student  
engaging in the research specified to be carried out in February - June 2007 in a

research project organized by Peter Koci (PhD candidate) and supervised by Dr. David Zandvliet of Simon Fraser University.

I certify that I understand the procedures to be used in this project and have fully explained them to (name of student) \_\_\_\_\_. In particular, it is clear that the above named student knows that s/he had the right to withdraw her/his participation in this project at any time. S/he also knows that her/his identity will be protected because of the use of numbers rather than student names in the final document and in any publication or conference presentation or in any discussion about the study. This identifying information will be shredded after all data is collected. I understand that I may register any complaint I might have about the project with the researchers to the SFU ethics board.

I may obtain a copy of the results of this study, upon its completion, by contacting Mr. Sturrock, Science Department, and Centennial School.

NAME \_\_\_\_\_ (please \_\_\_\_\_ print)

ADDRESS \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

## Appendix B

### Place-Based Learning and Constructivist Environment Survey (PLACES)

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Age: \_\_\_\_\_

For each of the statements below, CIRCLE the dot which best reflects your feeling or experiences in classes. Remember, there are no right or wrong answers; it is your opinion that is wanted.

#### Personal Relevance/Integration

	<i>always</i>		<i>sometimes</i>		<i>never</i>
1. I learn about the community outside of school.	<input type="radio"/>				
2. My new learning starts with issues important to the local community.	<input type="radio"/>				
3. I gain a better understanding of the community and places; outside of school.	<input type="radio"/>				
4. I learn interesting things about the community outside of school.	<input type="radio"/>				
5. Lessons are supported with field experiences and other community activities	<input type="radio"/>				

#### Critical Voice

	<i>always</i>		<i>sometimes</i>		<i>never</i>
6. It's all right for me to ask the teacher "why are we learning this?"	<input type="radio"/>				
7. It's all right for me to ask for a better explanation of confusing learning activities when I need one.	<input type="radio"/>				
8. It's all right for me to request fewer distractions that interfere with my learning.	<input type="radio"/>				
9. It's all right for me to express my opinion.	<input type="radio"/>				
10. It's all right for me to speak up for my rights.	<input type="radio"/>				

### Student Negotiation

	<i>always</i>		<i>sometimes</i>		<i>never</i>
11. I am provided with opportunities to talk to other students about how to solve problems.	<input type="radio"/>				
12. I make an effort to explain my ideas to other students.	<input type="radio"/>				
13. I ask other students to explain their ideas and opinions.	<input type="radio"/>				
14. Other students ask me to explain my ideas.	<input type="radio"/>				
15. Other students are provided with opportunities to explain their ideas to me.	<input type="radio"/>				

### Student Cohesiveness

	<i>always</i>		<i>sometimes</i>		<i>never</i>
16. Students get along well as a group.	<input type="radio"/>				
17. I have opportunities to get to know other students.	<input type="radio"/>				
18. Members of the class help one another out during classroom activities.	<input type="radio"/>				
19. Students get to know each other well through participation in classroom activities.	<input type="radio"/>				
20. I am able to depend on other students for help during classroom activities.	<input type="radio"/>				

### Student Involvement

	<i>always</i>		<i>sometimes</i>		<i>never</i>
21. The teacher asks me questions when we are learning.	<input type="radio"/>				
22. I ask the teacher questions when we are learning.	<input type="radio"/>				
23. My ideas and suggestions are used during classroom discussions.	<input type="radio"/>				
24. I pay attention during this class.	<input type="radio"/>				
25. I offer my opinions during discussions.	<input type="radio"/>				

**Shared Control**

	<i>always</i>		<i>sometimes</i>		<i>never</i>
26. I help the teacher plan what I'm going to learn.	<input type="radio"/>				
27. I help the teacher decide how well I am learning.	<input type="radio"/>				
28. I help the teacher decide which activities or projects are best for me to work on.	<input type="radio"/>				
29. I help the teacher decide how much time I spend on learning activities.	<input type="radio"/>				
30. I help the teacher decide which activities I do.	<input type="radio"/>				

**Open Endedness**

	<i>always</i>		<i>sometimes</i>		<i>never</i>
31. I am able to go beyond the regular learning activities and do some studying of my own.	<input type="radio"/>				
32. I am encouraged to think for myself.	<input type="radio"/>				
33. There are opportunities to pursue my interests.	<input type="radio"/>				
34. I can design my own learning projects.	<input type="radio"/>				
35. I am able to express myself freely in my learning.	<input type="radio"/>				

**Environmental Interaction**

	<i>always</i>		<i>sometimes</i>		<i>never</i>
36. I am more outgoing during field trips.	<input type="radio"/>				
37. I am able to express myself freely during community or field experiences.	<input type="radio"/>				
38. Learning is a top priority for me during our community field trips.	<input type="radio"/>				
39. I put a lot of effort into the learning activities during our community field trips.	<input type="radio"/>				
40. I spend most of the time during field trips learning about my community.	<input type="radio"/>				

## Appendix C

### Mindfulness Inventory (FMI)

The purpose of this inventory is to characterize your experience of mindfulness. Please use the last \_\_\_ days as the time-frame to consider each item. Provide an answer for every statement as best you can. Please answer as honestly and spontaneously as possible. There are neither 'right' nor 'wrong' answers, nor 'good' or 'bad' responses. What is important to us is your own personal experience.

Thanks very much for all your effort!

	Rarely	Occasionally	Fairly often	Almost always
I am open to the experience of the present moment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I sense my body, whether eating, cooking, cleaning or talking.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I notice an absence of mind, I gently return to the experience of the here and now.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am able to appreciate myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I pay attention to what's behind my actions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I see my mistakes and difficulties without judging them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel connected to my experience in the here-and-now.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I accept unpleasant experiences.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am friendly to myself when things go wrong.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I watch my feelings without getting lost in them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

0.

1. In difficult situations, I can pause without immediately reacting.

2. I experience moments of inner peace and ease, even when things get hectic and stressful.

3. I am impatient with myself and with others.

4. I am able to smile when I notice how I sometimes make life difficult.

***Thank you for completing this questionnaire, your assistance is appreciated!***

## Appendix D

### Ecological Attitudes Survey

Name: \_\_\_\_\_ Date: \_\_\_\_\_

For each of the statements below, CIRCLE the dot which best reflects your feeling or experiences in classes. Remember, there are no right or wrong answers; it is your opinion that is wanted.

		Strongly Agree	Mildly Agree	No Opinion	Mildly Disagree	Strongly Disagree
1	I'd be willing to ride a bicycle or take the bus in order to reduce air pollution.	<input type="radio"/>				
2	I would probably never join a group or club which is concerned solely with ecological issues.	<input type="radio"/>				
3	I would be willing to use a rapid transit system to help reduce air pollution.	<input type="radio"/>				
4	I'm <u>not</u> willing to give up driving on a weekend due to smog alerts.	<input type="radio"/>				
5	I'm not willing to go out of my way to do too much about environment since that's the governments job.	<input type="radio"/>				
6	I would donate a day's pay to a foundation to help improve the environment.	<input type="radio"/>				
7	I would be willing to stop buying products from companies guilty of polluting even though it might be inconvenient.	<input type="radio"/>				
8	I'd be willing to write my MLA concerning environmental issues.	<input type="radio"/>				
9	I probably wouldn't go house to house to distribute literature on the environment.	<input type="radio"/>				
10	I would be willing to pay a pollution tax if it would considerably decrease the smog.	<input type="radio"/>				

Please answer these questions concerning your sustainable living practices since you began high school.

	I've never bought a product because it had a lower pollution effect.	True	False
	I keep track of my MLA's records on environmental issues.	True	False
	I have never written my MLA concerning the environment.	True	False
	I have contacted a community agency to find out what I can do about pollution.	True	False
	I don't make a special effort to buy products in recyclable containers.	True	False
	I have attended a meeting of an organization specifically concerned with bettering the environment.	True	False
	I have switched products for ecological reasons.	True	False
	I have never joined a cleanup drive.	True	False
	I have never attended a meeting related to the environment.	True	False
	I subscribe to environmental publications.	True	False

## Appendix E

Self-Evaluation/

Note: You must support each mark with a supporting statement.

Name \_\_\_\_\_

1. Participation (10) – rate yourself out of 10 on the level of participation you demonstrated on all aspects of the trip. Make sure to support your mark with a statement.
2. Responsibility (10) – rate yourself out of 10 on the level of responsibility you demonstrated on all aspects of the trip. This includes supporting classmates' respect for the environment (garbage, etc.) and completion of all tasks asked of you (includes reading during the trip).
3. Learning Opportunities (10) – rate yourself out of 10 on the level of execution you demonstrated for all learning activities presented. This includes writing in your journal, collecting data, reflecting on experiences, etc.
4. Personal Growth and commitment to the Group (10) – rate yourself out of 10 on your personal growth in relationships to your commitment to the group and others around you. This includes supporting classmates, encouraging others, putting aside your differences for the sake of others, making wise choices that reflect a position outcome for the benefit of all.

Total: (out of 40)

## Appendix F

Results from Kolb's learning styles inventory — ES 10 students

