A CASE STUDY OF 'REFLECTIVE MOMENTS' IN CONVERSATIONS: MAKING SENSE OF ENVIRONMENTAL EDUCATION

by

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A Case Study of 'Reflective Moments' in Conversations: Making Sense of Environmental Education

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Abstract

This case study consists of four conversations between Lori, an elementary teacher, and myself, district resource person and researcher. The conversations focused on environmental education, particularly teaching the Port Study Program for Grade 7 students in the Coquitlam School District #43 in British Columbia.

The literature review develops a theoretical framework on teachers' learning as the phenomena of coming to "see" and understand events of teaching in new ways. After detecting reflection in the conversations, the content of these conversations is described and compared to illustrate our changing understandings of teaching events, as well as shifts in our views on teaching about environmental education, generally. Finally, I interpret the role that these conversations played in developing our pedagogical understandings.

At the outset, we identified a mutual perception of lack of student enthusiasm and participation during the Port Study. Segments of conversation, called "reflective moments," repeatedly returned to this concern. We reframed the problem of students' lack of enthusiasm and participation to being one of students' lack of learning to appreciate nature, to being a problem of students' lack of passion, or strong desire, to explore and understand nature. Furthermore, we realized our difficulty in assessing students' affective responses to outdoor experiences.

As a result, our implications for teaching environmental education changed from demanding participation of students by way of, for example, asking questions, to believing that our role was to provide experiences for children in which they can develop an affinity toward, and understanding of, environmental matters. Also, students need ample time to feel comfortable in the outdoors, to explore the outdoors, and to repeat experiences.

Then, I identified and analysed the role of conversation in our reframing and shifting views as providing opportunities for us to act as a sounding board, to respond to triggers in the environment, to think aloud, to open up to other perspectives, to reconstruct shared experiences, to integrate prior experiences, and to process experiences.

This thesis showed that reflection can be detected in conversations and supported the role of these conversations in our deepening understandings of environmental education.

Dedication

This thesis is dedicated to

my father

NICO MULDER TEN KATE

and to my mother

NANNY MULDER TEN KATE

Quote

We shall not cease from exploration

And the end of all our exploring

Will be to arrive where we started

And know the place for the first time.

T.S. Eliot, *Four Quartets*

"Little Gidding"

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This study was possible thanks to the dedicated participation of Lori. When we traveled by canoe and on foot to explore the environment around us, we ventured into the unknown to make sense of environmental education.

A special thanks to Allan MacKinnon for being the thoughtful and calm captain, guiding me through rough waters and unexpected storms of indecision and uncertainty. I stayed on course and reached my destination with your support and assistance. The traveling was worth it and will continue beyond.

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Table of Contents

Chapter 1
Overview of the Study

With the recent resurgence of environmental education in British Columbia, the Coquitlam School District #43 has maintained the Port Study Program for Grade 7 students. During the one-day field component of this program, students visit a number of industries in the Port Moody Inlet, traveling by canoe to explore the relationships between human activity and the natural environment. Teachers who are familiar with the program are beginning to examine these relationships in the classroom, and, in this sense, the Port Study exemplifies the potential of environmental education opportunities in the district.

I was employed as a resource teacher in the Port Study Program for several seasons. This thesis examines my work with one elementary teacher over a period of four weeks. During this time, Lori and I taught two lessons together—one before, and one during the Port Study—and participated in four conversations related to the Port Study experiences in particular, and environmental education in general.

I am interested in how teachers learn about environmental education. In developing a theoretical framework on teachers' learning, I draw on a literature pertaining to "reflection," as the phenomenon of coming to "see" and understand events of teaching in new ways. The problem for this study is to detect reflection in my conversations with Lori, and to examine the role of these conversations in deepening our pedagogical understandings of environmental education. The analysis focusses on: (1) our changing understandings of environmental education, (2) the consequent shifts in our views on teaching and learning, and (3) the role of conversation in these accomplishments.

Justifying The Study

It is useful to begin by addressing two broad categories of knowledge that are discussed in educational literature: knowledge generated in practice, and theoretical knowledge available to us from writings in the social sciences. Many educational researchers argue that the latter is not

sufficient to conceptualize teacher learning, and they propose that much of teacher learning results from inquiry in practice and reflection. Drawing from MacKinnon (1990), I summarize two conceptions of reflection, as the term is used in this literature, and convey some of the processes and contexts in which reflection is said to occur. The second half of this chapter describes the origin of this study, the methodological stance, and the three questions guiding this research.

Theoretical Knowledge And Practical Knowledge

In the context of environmental education, teachers must frequently pursue competing and uncertain means and must often face multiple, ambiguous, conflicting ends. For example, how do we engage students in a meaningful outdoor activity when many students feel like foreigners in the forest or like wanderers on the water? Or, how do we teach a forestry unit with raging debates between anti-loggers and loggers in our forestry-based community? And, how do we teach moral education, value clarification, and conflict resolution to students from diverse cultural, political, and social backgrounds without playing advocate? Also, how can we instill a sense of appreciation for nature in students? These questions are practical and personal in nature. Teaching about environmental matters requires making multiple and complex choices in situations that are uncertain and changing. We have to examine our personal, pedagogical understanding of these questions in practice, so that we can change our course of action.

When facing multiple, complex choices under conditions of uncertainty and instability, Sykes (1986) reminds the practitioner to develop[1]

> ...the capacity not only to act—to employ technical skills in performance—but to evaluate the consequences of his actions, to consider alternative courses of action, to set and to solve recurring and idiosyncratic problems, and to utilize a multiplicity of conceptual frames in these cognitive, interactive processes. (p. 230)

He recommends that

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[1]I recognize that many of the authors I draw upon in this document use gender-biased language, and that policy guidelines have been produced to deal with the issue (for example, Eichler & Lapointe, 1985, "On the Treatment of the Sexes in Research," Ottawa: Social Science and Humanities Research Council of Canada). In my own words, I have taken care to avoid the use of such language, and have chosen to leave quotations unaltered to avoid the awkward use of "[sic]."

> If teachers are to be responsive to the complexities of teaching work, two things will be required of them. First, they need to become knowledgeable about a range of concepts and theories derived from the social sciences which can be applied to their work. Second they should be capable of engaging in inquiry on their own practices. (p. 231)

Even though the social sciences offer an array of concepts and interpretations, many of which are conflicting and inappropriate, they are a source of external, theoretical knowledge from which to draw.

Syke's second requirement is that teachers inquire, but the inquiries are into their own practice. In addition to drawing from external knowledge of, for example, the social sciences, teachers have access to internal knowledge. In pursuit of knowledge within the sphere of their own practice, teachers must remain flexible, adaptable, constantly questioning their practice, and considering both ends and means regularly in tandem. Confusing and conflicting questions, controversial and confining practices, and improper and indoctrinating resources grab teachers' attention and demand resolution. When inquiring into their own practices, they may begin to see some diffusion of doubt, clearing of complexity, or resolve of ambiguity.

Reflective Inquiry

Schön's work renewed the debate and research surrounding reflection. An outpouring of research followed the publications of his two books: *The reflective practitioner: How professionals think in action* (1983) and *Educating the reflective practitioner* (1987). Discussions and studies, centering on reflection, and particularly reflection in teacher pre-service education and teacher in-service education, have been diverse and numerous. Within the context of this chapter, I introduce Schön's understanding of the nature of professional knowledge and how it is acquired. Chapter two continues this discussion with a more detailed review of the literature and, in particular, Schön's two books.

Schön's (1983) discussion centres mostly around professions, such as medicine, management, and engineering when concluding that "leading professionals speak of a new awareness of a complexity which resists the skills and techniques of traditional expertise" (p. 14). When these practitioners are faced with unique events, and conflicts of values, goals, purposes,

and interests, they can no longer rely on traditional, specialized knowledge to sweep away or solve complexity, instability, uncertainty, or ambiguity. Schön (1987) comments on what he calls "Technical Rationality,"

> Technical rationality holds that practitioners are instrumental problem solvers who select technical means best suited to particular purposes. Rigorous professional practitioners solve well-formed instrumental problems by applying theory and technique derived from systematic scientific knowledge. (pp. 3-4)

Schön addresses the limitations of such a perspective when contrasting problem solving, choosing from amongst available means to suit the end, with problem setting, constructing the problems from the materials of practice situations which are puzzling, disconcerting, or conflicting. Technical problem solving must incorporate problem setting; however, problems in practice are not all technical in nature. Recognizing the limitations of technical rationality in uncertain, conflicting, or complex practice situations, Schön recommends an epistemology of practice which is "implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness, and value conflict" (p. 49).

What happens when a practitioner faces a surprising experience? In Schön's (1983) own words,

> When intuitive, spontaneous performance yields nothing more than the results expected for it, then we tend not to think about it. But when intuitive performance leads to surprising, pleasing and promising or unwanted [sic], we may respond by reflection-in-action. (p. 56)

Without going into a lot of detail at this point, reflection, as seen by Schön, happens in the action when "we can still make a difference to the situation at hand" and "our thinking serves to reshape what we are doing while we are doing it" (Schön, 1987, p. 26). Reflection-in-action happens in the midst of practice and incorporates knowledge embedded in that practice.

Conceptualizing Reflection In Research

To understand the broader research context within which this study occurred, I believe it is valuable to briefly glance at what other studies are revealing and telling us. This overview will set the stage for a more in-depth look at reflection, and Schön's work, in Chapter Two.

MacKinnon (1990) identifies three conceptions of inquiry in teacher reflection "to understand the contexts and processes about which reflection seems to occur" (p. 514). He asked himself, "What is it that leads a practitioner to reconceptualize a problematic situation, to assign new significance to events, or to begin to attend to features of a situation that were previously ignored?" (p. 524). This discussion centres around two of the three conceptions. The third conception, which focuses on the influence of critical theory, especially work by Habermas (1971), is not addressed. Critical reflection, an emancipatory activity, identifies and, eventually, should eliminate the social, economic, and political components of teaching to address self-understanding (Carr and Kemmis,1986). I recognize that environmental education is riddled with assumptions that have been taken for granted; however, the focus of this study restricts itself to the activities between teachers and students in the indoors and outdoors and does not examine teachers' participation "in our society's educational discourse" (Sykes, 1986).

The first conception of reflection, based directly on Schön's work on reflection and the epistemology of professional knowledge, includes "how teachers represent and explain practice situations: how they see certain events, as well as the significance they attach to these events" (p. 514). For example, MacKinnon and Erickson (1988) explored how Schön's three "coaching models," "follow me," "joint experimentation," and "hall of mirrors," apply in science teaching practice. By analysing supervisory dialogues between a student teacher and an experienced science teacher, they identified some of the elements and the conditions that promoted a reflective practicum. They conclude that for the student teacher to develop an ability to reflect on his teaching practice, he might be dependent on a supervisor who can articulate and demonstrate an ability to reflect on his own as well as the student teacher's practice. Secondly, a climate of trust and support is necessary to encourage reflection on problematic situations in the practice of teaching.

In another project, MacKinnon and Grunau (in press) also believe that knowledge of teaching practice is not easily reduced to "technical description or rules for practice" (p. 4). Focusing their research on a school-based teacher education program, they dispute that principles

of teaching in a methodology course can simply be transferred from teacher educator to prospective teacher. Instead they say,

> We prefer to think that knowledge of teaching is actively constructed by practitioners themselves, inextricably linked to their experiences and inquiries in actual situations of practice. We think such experiences and inquiries are sustained through communities that enable ongoing action and discourse. (p. 4)

After analysing examples of interactions, for example, between student teachers and pupils, student teachers and supervising teachers, and amongst student teachers, "reflective sessions" after the lesson, and informal, voluntary, post-practicum feedback letters, MacKinnon and Grunau, when commenting on their view of the teacher education program, say, that "...we might nurture and develop students' own expertise in taking on the role of the teacher, in large part, by prompting the development of their sense of action and criticism of practice through interaction with others" (p. 4). Again, this teacher education program created a positive and supportive environment for reflection to occur. This category of research investigates the "character and quality of reflection as it can be seen to occur in teacher's dialogue about recorded lessons or particular classroom events" (MacKinnon, 1990, p. 514).

Other research focuses on the role of reflection in relieving the tensions within a teacher that may spring from worries and concerns about the integrity of subject matter versus pupil understanding of the subject matter. For example, Shulman (1987), being dissatisfied with all the rhetoric surrounding the knowledge base for teaching, presents an argument "regarding the content, character, and sources for a knowledge base of teaching that suggests an answer to the question of the intellectual, practical, and normative basis for the professionalization of teaching" (p. 4). He also believes that research on effective teaching may inform teachers, but it is not the only source of their knowledge in teaching. While focusing on pedagogical content knowledge, because it is "that special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding" (p. 8), he proposes a form of inquiry called "pedagogical reasoning" that will "lead to or can be invoked to explain pedagogical action" (p. 9). This model of pedagogical reasoning and action consists of six aspects that comprise most elements of teaching: comprehension (understanding the ideas to be taught),

transformation (transforming the ideas to be taught), instruction (teaching the ideas), evaluation (checking students' understanding of the ideas), reflection (looking back at the teaching and learning that has occurred), and finally, new comprehension (teacher arriving at a new understanding). Even though these processes may not occur in order, he encourages teachers to incorporate them into their practice of teaching. He describes reflection as "reviewing, reconstructing, reenacting and critically analyzing one's own and the class's performance, and grounding explanations in evidence" (p. 15). Reflection helps the practitioner learn from experience. And, reflection, in his eyes, means looking back to make sense of past experiences.

In contrast, the second category includes research on reflection in the context of teachers' practical knowledge. Elbaz (1981, 1983) identifies five orientations of practical knowledge: situational, theoretical, personal, social, and experiential and five content areas of practical knowledge: knowledge of self, knowledge of the milieu of teaching, knowledge of subject matter, knowledge of curriculum development and knowledge of instruction. She believes that the situational orientation most closely resembles the "practical" category, and says, "It is because teachers' knowledge is practical that it is directed toward making sense of and responding to, the various situations of teaching" (Elbaz, 1981, p. 49).

She investigates the development of teacher's practical knowledge from the perspective of the teacher. By reminding the reader that most educational theorists considered knowledge as "empirical" and "analytical," a view echoed by Sykes (1986), teachers may not have considered the wealth of knowledge embedded in their experiences. She writes, "The conception of practical knowledge developed here, however, is broader, encompassing knowledge of practice as well as knowledge mediated by practice" (Elbaz, 1981, p. 46). Furthermore, she conceptualizes three terms, "rule of practice," "practical principle," and "image," to characterize the structure of practical knowledge. A rule of practice is "a brief, clearly formulated statement of what to do or how to do it in a particular situation frequently encountered in practice" (p. 61). While in this case the teacher applies the rule methodically to implement her purpose which may not be known to her, in the case of using practical principles, she deliberates and reflects on her purpose and the

problem. Elbaz (1981) draws on the writings of Gauthier (1963), who suggests that to use the practical principle is

> ...to bring experience to bear on present problems. This experience is useful because the realm of the practical is necessarily a realm of uncertainty. To deliberate fully upon the consequences of future actions, or upon their possible grounds, would often be to ignore the practical context in which we must act. (p. 156-157)

She emphasizes the importance of rationale that underlies our actions. The third term, images, also of interest to Clandinin (1985) and Connelly and Clandinin (1988), represent the feelings, values, needs, and beliefs of teachers in their oral and written text that guide them in their purposes.

Connelly and Clandinin (1988) introduce the knowledge we have about ourselves as personal, practical knowledge which is "a moral, affective, and aesthetic way of knowing life's educational situations" (p. 59). They conclude that teachers learn from *being* teachers, from their milieu and from the subject matter. They examine images, metaphors, rhythm, and narrative unity in the language of teachers when making sense of their experiences.

Russell, Munby, Spafford, and Johnston (1988), interested in the learning of professional knowledge of teaching, study the occurrence of metaphors in teacher's talk that express the relationship between theory and practice of teaching. They describe the use of metaphors in the interviews with beginning teachers and an experienced teacher. In their research, they are particularly interested in seeing how these metaphors may change over time when teachers gain more experience and how these metaphors affect the practical knowledge that teachers develop. Towards the end of this chapter, they say,

> We are increasingly convinced that the image one holds of the relationship between theory and practice can significantly influence understanding of the personal learning process, at every stage in one's development of the professional knowledge of teaching. (p. 87)

These researchers talk with teachers to recover and analyse teachers' metaphors; they also continue to gain an understanding of the importance of the reflective process in the learning of professional knowledge.

These studies emphasize the processes and contexts of reflection in teachers' developing and changing understanding of teaching. My thesis is consistent with Schön's notion of reflective practice and builds on a more general literature on reflection, a few of which have been introduced above.

Origin Of The Study

My teaching experiences started long before I entered the Professional Development Program for teachers at Simon Fraser University, Burnaby, B.C. in 1990. Two volunteer positions, zoo interpreter at the Stanley Park Zoological Gardens and docent at the Vancouver Public Aquarium, both located in Stanley Park in Vancouver, B.C., provided me with opportunities to share my interest in local natural history with students and the general public. To combine my Bachelor degree in Zoology with my emerging interest in teaching, I accepted a position as park naturalist with the Greater Vancouver Regional District for two summers, prior to becoming a professional teacher. I consulted with elementary teachers to teach outdoor environmental education programs. Since obtaining my teaching certificate two years ago, I have been teaching on call and have been acting as a resource person for the grade seven Port Study per Canoe in the Coquitlam School District #43. In addition, I am a consulting environmental educator for local elementary schools and organizations, such as the Burke Mountain Naturalists and the Port Moody Ecological Society.

Throughout these diverse experiences a seed was planted, but laid dormant, until I entered the Master of Science program in the Faculty of Education at Simon Fraser University, Burnaby, B.C. It finally germinated and arose from the dark and messy soil. Two courses in particular provided the nutrients and nurture for growth. An action research-based assignment and a collection and analysis of four interviews described and interpreted the importance of collaboration between teachers. Furthermore, I gained insights into a change and a change process experienced by teachers throughout these assignments and readings of some of the literature. As well, in addition to my personal experiences with reflection on practice in clinical supervision cycles during my student teacher practica, my review of Schön's work sparked an interest in reflection,

particularly reflection in conversations. The plant was firmly rooted in past experiences and continued to grow with every subsequent outdoor experience, graduate class discussion, and professional reading. With further in-depth research I stimulated the plant to bloom.

Methodological Stance

The detection of reflection in conversations and an investigation of the role of conversations—the problem of this study—demanded a qualitative approach. The nature of this research was naturalistic and interpretative to match the focus of the analysis. Merriam (1991) reminds the researcher that "One of the assumptions underlying qualitative research is that reality is holistic, multidimensional, and ever-changing; it is not a single, fixed, objective phenomenon waiting to be discovered, observed, and measured" (p. 167).

In this case study, I was concerned with how my findings and interpretations of the conversations reflected those of Lori. Furthermore, I realized that using these conversations to describe and interpret their importance would elevate them to another level that under non-research circumstances would not have happened. When asked if the results were plausible, she agreed with the interpretation of the content of the segments. I am reminded by Lincoln and Guba (1985) that my interpretations of the data, which are also constructions, must be credible to Lori who was also a "constructor of the original multiple reality" (p. 296).

To safeguard the nature of these conversations, expressing ourselves orally and relying solely on our memory, I did not access any data until after the completion of the field component. I did not want my reading of the transcripts to have an influence on the data as they were collected. Nor would these conversations have been transcribed and analysed had they not been part of a research project.

Summary

Keeping in mind that there are no standard and routine solutions to some of the fundamental questions about learning and teaching environmental education, teachers must constantly inquire into their practice. They must draw from personal and practical knowledge to

come to "see" and understand problematic situations in new ways. Much of the literature on reflection focusses on the diverse purposes for reflection and contexts within which reflection manisfest itself. This thesis aims to develop a theoretical framework on teachers' learning by reviewing other related literature on reflection and by reviewing, in more detail, Schön's conception of reflection. In addition, I must review some of the literature with respect to conversations and environmental education to provide the context within which this reflection is embedded. The problem, to detect reflection in our conversations and interpet the role of these conversations in deepening our pedagogical understanding of environmental education, implies a set of prior questions.

I address three questions in the analysis (1) What changes do I detect in our understanding of environmental education in the conversations?; (2) What consequent shifts do I detect in our views on teaching and learning about environmental education?; and (3) What is the role of conversation in changing our understanding of environmental education and in shifting our views on teaching and learning about environmental education?

Overview Of The Document

This chapter described the components that shaped the focus of this research, undertaken during the spring of the 1992/1993 school year. In preparing the research context in which this case study is embedded, Chapter Two reviews the literature for a more in-depth discussion of reflection, conversations, and environmental education. After reviewing the literature, I return to the justification for reflection in larning and teaching about environmental education, an argument hinted at in this chapter. This is followed by Chapter Three, which describes, in more detail, the methods used to collect the data, and Chapter Four, which describes and interprets illustrative segments of conversations. Finally, Chapter five articulates the conclusions, limitations, and implications of this study.

Chapter 2
Review of Related Literature

This chapter reviews some of the literature related to reflection, the nature of "conversation" and an environmental education initiative in the Province of British Columbia. After reviewing the contexts within which reflection may be manifest, I turn to the process of reflection by reviewing Schön's two books in detail. Then, I compare and contrast a number of frameworks, with an emphasis on conversations, that incorporate reflection. The latter part of this chapter travels a path through magazine articles, discussion papers, and journal articles to make sense of environmental education in the province of British Columbia. Also, this component of the review exemplies the complex and uncertain nature of the content of environmental education as well as the uncertain approach to teaching environmental education in this province. And finallly, the chapter concludes with linking reflection, conversations and environmental education.

Making Sense Of Reflection

The first chapter introduced the concept of reflection; however, as illustrated, "reflection" has a variety of meanings and has a diversity of purposes. After reviewing another three classification schemes to make sense of reflection in the initial part of this present chapter, I step back in time to summarize Dewey's ideas on reflection which paved the way for Schön's work. Following this, I turn to a more rigorous review and a scrutiny of Schön's concept of reflection. Schön's understanding of reflection lays the foundation for reviewing a literature pertaining to conversations, which are seen as contributing to teacher's learning.

Reviewing Perspectives On Reflection

In addition to identifying categories of reflection based on its purpose, Grimmett, MacKinnon, Erickson, and Riecken (1990) identify three perspectives on reflection based on the source of knowledge, the mode of knowing, and the use of knowledge in the reflective process. The first perspective, "instrumental mediation of action," sees knowledge as directing teachers in

their practices. In contrast, "deliberation amongst competing points of view" in teaching during reflection suggests that knowledge informs teachers in practice. Finally, the third perspective, "reconstruction of experiences," identifies reflection in teachers' practice with the apprehension of knowledge. These three perspectives are just one way to make sense of the different conceptions of reflection; however, they, by no means, exclude other possibilities for viewing reflection.

Zimpher and Howey (1987) describe four types of reflection: "technical," "clinical," "personal," and "critical." Of these four types, technical reflection is the lowest level of reflection. When teachers are learning and implementing, for example, a specific teaching strategy, they may reflect in a technical way when they are evaluating the ends. In contrast, when clinical reflection happens, teachers examine what they are doing and make changes based on inquiry and reflection into their actions. The next level of reflection demands that teachers examine their morals and cognitive development as adults to inform their practice. Colleagues and the community support them in their efforts. When teachers examine the larger political and social role of the school in society, they reflect in a critical manner.

Feiman-Nemser (1990) identifies five levels, or orientations, towards reflection. These levels are dependent on the content of reflection. The "technocratic orientation" focuses on how to teach most effectively a particular set of objectives. The second level, the "academic orientation," pays attention to the school or subject matter; whereas the third level, "practical orientation," addresses how to teach this subject matter. Thirdly, reflection that focuses on the teachers themselves is part of the "personal orientation." And finally, in the "critical orientation," the teacher reflects on the school's role in forming a more just and democratic society. Even though these five orientations incorporate elements of reflection, the purpose of reflection varies from orientation to orientation.

Having brought to light some of literature that address the purpose of reflection in a teacher's practice, I summarize by describing a pattern that seems to develop amongst the different orientations. In most cases, the most elemental purpose of reflection seems to deal with fixed ends that can be addressed by flexible means. Reflection tends to direct teachers to outcomes that have been decided upon beforehand. In contrast, the more complex form of reflection contributes

to situations that are characterized by neither fixed means nor fixed ends. Upon reflection, teachers begin to reconstruct the practice situation which leads to different consequences and implications as well. These authors recognize that teachers may shift between different forms of reflection, depending on the content of the reflection, the contribution of knowledge to reflection, and the context within which reflection happens.

Stepping Back In Time—Returning To Dewey For The Nature Of Reflection

Dewey (1933) believes that the process of reflection is not merely a method of problem solving but a way of being or thinking. "Not the thing done, but the quality of mind that goes into the doing, settles what is utilitarian and what is unconstrained and creative" (p. 215). When experiencing an "uncertain, perplexed, or troublesome question," we must think reflectively. "The function of reflective thought is, therefore, to transform a situation in which there is experienced obscurity, doubt, conflict, disturbance of some sort, into a situation that is clear, coherent, settled, harmonious" (pp. 100-101). Reflective thought differs from other forms of thought in that it arises in practice situations characterized by doubt and uncertainty and it is a form of inquiry to search for suggestions to lift the doubt and uncertainty.

To reflect means to face a problematic situation by observing with the senses and recollecting past observations. Dewey (1938) writes, "But observation alone is not enough. We have to understand the significance of what we see, hear, and touch. This significance consists of the consequences that will result when what is seen is acted upon" (p. 68). In other words, the conclusion is tentative and must be subject to further reflective thought which constitutes, "Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (p. 9). After teachers have noted the problematic nature of the situation, they have to search for solutions which can only be suggested by "the data at hand." Reflection is purposeful and leads to a consequence. "Demand for a solution of a perplexity is the steadying and guiding factor in the entire process of reflection" (Dewey, 1933, p.14).

Dewey recognizes a number of sources of suggestions, but he singles out:

> ...past experience and a fund of relevant knowledge at one's command. If the person has had some acquaintance with similar situations, if he has dealt with material of the same sort before, suggestions more or less apt and helpful will arise. But unless there has been some analogous experience, confusion remains mere confusion. (Dewey, 1933, p. 15)

When comparing these suggestions in light of the situation, judgments are temporarily suspended. In Dewey's words, we must be "willing to endure suspense and to undergo the trouble of searching" (p. 16). Eventually, we recognize an order in the ideas that lead to "a conclusion that contains the intellectual force of the preceding ideas...making some ideas worthy of belief...making it *trustworthy"* (Dewey, 1933, p. 47).

When searching for solutions to transform a problematic situation, we make inferences. In Dewey's terms, an inference is "the process of arriving at an idea of what is absent on the basis of what is at hand...it involves a *jump from the known into the unknown*" (pp. 95-96). Reflection, then, is also testing the inferences or suggestions.

> ...first, the process of forming the idea or supposed solution is checked by constant cross reference to the conditions observed to be actually present; secondly, the idea *after* it is formed is tested by *acting* upon it, overtly if possible, otherwise in imagination. The consequences of this action confirm, modify, or refute the idea. (pp. 104-105)

After selecting a path, teachers incorporate their understanding into their practice upon which further reflection occurs to refine this practice. In summary, Dewey portrays reflective thinking as a sequence of isolating and observing some uncertainty or perplexity in a directly experienced situation, of making inferences and proposing possible suggestions which in turn are followed by intellectualization and testing of hypotheses. Reflection is a practical and deliberate process to remove doubt from a situation.

Schön (1983, 1987) builds on Dewey's ideas of inquiry and experiment that occur at two different times—in-action and on-action. In the first instance, practitioners, holding knowledge tacitly, know-in-action and reflect-in-action. They act without consciously thinking about it. He says, "Indeed, practitioners often reveal a capacity for reflection on their intuitive knowing in the midst of action and sometimes use this capacity to cope with the unique, uncertain, and conflicted situations of practice" (Schön, 1983, p. ix). And, he continues,

> Often we can not say what it is that we know. When we try to describe it we find ourselves at a loss, or we produce descriptions that are obviously inappropriate. Our knowing is ordinarily tacit, implicit in our patterns of action and in our feel for the stuff

> with which we are dealing. It seems right to say that our knowing is in our action. (p. 49)

Thus, 'new' knowledge is part of the action and 'old' knowledge originates from past experiences. It is embedded in the action. Knowledge and experience are inextricably linked.

In the second case, practitioners become aware of their knowledge and actions when reflecting upon them retroactively. Their past experiences and knowledge assist them in constructing their representation and understanding of their practice with the intent to improve it. Schön remarks,

> There is some puzzling, or troubling, or interesting phenomenon with which the individual is trying to deal. As he tries to make sense of it, he also reflects on the understandings which have been implicit in his action, understandings which he surfaces, criticizes, restructures, and embodies in further action. (1983, p. 50)

Descriptions and interpretations of knowledge-in-action and reflection-in-action afterwards, for the most part, are conscious processes. Teachers are then reflecting on knowledge-in-action and reflecting on reflection-in-action with the intent to resolve a particular problematic situation that has been identified. The practitioner becomes aware of the problematic situation, begins to understand, and starts to incorporate suggestions to improve the situation at a conscious level.

Structure Of Reflection

In Chapter One, I introduced Schön's concept of reflection that captures the practical knowledge embedded in the practice of a teacher. When following Schön's analysis of reflection-in-action in *The reflective practitioner: How professionals think in action*, we see a clear reference to Dewey's work in reflective thinking and thought with the addition of two fundamental ideas. In addition to elaborating on these two ideas, tacit knowledge and frames, this discussion focuses on the structure of "reflection-in-action."

Schön's ideas are grounded in a number of case studies. He observes and records a number of interactions, for example, between a teacher and student of architecture, between a therapist and student in psychiatry, and between faculty and students in engineering from which he derived his structure of "reflection-in-action."

After Schön concludes that Technical Rationality has "limited utility in practice," and "fails to account for practical competence," he looks for an epistemology of practice that is implicit "in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness, and value conflict" (p. 49). Drawing from Polanyi's (1962) idea of "tacit knowledge," Schön (1983) writes, "Our knowing is ordinarily tacit, implicit in our patterns of action and in our feel for the stuff with which we are dealing. It seems right to say that our knowing is *in* our action" (p. 49). Instead of viewing the "application of knowledge to instrumental decisions" in the Technical Rationality model, knowing-in-action is "inherent in intelligent action" (p. 50). Not ignoring that at times we think before we act, Schön also believes that "in much of the spontaneous behaviour of skillful practice we reveal a kind of knowing which does not stem from prior intellectual operation" (p. 51). In other words, just because we cannot say what we know, does not mean that we do not know how to act intelligently. He calls "knowing-in-action" "the characteristic mode of ordinary practical knowledge" (p. 54).

He extends this argument by saying that "If common sense recognizes knowing-in-action, it also recognizes that we sometimes think about what we are doing" (p. 54). To support the argument that "not only we can think about doing but that we can think about doing something while doing it" (p. 54), he uses expressions, such as "thinking on your feet," "keeping your wits about you," and "learning by doing." Illustrating his point with examples from major-league baseball pitchers getting a "feel for the ball," or jazz musicians manifesting a "feel for" their materials during improvisations, he claims that

> Much reflection-in-action hinges on the experience of surprise. When intuitive, spontaneous performance yields nothing more than the results expected for it, then we tend not to think about it. But when intuitive performance leads to surprises, pleasing and promising or unwanted, we may respond by reflection-in-action. (p. 56)

To explain the meaning of the term, "in-action," he states,

> A practitioner's reflection-in-action may not be very rapid. It is bounded by the 'action-present,' the zone of time in which action can still make a difference to the situation. The action present may stretch over minutes, hours, days, or even weeks or months, depending on the pace of activity and the situational boundaries that are characteristic of the practice. (p. 62)

The rest of my discussion focuses on the process of reflection. First, the practitioner has to exercise "problem setting" to make sense of problematic aspects in a practice situation.

> In real world practice, problems do not present themselves to the practitioner as givens. They must be constructed from the materials or problematic situations which are puzzling, troubling and uncertain...When we set the problem, we select what we will treat as the "things" of the situation, we set the boundaries of our attention to it, and we impose upon it a coherence which allows us to say what is wrong and in what directions the situation needs to be changed. Problem setting is a process in which, interactively, we *name* the things to which we will attend and *frame* the context in which we will attend to them. (p. 40)

Naming and framing a problematic situation helps the practitioner to organize and clarify the means to which he should attend and the ends which he likes to achieve. The original frame superimposed on a situation may not resolve much and, therefore, the practitioner has to continue to reframe, including the "repertoire of examples, images, understandings, and actions" (Schön, 1987, p. 66) to bear onto the problematic situation.

> When he finds himself stuck in a problematic situation which he cannot readily convert to a manageable problem, he may construct a new way of setting the problem—a new frame which, in what I shall call a "frame experiment," he tries to impose on the situation. (p. 63)

When we reframe, we see a different problem, which allows us to suggest new approaches to a troubling or puzzling situation. We construct the problem differently and a solution may follow more quickly. Reframing implies that the initial frame, in which the problem had been constructed, did not resolve the situation.

> In order to see what can be made to follow from this reframing of the situation, each practitioner tries to adapt the situation to the frame. This he does through a web of moves, discovered consequences, implications, appreciations, and further moves. Within the larger web, individual moves yield phenomena to be understood, problems to be solved, or opportunities to be exploited. (p. 131)

Reflection is a metaphorical "conversation" between the practitioner and the situation. This exchange continues to reframe the problem which then brings with it new consequences and implications. These, in turn, may bring some changes not wished for by the practitioner.

> But the practitioner's moves also produce unintended changes which give the situation new meanings. The situation talks back, the practitioner listens, and as he appreciates what he hears, he reframes the situation once again. (pp. 131-132)

In fact, the solutions that we develop and choose depend on how the problem is conceptualized.

The process of reflection does not stop here. "Seeing as" has to be followed by "doing as."

> When the practitioner sees a new situation as some element of his repertoire, he gets a new way of seeing it and a new possibility for action in it, but the adequacy and utility of this new view must still be discovered in action. Reflection-in-action necessarily involves experiment. (p. 141)

Reminding the reader that a professional practice is constantly, and often rapidly, changing and is uncertain and unpredictable, he proposes three forms of experimentation—"exploratory," "move-testing," and "hypothesis testing"—to see what an action might lead to. The first, exploratory experiment, answers the question, "What if?"

> When action is undertaken only to see what follows, without predictions or expectations, I shall call it *exploratory experiment.* This is much of what an infant does when he explores the world around him, what an artist does when he juxtaposes colors to see what effect they make, and what a newcomer does when he explores a strange neighbourhood. Exploratory experiment is the probing, playful activity by which we get a feel for things. It succeeds when it leads to the discovery of something there. (p. 145)

When the action is chosen deliberately to achieve a certain end, Schön calls this type of experiment "move-testing experiments."

> In the simplest case, where there are no unintended outcomes and one either gets the intended consequence or does not, I shall say that the move is *affirmed* when it produces what is intended for it and is *negated* when it does not. In the more complicated cases, however, moves produce effects beyond those intended. One can get very good things without intending them, and very bad things may accompany the achievement of intended results. (p. 146)

There are two criteria that the results of the move have to satisfy for it to be affirmed. Does the move get you what you intended? And, do you like what the moves get you?

The third type of experiment, "hypothesis testing," is successful when it discriminates one hypothesis from all others. Only one hypothesis produces the predicted consequences.

> Hypothesis-testing experiment succeeds when it effects an intended discrimination among competing hypotheses. If, for a given hypothesis, its predicted consequences fit what is observed, and the predictions derived from alternative hypotheses conflict with observation, then we say that the first hypothesis has been *confirmed* and the others, *disconfirmed...*(p. 146)

What makes this hypothesis testing in practice different from hypothesis testing in research is that the context of the practice is different in some significant ways. Most of these differences originated from "the relationship between changing things and understanding them" (p. 147).

When practitioners reflect-in-action, they pay attention to phenomena, surface their intuitive understanding of and experiment in a particular case or a unique situation. Their experimenting encompasses exploratory, move-testing and hypothesis-testing in the same action, which distinguishes it from experimenting in research.

In closing, Schön (1983) sees reflection as a cyclical process through which we continue to move for as long as a situation is problematic.

> In this reflective conversation, the practitioner's effort to solve the reframed problem yields new discoveries which call for new reflection-in-action. The process spirals through stages of appreciation, action, and reappreciation. The unique and uncertain situation comes to be understood through the attempt to change it, and changed through the attempt to understand it. (p. 132)

And, in 1987 he writes,

> Underlying this view of the practitioner's reflection-in-action is a *constructionist* view of the reality with which the practitioner deals—a view that leads us to see the practitioner as constructing situations of his practice, not only in the exercise of professional artistry but also in all other modes of professional competence. (p. 36)

Making Sense Of Conversations

When Schön analyses reflection, he uses "conversations," "language," and "back-talk" in a metaphorical sense. For example, he writes about "designing as a conversation with the materials of a situation" (p. 78), "the situation talks back, and he responds to the situation's back-talk" (p. 79), "Drawing and talking are parallel ways of designing, and together make up what I will call the *language of designing*" (p. 80), "...reframing the problem is also a reflective conversation with the situation" (pp. 94-95), and "He discovers in the situation's back-talk a whole new idea which generates a system of implications for further moves" (pp. 102-103). Yinger (1990) uses conversations as a metaphor for practice as well. He writes, "Firstly, conversation refers to the means by which social practices are conducted. Language as utterance or text frames social interaction, and evidence suggests that a practitioner's interaction with materials and places is framed by a 'language of practice' as well" (p. 81). The following examples of research acknowledge reflection as an essential component of conversations or dialogues between two or more people in the practice of teaching.

Structured Dialogue

Structured dialogues are important in Pugach and Johnston's (1990) work. They elaborate on a systematic structure that makes explicit the inner-conversation from problem framing to solution to implication to reconsideration. They find that

> ...the acquisition of and continuing support for a reflective disposition among teachers can be mediated and substantially enhanced by peers, whose role might be described as helping to stretch the limits of their colleagues' capabilities for reflection. (p. 186)

The purpose of this reflection is to develop new patterns of thinking which will help the teachers understand and approach the complexity of teaching. Thus, this structured, interactive process between peers, called peer collaboration, provides opportunities for teachers to "rehearse specific reflective, strategic thinking patterns in a structured dialogue with their colleagues" (p. 189). This framework includes four sequential steps. One teacher, "initiator," presents her problem, and the second teacher, "facilitator," guides the first teacher through the four steps in a cyclical manner until the problem has been satisfactorily resolved.

In the first step, the teachers participate in sessions where they ask and answer questions to identify and reframe the nature of the problem or problems, which they have experienced in the classroom. The problems are approached from different viewpoints with the assistance of the facilitator who provides feedback and suggests aspects of the situation that the other may be overlooking. The authors comment, "It is within this internal yet public reflective conversation that professionals can explore problems from multiple perspectives, consciously stepping back from the daily routines of practice" (p. 190). Practitioners must reflect to correct routines. The conscious act of self-conversation, represented by engaging in clarifying questions, provides a deliberate structure for that correction to take place. After the clarification of the problematic situation, the teacher summarizes by identifying a pattern of classroom behaviour, her affective response to the situation, and the specific variables over which she has control to provide closure. This sets the stage for the third step, the generation of at least three action patterns, the prediction of possible outcomes, and the selection of one action to be implemented. Finally, after one action has been selected, the teachers must develop a plan that will predict how the action is going to

work, how the action is going to be monitored, and how the action is going to be evaluated, in terms of checking for effectiveness of the change. Upon completing the action, the evaluation indicates the degree of success. If the action did not measure up to the expectations outlined in the plan, the teachers revisit this plan and continue the cycle of inquiry and reflection.

As the name indicates, this process of reflection is structured. The facilitator tries to gain access to the other teacher's beliefs, understandings, or views without sharing her own. By asking probing questions, the facilitator may gain insights into her own beliefs, understandings, or views; however, these are not shared with the initiator. The role of the facilitator is to help the other teacher, not to help herself. They may reverse roles only after an action has been successfully implemented. The collaboration is interactive in nature, but each participant has different roles and responsibilities.

Teacher Conversation

Yonemura (1982) analyses teacher conversations to gain insights into the learning that teachers gain from one another. She distinguishes conversations from chats by characterizing conversations as "...serious examinations of reflection upon the practices and underlying theories of one teacher to which another gives undivided and supportive attention at times set apart for this" (p. 240). Yonemura's work is influenced by Benjamin (1974), as illustrated by this last quote, "One listens and enters into another person's thinking, avoiding premature judgments" (p. 241).

The purpose of these conversations is to,

> ...give teachers a chance to think, to reflect not so much on what will be done tomorrow but on what has been done and is too easily forgotten. An empathic listener to show interest and to bring clarity to these memories is needed. Teachers have unequalled potential for providing this service for each other. Discussion with a nonjudgmental peer can offer support for the emotional stresses and isolation of the work because teaching is not all practical art and aspects of it can be draining. Out of these reflective, supportive conversations a clearer identification of the practical principles guiding teachers can be formulated. (p. 241)

The peer teachers who attended seminars with Yonemura, chose a teacher in their school who agreed to participate in a five stage process. They completed a questionnaire and a structured

interview, identified an area of concern, observed in the classroom, and conversed about the observations. The peer teacher was always observing the teacher. These sessions were held between people, teaching different grades, having different subject specialties, and different interests and experiences. Over a twelve week period, one hour conversations about the observation between the teacher and peer teacher were tape-recorded and listened to by both afterwards.

After having presented three scenarios, Yonemura outlines the limitations of this work and makes recommendations. She concludes that the conversations required the presence and support of a supervisor so that these conversations would contribute to professional development. The number of conversations may vary and participants may move in and out of these conversations. Furthermore, the teacher and peer teacher could reverse their roles. In this seminar setting, she is adamant that the relations need structure and a leader to "help the peer teachers broaden their understandings about adults as learners and, with distance from the immediacy of the peer teacher-teacher relationship to suggest channels for the conversations that seemed educationally rich" (p. 255).

Partnership Supervision And Professional Dialogue

In the context of professional development, Rudduck (1987) introduces partnership supervision which "rests on the straightforward assumption that the understanding implicit in teachers' intuitiveness and experience can be transformed into educational knowledge through critical reflection on practice and focused professional dialogue" (p. 129). Partnership supervision is suitable for pre-service as well as in-service education for teachers who, with an outsider such as a university tutor or advisor, "work together to analyse and learn from the evidence of the teacher's classroom" (p. 129). Partnership supervision, modeled after clinical supervision, emphasizes the importance of dialogue between professionals. As Schön (1983) puts it,

> A professional practitioner is a specialist who encounters certain types of situations again and again...(but) many practitioners, locked into a view of themselves as technical experts, find nothing in the world of practice to occasion reflection.

> They have become too skillful at techniques of selective inattention, junk categories and situational control, techniques which they use to preserve the constancy of their knowledge-in-practice. (p. 69)

Rudduck believes that "the outsider as partner helps experienced teachers to loosen the hold of habit" (p. 130). The outsider brings new perspectives and fresh alternatives to a teaching situation. This model consists of three stages: pre-observation to discuss a focus for observation, observation of teaching, and post-observation to discuss the observer's notes and the decided-upon focus. She concludes that

> By fostering dialogue in a situation which minimizes the tutor's institutional power and instead emphasizes a colleague-like relationship, the student's developing sense of "self as teacher" is nurtured. Moreover, the student begins to appreciate the value of professional dialogue which helps him or her reflect on and analyze the events and structures of particular classrooms. (p. 135)

and,

> The energy which fuels the act of collaborative interpretation comes from the sparking of the two perspectives; that of the *insider*, who has the intimate knowledge of the setting but whose eyes are dulled by routine reconstruction of events in their own image—the habits which allow us to survive in complex situations but which make it difficult for us to "see" and to change what is there; and that of the *outsider*, whose wares include ways of "seeing" and thinking about the events in the classroom which he or she has developed through broad experience of classrooms and through critical reflection on different conceptual frameworks for analyzing classrooms. (p. 139)

After a cycle has been completed, participants may identify a new focus for observation, preferably with some time in between the cycles to be spent reflecting on and adjusting the focus. She recognizes that "Together they develop 'insights into problematic dimensions' of the classroom that might otherwise have been unavailable to either party" (p. 139). Yonemura (1982) and Pugach and Johnston (1990), on the other hand, never explicitly state that this may be a by-product of the conversations between teachers and peer teachers. Furthermore, they describe the role of the peer teachers as providing "undivided and supportive attention at times set apart for this" (p. 240). The peer teachers distance themselves from the teacher's developing understanding of the problematic situation.

Rudduck's framework for focused dialogue is similar in some ways to Yonemura's framework for conversation and Pugach and Johnston's framework for structured dialogue. Each model includes a series of stages through which the two participants move. The purpose of the

cyclical processes is to resolve a problematic situation in the practice of one of the participants. Even though the nature and purpose of the dialogue is different in the models, reflection is an essential component.

Reflective Action

Cinnamond and Zimpher (1990) reviewed Mead's (1932, 1934) "notion of reflective action as a fundamental process in attaining a sense of self and a sense of community" (p. 58) to think about the socialization process in which beginning teachers engage. Mead (1934), having just written about the importance of the language process for the development of self, continued with

> The self is something which has a development; it is not initially there, at birth, but arises in the process of social experience and activity, that is, develops in the given individual as a result of his relations to that process as a whole and to other individuals within that process. (p. 135)
>
> The individual experiences himself as such, not directly, but only indirectly, from the particular standpoints of the other individual members of the same social group, or from the generalized standpoint of the social group as a whole to which he belongs. (p. 138)

Communication within a community contributes to the development of self. Cinnamond and Zimpher (1990) write,

> The self is always preceded by the other. This other is generalized. Thus, the generalized other is a part of every self. It is only because of the generalized other that thinking or creative reflection can occur. The key component of this process is the dialogue that occurs between the I and the organized attitudes of others. The self becomes unified through social activity, and as a result it does not maintain itself as an individual self. It is always linked to the social communities that help give it definition. Consequently, when individuals act, they take into account the behaviours, values, and orientations of their community. (p. 58)

They summarize the function of language as seen by Mead as "...is to evoke action, not to describe it. This ties language to the doing of reflection as both a function and a necessary condition of social development" (p. 61). Unlike Dewey, Mead's notion of the process of reflection depends on the larger community surrounding the self.

Cinnamond and Zimpher recognize that when student teachers communicate with teachers, other students teachers, or administrators, it is more than transferring knowledge. Student

teachers must learn to gain access to this community of others and be able to function well once they have gained access into the community. They conclude that the interaction within these communities promotes exchange, discourse, and change for the individual as well as the group. They believe that the process of reflectivity will encourage student teachers to learn from others in the community, which is part of the socialization process. Referring to Dewey's work as an example, they note that the process of reflection is not yet seen as being interactive in nature. In other words, reflective practice has to take into account "the individual student teacher's active dialogue with the various groups that exist within the context of the school as a social system" (p. 59). Recommending that "dialogue with the other participants is necessary for appropriate understanding and reflection," (p. 59) they see the growth and development of student teachers occurring in a less technical and authoritarian enterprise.

After reviewing Mead's theory of self and some of the literature on reflective practice, Cinnamond and Zimpher conclude that

> The professional development of teachers must incorporate a fuller dialogue with all participants in the system(s) of schools because it must focus on the lived experience of the members of the system(s). Individuated reflective teachers are unable to grasp fully the power of any reflections without discourse because they are distanced from those they are reflecting about. The power of reflection is that it is an instance of social action, and it must be understood as being grounded in the every-day life world. (p. 70)

and,

> Language is the central feature of this public discourse. It is the way in which meaning is given to the everyday life-world and the self. (p. 71)

A reflective teacher who is committed to discourse and process of adjustment will contribute to shared values and expectations in the community. The process and purpose of dialogue and reflection are seen as a way into and adjustment to a community.

Community And Discourse

The literature, that I have addressed thus far, assigns specific tasks to the two people whom are reflecting together. This next piece of literature weaves a few other strands into the

social fabric of reflection. In particular, they recognize the importance of participants other than the student teacher and teacher in a pre-service practicum when developing a sense of teaching.

MacKinnon and Grunau (in press), when participating in "an exploratory, school-based program for prospective elementary teachers," recognize the importance of the *social structure* among participants, including, teachers, supervising teachers, pupils, and student teachers as well. In contrast to Cinnamond and Zimpher, MacKinnon and Grunau see reflection as a process nurtured by a sense of community rather than the sense of community depending on the process of reflection.

Being particularly interested in the community of student teachers, they focused on "the relationships between and among these participants as the foundation for a number of 'forums of action and discourse,' in which knowledge and ability in the practice of teaching gradually and continually develops" (pp. 2-3). Having reviewed literature from Mead (1932, 1934) and Cinnamond and Zimpher (1990), they reconceptualize an earlier model by MacKinnon (1989) to take into account the social nature of teacher development.

They argue that these "shared experiences and discourse within these forums enable prospective teachers to come to 'see' their classroom experience in new ways" (p. 3). This happens because

> ...the way student teachers understand teaching depends on how they regard the generalized other—the characterizing features of the good teacher that emerge from their discussions; the substantive qualities of teaching that are important to them as a group; their growing criticism for one another's practice; and the manner in which they witness their peers enter the role of teaching. (p. 17)

Even though they think that teacher development "is more social than individual," they admit that "The possibility seems remote that we could argue convincingly, on empirical grounds, that teachers' cognitions are influenced by their images of the generalized other, which, in turn, are derived vis-à-vis social processes in teacher education programs" (p. 11).

In the arena of teacher education programs, MacKinnon and Grunau advocate "...the nurturing of appropriate forums in which community and relationship are valued, and reflection and discourse encouraged in large part simply by living the experience" (p. 30).

In every one of these accounts, from structured dialogue to teacher conversations to partnership supervision to reflective action and to community discourse, reflection plays a role in developing an understanding of teaching by teachers. Secondly, all these cases recognize the importance of one or more persons in the process of reflection even though the level of involvement varies immensely. While in first case, the second person, an outsider, is to provide undivided and supportive attention, in the last case, the other person or persons, insider(s), are to participate in the dialogue as equals. From the first case to the last case, reflection is documented; however, it is only in the last case that the authors recognize the importance of "...nurturing of appropriate forums in which community and relationship are valued, and reflection and discourse are encouraged in that context, in large part by simply *living the experience* [my empasis]" (p. 30).

This section reviewed a literature pertaining to the role of conversations, incorporating elements of reflection, in either teacher pre-service education or teacher in-service education. Next, I have to review a literature on environmental education to introduce and elucidate the content knowledge and the pedagogical knowledge around which the reflection and conversations are centered.

Making Sense Of Environmental Education

The media increasingly reports on environmental and global issues such as deforestation, ozone depletion, green house effect, water shortages, air quality, and acid rain. Our senses are being bombarded with images, texts, and sounds that convey messages of despair and disillusionment, and decay and death. Until recently, high school graduates received an education that paid little attention to these messages. Environmental education, including outdoor experiences, is often scattered throughout their thirteen years of education, and rarely deals with the complexity of interactions between us and the environment. More recently, with the liaison amongst the Ministry of Education, Ministry of Environment, Lands and Parks, Ministry Responsible for Multiculturalism and Human Rights, and the Round Table on the Environment and the Economy, different stakeholders, for example, students, teachers, and industry, are being

drawn into the process of identifying concerns centering around environmental education and sustainability. Environmental education is slowly reappearing on the agendas of the Round Table of the Environment and the Economy, the various ministries and local school district committees.

In British Columbia, the mission statement in the *Year 2000: A Framework for learning*, guiding students and their teachers states:

> The purpose of the British Columbia school system is to enable learners to develop their individual potential and to acquire the knowledge, skills, and attitudes needed to contribute to a healthy society and a prosperous and sustainable society. (1991, p. 3)

The following discussion outlines the most recent developments of environmental education in British Columbia to exemplify its plurality and complexity. This overview tries to answer three questions. What might environmental education sound like and look like in this province? Secondly, what should teachers teach and learners learn? And finally, how are teachers going to teach it? This synopsis parallels initiatives in other provinces across mountains and lakes and in other countries across land and water.

Characteristics Of Environmental Education

Since the 1970s environmental education in British Columbia has slowly gained momentum with the dedicated effort of such people as Dr. M. McClaren at Simon Fraser University, Dr. G. Snively at University of Victoria, and Dr. D.J. Anastasiou at the University of British Columbia. Having places, such as the North Vancouver Outdoor School in Squamish and McQueen Lake Environmental Education Centre in Kamloops, the Greater Vancouver Regional District's Capilano Camp in North Vancouver, increasing number of students have an opportunity to explore the outdoors for an extended period of time. Other organizations, such as the Vancouver Public Aquarium, VanDusen Gardens, and Lynn Canyon Ecology Centre, Greater Vancouver Regional District Parks expose students and the general public to a variety of programs and experiences. The Environmental Education Provincial Specialists' Association, associated with the B.C. Teachers' Federation, continues with its persistent and committed effort to advance a more thoughtful theory and practice of environmental education. And, with the recent

establishment of the Round Table of the Environment and the Economy and the appointment of Rick Kool as a liaison between the Ministry of Environment, Lands, and Parks and the Ministry of Education, environmental education in this province is receiving much needed attention and commitment. After twenty years of haphazard teaching of environmental education without clear guidelines and adequate resources, a dialogue flows between different interest groups such as Ministries, industry, professional organizations, teachers, parents, students, administrators, trustees, universities, and other members of the community.

Differing world views, illustrated by such concepts as anthropocentrism and biocentrism, preservation and conservation, modern/industrial and sustainability, influence dialogue when trying to reach consensus about a theoretical and practical conception of environmental education. Environmental education means many different things to many people. Environmental education has often been associated with, for example, conservation education, experiential education, and earth education, and more recently in British Columbia, with sustainability education. It may also include one or more of value clarification, moral education, conflict resolution, investigation skills, problem solving, action taking. While debates continue to clarify a definition of environmental education, questions concerning what should be included and how it should be taught seem to take priority.

Environmental education, composed of the words "environment" and "education," continues to be confusing and perplexing for as long as we are unclear about what we mean with environment and what we mean with education. What is the environment? What is education? And finally, what is the relationship between education and the environment. It is not my intent here to answer these questions, which would be a formidable task, but to suggest some direction for a more meaningful discussion.

McClaren (1993a) weaves threads between "environment" and "education" in the following way:

> When human being [sic] attempt to understand the relationships between themselves and the other elements of the environment, when they think creatively and critically about those connections, when they actively seek to find the truth about those interactions and try to anticipate the consequences of certain behaviors and the range of options which are available, they are directing attention at the

> environment in an educated way. When teachers promote consideration of this sort they are fostering education about the environment. When people consider their interactions with the environment in an educated fashion they are required to understand the range of knowledge which might inform those interactions. They are also required to think about human-environment interactions historically, culturally, economically, and aesthetically. Any programme of education which proposes to develop understanding of the environment must consider the major concepts currently available about the environment and human impacts on it. (p. 8)

Little agreement exists on what this environment is. We often refer to a dichotomy between human environment and natural environment. But can we objectify the natural environment as something separate from the human environment? In an earlier issue of *Clearing*, McClaren and some of his graduate students (1993b) suggest that "There is no such thing as the environment" (p. 8). The human environment is not an object out there and removed from us. Instead, McClaren suggests that

> The environment is SUBJECTIVE, based on personal experience or meaning system of the person who is experiencing it. To some extent the environment is also COLLECTIVE, that is, our cultural heritage influences how we perceive and interact with the environment (including ourselves). (p. 8)

McClaren and his colleagues propose six dimensions of the human environment: personal, interpersonal, local, regional/national, information/cultural, and biospheric. In addition, there are eight processes—knowing, acting, imagining, valuing, judging, opening, inquiring, and connecting—that act together, and interact with the dimensions of the human environment. These elements, and possibly many others, belong to environmental education. A goal of education is then to make sense of these elements and their interactions.

In contrast, a discusion paper entitled " Environmental citizenship and literacy: A focus for environmental education and learning about sustainable societies in British Columbia schools" from an interministry working group in British Columbia (1993) has a considerably narrower vision of environmental education. They suggest that,

> Environmental education can offer students an opportunity to experience new ways to organize and integrate knowledge and experiences. As a result of education, students should develop a lifelong interest in, and respect for, the world in which they live. And through education, citizens will gain added abilities to reduce environmental problems, to appreciate the value of the natural world, to better resolve conflicts, and to have a feeling of personal empowerment and social responsibility. The sum of the actions of environmentally responsible citizens must be a sustainable society. (p. 4)

This is going to be accomplished when, "...educators in formal and informal settings make every effort to integrate economic and social issues with environmental education, in order to promote a broader understanding of sustainability" (p. 1). Is the purpose of environmental education to build a sustainable society? How are we going to do this as long as we are unclear about what "sustainable" means? And, furthermore, what about political, historical, and cultural issues?

In March of 1993 the Round Table published a report titled, "Towards Sustainability: Learning for change" that seems to suggest that sustainability education includes environmental education. McClaren (1993a), in a recent article in *Clearing*, warns educators about the dangers of taking this direction. Like conservation education that suggests that education is to promote conservation, sustainability education is suggesting that education is to promote sustainability. We have two serious problems. First of all, education's aim is not to promote one view of the world as correct. Education is not indoctrination. Instead, education has to provide students a variety concepts or perspectives, such as deep ecology, classical market economics, as well as sustainable development to make informed decisions and take responsible action. We can not avoid mistakes by telling people what to think and how to act.

Learning Environmental Education

B.C. has also outlined, in the *Year 2000* , a description of an educated citizen.

- thoughtful, able to learn and to think critically, and to communicate information from a broad knowledge
- creative, flexible, self-motivated and possessing a positive self-image
- capable of making independent decisions
- skilled and able to contribute to society generally, including the world of work
- productive, able to gain satisfaction through achievement and to strive for physical well-being
- cooperative, principled and respectful of others regardless of differences
- aware of the rights and prepared to exercise the responsibilities of an individual within the family, the community, Canada, and the world. (1990, p. 14)

This description of an educated citizen has to be in a context. McClaren (1989a) emphasizes that awareness of the our subjective and collective environment is where it all has to start. He then continues and says,

> Awareness and appreciation are closely linked. Values and action are also closely linked. We seldom value what we don't have awareness or appreciation for, and we are unlikely to act to conserve, protect, manage, or enhance what we don't value. (p. 29)

We must acquire information and gain an understanding of the complexities of the environmental, economic, political, and social systems so that we can make informed decisions. Perception, thoughts and values affect decisions and guide actions.

What are students' attitudes and values in and towards these environments now? And, what changes in attitudes and values do students have to make? Finally, how do students make these changes? Having developed a conceptual and an affective understanding of their environment, students have to learn investigation, critical analysis, and conflict resolution skills that lead to informed, justified, and ethical decisions and actions. The role of teacher is then to assist students in developing knowledge, skills, and attitudes and values that contribute to their individual potential to contribute to a healthy society and a prosperous and sustainable society.

Teaching Environmental Education

One of the many difficulties that the education system has to face is deciding what to teach and how to teach students when society is so rapidly changing. The more recent discussion papers printed in British Columbia have tended to focus on sustainable societies as a viable perspectives that should be embraced by those who teach environmental education. British Columbia has borrowed Meadows, Meadows, and Randers's definition of a sustainable society (1992). These authors define sustainable society as "one that can persist over generations, one that is far-seeing enough, flexible enough, and wise enough not to undermine either its physical or its social systems of support" (p. 209). Within this context, Dennings (1992) encourages change; however, we do not want to promote any kind of change. He says, "It is not reactive to

environmental problems but proactive based on considerations of the earth's limitations to support us and the condition of the global human community" (p. 5).

In addition to the difficulty of anticipating what direction we are heading in as a society, it is also difficult to decide what and how to teach environmental education. It is important to notice that 'the *how* of teaching' environmental education influences 'the *what* of learning' environmental education and vice versa. B.C. has elected to adopt the infusion approach to implementing environmental education in the schools. The infusion approach refers to "the integration of content and skills into existing courses in a manner as to focus on that content (and /or skills) without jeopardizing the integrity of the courses themselves" (Ramsey, Hungerford, and Volk, 1992, p. 40). Environmental education is not an addition to an already overcrowded curriculum. Existing subjects can contribute to raising awareness and understanding of the nature of environmental issues. Jickling (1991) argues that different modes of inquiry and the "the reasons why" of things from different perspectives help the educated person to perceive and understand relationships between environmental issues. He writes, "Students' ability to think clearly about a situation will not be contingent upon their mastery of some superficial skills, but rather upon their ability to think scientifically, philosophically, morally, historically, and aesthetically" (p. 174).

In a paper entitled "Environmental literacy: A critical element of a liberal education for the 21st century," McClaren (1989b) describes nine elements of environmental literacy, which I believe apply to subjects across the curriculum.

- The ability to think about systems.
- The ability to think in time: To forecast, to think ahead, and to plan.
- The ability to think critically about value issues.
- The ability to separate number, quantity, quality, and value.
- The ability to distinguish between the map and the territory.
- The capacity to move from awareness, to knowledge, to action.
- A basic set of concepts and facts plus the ability to learn new ones and to unlearn the old.

- The ability to work cooperatively with other people.
- The capacity to use skills in eight processes: Knowing, inquiring, acting, judging, opening, imagining, connecting, and valuing.

Environmental education provides opportunities to build connections between subject areas, opportunities to explore relationships between ourselves and the world around us, and opportunities to apply school learning to community living and participation. It directs and modifies the purpose for and approach to learning and teaching in school.

Teachers Learning To Teach Environmental Education

Before charting a course for our students, we have to set a course for ourselves as teachers. McClaren (1989b) warns that many teachers may assume that environmental education is anything and everything. Instead, teachers have to teach these nine elements within an environmental context, as outlined by the dimensions of the human environment conceptual model.

Furthermore, we can not teach these environmental literacy elements systematically, or sequentially by simply infusing them within the context of environmental education. Environmental issues are inundated with controversial and conflicting opinions, values, and attitudes. Environmental issues rely on information that is punctuated with bias, misconceptions, and inaccuracies. Environmental actions may divide communities rather than bridge differences, create harmony, and encourage healthier and more environmentally sound living. As if this uncertainty, variability, unexpectedness, and complexity in environmental education is not enough, teachers are caught in a whirlwind of surprises and problematic situations when selecting and organizing learning experiences for students that will educate rather than indoctrinate them.

The British Columbia Round Table, in a preliminary report (1992), discusses the incorporation of "sustainability education" into formal and informal education. The report recommends, for example, experiential, processed-based learning approaches, the development of current, local and interesting materials, integration of curriculum, teacher education and professional development, and teaching problem solving and decision making skills. McClaren

(1989a) wrote an early policy development guide "Environmental education and the public schools in British Columbia" in which he states the importance of treating schooling for teachers and their students as a coherent program based on the assumption that we "develop a deeper understanding over time as we mature, and as our experiences become richer" (p. 31). Teachers will require different backgrounds and new skills with a wide, liberal education in both arts and sciences. They must be able to work in interdisciplinary teams, which can design effective instruction, and which can help students to think about complex problems by using simulations, debates, critical thinking, and creative problem-solving (McClaren, 1989a). He recommends teacher training or re-training. Unfortunately, he does not describe how this training should take place.

Curriculum change is often viewed "as training teachers to adopt ideas and behaviours determined by external authorities" (Stevenson, 1993, p. 4). This curriculum research, development, and finally diffusion rely on a traditional scientific model. This model neither answers questions of definitions, values, ethics and morality that are part of teaching environmental education, nor recognizes that teaching environmental education is shaped by the teachers' own educational theories and practices.

The first model fails to acknowledge that teachers have practical /professional knowledge that they access when "engaging in a struggle to understand their own values, theories, and intentions; [sic] and how they are played out in their particular setting" (p. 6) and conflicts with the perspective that I have taken in this thesis. In contrast, the third, critical perspective, acknowledges teachers' pedagogical knowledge and adds the historical, ethical, moral, and societal context affecting the creation of knowledge in environmental education, which I do not address in this thesis.

The second perspective, an interpretative framework, emphasizes "individuals' construction of reality or their subjective meanings in order to understand the social roles, rules, and meanings that are created by human interactions" (Stevenson, 1993, p. 7). Negotiation between the participants affected by this curriculum change, students and teachers in particular, builds consensus and constructs meaning. Issues involved in environmental policy are being questioned by the community-at-large, but especially by students and teachers, rather than follow

prescribed behaviours. This framework, even though it takes into account the interpretations of the practitioner, fails to "confront the goals and values of educational actions, as well as the social structures that might be limiting individuals' perceptions of their situation and therefore constraining their subsequent actions" (p. 7).

Stevenson concludes with the following:

> The interpretative and critical perspectives recognize the importance of teachers' understanding their own theories and values about environment and education and of incorporating their practical knowledge of the context in which EE curriculum is enacted....This recognition that teachers and students should have the right of choice in the educational process is central to the basic tenet that both our educational and environmental actions should be consequences of our conscious and informed moral choices. (p. 8)

Linking Reflection, Conversations And Environmental Education

As proposed by Schön, reflection helps teachers because they "can surface and criticize the tacit understandings that have grown up around the repetitive experiences of a specialized practice, and can make new sense of the situations of uncertainty or uniqueness which he may allow himself to experience" (Schön, 1983, p. 61). Teachers, who reflect on their practice, will "see" and understand complex, uncertain or surprising situations in a new way. The literature review illustrates that conversations are an appropriate medium for reflection; however, in most cases with the exception of MacKinnon and Grunau's study (in press), the conversations occurred between and an "insider" and an "outsider" and in an indoor environment. This review also suggests that teachers who are engaged in the subject of environmental education are exposed to uncertainty, variability, and complexity in the practice of learning and teaching about environmental matters. Reflection is, therefore, an essential component in both learning and teaching environmental education, because it provides opportunities for distancing and inquiring into complex and uncertain situations. The role of conversation, as supported by the literature, seems to vary depending on, for example, the people involved, the subject area, and the problem that is being addressed in the conversation.

Summary

This chapter reviewed a literature on reflection, the nature of "conversation," and environmental education in British Columbia and wove connections between these three components. Even though the literature conveys the importance of a critial perspective when reflecting on practice, the focus of this study is limited to detecting reflection and exploring the role of conversations. Having laid the foundations for the collection of qualitative data in the field, I next turn to a discussion of the methods employed to collect and analyse this data, in preparation for Chapter Four which presents the case material to illustrate the role of conversations in guiding and developing our pedagogical understanding of environmental education.

Chapter 3
Methodology

"A joy shared is a joy doubled."

Goethe

Assuming that the British Columbia Ministry of Education is continuing to support sustainability education, or environmental education in general, as part of the elementary and secondary curriculum, teachers must know not only what it is and why it should be taught, but what scientific content should be taught and how this should to be done. To fulfill this mandate, opportunities have to be available for teachers, in addition to students, to learn environmental education. During this research I had a closer look at the conversations between Lori and myself to detect the presence of reflection and examine the role of conversations.

Making A Case For A Case Study

The case study is valuable because it enables a vivid, real, and "thick" description and interpretation of the experiences of the participants for the participants, and calls for a consideration of reflective inquiry in the context of environmental education. The case study is well suited to access and understand the experiences from the point of view of Lori and myself during the collaboration in the Port Study Program. To guarantee capturing the experiences of the teacher, I chose a teacher who seemed to be committed to her profession and her students, and who was interested in participating in conversations as a means to inquire into her practice.

Furthermore, this approach to qualitative research addressed the importance of centrality of meaning. Hammersly and Atkinson (1990) discuss the importance of centrality of meaning, which requires the participants' behaviour to be understood in context. I was able to interpret my behaviour within the context of the conversations and our shared experiences. Furthermore, this method of research fits the four essential properties of a case study as outlined by Merriam (1991). First, this case study is particularistic because it focuses on my relationship as a resource

person with one teacher in a classroom and in the out-of-doors and it does so in a manner directly related to our experiences and conversations about the phenomena under study. Secondly, the end product is a rich, "thick" description of the phenomena examined and their interpretation. This case study is heuristic to the extent that the reader understands the phenomena and develops new meaning, or confirms what he or she already knows. Lastly, the case study approach has the capacity to generate concepts and hypotheses that emerge from the analysis of data.

The strengths of this approach are that multiple variables affecting our experiences can be investigated simultaneously during the Port Study Program. I can generalize from this one case, because it is "generalizable to theoretical propositions and not to populations or universes" (Yin, 1989, p. 21). Further, in Stake's (1978) words, when discussing generalizations and ethnographic research,

> Naturalistic generalizations develop within a person as a product of experience. They derive from the tacit knowledge of how things are, why they are, how people feel about them, and how these things are likely to be later or in other places with which this person is familiar. They seldom take the form of predictions but lead regularly to expectations. They guide action, in fact they are inseparable from action....These generalizations may become verbalized; passing of course from tacit knowledge to propositional knowledge; but they have not yet passed the empirical and logical testing that characterize formal (scholarly, scientific) generalization. (p. 6)

Describing The Development Of The Case

During May of 1993 I participated in two Port Study Programs as a resource person for the Coquitlam School District #43. I approached the two classroom teachers, whose students would participate in these Port Study Programs, to encourage them to become more involved in a documentation of the Port Study field component. One of the teachers declined to partake in my proposed research project, even though she was enthusiastic about the idea. Prior commitments and time constraints prevented her from doing more than attending the one-day Port Study Program. The second teacher, Lori, accepted the proposal to collaborate on the Port Study, including any possible pre-study and post-study sessions with her class. Lori was a first year teacher in a split grade six and seven class. Recognizing that Lori had feelings, values, perceptions, needs, and her purpose for participating in the research, I disclosed my purpose

beforehand and the interpretations afterwards and invited her to disclose her purpose beforehand and interpretations afterwards. Before finalizing the descriptions and interpretations, Lori had an opportunity to read and respond to Chapter Four and Five. In Clandinin, Connelly, & Conle's words (1990): "Collaboration is a two-way street in which the researcher participates in the participant's agenda and the participant participates in the researcher's agenda" (p. 58). We established an open and emphatic rapport throughout the research.

Unfortunately, soon after agreeing to this project, two unavoidable circumstances affected our plans. Being a teacher-on-call in the District #43, I was called for a long-term Chemistry position at a local secondary school which reduced my visits to the school to one morning, a week before the field trip. Fortunately, we were able to visit the Port Study stations in the Port Moody Inlet by canoe one Saturday morning prior to the program. After the completion of the field component of the Port Study and a short session afterwards, we paid a second visit to the Port Moody Inlet area, this time by foot on the trail leading around the marshy and forested end of the Inlet, to discuss possibilities for another study in a local municipal park. With a sudden contract settlement, the school year ended sooner than expected and the students never visited the park.

I audio-taped and transcribed the pre-lesson and post-lesson conversations that we participated in. These conversations were held in the classroom or outdoors without the students present. In addition, the two sessions with the students in the classroom and outdoors provided Lori and myself with opportunities to team teach and experiences to refer to in our conversations. A transcript, a source of evidence, facilitated the retrieval and identification of our talk and experiences and their relationship to particular events in the lessons. After listening to the audio-taped conversations, I transcribed the complete conversations. When collecting and interpreting the conversations to write this thesis, I became fully aware of the challenge to recapture and convey what happened and how it happened. The challenge for the task was to represent the conversations in a manner faithful to the events themselves, as well as my categories of analysis.

Selecting "Reflective Moments"

Cochrane (1988) writes that "reflective process involves an examination of one's experiences in order to derive new levels of understanding by which to guide future actions" (p. 197). In other words, a "moment of reflection" is characterized by a period of time during which we would be making sense of problematic situations in conversations about our experiences in teaching environmental education.

Having accumulated more than two hundred pages of transcripts, I selected only those segments that illustrated reflective moments embodied within the conversations. Since these conversations were also an opportunity to plan our next lesson and to enjoy the surroundings, in addition to providing opportunities for reflection, the reflective moments were scattered throughout the transcripts.

A reflective moment was identified by using one or more of the clues identified by MacKinnon (1987). His first clue, "Is there a period of reframing activity?" was most useful. A series of utterances frequently reframed the original problematic situation. In other words, we began to see a situation differently and to resolve the problematic situation by drawing a different conclusion, and identifying new implications for practice during a particular segment of conversation. The next clue, "Does the teacher make a shift from using teacher-centered to using student-centered interpretations of the classroom event?" was not as helpful. The third clue, "Is there a change in the 'I should haves?' " and "Does the teacher draw from his or her personal experience as a student to make sense of the pupil's position was identified more often in the segments of the conversations. Even though the other segments of conversation were just as valuable in the collaboration and teaching of the Port Study, this research was limited to exploring and interpreting reflection within conversations.

Interpreting "Reflective Moments"

Having selected "reflective moments," I examined each segment from my perspective. Even though Lori had an opportunity to comment on my interpretations, especially my

interpretations of her talk, the understanding of what was happening is mainly gained through my eyes. As a result of our different professional obligations and personal commitments, we were unable to collaboratively interpret the data. It is important to emphasize that with or without the collaborative interpretation of what was happening afterwards, the interpretations of each other's talk was also the result of different perspectives. In the action of conversations, each participant involved in the interaction interprets the preceding utterance before responding with another utterance. Then the answer to this question, what is happening?, is tentative and disputable. It is based on a person's interpretation of a series of utterances during the discourse as well as the interpretation of the discourse afterwards in the transcript.

While reading and selecting these segments of conversation, I noted that our understanding of our mutually perceived concern was recurring and the nature of this concern seemed to change in subtle ways. This was to be expected if these segments were moments of reflection. The analysis focuses on what these changes in our understanding were as well as what possible implications these changes might have on our practice of teaching environmental education. Finally, after the sampling of the data, I identified and coded the segments and constructed categories that captured the role of each segment of conversation in these achievements. Even though many segments could have featured and supported more than one category, I chose the category that was most clearly portrayed in a segment to make a point.

Summary

This case study consists of a series of segments that characterize "reflective moments" in conversations. Each reflective moment is a sequence of utterances that include periods of one or more of: reframing a situation, drawing a conclusion, and stating implications for practice. The content of the talk is described and compared to other segments with the intent to convey our deepening pedagogical understanding of environmental education. By interpreting the segments chronologically, each subsequent segment and its interpretation builds on the ones preceding it. These periods of reflecion were embedded in the conversations. And, it is possible, therefore, to associate conversations with our ability to develop our understanding of the problematic situation

and our experiences surrounding it over time. Finally, the role of conversations in this endeavour is analysed by assigning categories to each segment and elaborating on the significance and contributions of these categories to teacher learning.

Chapter 4
Making Sense of Conversations

Thus far, I have built connections between reflection, conversations, and environmental education and described the method of research. After conceptualizing the importance of conversations, I discuss and compare the reflective moments that I detected in the conversations. These reflective moments illustrate our changing understandings of environmental education and shifts in our views on teaching and learning about environmental education. Finally, I analyse the role of conversations in developing our pedagogical understandings of environmental education.

Conceptualizing The Importance Of Conversations

Having participated in clinical supervision cycles as a student teacher, having read and later reviewed, the literature that sets the context for this thesis, and having completed course assignments that indicated the importance of collaboration amongst teachers to make sense of teaching, I began to develop the notion that conversations amongst "insiders" might play an important role in reflection. Instead of setting aside time to reflect systematically and formally, teachers may occasionally and casually reflect during periods of conversations.

Instead of an outsider encouraging an insider to reflect by employing a formal and systematic approach, such as partnership supervision, two or more teachers, both sharing the same experience and problematic situation within it, may have an equal interest invested in the process of conversations within which this reflection is embedded. Reflection in conversations encourages participants to make sense of shared experiences together within the practice of teaching.

Having established the context for this study by reviewing a literature pertaining to the concept of reflection in teacher education and the importance of conversations to professional growth, the task remaining is to illustrate the resulting conceptualization with the case material.

Interpreting Conversations

The following analysis focuses on the three questions that this thesis sets out to answer. The analysis of the first two questions is strengthened by the provision of examples of talk from Lori and myself. It is important to remember that these pieces of talk were part of a larger conversation. The third part of the analysis contextualizes the role of conversation and, in particular, the content of this talk. With the exception of the third part of the analysis, the sequence of segments of talk is in chronological order to convey the changes over time. I used the following transcription symbols to indicate how the conversation progressed.

... to indicate a pause in a sentence or to indicate an interrupted sentence

(??) to indicate the approximate number of unidentifiable words

(on?) to indicate that this word was uncertain

[ ] to indicate events that interrupted the conversation

Our Changing Understanding Of Environmental Education

Over the course of the four conversations in the indoors and outdoors, our understanding of environmental education changed gradually. Initially, we identified a mutual lack of enthusiasm and participation on the part of students in the Port Study Program. The problematic situation slowly evolved over a period of reframing and giving reasons during our conversations. We expected students to participate actively and with enthusiasm in the environmental education activities that we had designed for them. Then, we began to note a lack of learning to appreciate nature. In terms of the assessment of students' learning we began to see that our tasks as teachers to detect students' learning was further complicated by being aware that much of the students' learning might not be detected immediately and outwardly. Towards the end of our conversations, we noted the importance of students having a passion, or strong desire, in their pursuits of appreciating nature and gaining an understanding of environmental matters. The following segments of talk illustrate the framing and reframing of the problem as well as the

importance of giving reasons and stepping in the shoes of the students to understand the experiences from their perspectives.

Lack Of Enthusiasm For Outdoor Experiences

The first conversation occurred in Lori's classroom to discuss the lesson that I was going to present to the students. Lori expressed her disappointment with the students' lack of enthusiasm to be part of the Port Study.

> That's a great question. The grade sevens were...Well, I always wonder if...what you attributed it to, because they are going, "Oh, do we have to go on this?" Right? Not...It wasn't like, "Oh, great!" There wasn't this really enthusiastic response. And I...and I am not sure if that was because of my presentation. Right? And I am quite chalk it up to that. Or, it is also being cool is a factor. One person said that, and then they all have to fall into that.

She searched for possible reasons that might have attributed to this unexpected response from the students. She attributed it to her presentation or the students' attitude which she described as "cool." A moment later, she added another few possible reasons by saying,

> Yes, right exactly. And, maybe some of them had some tough experiences last year. Sore knees or being cold or wet or whatever. So, some of them might not have had such a pleasant experience from last year. And so, all those factors and then some of the non athletic people, you know, who are non-active students were saying. Weren't as keen perhaps as they...as I would have liked them to have been. To me this is just an incredible opportunity. And I felt that they weren't really as enthusiastic as I'd hoped.

Lori considered the Port Study an incredible opportunity for the students to explore the outdoors; however, the students did not seem to have the same impression. Lori's enthusiasm was not reflected in her students. She continued with giving two more reasons: painful experiences during the grade six canoeing program and lack of athletic ability. She admitted that some students would probably have complained of sore knees and being cold. And, other students may not be used to strenuous physical exercise.

These reasons, which arose from situations prior to the Port Study, explained to Lori the students' lack of enthusiasm. Towards the end our first conversation, she described the importance of outdoor experiences in her life.

> I mean that's so much part of my life, environment, outdoor and things like that. I would really want them to get out of it. Is that?

She had hoped to convey some of her enthusiasm to the students. Thus far, the presentation had not been able to accomplish this mission for her.

This first conversation focused on the problematic nature of the observations that we had made as teachers in our prospective settings—the classroom and the Port Moody Inlet. We expected to see enthusiasm on the students' faces; however, we were both disappointed. The reasons, given in this case by Lori, tried to account for these observations; however, not all of the reasons were directly linked to observations connected with the Port Study Program. Instead, these reasons arose from prior, and somewhat dissimilar, experiences in which these students had participated in grade six. We did not take the time to dig a little deeper to examine the nature of these reasons or the origin of these reasons.

Lack Of Learning To Appreciate Nature

Five days later Lori and I were sitting in a canoe to tour the stations around the Port Moody Port. While enjoying our surroundings, we continued to discuss our concern about the lack of enthusiasm. Towards the beginning of this conversation, Lori realized the importance of having an opportunity to explore the program herself beforehand.

> Yeah. Well, I must say even just being out here on the water already makes it so much more life-like for me. And, it's already now that emotional part that I can take back into the classroom.

Her talk illustrates the importance of being immersed in the experience. Even though we did not link this to the students' enthusiasm, she connected the importance of having the experience with making it more life-like or real for her. It might have been difficult for the students to realize the potential of this program to their learning about the outdoors, not having had an opportunity themselves yet to explore the Port.

She recognized that few students have had the opportunity to be in the outdoors and appreciate or value the outdoors. She believed that, for example, watching TV and rollerblading are activities that disengage students from exploring the outdoors. Rather than enjoying the beauty and value of nature, students are more intune with the physical discomfort that they might experience in the outdoors.

> That...it's just (?) something, and what breaks my heart mostly though, is that the kids don't know...don't appreciate that nature. Don't appreciate this.

She continued by saying

> Well, I think it needs both. There's a couple of kids that have been raised in the outdoors. I've got one hiker, for example. And then I got all these ones that are, are TV, TV and video and roller-blading and, and not to say that there is anything wrong with all those in themselves, but that...they don't understand the value of this. And, I...and I...you know, whether or not, they're gonna focus on the value of the nature...natural aspect of this. Or, they gonna focus on, "Oh, my knees are tired." And, that's what I'm, I'm hoping, of course, they'll see the beauty and the...
>
> ...Well, it's interesting that they're actually pretty good once you start discussing things. They give you their eleven or twelve old mind. Like, "Oh, right on someone was killed." You know, that kind of reaction. Then when you start talking to them, then they start to reevaluate and think about it. And, you never know how much they're thinking about it.

A little later, Lori returned to the importance that TV plays in the students' lives.

> And, the kids have definitely been given a very convenient life-style. And, therefore..."Oh, my knees are sore." "My arms are sore." You know. "I can watch this on TV" Smelling, really feeling the wind...there's all those other experiences that I think they need to be exposed to.

She exposed some of the limitations of TV and identified features of outdoor experiences, such as smelling and feeling the wind, that can only be appreciated and understood in the outdoors. In addition to Lori's concerns about TV in providing students with a convenient life-style, I added another feature of TV.

> Uhmm. Uhmm. Yeah. I feel instant satisfaction almost, isn't it?
>
> ...And the instant stimulation on TV, but it's very visually and orally, but that's all it is.

Lori realized that everything is not as black and white as it might initially appear to be. It is important to talk to students to understand what is on their mind. Also, it is difficult for us to know how much they are thinking about what they are experiencing.

Lori's understanding was slowly altering to a view far more subtle and affective in nature. She identified a lack of learning, or an opportunity to learn, to appreciate nature. Students neither know what it means to appreciate nature nor how to appreciate nature. And, TV can not act as a substitute. Maybe even more importantly, she began to see that we will never know what students are thinking. In the context of our original frame, we might conclude that enthusiasm

might not always be visible on students' faces. Lori reframed our mutual concern from a lack of enthusiasm to a lack of appreciation.

Nature Of The Outdoor Experience

Thus far, our conversations had centered around the lesson in the classroom and our own trip in the Inlet. The concern had evolved from a lack of enthusiasm to a lack of learning to appreciate nature. The next segment, taken from a conversation conducted after the Port Study, provides further reasons to understand the nature of outdoor experiences for students.

While reviewing the day station by station, Lori emphasized how pleased she was with the students' attitudes.

> Not...because, remember when we talked about before, my concerns were attitudes. And, I thought the attitudes were just fine. Keen. Like...they were really ready to go. I was, I was really pleased. And there was a lot of inter-canoe competition which was nice to see. So, that, that again, the dynamics could change very much, depending I guess on, on [interrupted by P.A. system]...could really change depending on your group dynamics. But I was really impressed. I thought that went really well. So, that was of a concern, that was O.K. I thought that, that their questioning was O.K. It could have been much better. But I really felt that the heat was another factor in that. By the time I got the station, the boat...terminal.

During the first lesson in the classroom, we had taken students through an activity to generate questions for the field day of the Port Study. We had anticipated that students would be able to become more involved in the program by asking these questions. Even though students asked some of these questions, Lori believed, that the heat was a factor on this day. Furthermore, she was pleased with the dynamics of the group even though the two groups that were supposed to come together were switched.

In addition to illustrating some of the assumptions on which some of our talk is based, the next comments also convey the importance of being able to understand the experiences of the students by gaining an understanding of our own experiences. We described our physical and emotional well-being, which would have been similar to the students' well-being. Lori said,

> Yeah. And, in terms of the tugboat...I don't know. I guess right now, I'm talking from my own perspective. What I, what I really enjoyed about it, because I really don't know what the kids got out of it. I think they were all exhausted....

> ...Yeah. And, then around the corner and again, I thought that the deep sea ship was really disappointing, because it was just such a great thing. But everyone was toasted. And, then on to the tugboat. And that was fun. The kids were revitalized. They enjoyed that talk. I think they really enjoyed the day.

The students were toasted and exhausted from the heat and the wind. After lunch, the students had regained some of their strength.

I added,

> Yeah. It was interesting to note that it wasn't always the same group who was behind. Which I think in a sense, too, gives them the sense that they not always have the power to control. They don't always have...they're not always going to be first. So, I think in a sense, you know, because they were different people, I was thinking about the fact that if you're always last, then you feel kind of down. You feel, you feel kind of like a loser probably. So...at least those are the kinds of terms that grade sevens would assign to themselves. But because they were different people, in a way, you know, that sort of... hopefully made them realize that they're all human. And they're all...

I realized that certain feelings, such as "feel kind of a loser," would be very sensitive issue for grade sevens.

Our reframing continued with becoming more aware of some of the other factors that influence students' learning about environmental matters. Students' discomfort with outdoor activities is not only result of a lack of physical activity in their lives, but is also influenced by environmental factors over which they have no control. Students struggled to reach their destination with their canoes and paddles during this hot and windy day. We began to develop a more complex picture of what these experiences would mean to students. In other words, students' enthusiasm was influenced by their own attitudes, our presentations, and also the environment in which these activities were conducted.

Also, Lori and I began to see that students are exposed to a multitude of experiences within a short time frame. They had to worry about getting the canoes to the stations. They had to worry about questions and understanding the information at the stations. They had to worry about what the wind and sun were doing to their physical well-being. By going through the experiences a second time, and this time with more wind and sun and with the students present, we were more sensitized to students' feelings and perceptions of the experiences. Our reframing continued to refocus and readdress the problem of lack of enthusiasm to include students' feelings

during the program. We had observed examples of students who struggled with not being in the front canoe all the time, or with being uncomfortable and exhausted. Now, our understanding of environmental education began to be more comprehensive by connecting the physical development (e.g., athletic ability), social development (e.g., peer relations), and emotional development (e.g., feelings toward outdoor experiences) of the students in our reframing of the situation. Our sense making slowly acknowledged the links between the physical, social, and emotional nature of the experiences.

Assessing Students' Learning In Environmental Education

In the previous conversations our understanding of the problem was based on the assumption that we could adequately measure the types of experiences and learning that students were gaining from the day. In contrast, the next conversation conveys that this may be more difficult than we had initially believed.

The conversation continued to suggest post Port Study activities and possibilities to receive feedback from the students. When expressing a lack of inappropriate behaviour, such as splashing water, the conversation returned to an earlier question about teacher expectations for students. In the following segment of talk we recognize that not all students' learning can be measured immediately. Some of the learning may not be exposed or come to the surface until these students are engaged in other activities. Lori used the following anecdote to make her point,

> As supposed to really enjoying it. But I think...those are life-long things again. Like, that's why I kept pulling back and thinking, you know. You kids are just so lucky. And, you can't appreciate it right now. But the fact that you've done this, you know. One day when you got a friend and they said, "Look, I got my parents' canoe, you want to go down and go canoeing?" Or, at the lake, "you want to go canoeing?" Well, it's not like, "Do I hold the paddle like this or like this." "Or, what if I do this?" "Or, how do I get it to do that?" You know, it's yet another building process for them. Another, actual experience of which they have taken part of. So, those are the kinds of things, we can't measure. Those are the kinds of things we won't even know in our life time how it affected them. Or, what they took out of it. But I think as a child I appreciated being exposed to a lot of things. And for them, I don't think, a lot of them do it with their parents. Or, whatever. That this, you know, a really big opportunity for them. That was good. And what else? And, again, the whole environment concern. I know that's one of your things. I don't feel that there was...well, what can you expect?

She described her role as a teacher to expose students to a variety of experiences, remembering the opportunities that her parents provided for her when she was younger. Many students do no longer have the same opportunities. The aim of creating these kinds of experiences for students is so that they will have something to take away with them. Further, they may not realize the significance of this experience and we can not understand the significance that these events will have on their lives. It is, however, still important to immerse students in outdoors experiences.

In this episode of reframing, we realized that we will never know what students are thinking, feeling, or learning at the time. We, however, have to continue organizing these kinds of experiences and trust ourselves that these students will gain a benefit from having been a part of them.

Having A Desire To Learn About Environmental Matters

This last episode built on the nature of students' learning. We began to see that we should be more aware of the affective responses in students. And, we can not necessarily measure or observe this learning. In other words, students must also obtain certain affective qualities to initiate them into appreciating and understanding nature.

The next conversation was supposed to focus on our efforts to give Lori's and Mrs. X's class an experience on foot around the Inlet trail, leading through a forest and marsh. Upon arrival Lori told me that they had to change this plan, because of the anticipated difficulty in getting parent drivers. Nevertheless, they were still interested in taking the students for a walk, but through a neighbourhood municipal park instead. Even though the location of the walk had changed, we still decided to walk around the Inlet while talking about this next field trip.

While discussing a novel by Gary Paulson, called *Hatchet,* Lori identified the importance of a desire to know herself about environmental matters and then the importance of sharing that with others.

> It was just a neat thing that, that's where I sort of feel myself, too. That desire to...know, and therefore, to share. You know. And then for the kids, too...that, that desire.

I added,

> Uhmm. Yeah. I mean it's like you say. I mean you have to have the desire to know so you can't know or you don't want to know if you don't have that initial desire...
>
> ...So, if that's the case than would you not think that in the students, before you impart any knowledge or understanding on them, you would have to instill that desire as well. Or, bring out that desire, because if they don't have that desire, we can have them fill in...

Lori paralleled Hatchet's desire and his urge to learn as much knowledge with her own desire to do the same. I agreed with her. While observing people passing us on the trail, we return to the importance of having a passion for something. Lori said,

> People that have passions. They know the birds They've got all those identified. Right? That's their passion. They've gone and learned all about it. Something has drawn them into it. (???) and we can get naturalists who know about fungus, know what (happens?) to the forest. Knows about certain things and, and...

I continued,

> Yeah. I mean you can't...Even as maybe a narrow passion. Even though it's maybe focusing in on something small, but at least ...you know, from there they can go out into different directions.

This reframing focuses on the starting point for instilling an appreciation for nature in students. Student who have a passion for a particular aspect of nature might be more drawn to and ready to explore the outdoors. Instead of recognizing a lack of learning on the part of the students, we may have to look deeper and recognize the importance of having the desire to learn first of all. The lack of learning to appreciate may be attributable to a lack of *passion* to learn about environmental matters.

In summary, the nature of the problematic situation, students' lack of enthusiasm and participation in the Port Study, changed from the first to the last conversation. Initially, we contributed the lack of enthusiasm for the outdoor environmental study to Lori's presentation, peer relations, and unpleasant experiences during the grade six sailing /canoeing program. In the following segments, we reframed the problematic situation to students' lack of learning to appreciate nature as a result of, for example, living with all the modern conveniences, such as TV. During this reframing we also began to see that students may be processing their experiences internally so that we could not measure or observe any appreciation that the students may be gaining.

Being enthusiastic about our time and experiences in the outdoors, we identified the importance of having passion, or a strong desire, as a prerequisite for students when they try to make sense of their environment. Without a desire, students may not be able to appreciate or understand nature. It is up to us to instill this desire in our students.

We saw similarities between our own experiences and the experiences we hoped the students would participate in. Reframing the original problematic situation through our own eyes, we began to look at our own experiences in the outdoors, learners of environmental education, to make sense of students' experiences in the outdoors. Being aware of our own responses in and towards outdoor experiences, we would have to look at students' feelings and thoughts in and towards the outdoors so that we gain an empathic understanding of their learning experiences.

Thus, this reframing deepened our understanding of the students' participation and apparent lack of enthusiasm for environmental education. At the end of these conversations, we concluded that we will never know what the students take away from a situation and we should never push our own delight for the outdoors onto our students too fast without considering their part in it.

Shifts In Our Teaching And Learning

During each subsequent reframing event, we identified how this new frame would affect our views on teaching and learning about environmental education. In Schön's words, we were identifying corresponding implications for our practice. The following analysis, illustrated with other segments of talk from the same conversations, notes the changes in these implications as a result of seeing the problematic situation in a new way.

Initially, we believed that teaching students questioning techniques was going to enhance their participation in the program. Throughout the subsequent conversations, we began to realize that we needed to look farther and deeper to gain a better understanding of how students learn about environmental matters and how to teach these students about environmental matters effectively. The nature of our role changed from teaching questioning techniques to modeling expected behaviours and attitudes to providing experiences for children in which they can develop

an affinity toward and understanding of environmental matters. We also understood that students need ample time to feel comfortable in and explore the outdoors, which can be achieved by providing them with repeated experiences.

Modeling Appreciation For Environmental Matters

During the first conversation, Lori identified the importance of being able to speak from personal experience when presenting a lesson to the students. She said,

> Had the experiences first hand and can really relate that on a personal level, that the kids will be much more receptive to it. And, much more, "Oh, wow!" This is...can be a really neat opportunity. And look at it under a more positive...light.

And she continued with,

> Yes, exactly. So, that's what I am hoping that, that your, your knowledge and information will... aid the children in understanding what they are going to be experiencing.

We determined that it was important to have a personal experience in the program. The following two segments illustrate some of the ways that a personal experience would benefit the students.

> That's what I mean. Like, I mean it probably makes a difference, too, if you actually know the site and seen it. Maybe that would, you know, contribute to being able to share a bit more on in a personal note, like you were referring to in my case...
>
> Definitely, that, that's...Yeah, exactly. That's why I am hoping that we can get out and do it ourselves...to canoe around. Or, if I had an opportunity to do this before, then again you just bring that personal touch. And I think that brings it much more into focus...and much more alive. So, that's what I definitely like to work out, which I really appreciate.

In the first instant, I recognized the importance of being able to talk from personal experience to the students. My sharing is from a personal perspective. In other words, I had experienced whatever I was talking about. In the second instant, Lori concluded that if she went out beforehand, she would be able to bring that personal touch to her presentations as well. In conclusion, the personal touch or personal tone would create a more effective approach to teaching students about environmental education.

In the next episode, the examples of talk are selected from the second conversation which happened in the canoe. The following segments convey the importance of teachers modeling the behaviour and attitudes that students should develop. These examples are introduced by a piece of talk from Lori, who indicates that we can not assume anything. Even though students may sound cool by using phrases, such as "Oh, right on. Someone was killed.," we can affect their thinking by talking to them. As a teacher, we do not know what is happening in their minds.

> Well, it's interesting they're actually pretty good once you start discussing things. They, they give you their eleven or twelve year old mind. Like, "Oh, right on. Someone was killed." You know, that kind of reaction. Then when you start talking to them, then they start to reevaluate and think about it. And, you never know how much they're thinking about it.

Based on this assumption, Lori believed that it is worthwhile to expose students to the actual experience, even though she will not know what the students take away with them.

> You know, just like ourselves. You can't always read how much someone's taking out of a situation. And, so hopefully, just the actual experience of them being around here will allow...them to enjoy and appreciate it a lot.

I continued and said that students will pick up on our enjoyment and appreciation as well. In other words, we should model to students our enjoyment and appreciation in nature and our attempts to understand nature.

> What I am noticing in class, too, if you really get into it, then the students will get into it, too.

The conversation continued to centre around findings way to teach environmental education. Thus far, the shift has gradually changed from focusing on the teacher to paying attention to the student. In the beginning, we looked for ways to become more effective ourselves as teachers of environmental education. We examined what we could change about ourselves as a person. We decided that we should have some personal experiences to share with the students so that we could demonstrate or model our appreciation and understanding of outdoor experiences.

Understanding Environmental Education

The focus in this segment shifts from being teacher-centered, illustrated above, to being student-centered. Next, we began to develop the view that we have to alter the types of opportunities that we provide for students.

> In the next example, I concluded that we need time and energy when teaching environmental education. It is important for students to explore the outdoors a number of times. One field day is not sufficient for students to gain an appreciation and understanding. There's no involvement in it. Is there? But, I think, too, that it's going to take time and that's why, you know, like your suggestions...If there was time and there was, you know, the energy there to go a number of times.

I believe that students need ample time to develop a comfortable feeling in and about the outdoors.

> You know. I think that would be worth it, because then at least...The first time, for some of them, it's a very uncomfortable experience.

Lori suggested a specific solution for the Port Study, doing fewer stations on one day, because it will be less tiring.

> That, that what they take away from this is the pain of it and the hard work of it. The...not the...just sitting and coasting, like we're doing right now. You know. You don't have to be... like.... You know, almost, even doing fewer stations and just making it so that the kids aren't physically...frustrated?

Even though we considered content knowledge about the environment important, we tended to shift our priorities towards the importance of enjoying just being in the outdoors. Illustrated by such comments as, "floating around and not even paddling," "just sitting in the canoe," and "just listening," we stepped away from the focus on content and stepped into a focus on enjoyment. We would have to create opportunities for students so that they could start to feel comfortable in the outdoors. Repeated visits to the outdoors would be one option.

In contrast, the following examples return to the questioning activity designed for their students. What could be do to help students remember the questions for the Port Study? One possible solution would have been a review of the questions beforehand, as suggested by Lori.

> Like all these blank stares. And even student J wasn't even in on it. And so what I would have liked to have done, have another session and gone over the actual questions we generated. Like you said, compile them, go over them again, and take them through it again. You know. We could have done one more pre-study. And that would have solidified. Because I was even having trouble thinking back to the questions they came up with.

And,

> And just that fact that they...that the, the, the...there wasn't enough consistency. If we'd done one more pre-study at least that would have brought the consistency in. That would have brought the memory...and triggered their memories a bit more.

We usually try to remember something so that we can recall it at a later time. In this case, students were expected to remember some of the questions that they had written in class, so that they could retrieve them during the Port Study. We wanted them to remember, or to recall these questions at the appropriate stations. Seeing the stations again, but now live and not on the screen, should have triggered their memories in recalling these questions. Lori felt that this triggering might have been facilitated by reviewing the questions beforehand in class.

In addition to providing students with repeated experiences, more opportunities to practise and refine their strokes may have facilitated getting around in the canoe. I recalled a statement from the other resource person involved with the program.

> And resource person Y. has made some remarks, today. And said, well, you know, even the canoeing skills. If you really want to truly make it an environmental study, the canoeing skills have to be so up that, that's not going to be as much of a factor anymore. I mean how far do you need to go. Well, probably up to level one, two, or may be even three. You know. Level three.

Even though this segment seems to suggest that our main goal is to emphasize the content knowledge of environmental education, we returned to the importance of creating opportunities to promote affective learning in our last conversation on the trail. How can we develop an affinity in students towards environmental matters? The next three segments exemplify our belief that students need to develop this affinity at their own rate and in their own way. I discussed an approach that may have some potential.

> And, I guess with your students, too. Or, with our students we have to start somewhere. And, if can have them go through a forest the first time with a hike. If that's what they feel comfortable with. [someone passes]. And maybe the next time instead of hike, we can walk. And, maybe the next time we don't even need to walk. We plunk ourselves down.

And,

> And, see it more as sort of a stage or development of...And maybe that's mistake I've made a lot in the past. I mean we take school groups and do these activities. And, there's a sequence to the activities. And, there's a theme. But, we sometimes don't have the time to really get to know who these students...who these kids really are and what they've done in the past. And, just by saying that this is all gonna be fun for them. We're all gonna be into it. We don't take their

> own thoughts and feelings in consideration. And, maybe they *are* scared. And, maybe they *are* kind of foreign to this whole place.

And,

> We don't give them an opportunity to feel comfortable at first. Maybe rush them into ...all these activities. And, all these games. And, maybe, just by walking quietly or by sitting, or...

We have to assist students to develop this comfortable feeling slowly and sensitively. Before we design any activity, we have to know the background and prior experiences of the student. Also, it is important to consider the students' feelings, for example, sense of being scared and sense of feeling like a foreigner. With this in mind, we can more effectively provide students with worthwhile and life-long experiences.

And finally, I returned to the importance of giving students ample time. We have to be sensitive to their needs and we can not push our delight onto our student.

> No, because (??) we're twenty-seven years old and, and really stopping to hear the birds. And, see the hummingbirds. And, you know, to see it as a special treat as supposed to "Oh , yeah!"

This latter part of our talk, focusing on important implications for the practice of teaching environmental education, supports a gradual acclimatizing of students to the outdoors. First, students have to feel comfortable in the outdoors before they can exhibit any kind of affective response to their surroundings. They have to feel at peace with their surroundings before they can start to observe, admire, value the aesthetics and beauty, intricacies, complexity, or wonders of nature.

In conclusion, a number of implications for teaching and learning about environmental education in the outdoors arose during our conversations outside as well as inside. Lori was looking forward to experiencing the program beforehand so that she could share her personal experiences with her students. Teaching an effective and alive program depends on a teacher having had the experiences herself. Most of the implications focused on the importance of selecting and organizing learning experiences for students that would expose them to outdoor experience and the importance of us setting an example for the students.

Next, we recognized the importance of having an affinity to appreciate and understand nature. This could be accomplished, for example, by reducing the number of stations that students visit. They would experience less physical pain and, therefore, more enthusiasm. Also, we discussed the limited number of questions that the students had asked during the program. Another session to discuss the questions would have helped the students to transfer them from the indoors to the outdoors. And one session just before the program would have helped the students to recall the questions during the program.

The latter segments suggested that we should give students repeated experiences in the outdoors. And, we recognized the importance of taking into account students' feelings and thoughts when teaching environmental education. We have to start at the level of the students, slowly introducing them to outdoor experiences and building on past experiences. By being aware of the students' level of comfort and past experiences, we provide them with experiences that make them feel more comfortable and give them a lasting and rich experience in the outdoors.

Role Of Conversations

Thus far, I have addressed our changing understanding of environmental education in addition to portraying our shifts in our views on teaching and learning about environmental education. What remains to be discussed is the role of conversation in these accomplishments. The purpose of this third part of the analysis is to explicate the opportunities that these conversations provided for in helping us make sense of environmental education.

The following sections consist of a brief introduction to the segment, the segment of conversation, an interpretation of important components of this segment, and finally an analysis. This final analysis links the content of the segment with the category assigned to it.

I identified a number of roles that these conversations played in our developing understanding of learning and teaching about environmental matters. The following categories convey the important role that a segment played in contributing to our reframing and shifting views: sounding board, triggers in the environment, thinking aloud, opening up to other

perspectives, reconstructing shared experiences, integrating prior experiences and processing experiences.

The first segment, selected from the first conversation in the classroom, demonstrates that Lori and I provided each other with opportunities to speak and to listen. This segment is best described by using the metaphor of a "sounding board" to indicate that sometimes Lori spoke most of the time; whereas, other times I spoke for longer periods of time.

Sounding board

1 Q: How did the students respond to...when you were doing...

2 L: ...That's a great question. The grade sevens were...Well, I always wonder if...what you attributed it to, because they are going, "Oh, do we have to go on this?" Right? Not...It wasn't like, "Oh, great!" There wasn't this really enthusiastic response. And I...and I am not sure if that was because of my presentation. ...Right? And I am quite chalk it up to that. Or, it is also being cool is a factor. One person said that, and then they all have to fall into that.

3 Q: Same mode?

4 L: Yes, right exactly. And, maybe some of them had some tough experiences last year. Sore knees or being cold or wet or whatever. So, some of them might not have had such a pleasant experience from last year. And so, all those factors and then some of the non athletic people, you know, who are non-active students were saying. Weren't as keen...perhaps as they...as I would have liked them to have been. To me this is just an incredible opportunity. And I felt that they weren't really as enthusiastic as I'd hoped.

5 Q: Uhh. (?)

6 L: Yeah. So, I am hoping now with someone that's been on the...

7 Q: ...Uhh.

8 L: Had the experiences first hand and, and can really relate that on a personal level, that the kids will be much more receptive to it. And, much more, "Oh, wow!" This is...can be a really neat opportunity. And...look at it under a more positive...light.

9 Q: A bit more enthusiasm, then...

10 L: ...Yes, exactly. So, that's what I am hoping that, that your, your knowledge and information will...aid the children in understanding what they are going to be experiencing.

11 Q: Are they expecting me? Do they know that I am coming?

12 L: Uhmm, actually I...by the time I mentioned to the students...to them this morning that this might be going on, that's when I wasn't still sure about it as well. So, of course, flying by the seat of our pants, they have a half idea of it. Especially my class and I am sure Mrs. X will let them know as well. But I think it is really effective when someone from the outside, so to speak, comes in as well as...the expert. You know, like help the...increase their awareness.

13 Q: Now, your past experience has been...you've been to the workshop.

14 L: That's right.

15 Q: And, are you familiar with the site itself?

16 L: I am...the area...yeah I can...I can quite picture this, but I haven't actually gone out myself and...yeah...I don't know (about?) your question?

17 Q: Yeah. That's what I mean. Like, I mean it probably makes a difference, too, if you actually know the site and seen it. Maybe that would, you know, contribute to being able to share a bit more on in a personal note, like you were referring to in my case...

18 L: ...Definitely, that, that's...Yeah, exactly. That's why I am hoping that we can get out and do it ourselves...to canoe around. Or, if I had an opportunity to do this before, then again you just bring that personal touch. And I think that brings it much more into focus...and much more alive. So, that's what I definitely like to work out, which I really appreciate.

19 Q: Oh, yeah. I can say from my part, too, I think it would be so much more effective because that way then the students come and they are more prepared and they can be more involved. It's not just the canoeing and then stop, listen, canoeing, stop, listen, which has been in the past. It's been very often the case. But in this sense, uhmm, hopefully we'll be able to generate more questions from them and, uhmm, maybe...how familiar are they with question strategies? Like, do they know some of the characteristics of a good question? I was thinking on the way here, maybe that's something that we just want to think about as well.... You know. What makes a good question? Like, when you're on a site, you know, I mean, "How old are you?" Oh, those kind of questions might not be appropriate.

20 L: Right.

21 Q: Uhm, how do you judge your class?

22 L: That's actually an excellent thing. I hadn't actually...I haven't ever done that with them. I mean I have my particular class since January of the year (?). So, I haven't really worked on...I, I am finding that we are doing a newspaper study who, where, what, when, why, but not really in depth. You know, what makes a good question. That's, that's a really good thought. And, I think it would be well worth spending some time generating, and even if it wasn't on the slides. For example, before you got started just talking about...so that they are more prepared, because that's what's going to make the difference. Otherwise you are going to get, "What do I want to know?" You know, why is the ocean green and brown, or blue or whatever. And, I think that you really want to probe their knowledge and growth in questioning. I think that's really a good point.

23 Q: Uhmm, and around those lines, something else that came out of our meeting with teacher Y, about a week and a half ago now, was the...idea, like what would you like them...like after the program or after this unit is completed...what would you like as a teacher...

24 L: ...Uhmm.

25 Q: Uhmm, have your students walk away with?

26 L: Right.

27 Q: Uhmm, and maybe, if I get a feel for that as well then when we do this I can sort of gear it in that direction.

28 L: Right. I think...Yeah, the...again the tricky situation of course that every...every activity has to entail...the fact I am working with the two classes and, therefore, it doesn't quite give that same opportunity for equal class exploration of this unit. But one thing that I know...to be working towards, at least in the future and if not, we can at least pull together for this time, is the idea of the industry, environment. Uhmm...What else do we talk about? History. ...Remember when we talked about how much the unit has to offer and how much this program, Port Study, could show the children on a large scale. So, that is like the big [door slams] (??) How...what happens? (??) There is these continual conflicts and how are they resolved? And, who has to give in and how far should we have to get. Like, looking at it from...from the environmental perspective and the fact that the industry needs to be part of our...It is and has to be part of our lives as well.

29 Q: Lives. The human component as well.

30 L: Definitely. I think so, because, if anything, we're not going to wow them with facts. There might be a couple of them at the tugboats. They might, "Wow." You know. And a few things about sea lions and things like that. But I think it is the emotional...So, it will be an affective experience. Like, "Oh, you know, how am I affected by this?" To be actually out on the water to experience that. And that's why I hope that it will be a positive experience for them so that they...can take it with them. I mean that's so much part of my life, environment, outdoor and things like that. I would really want them to get out of it. Is that?

31 Q: Yeah. That makes sense. I think, uhmm, from my perspective, too, that's something that I would like to encourage. And, as you sort of, uhmm, alluded to, it's sometimes...that's not as easy, because at the tugboat station, you might have a speaker, you know, who's, who's quite, uhm, aware, of all the facts and figures...

32 L: ...Yeah.

33 Q: Of, you know, how long this tugboat has been there. What it is capable of doing and it will entice, you know, part of the group. But it doesn't mean that alongside of this, we can also emphasize some of the components that you have just described.

34 L: Yeah.

Until utterance 13, I provided Lori with short questions, phrases, and prompting words, such as "Same mode?" (3), "A bit more enthusiasm then..." (9), and "Uhh" (5 and 7) to guide her to discuss the response of her students to her presentation and the Port Study, in general (1). From utterance 14 to 19 the amount of talk is more equally distributed between us, while we are discussing the importance of experiencing the program beforehand. I made a larger contribution to the content of the talk by sharing my opinion about the value of going out ourselves, because then we can present a program that is more focus and more alive (16, 17 and 18). In utterance 19, I returned to the objective of the lesson: to assist students with generating questions for the day of the Port Study. Having explained my reasons for going this route with preparing the students, I turned the conversation over to Lori by asking her about the students' familiarity with questioning techniques (19). In the latter part of this segment, Lori talked most often guided by more of my prompting sentences, for example, "Uhm, how would you judge your class?" (21) and "...what would you like as a teacher..."(23). Utterances 25, 27 and 29 provide other examples. Finally, Lori provided more openings for me to talk by asking, "Is that?" (30) and saying "...Yeah." (32). I responded by acknowledging her talk with, for example, "That makes sense " (31).

At the beginning and towards the end of this segment I acted as a sounding board against which Lori was able to bounce her ideas back and forth. My short phrases and questions encouraged her to expand on her ideas and develop her understanding. Even though I already knew what I preferred to present in her class and what the Port Study Program was like, I needed to give Lori an opportunity to develop her own understanding. During this conversation we reached a common ground on which to build our subsequent experiences.

I acted as a facilitator for Lori's growing understanding about the purpose and focus of the Port Study. With another person in her classroom who can talk from personal experience, Lori began to understand the importance of experiencing the program herself so that she could present lessons that were more personal and positive to her students. This conversation, therefore, focused our attention on the elements that make environmental education more meaningful to students.

The role of this conversation was to create an opportunity for Lori to come on board and be part of teaching the Port Study. Acting as a sounding board, I provided the time and space for Lori to talk for longer periods of time with only a few of my short questions and phrases interspersed throughout the conversation. As a result, Lori became more intune with the nature of this Port Study.

The next analysis focuses on the importance of the environment in providing materials or triggers for our discussion with respect to learning and teaching about the environment. Two conversations, illustrated with the excerpts below, were conducted in the outdoors. These conversations were different in nature or content because we were able to integrate our exploration of the environment with our planning of outdoor experiences for the children. The first two segments are taken from a conversation that took place in the canoe and the second two segments are selected from a conversation that took place on the trail around the Inlet.

While heading for our first station, seal heads popped out the water.

Triggers In The Outdoor Environment

1 L: Aren't they just gorgeous?

2 Q: Four of them.

3 L: Are they gonna come and check us out?

4 Q: Well, they might. Yeah. Sometimes, sometimes we encourage the kids to just sit really still and have them come to you.

5 L: Yeah.

6 Q: If you go over to them, they'll just dive and they're gone.

7 L: Yeah. Well, I must say even just being out here on the water already makes it so much more life-like for me. And, it's already now that emotional part that I can take back into the classroom.

8 Q: Uhmm.

9 L: That...it's, it's just (?) something, and what breaks my heart mostly though, is that the kids don't know...don't appreciate that nature. Don't appreciate this.

10 Q: You mean the value of the program or nature, in general?

11 L: Yes. Yes. I...Well, I think it needs both. There's a couple of kids that have been raised in the outdoors. I've got one hiker, for example. And then I got all these ones that are, are TV, TV and video and roller-blading and, and not to say that there is anything wrong with all those in themselves, but that...they don't understand the value of this. And, I...and I...you know, whether or not, they're gonna focus on the value of the nature...natural aspect of this. Or, they gonna focus on, "Oh, my knees are tired." And, that's what I'm, I'm hoping, of course, they'll see the beauty and the...

In utterances 1 to 4 we shared in the excitement of seeing the seals and I connected this to the importance of providing students with similar experiences by saying "...sometimes we encourage the kids to just sit really still and have them come to you" (4). Lori added that being out on the water makes the experience more life-like for her. She recognized that being in the outdoors gives her that emotional part that she can take with her when teaching students about environmental matters (7). Unfortunately, students often do not know or do not appreciate nature (9). She reiterated a concern that was addressed in the classroom by saying that students may focus on their physical discomfort rather than the enjoying the beauty of nature (11).

Seeing these seals in the water triggered a discussion of the purpose of our trip and environmental education in general. Also, there tended to be a shift in our focus for the study. We believed that the students' task should not only be to ask questions, but also they should value and appreciate nature when they are going out themselves.

The environment, or seals in particular, provided us with the materials that led to a refocus, or reframing of our concern. The content of our talk is enriched with our experience in the outdoors. And secondly, we used our observations to guide us along in our developing understanding of environmental education.

While the seals continue to follow us, we changed the topic and talked about the canoeing experience itself. This analysis builds on the previous segment.

1 Q: Yeah. I think...I mean those are good things to be aware off, because when the actual day happens, then you sort of...are being reminded. Or, what your priorities are. What do you really...and that's why I was asking "What do you...what would you like your students to take away from this?" Because maybe it's not the number of stations, maybe it's just this. You know. Floating around and not even paddling. Just sitting in the canoe. You've your paddle just to steer just in case you need.

2 L: And just listening. And, how many sounds can you hear? What do you think the sounds are like from the past? You know. Like, going back ...What it was like

before...when just the Natives were here? And, coming down...you know, just think of all the foreign sounds that have come with time.

3 Q: Yeah. Pretend to be a pioneer? Guess, when there's nothing here yet. What would it have been...felt...what would it have felt like?

4 L: Can you imagine yourself...Can you actually picture yourself here? I've trouble with that sometimes, though, too, being a beginning teacher. I'm still nervous to ask questions like that. Uhmm. Do you understand the...?

5 Q: Yeah. Oh, sure...

6 L: ...Sort of like,...it's not a, "So, why is it...why are the trees green?" It's not a very cut and dry question. That, you're asking them to think, you know, beyond what's here and now and try and get that bridge. And, I don't know even, if they're capable at that age. It's hard to say. They're very sensitive in lots of ways.

Having just talked about the importance of responding affectively to an outdoor experience, we continued to describe what we were hearing, seeing, and feeling. The first utterance illustrated the shift in priorities. I returned to a question that we frequently asked ourselves throughout the conversations, "What do you...what would you like your students to take away from this?"(1). While in the midst of experiencing what it feels like to sit in a canoe pushed along by the current, I noted the importance of "Floating around and not even paddling" and "Just sitting in the canoe"(1).

Lori added the importance of listening to the sounds around us as well (2). In addition to these sensory activities, feeling and listening, Lori remarked that she was curious about the Natives who lived in this Inlet (2). This reminded me about the pioneers who used to live in the same location (3). In utterance 6, Lori used the question, "Why are the trees green?" to illustrate that some questions are not very cut and dry. In other words, some questions are hard to answer. I believe that the nature of this question has its origin from the surrounding hillsides that were covered with trees.

This segment is just another example of the influence that the environment has on the nature of our talk. While being immersed in an outdoor experience, we use what is presented to us and made it part of our talk. Our understanding of environmental education, and more specifically our role in bringing about students' learning, arises from the outdoor experiences and our interpretation thereof.

The analysis continues to elaborate on the links between the environment and our talk about it. Especially, I am interested in explicating the change in our understanding as a result of incorporating these exploratory episodes in our talk.

1 L: Yeah. And, then to go out tree-planting. That solidified it now that I've met D. Well, it's very strong. Look at this? Isn't that an interesting growth.

2 Q: Hey. Oh. All dotted all the way to the top.

3 L: I wonder how it spreads? It's split up.

4 Q: You think it's part of the tree, or?...

5 L: ...It's a fungus.

6 Q: Fungus, like the...

7 L: Sort of like...

8 Q: ...You think it is a bracket fungus. A little bit like...I get the idea that's starting to bulge.

9 L: Yeah. Getting...

10 Q: ...Side ways.

11 L: Yeah. Yeah. (????) Moss on it as well.

12 Q: Yeah. (?????).

13 L: Yeah. (?????).

14 Q: That's it. I mean you choose...your eyes fall onto something. Right? And then you try to figure it out. Whereas TV, someone else controls what you see...

15 L: ...And what you're gonna do.

16 Q: And what you're gonna think about it. And here we can think about anything we want. I mean we can ask ourselves any questions we want.

From utterance 1 to 4, we examined a growth on a tree, which we identified as a fungus (5) and more specifically a bracket fungus (8). After noting other interesting growths around the fungus, I concluded from this experience that "our eyes fall onto something" and "you try to figure it out." This stands in sharp contrast to a TV, which, even though it provides us with sounds and images, controls what we see and hear to a large extend (14). The TV does not allow us, or reduces our ability, to do or think whatever we want. When we are in the outdoors, on the other hand, we can choose to select or isolate certain aspects in nature for further study.

Again, the exploration of our surroundings contributed ideas and possibilities for teaching environmental education. We noted the inadequacy of TV in providing the necessary stimuli to make sense of the natural environment. Therefore, we continued to develop the notion that it is important for students to be in the outdoors and to make sense of the environment for themselves. They would be able to think about anything and ask any questions.

The bracket fungus led us on a path of comparing the role of TV in providing an education about the environment versus the role of outdoor experiences in doing the same. Our eyes fell onto the bracket fungus which led us to conclude the importance of selecting an aspect of nature which we would want to explore further. In addition to exploring the fungus in detail, we refined our understanding about environmental education.

This last example builds on the idea of giving students opportunities to do their own exploring as well as the importance of triggers in the environment to guide our conversation in a particular direction.

1 L: ...Look at this? It's been totally...

2 Q: ...Well, you were looking at this, I was looking at...saw that over there. A tree growing on a tree.

3 L: Oh, is that it?

4 Q: Tree providing food for another tree. Or, holdfast. Then slowly...

5 L: Getting its roots down to to feed itself. That's neat. This one looks like a (??). It's tall enough to do it. It looks like it's getting some good strong roots down to to keep it up. As supposed to the ones where the, the host hasn't ...didn't have quite enough...Look at all that blue.

6 Q: How it disintegrates. I mean...

7 L: ...Yeah. Exactly.

8 Q: Enough of a balance. It's gonna stay up straight.

9 L: Hopefully. It's neat. How many people have we seen doing what we're doing? Oh, wow. You see all those.

10 Q: But even that...I'm wondering about...Pardon?

11 L: Have a look in here. All these little (??????). These little flat guys that have, uhh,...Did you actually one?

12 Q: No, I didn't. You saw something hiding away in there? Oh, there. Yeah. I saw it. O. K. Yeah. One of those...like they're miniature armadillos.

13 L: Where are you going? Go back to your home.

14 Q: He wants to be. Ooops. There it is. It's finding a place to hide. Yeah, again, I guess that maybe brings us back to your bird watching (?). You know. How the people that we have seen today. Most people just walk.

15 L: Or, running.

16 Q: Or, run. Walk their dog. And may not stop and listen. But then I'm wondering what they're thinking about. Because here they see the two of us. Stopping. Talking. Taping. Listening. And so while they're running past us or walking past us, I'm wondering if maybe...

17 L: ...Think that we're strange.

18 Q: Yeah. Are we strange or, or maybe puzzled? And, then, you know, think about what they're doing with respect to what we're doing.

19 L: Right.

20 Q: And maybe the next time, they walk. Or, maybe, you know, ten times later or next year, they might not end up doing the same thing. And, I guess with your students, too. Or, with our students we have to start somewhere. And, if can have them go through a forest the first time with a hike. If that's what they feel comfortable with. [someone passes]. And maybe the next time instead of hike, we can walk. And, maybe the next time we don't even need to walk. We plunk ourselves down.

In the first part of this segment (1 to 8), we discussed our observation of a tree growing on a tree. Lori suddenly noticed a pillbug escaping from us into a small hole in one of the trees. After a fruitless search for the pillbug, we linked our hunt for this critter to other activities in which the people that passed us are engaged (14, 15 and 16). Most people were walking or running on the trail and did not stop to look at interesting objects and events as far as we could tell. I remarked that we were the only people who stopped and explored and wondered what other people were thinking about us (16). It was, however, not a matter of saying who was getting the better experience (18). I concluded that people have different starting points at which they feel comfortable to explore nature. I connected the description of activities of people on the trail to an interpretation of what students may feel comfortable with during their first visit to this place (20). We have to be sensitive to their needs and feelings. Introducing the students to the outdoors may

be a slow and gradual process whereby the type of activities may change from a hike, to a walk, to sitting somewhere (20).

In this last case too, I showed that the environment guides and supports us through a particular conversation. Or, the content and nature of the conversations are influenced by our observations. Furthermore, this segment developed a focus for the type of activities that we should be selecting or designing for students when we take them into the outdoors. By being involved in some of these activities and observing others at the time of this conversation, we had a better understanding of what the outdoors might mean to people.

These four examples illustrate that our conversations were affected by the environment that enveloped us. The environment provided us with experiences and interpretations that we incorporated into our talk. Our understanding of teaching and learning environmental education continued to be refined with every new experience. Initially, we identified the importance of providing students with affective learning opportunities which continued to be important in the second segment as well. The third selection, however, emphasized that we might not be able to tell who is getting the quality experience. This discussion continued, in more depth, in example four when we returned to our role as teachers in providing outdoor experiences for students. We began to realize that some students may have to be introduced to exploring the outdoors more gradually. In other words, we can not expect them to sit down quietly during the first visit in a forest if this place is foreign to them. Instead, we have to provide them with a number of experiences over time to acclimatize them to their surroundings.

In all four examples, I attempted to convey the importance of conducting these conversations in the outdoors. The content and interpretations embedded in these conversations were rich and provided us with unique and new perspectives on teaching and learning about environmental education. The natural environment contributed to reframing our initial concern from lack of enthusiasm to lack of learning to appreciate nature. Secondly, I noted a shift from the importance of teaching studens to ask questions to familiarizing students with nature at a more affective level. This shift is attributed, for a big part, to our own experiences in the outdoors and our talk centering around these experiences.

The next category, called "thinking aloud," exemplifies what happens when you give someone the opportunity to speak without too many interruptions. I believe that there are at least two possible reasons for needing another person there. First of all, without the second person being around, the other person may never have spoken. And secondly, the presence of the second person may encourage the other to speak and to develop her own ideas.

Thinking Aloud

1 Q: Uhm. Uhm. Are you familiar with Harmack at all, in Nanaimo?

2 L: No.

3 Q: Yeah. That's a place where,...with the seals...sea lions...At Nanaimo. And, that's exactly sort of along the lines of what you've just been saying. Is that, uhm, all the sea lions were there on the log booms. And, it was really awkward for the workers. You know. And, they want...tried to chase them off. And do all sorts of stuff. And, of course they came back. And, in the end they said, "O.K. Well, we have them so why not make the...you know...use them for something positive." And, now, you know, that time, it was last year or the year before. It might have been two years ago. They toured the public around the mill to show them the sea lions. You know. I mean, isn't that a great way? I mean we got that...we got the mill anyway. And, now we got the sea lions, which really are bothersome for the workers.

4 L: Yeah. But they're trying to come to some sort of agreement. Some sort of working arrangement where you can't just blow things off, because they're not convenient for you. And, that tends to be the kind of society we're living in right now. And, the kids have definitely been given a very convenient life-style. And, therefore..."Oh, my knees are sore." "My arms are sore." You know. "I can watch this on T.V." Smelling, really feeling the wind...there's all those other experiences that I think they need to be exposed to.

5 Q: Uhmm. Uhmm. Yeah. I feel instant satisfaction almost, isn't it?

6 L: Uhmm.

7 Q: And the instant stimulation on T. V., but it's very visually and orally, but that's all it is.

8 L: Yeah.

9 Q: There's no involvement in it. Is there? ... But, I think, too, that it's going to take time and that's why, you know, like your suggestions...If there was time and there was, you know, the energy there to go a number of times. You know. I think that would be worth it, because then at least...The first time, for some of them, it's a very uncomfortable experience.

10 L: That's what I'm saying.

11 Q: Yeah.

This segment illustrates that I thought aloud, solely relying on Lori's "uhmm's" and "Yeah's" (6 and 8) to lead me to a implication for practice that Lori had apparently already made for herself (10). Upon hearing the comment "That's what I am saying, " I realized that she had already gained an understanding that I was still seeking. By expressing my thoughts aloud and hearing myself speak, I made sense of what I experienced and brought it to a conscious level. I was aware of what I was coming to know.

As Britton (1992) comments, "In considering language as a mode of representing experience, our main stress has been upon its use in turning confusion into order, in enabling us to construct for ourselves an increasingly faithful, objective and coherent picture of the world" (p. 105). In the presence of another person, we use language to express ourselves aloud and in so doing, we hear ourselves make sense of a situation. The role of conversation in this particular case was to provide me with an opportunity to reach an understanding that Lori had already achieved. Lori listened carefully and provided the space and time for this to happen. In the mean time, we developed a further understanding of environmental education by realizing that TV does not fulfill all the necessary experiences and lacks the ability to involve students more actively in the experience.

Even though this latter example focused solely on me gaining a perspective on environmental education, it did not depend on the perspectives of others or other prior perspectives. In other words, the previous conversation did not readdress an existing perspective. In the latter analysis, I concluded that the role of the conversation was solely to bring to the surface a perspective that the other already possessed. In contrast, the next category emphasizes the ease at which a perspective may evolve. The first segment was selected from the conversation in the canoe and the second segment was taken from the conversation in the classroom in the afternoon after the Port Study.

Opening Up To Different Perspectives

1 Q: How would you describe your students, like as a teacher? How would you describe your student ?...

2 L: ...Uhmm, that's a hard question for me, because I'm so new at it. Then I don't really...So much of it...is like...

3 Q: ...Just getting...

4 L: I've got some very nice students. I've got some spoiled rotten students. I've got some. going-on-twenty students. They're really gems and a treat. And so, (what?) a mix. And, then the group that I'll be getting from the other class. There's a bit of whiners and quite a variety of personalities in there, too. What do you mean describing them, what do you mean?

5 Q: Well, what are they like? Like, if you...let's say that we are here now, Like...what would you predict would happen to them? How would they respond if...once they're out here? Like, how do you think they would...

6 L: ...I know what you're thinking about.

7 Q: Like you talked about the canoeing. You know, you talked about the knee pain, etcetera. But,...or maybe what...

8 L: ...They would, they would be delighted to be seeing these, the...seals. They would think that that was great. I could see them enjoying that. And,...but, you know, at this age, too, it is so much... peer relations. Where's, where's Jesse? Oh, her canoe is over there. You know, like...that's where you lose so much of what we're enjoying right now. It's this, it's this peacefulness. The listening. The looking. The questioning. The thinking. The wondering. All that is lost in the "Oh, I don't want to be in your canoe."

9 Q: Yeah. All the other inter...like the personal interactions. Like, that's at the social level rather than,...

10 L: ...This is a day where they, like you said, they're away from school. And, so that's part of it. And, I think it must be hard for you refocus them all. Do you find that you're continually refocussing the students?

In the first five utterances we developed a description of the students who were going to be part of the Port Study. In utterance 4 Lori decribed her students as a mix of whiners, spoiled rotten students and gems. This description is based on her classroom experiences. When asked, "how would they respond...once they're out here?," (5), she believed that they would be delighted to see the seals. Unfortunately, this delight may be overshadowed by their concern about what other students are doing at the time or the influence of peer relations (8). Lori also recognized that when the students are away from school, students may be difficult to focus.

Even though Lori's decription of her students would seem to indicate that these students might not be ready for an outdoor experience, she believed that they would be delighted with seeing seals. Being away from school ourselves at the time of this conversation, Lori realized the

significance of this for her students. As a result of my probing questions in utterances 1 and 5, Lori developed a view of her students that may have some impact on how the Port Study was going to be conducted. We slowly added other reasons to take into account their lack of enthuasiasm. We added the importance of relating to peers and being away from school. These other reasons would affect the Port Study experience.

While in the first instant Lori opened up to a new perspective, it was my turn in the next segment.

1 Q: And we've had a lot of problems with students using their washrooms, because they have a TV in the washroom. And the computers. And no matter how much we, you know, tried to explain to the students that this is someone else' work area. You can not touch any buttons. We've had students actually jam the system. The computer system. Yeah. Like it was just unbelievable. You know. I mean...and that's the thing. It was interesting you said, "You seemed to manage the students well." I want to get your response, because, I guess at one point I was getting frustrated when that little, uhmm, yellow thing was floating around in the water.

2 L: Oh. Yeah. You know, that was...

3 Q: ...You know. Yeah, but, you know, I felt...I guess you make a choice or a decision and then later on you realize that no maybe I should have gone with what we actually ended up doing. Getting it out of the water, because it was distracting them and they were so worried about it. But, I guess I was upset in the first place, because how could it have ended up in the water?

4 L: Yeah.

5 Q: That makes sense to me now. And, then the second thing is, and that goes back to our talking on Saturday about their attitude. It's, you know, if they want it, they want it now. Like, they did not trust me or they did not believe me or they did not want to care about what I said.

6 L: Yeah. Yeah.

7 Q: It's floating here. There's no current. You know. It was not gonna go anywhere. But no, you know, they insisted on getting it right away.

8 L: Well, see I didn't know that it was in the water when they were fooling around. I didn't know what they were doing. Right? I just saw that they were talking. So, I thought, well stop talking. And then all of a sudden I saw it. And, I thought well, you know. It's your natural reaction to get...If something is not supposed to be in the water, it's your natural reaction to get it out.

9 Q: To take it out?

10 L: And then I think...but their canoe wasn't tied up. We weren't tied up very well either. So, there was a lot of, uhmm, extra factors that were making the distractions possible and making them more...because it's so hard. Like...think you've an incredible job to be the resource person and talk over the wind, the

> waves, the canoes, trashing, the talking. You know, there's so many, uhmm, distractions for the kids. And I thought they did very well actually for the most part listening. But like, even at that station...remember you just looked out and they're all just this [spaced out look on my face], because they were so tired.

An yellow object had landed in the water and some students tried to get it out when we were about to start the study of the deepsea ship station (1). Even though I felt frustrated at first (1), I, then, admitted that getting it out of the water was the best solution, because the students would no longer be distracted and be worried about it (3). And finally, I identified the origin of my frustration by saying "how could it have ended up in the water" (3). In my next turn (5), I gave more reasons, returning to students' attitudes, believing that some students are impatient by wanting it now and they did not trust me or wanted to care about what I had told them. When Lori spoke, she provided a different perspective by remarking that it is our natural reaction to get something out of the water if it did not belong there (8). She continued to decribe how a number of different circumstances, such as other distractions and drifting (untied) canoes, made it hard for the students (10). Listening to Lori provided me with a different perspective on the events that had unfolded in a manner that was frustrating for me.

These two segments of conversation created opportunities for bringing to light perspectives that contributed to more reasonable and acceptable explanations of the events. These perspectives helped us make sense of a situation in a different way. The second person, who was part of the experiences as well, may have interpreted the events in a different manner. When discussing these events afterwards, opportunities are available for examining these different perspectives.

The next category also emphasizes the importance of taking the opportunity to reconstruct the events in a conversation. By retracing the day, certain problematic situations are addressed and implications for practice are stated.

Reconstructing Shared Experience

1 L: In the...I guess...should we just...do you have questions right away?

2 Q: I don't have...maybe just get a general sense of how you felt about the day.

3 L: O.K.

4 Q: And depending on what you're talking about, sort of expand on some points.

5 L: Oh, good. Generally, for the whole day, I would say it went way better than I had anticipated. Not...because, remember when we talked about before, my concerns were attitudes. And, I thought the attitudes were just fine. Keen. Like...they were really ready to go. I was, I was really pleased. And there was a lot of inter-canoe competition which was nice to see. So, that, that again, the dynamics could change very much, depending I guess on, on [interrupted by P.A. system]...could really change depending on your group dynamics. But I was really impressed. I thought that went really well. So, that was of a concern, that was O. K. I thought that, that...their questioning was O. K. It could have been much better. But I really felt that the heat was another factor in that. By the time I got the station, the boat...terminal.

6 Q: Tugboat station?

7 L: No. The terminal. I couldn't think of anything at the, at the...what was it called now again? Now, I can't even...

8 Q: ...Pacific Coast Terminals?

9 L: Yeah. The boat, even the Pacific Coast Terminals. That's a hard station to ask question, because you're really not seeing anything. So,...

10 Q: ...Well, where we were, we didn't see much because...but when you go passed it, but then they were so busy getting in...through the wind, I guess.

11 L: Oh, yes. They were...O.K. No. No. Not at all. And, so that was one thing and by the time I got the, the boat, it was just like, I couldn't even think of anything really (?). I was quite interested in those to begin with.

12 Q: The deepsea ship, you're talking about?

13 L: The deepsea ship, that's what I'm talking about. And, then, uhmm, it was lunch time, then I found I was much more interested after lunch I would have liked to have done the deepsea ship after lunch. Right. So, you would have paddled on. Done your station. Have lunch. And then come back and done the deepsea ship [trouble pronouncing the word], because then you're feeling a little bit more energized. A little bit more fresh and ready to ask questions. It was quite fascinating for it to be up that close up. It's so huge.

14 Q: Especially on the way back, because the booms are...the container booms seemed to have moved.

After the first four utterances established the direction that this conversation was going to take, Lori started to recount the day's events, starting with general group dynamics and leading into the third, deep sea ship station. When confusion arose over the name of the station (6 and 8), I asked her which station she meant. After it was decided that it was the Pacific Coast Terminal station (9), Lori remarked that it was hard for students to ask questions at this station because they could not really see anything. I disagreed by saying that we were so concerned about the wind

that we did not take the opportunity to look at what was on shore (10). Lori reluctantly agreed and then disagreed by saying "Oh, yes. They were...O.K. No. No. Not at all." Then she referred to the deep sea ship and her disappointment with not being able to think of any questions (11). She then offered a solution by suggesting that we should have done this station on the way back (13). I agreed and added that we would have been able to get closer, because the pollution boom around the ship had moved closer to the ship (14).

This conversation continued to discuss each station. The reconstruction of the events of the day relied on input from Lori and myself. The listener and speaker received triggers, in the form of words or short phrases, from the other. Then, we used these triggers to tell our own experiences. Also, every time something was not clear or incomplete in terms of what happened, we corrected each other and elaborated on each other's comments. The role of the conversation was clearly to depict an as accurate account of the events as possible by reconstructing the day bit by bit. By describing the events carefully, we also opened up to different perspectives, its importance hightlighted in the preceding category.

While the situation was unfolding, we were "internalizing" the situation in our minds. And, when we retold the situation afterwards, we were "externalizing" it. Britton (1992) says,

> Our representation of that situation is the resultant of the two processes, that of *internalizing* and that of *externalizing*: and because what you project is a function of your personality (Your mood of the moment as well as your habitual feeling and thinking about things), and what I project is a function of my personality, our representations of the shared situation will be different. Moreover, the way I represent similar situations on different occasions will be different. (p. 14)

Most importantly, by talking about the experience we recollected the experience more clearly. Lori triggered my memory and I triggered Lori's memory when describing the events. Britton (1992) remarks, "It will often happen that people will recover in talk about a shared experience far more detail than either of them could have supposed before they started" (p. 30).

These conversations not only focused on our present experiences in the outdoors, but also included anecdotes and analogies about past, or prior, experiences. This next category emphasizes the contributions that these prior experiences make to our present experiences in the

outdoors. This conversation provided opportunities to relate and integrate prior with present experiences.

Integrating Prior Experiences

1 L: As supposed to really enjoying it. But I think...those are life-long things again. Like, that's why I kept pulling back and thinking, you know. You kids are just so lucky. And, you can't appreciate it right now. But the fact that you've done this, you know. One day when you got a...a friend and they said, "Look, I got my parents' canoe, you want to go down and go canoeing?" Or, at the lake, "you want to go canoeing?" Well, it's not like, "Do I hold the paddle like this or like this." "Or, what if I do this?" "Or, how do I get it to do that?" You know, it's, it's yet another building process for them. Another, actual experience of which they have taken part of. So, those are the kinds of things, we can't measure. Those are the kinds of things we won't even know in our life time how it affected them. Or, what they took out of it. But I think as a child I appreciated being exposed to a lot of things. And for them, I don't think, a lot of them do it with their parents. Or, whatever. That this, you know, a really big opportunity for them. That was good. And,...what else? And, again, the whole environment concern. I know that's one of your things. I don't feel that there was...well, what can you expect? We did a tiny pre-study with half the group. You know. We weren't priming them for all what was to be learned. In terms of what, what was,...although we did talk about the oil spill. And, I thought that that was good. But, again, how much...I mean we knew what he was talking about. The, the...at the...industries have to be more responsible for their spills or for their accidents and things like that. But, whether or not the kids are picking up on that, I would...you know?

2 Q: It seems...I don't know. You're very realistic. I would say exactly the same and I'm just kind of wondering, you know. Even though the pre-study that we did, in terms of the questioning, generated more questions from them. Of course...yeah, especially with all the factors...You have to deal with the tide, the wind, the weather, you know. The sunshine in this case, too. That takes a lot a way from, from anything else. And, the canoe is not just a vehicle. It's not just a vehicle that gets us from one station to the next. You've to learn how to drive that vehicle. And, that takes up a lot of your energy. Your focus.

3 L: Yes.

4 Q: And, so all of a sudden, you're being bombarded, say, you know. "What about this place?" It's like, "Oh, we got there." They're so...you know. It's like driving a car. Half the time you don't know what you've passed. You just know that you've arrived. And so with the Pacific Coast Terminals...Terminals. Yeah. I mean, they didn't even look at the shore. It's like, "Oh, this is where we've to go." And, "Oh, yeah, we may have heard the geese."

5 L: How to get there.

6 Q: It doesn't sink in.

In the first part of this selection, Lori recalled the experiences of her childhood to make sense of the experiences of the studens. She incorporated a story of children who one day may

realize the importance of the experiences that the Port Study provided for them. For example, they may now know how to hold a paddle (1). This story told us that we may never know the influence of the experiences on the students. This led us to an implication for practice by realizing that we still need to provide for these experiences.

In the following utterance, I use an analogy of a vehicle to put the use of a canoe in perspective. The canoe is more than a vehicle to get us to a destination. This vehicle gets its fuel from our body (2). Using the analogy of driving a car, we may be so intent on getting to our destination, we may not see what we are passing (4) when we are in a canoe either.

We were not simply telling a story. Instead,we are using these anecdotes, childhood experiences or analogies, to make sense of the current situation of which we are a part and of which we try to make sense. These anecdotes provided us with different perspectives, which, when superimposed onto our experiences, can provide us with a clearer or richer understanding of these experiences. Firstly, we recognized that students may never have had the chance to explore the outdoors with their parents. Secondly, we described the difficulty with paddling a canoe in such extreme sunny and windy conditions.

This next segment is similar to the previous segment with the exception that it refers to a fictional source of information, a novel, called *Hatchet.*

1 L: Well, absorbed. And he did suddenly had this desire, the urge, to learn as much knowledge. That he needed to understand as much as he could. And he thought even if he could understand everything. And I stayed here every day, watching the heron, watching the frogs, I still not know everything. And I would still be, not...I wouldn't know it all.

2 Q: Yes.

3 L: It was just a neat thing that, that's where I sort of feel myself, too. That desire to...know, and therefore, to share. You know... And then for the kids, too...that, that desire.

4 Q: I mean it's like you say. I mean you have to have the desire to know so you can't know or you don't want to know if you don't have that initial desire.

5 L: Right.

6 Q: So, if that's the case than would you not think that in the students, before you impart any knowledge or understanding on them, you would have to instill that desire as well. Or, bring out that desire, because if they don't have that desire, we can have them fill in...

This segment is different from the others because our experiences with the same book where in a different place and time. Lori tried to fit her experiences into Hatchet's experiences by continuously searching for connections. Hatchet struggled to know as much as possible about nature. Lori recognized the same dilemma in her attempts to learn as much as she could, knowing that was going to be impossible (1). She continued to compare herself to Hatchet by recognizing a desire in her that is similar to Hatchet's (3). In the next utterance, I picked up on Lori's talk by suggesting that students, too, need to have that initial desire before they can make sense of what they are experiencing (4 and 6).

This conversation illustrates the importance of other sources of information that have an environmental overtone. For example, Lori compared her own outdoor experiences to Hatchet's outdoor experiences. By elaborating on the ideas expressed in the novel or discussing the analogy, we became more sensitive towards other people's experiences in the outdoors. Through the discussion of the novel, facilitated by this conversation, we reframed our lack of learning to appreciate nature to lack of a desire in students as a contributing to their experiences in the outdoors. In conclusion, by contributing this story, analogy and novel summary, we continued to gain a better understanding of the students' experiences.

While the segments thus far have focused on the words and phrases, particularly the content of these words and phrases, the last selection pays attention to the numerous pauses that were interspersed amongst the talk. The next segment indicates the pauses in seconds between brackets. The "Uhh's" and "Yeah's" have been included to illustrate the short sentences that were spoken.

Processing Experiences

1 Q: I got the sense that your students were quite...They were picking up on some of the ideas. But we didn't get to experiment with it too much. But, if we drifted or we were quiet, then they seemed to be quite quiet as well. So, I think...

2 L: ...They were pretty responsive. I agree.

3 Q: I'm wondering, you know, if we can...

4 L: ...Through practice?

5 Q: Uhmm.

6 L: You know. And continue the experiences. Yes. Definitely.

7 Q: As long as we can do it ourselves and possibly you have to explain to them, why.

8 L: Why?

9 Q: Like, I mean. They haven't had as many experiences in their life yet as we have had. We've had more opportunities to recognize the value and to appreciate the value of sitting quietly. And, let things happen to us rather than the other way around.

12 L: Uhmm. (12). You're right.

13 Q: And part of it is it's probably our own fault. Isn't it? Look at what we do in the classroom. That we hustle and bustle them from one thing to the next. And, so I guess, when we take them outside, they probably expect to be entertained by us again.

14 L: Yeah.

15 Q: Because if they sit quietly...I mean, it's , it's ironic actually. Isn't it? I'm thinking back about some of my teaching. If, you know, a student's sitting still for five minutes and not...Or, seems not to participate. Or, seems to be daydreaming. Or, seems to be deep in thought about something else. You always kind of wondering. Oh, my gosh, maybe something is wrong. Rather than thinking that "Hey, something is right, here."

16 L: Yeah. That's a really good point.

17 Q: We think that something's awfully wrong. We need to help or we need to...

18 L: ...Get them back on task.

19 Q: That's right. Back on task. And maybe they're thinking about exactly the same things as we're thinking about now.

20 L: Yeah.

21 Q: I mean...And yet, you know, we have forty minutes to do math. And, we have to finish this page. And, if not, then they'll have to take it home for homework.

22 L: Right.

23 Q: And. (4).

24 L: I know. It gets really frustrating I find when you really trying to revamp the education system too much, because you start to find very little right.

25 Q: Uhmm. Yeah.

26 L: You do. You know. This...there's so many contradictions or (2).

27 Q: Yeah. Inconsistencies.

28 L: Yeah.

29 Q: I, uhmm. Here we're trying to encourage to...know and enjoy just being here. And, here, once we're in the classroom, we're not encouraging them to just being there.

30 L: Right.

31 Q: And. (5). And then you feel guilty, but at the same time you only have them a year. It's not like you can, you know, you know when they go on and have a different teacher. The teacher's expectations, uhh, that she feels...he feels or she feels, that you have to meet the year before.

32 L: Right.

33 Q: So...

34 L: ...Right.

35 Q: It's like a roller coaster then. Isn't it? One person meeting the needs of another. And, uhh, there seems to be no way out.

36 L: Yeah. I don't know if I mentioned this earlier, but the sense of peace that we're feeling again out here. You know. We're feeling very low pressure, very low-key.

37 Q: Uhmm.

This short segment illustrates the number of times we paused for longer than one second (12, 23, 26, 31). For example, twelve seconds of silence in turn 12 was a long time, especially for us, when we had been talking back and forth at quite a rapid pace. Secondly, Lori did not talk as much as I did during this segment. She occasionally acknowledged that she was listening with a "yeah," "right," or a short phrase.

Keeping in mind that the complete conversation lasted for about three hours, this segment was taken from the latter part of the second hour. Unable to explain this sudden change in the nature of our conversations, I asked Lori about the many silences during our discussion of the other categories and interpretations. She told me that this was a time for her to think about what had been said so far. We felt no pressure, just sitting on a log and taking in the sights and sounds. Their was a feeling of contemplation on Lori's part, observing the geese and taking a break from the talking. We did not have to verbalize every one of our thoughts.

Van Manen (1991) identifies three purposes of silences. Firstly, silence can "speak." The mere being together is an essential part of the conversation. In some circumstances, responses or

questions from the listener to clarify meaning might intrude participant's thoughts. Secondly, a silence leaves space for participants to come to a self-understanding. Speakers and listeners need time to process feelings, thoughts, and experiences. Finally, if one of the participants stops speaking, the listener should hold back advice, opinions, points of view, or comments while paying attention to the speaker's thoughts and feelings. In other words, silences provide time to process what has been said and experienced so far, contributing to our own awareness and understanding of teaching and learning about environmental education.

In summary, the categories and their corresponding descriptions and analysis have illustrated the role of conversations in providing the medium for developing our understanding of environmental education. Secondly, these conversations contributed to our shifting views of teaching and learning about environmental education. This was accomplished because the conversations provided us with opportunities to act as a sounding board, to respond to triggers in the environment, to think aloud, to open up to other perspectives, to reconstruct shared experiences, to integrate prior experiences and to process experiences.

Summary

From the first to the last conversation, we framed and reframed the problematic situation together. With every reframing, we drew different conclusions and identified different implications for teaching environmental education. The initial frame, lack of enthusiasm and participation of students in the Port Study Program, slowly evolved over a period of reframing and giving reasons during our conversations. We slowly began to note a lack of learning to appreciate nature. This new frame opened our eyes to the difficulties of assessing students' learning. Our tasks as teachers to detect students' learning was further complicated by being aware that much of the students' learning might not be detected immediately and outwardly. Eventually, towards the end of our conversations, we believed that it was important for students to have a passion, or strong desire, in their pursuits of appreciating nature and gaining an understanding of environmental matters.

Parallel to our reframing in conversations, we also began to alter our implications for teaching and learning about environmental education. Our focus on teaching questioning techniques changed to realizing that we needed to look further and deeper to gain a better understanding of how students learn about environmental matters and how to teach these students about environmental matters effectively. The nature of our role changed to providing experiences for children in which they can develop an affinity toward and understanding of environmental matters. We also understood that students need ample time to feel comfortable in and explore the outdoors, which can be achieved by providing them with repeated experiences.

The third section of this chapter substantiated the important role of conversations in contributing to the content of the moments of reflection. The following categories, sounding board, triggers in the environment, thinking aloud, opening up to other perspectives, reconstructing shared experiences, integrating prior experiences and processing experiences, convey the important role that a segment played in contributing to our reframing and shifting views.

In this chapter, I illustrated and analysed the deepening of our pedagogical understandings of environmental education and the role of conversations in this endeavour. In the final chapter, I review the argument and the conclusions and discuss the limitations of this study as well as further implications for research and practice.

Chapter 5

Looking Back, Looking Into, And Looking Beyond

The thesis examines our changing understandings of environmental education and the shifts in our view on teaching and learning. Finally, it analyses the role of conversation in contributing to our pedagogical understandings of environmental education. Set in the practical context of environmental education in British Columbia, and the theoretical context of teacher's learning as coming to "see" and understand events of teaching in new ways, this study sets out to detect and convey "reflective moments" in my discussions with a teacher who is attempting to address environmental issues in her classroom. Several excerpts of conversations have been taken from my ongoing relationship with her, and these have been presented and analysed in the preceding chapter. This final chapter begins with a review of the argument I have been developing throughout the document in order to pave the way for the conclusions that can be drawn from the case material. After summarizing the claims I would like to put forward by way of conclusions, I look beyond this thesis to discuss the limitations and implications of my work for further research and practice.

Reviewing The Argument

The literature provides us with an overwhelming array of perspectives on reflection and purposes for reflection. Furthermore, British Columbia is supporting sustainability education, but it still has a long way to go before we will see any substantial change in the formal and informal education system to include sustainability education or any other form of environmental education in its curriculum.

Most authors, who recognize the importance of conversations or dialogues, recommend that the participants complete a series of steps of which one is usually systematic reflection (see, for example, Yonemura, 1982; Rudduck, 1987). Instead of using conversations in its literal sense, Schön writes about conversations in a metaphorical sense. The participant has a metaphorical reflective conversation with the materials of a problematic situation. He or she

constructs situations in practice based on his or her own beliefs, views, perceptions, and appreciations. Others have identified the importance of a sense of community and the social nature of making sense of a situation (MacKinnon and Grunau, in press). With this research in mind and with the addition of past projects and experiences, I conceptualized that conversations provide a context for informal reflection between participants.

Conclusions

I detected reflection when reading and interpreting the content of segments of conversations. These "reflective moments" illustrated the setting of a frame, noting the lack of student enthusiasm, and subsequent reframing of this concern over time. With every reframing episode, we gradually began to see that a lack of student enthusiasm was not sufficient to describe the problem that we were facing. This problematic situation slowly evolved over a period of reframing and giving reasons during our conversations. While previewing the Port Study in the canoe ourselves, we slowly began to note a lack of learning to appreciate nature. With this new frame in mind, we became aware of the difficulties with assessing students' learning. We realized that much of students' learning might be difficult to detect. Much of students' learning was in the affective domain to which we could not gain access at the time of the outdoor experience. Eventually, we added another component to this affective domain by stating that students must have a passion, or strong desire, in their pursuits of appreciating nature and gaining an understanding of environmental matters. In these four conversations the frame was refined from expecting active participation from students in the form of asking questions to expecting students to appreciate nature and to have a passion to explore nature. Also, we would have had fewer difficulties assessing students' learning with respect to the initial frame. Through the reframing, we began to conclude that appreciation and passion were not easily measured, because students may not demonstrate these qualities until later in their lives.

In addition to demonstrating reframing in the talk, I also identified a number of implications for teaching and learning about environmental education. In our second conversation, we shifted our view from teaching questioning techniques to teaching these students

to appreciate and enjoy nature. Our focus shifted from ourselves to our students. After concluding that enjoying the Port Study together helped us with our own appreciation and understanding of nature, we remarked that it was important to demonstrate these qualities to the students. The nature of our role changed to modeling and providing experiences for children in which they can develop an affinity toward and understanding of environmental matters. Rather than bombarding students with activities, such as asking questions, they needed ample time to feel comfortable in and explore the outdoors, which can be achieved, for example, by providing them with repeated experiences.

Finally, the third section of the previous chapter substantiated the important role of conversations in contributing to the content of the moments of reflection. The following categories, sounding board, triggers in the environment, thinking aloud, opening up to other perspectives, reconstructing shared experiences, integrating prior experiences and processing experiences, convey the important role that a segment of conversation played in contributing to our reframing and shifting views. The first category portrayed the importance of having a second person involved in making sense of experiences. This person acts as a sounding board against which the other person can bounce her ideas. This gives the person the space and time to develop her own understanding. In the second category, I demonstrated the importance of having these conversations in the outdoors. The environment provided us with materials, or triggers, that became part of the conversation. Our conversation centered around an observation, such as the pillbug or bracket fungus, and then gradually another important frame or implication emerged from this exploration.

The conversations also opened our eyes to different perspectives. While one of us shared our understanding of a particular incident, the other was able to contribute a different perspective which helped us to see the situation in a different light. While reconstructing shared experiences, the retrieval of other incidents was facilitated because the other was able to identify and fill in the gaps when hearing the other talk or struggle with recounting the events. If one of us had misinterpreted, had misunderstood, or was misinformed, the other was able to correct this person.

These corrective moves kept the conversation flowing so that we arrived at other reframing opportunities.

The conversation relied on present as well as past experiences to provide content and to gain an understanding of environmental education. We contributed stories, childhood experiences, and a novel to the conversation. These controbutions were integrated and became part of our talk about environmental education. The last category, processing experiences, stands out from the other categories, because it focuses on the silences interspersed amongst the talk rather than the content of the talk itself. These silences gave us an opportunity to process our experiences and make sense of what we had learned so far. These categories and their analyses demonstrated the role of conversations.

Limitations

Unfortunately, as a result of a shortened school year, we were not able to take the students into the outdoors for another trip and I was unable to observe how the conversations might have contributed to any change in teaching environmental education. These conversations spanned over a four week period which was rather short to begin to see—if any— changes in teaching about environmental matters. Had I been able to continue to collaborate with Lori over a number of months, to share more experiences, and to converse on more occasions, my understanding of our teaching of environmental education would continue to evolve over time.

The second limitation is a side-effect of oral communication. The focus of the conversations is on how we act in the same place and at the same time and on what we are thinking and feeling in this action. Conversations rely on participants to report what occurred, what they felt, and what they thought. These conversations relied on our memories, willingness, honesty, and ability to report and to recall present and past experiences, having no written record of what, how, why, or when something was said, we have no way of telling exactly what. Forgetfulness, selective memory, or misreporting affect, for example, how the story is told, how the experiences are described, or how the problematic situation is interpreted. Having at least a second person participating in the conversations who was as much part of the experience, reduces the risk of

forgetting and threat to invalidating the shared experience and problematic situation. We can cross-check each other's observations and interpretations.

Finally, the transcript and the interpretation of the conversations did not convey, for example, the tone and mood of the conversation. When the conversations were rendered as text, the nature of the talk changed. By paraphrasing and highlighting certain utterances, I attempted to recreate the context surrounding the conversations, but I recognize that a textual representation does not appear as dynamic and alive as the actual conversations.

Implications For Further Research

These conversations occurred over a short period of time. Even though the conversations contributed to our understanding of what environmental education is, why it should be taught, and how it should be taught, I had no opportunity to see if it affected our teaching of environmental education. Our knowing was affected, but how it affected our acting is unknown. Had Lori and I been able to conduct the second field trip, some of the changes in our understanding may have begun to emerge from these experiences.

Also, the four conversations for this research project, scattered throughout a four week period, were between two people, a teacher and a district resource person. Further research in examining conversations between more than two people with a variety of professional responsibilities, and over a longer period of time would be worthwhile. Furthermore, having conversations between people with different personal and professional responsibilities, commitments, beliefs, values, and experiences should widen the range of perspectives on teaching and learning theory and alternative ways of seeing and making sense of practice. Having more people sharing the same experience of which to make sense opens the flood gates to multiple interpretations and possibilities. Conversations become an extended forum for reflection and collaboration. How do conversations amongst more than two people contribute to the content of reflection and the role of conversations?

Implications For Practice

I believe that to make sense of a problematic situation with others, it is important that we have had similar experiences surrounding the situation. So often, we say, "I understand" to someone, without having experienced the problematic situation ourselves. To make sense of someone else's feelings, thoughts, or perceptions, it helps if we have experienced them ourselves. By coming together, we can then begin to understand the other and, therefore, begin to understand ourselves better. The emphasis of the kind of conversations that I have been proposing is that of conversations between insiders. Insiders, or people with the same experiences, preferably with the same group of students in the same place and at the same time if at all possible, are more likely to understand what it is like to be in that situation and how it could and should be different. Two teachers team-teaching in the same class, or a teacher and resource person, who temporarily is available to join into a team-teaching situation, provides excellent opportunities for such conversations to take place. However, these opportunities are rare within the current timetable scheduling arrangements in schools.

Reflection is not always an activity that we have to plan for and set time apart for. In contrast to, for example, partnership supervision, reflective conversations are not a linear, instrumental or technical approach to solving a problem. They could be a more informal and unsystematic approach that does not rely on completing a cycle of steps. Teachers can participate in conversations at any time and in any place when it is convenient for them. It does not require an elaborate structure, or sequence or steps that have to be completed before any results are seen. There is a time and place for partnership supervision and structured dialogues; however, we should not discount the importance of focused conversations between teachers who are experiencing a common problematic situation.

Finally, conversations between people who do not teach in the same school or who have different professional responsibilities in a school district are a means to in-service that might more closely address the needs of the participants. Teachers identify their own concerns which, through the collaboration and conversations with colleagues and other professionals, they can address.

Resource people in the district, in addition to offering in-service workshops and seminars after school, should look into working with a small group of teachers in a school over a particular period of time. When they join each other in teaching a lesson indoors or outdoors, the resource person gains an inside perspective on the situation. Observing a situation is not the same as participating in a situation.

Concluding Comments

Conversations embody moments of reflection that do not need to be—in fact, can not be—formally and systematically planned for. Teachers who participate in these conversations create a context in which they learn about their practice from one another. After exposing a problematic situation common to them, teachers gain from sharing experiences surrounding this problem and participating in conversation. Moreover, teachers come to see their practice in a different light when listening to the interpretations and alternatives suggested by themselves and other participants. These conversations showed that we rarely made sense of a situation in isolation, but that we depended on, for example, the talk of others to lead us to a different way of seeing the problem that was set.

Even though this thesis focused on conversations around teaching environmental education, conversations can address any area of the curriculum. This thesis is unique in that we were able to spend time together in the outdoors to make sense of teaching environmental education while learning environmental education.

By participating in conversations, we are starting to bridge the gap between outsiders and insiders, and between our personal and professional lives. Every participant has a valuable contribution to make to the development of the discourse. To enter into a conversation we do not have to have a special set of prior knowledge or skills. In other words, we do not have to learn elaborate and detailed techniques or strategies before we can become effective in participating in these conversations.

The problem for this thesis was two-fold. First, I detected moments of reflection in a conversation, leading to a change in our understanding of teaching environmental education.

Second, I explicated the role of conversation in contributing to our deepening pedagogical understanding of environmental education. These "reflective moments" become part of the teachers' practical, professional knowledge. Thus, the final outcome of conversations should be to improve our teaching of environmental education so that it promotes the development of a responsible, environmentally active citizen.

Bibliography

Benjamin, A. (1974). *The helping interview.* Boston: Houghton Mifflin Company.

British Columbia - Interministry Working Group. (1993). Environmenal citizenship and literacy: A focus for environmental education and learning about sustainable societies in British Columbia schools. (Unpublished manuscript).

British Columbia Ministry of Education. (1990). *Year 2000: A framework for learning.*

British Columbia Round Table on the Environment and the Economy. (1992). Towards a strategy for sustainability. (Unpublished manuscript).

British Columbia Round Table on the Environment and the Economy. (1993). *Towards sustainability: Learning for change.*

Britton, J. (1992). *Language and learning.* Toronto: Penguin Books Canada Ltd.

Carr, W., & Kemmis, S. (1986). *Becoming critical: Education, knowledge and action research.* Philadelphia: The Falmer Press.

Cinnamond, J.H., & Zimpher, N.L. (1990). Reflectivity as a function of community. In R.T. Clift, W.R. Houston, & M.C. Pugach (Eds.), *Encouraging reflective practice in education.* (pp. 57-72). New York: Teachers College Press.

Clandinin, D.J. (1985). Personal practical knowledge: A study of teachers' classroom images. *Curriculum Inquiry, 15* (4), 361-385.

Clandinin, D.J., Connelly, F.M., & Conle, C. (1990). Collaboration in curriculum research and student learning. In T. Husen & T.N. Portlethwaite (Eds.), *The international encyclopedia of education.* (pp. 57-60). Toronto.

Cochrane, D. (1988). Why should teachers be able to think proficiently about values. In P. Holborn, M. Wideen, & I. Andrews (Eds.), *Becoming a teacher* . (pp. 143-146). Toronto: Kagan and Woo Ltd.

Connelly, F.M., & Clandinin, D.J. (1988). *Teachers as curriculum planners. Narratives and experiences.* New York: Teachers College Press.

Denning, D. (1992). Discussion paper: Should we teach 'Sustainability Education'? Victoria: University of Victoria. (Unpublished manuscript).

Dewey, J. (1933). *How we think.* Boston: D.C. Heath.

Dewey, J. (1938). *Experience and education.* New York: MacMillan Publishing Company.

Elbaz, F. (1981). "Practical knowledge" Report of a case study. *Curriculum Inquiry, 11* (1), 43-71.

Elbaz, F. (1983). *Teacher thinking: A study of practical knowledge.* London: Croom Helm.

Feiman-Nemser, S. (1990). Teacher preparation: Structural and conceptual alternatives. In W.R. Houston (Ed.), *Handbook of research on teacher education.* (pp. 212-233). New York: MacMillan.

Gauthier, D.P. (1963). *Practical reasoning.* Oxford: Clarendon Press.

Grimmett, P.P., MacKinnon, A.M., Erickson, G.L., & Riecken, T.J. (1990). Reflective practice in education. In R.T. Clift, W.R. Houston, & M.C. Pugach (Eds.), *Encouraging reflective practice in education.* (pp. 20-38). New York : Teachers College Press.

Habermas, J. (1971). *Knowledge and human interests.* Boston: Beacon Press.

Hammersly, M., & Atkinson, P. (1990). *Ethnography principles in practice.* London: Routledge.

Jickling, B. (1991). Environmental education and environmental advocacy: The need for a proper distinction. In R. Lorimer, M. M'Gonigle, J. Reverét, & S. Ross (Eds.), *Proceedings of the Annual Conference of the Association for Canadian Studies.* (pp. 169-175). Montreal: Association for Canadian Studies.

Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry.* Beverly Hills: Sage Publications, Inc.

MacKinnon, A.M. (1987). Detecting reflection-in-action among preservice elementary teachers. *Teaching and Teacher Education, 3,* 135-145.

MacKinnon, A.M. (1989). Conceptualizing a "hall of mirrors" in a science teaching practicum. *Journal of Curriculum and Supervision, 5* (1), 41-59.

MacKinnon, A.M. (1990). Reflection-in-action. In T. Husen, & T.N. Postlethwade (Eds), *The international encyclopedia of education.* Supp. Vol. 2 (pp. 514-515). Toronto: Permagon Press.

MacKinnon, A.M., & Erickson, G.L. (1988). Taking Schön's ideas to a science teaching practicum. In P.P. Grimmett, & G.L. Erickson (Eds.), *Reflection in teacher education.* (pp. 113-138). Vancouver: Pacific Educational Press.

MacKinnon, A.M., & Grunau, H. (in press). Teacher development through reflection, community, and discourse. In P.P. Grimmett & J. Neufeld (Eds.), *The struggle for authenticity: Teacher development in a changing educational context.* New York: Teachers College Press.

McClaren, M. (1989a). Environmental education and the public schools in British Columbia. Vancouver: British Columbia School Trustees Association.

McClaren, M. (1989b). Environmental literacy: A critical element of a liberal education for the 21st century. Burnaby: S.F.U.

McClaren, M. (1993a). Talking sense about developing environmental understanding. *Clearing, May/June* , 79, 7-10.

McClaren, M. (1993b). The ecosystem of environmental education. *Clearing, Jan/Feb,* 77, 8-10, 33.

Mead, G. (1932). *The philosophy of the present.* Chicago: University of Chicago Press.

Mead, G. (1934). *Mind, self, and society.* Chicago: University of Chicago Press.

Meadows, D.H., Meadows, D.L., & Randers, J. (1992). *Beyond the limits: Confronting global collapse. Envisioning a sustainable future.* Toronto: McClelland and Stewart, Inc.

Merriam, S. (1991). *Case study research in education A qualitative approach.* San Francisco: Jossey-Bass Publishers.

Polanyi, M. (1962). *Personal knowledge* . Chicago: The University of Chicago Press.

Pugach, M.C., & Johnson, L.J. (1990). Developing reflective practice through structured dialogue. In R.T. Clift, W.R. Houston, & M.C. Pugach (Eds.), *Encouraging reflective practice in education.* (pp. 186-207). New York: Teachers College Press.

Ramsey, J.M., Hungerford, H.R., & Volk, T.L. (1992). Environmental Education in the K-12 curriculum: Finding a niche. *Journal of Environmental Education, 23* (2), 35-45.

Rudduck, J. (1987). Partnership supervision as a basis for the professional development of new and experienced teachers. In M.F. Wideen, & I. Andrews (Eds.), *Staff development for school improvement: A focus on the teacher* (pp. 129-141). Philadelphia: The Falmer Press.

Russell, T., Munby, H., Spafford, C., & Johnston, P. (1988). Learning the professional knowledge of teaching: Metaphors, puzzles, and the theory-practice relationship. In P.P. Grimmett, & G.L. Erickson (Eds.), *Reflection in teacher education.* (pp. 67-90). Vancouver: Pacific Educational Press.

Schön, D. (1983). *The reflective practitioner How professionals think in action.* New York: Basic Books.

Schön, D. (1987). *Educating the reflective practitioner.* San Francisco: Jossey-Bass.

Shulman, L.S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Education Review, 57* (1), 1-22.

Stake, R.E. (1978). The case study method in social inquiry. *Educational Researcher, 7* (2), 5-8.

Stevenson, R.B. (1993). Becoming compatible: Curriculum and environmental thought. *Journal of Environmental Education, 24* (2), 4-9.

Sykes, G. (1986). Teaching as reflective practice. In K.A. Sirotnik & J. Oakes (Eds.), *Critical perspectives on the organization and improvement of schooling.* (pp. 229-245). Boston: Nyhoff Publishing.

Van Manen, M. (1991). *The tact of teaching The meaning of pedagogical thoughtfulness.* New York: The State University of New York Press.

Yin, R.K. (1989). *Case study research design and methods.* Vol. 5. Newbury Park: SAGE Publications, Inc.

Yinger, R.J. (1990). The conversation of practice. In R.T. Clift, W.R. Houston, & M.C. Pugach (Eds.), *Encouraging reflective practice in education.* (pp. 73-94). New York: Teachers College Press.

Yonemura, M. (1982). Teacher conversations: A potential source of their own professional growth. *Curriculum Inquiry, 2* (3), 239- 256.

Zimpher, N.L., & Howey, K.R. (1987). Adapting supervisory practices to different orientations of teaching competence. *Journal of Curriculum and Supervision, 2*, 101-127.