

# Problematizing Enquiry In Environmental Education: Issues of Method In A Study Of Teacher Thinking and Practice

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## **Abstract**

Although environmental education activity has increased greatly in Canadian elementary schools in recent years, very little is known about the nature of this activity or about the teacher's rationale for inclusion in the school program. This paper addresses the question of how educational researchers find out about what happens in schools and why. Based on the notion research methods must be compatible with methodological and philosophical rationale, the paper examines first the compatibility of environmental education and teacher thinking research and second the appropriateness of narrative forms of inquiry for examination of teacher thinking and practice in environmental education. Using the epistemological claim that teachers' knowledge is ordered by story and the methodological claim that stories are best accessed by conversations, the paper raises several issues of method concerning voice, language, and relationships. These issues, while common to several forms of qualitative and autobiographical method are particularly relevant to the debate in environmental education about the politics of method as well as the role of practitioners in goal setting and professional development.

## **Résumé**

Bien que l'éducation relative à l'environnement (ERE) ait connu d'importants développements au cours des dernières années dans les écoles primaires canadiennes, nous connaissons fort de choses sur la nature des pratiques pédagogiques à cet effet ou sur les théories justificatives des enseignants quant à l'introduction de l'ERE à l'école. Cet

article traite des questions méthodologiques auxquelles les chercheurs sont confrontés lorsqu'ils tentent de décrire et d'expliquer ce qui se passe à l'école. Basé sur le principe de la nécessité d'une cohérence entre les méthodes de recherche et les fondements méthodologiques et philosophiques adoptés, cet article se penche d'une part sur la compatibilité entre l'éducation relative à l'environnement et la recherche sur les théories des enseignants et d'autre part, sur la pertinence de l'enquête de type narrative pour l'étude des théories et des pratiques des enseignants en éducation relative à l'environnement. Adoptant la prémisse épistémologique selon laquelle le savoir de l'enseignant s'organise sous forme d'histoire et la prémisse méthodologique selon laquelle la conversation est un moyen privilégié de révéler cette histoire, l'auteur soulève plusieurs questions méthodologiques concernant la voix, le langage et les relations en cours de conversation. Ces questions, bien que communes à plusieurs formes de méthodes qualitatives et autobiographiques, sont particulièrement pertinentes en regard du débat en éducation relative à l'environnement concernant l'aspect politique du choix d'une méthode de même que le rôle du praticien dans l'identification des buts et le développement professionnel.

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Environmental education has emerged quite recently as a topic of considerable interest to teachers. Only within the past thirty years or so has "environment" been considered seriously as a legitimate feature of social debate. And only within the last ten years has environment-related activity become a definite part of the school experience in many countries, including Canada. Although environmental education is not a school subject such as science or social studies, many topics ranging from recycling to school yard improvement have become prominent in school programs. Federal government initiatives such as Canada's Green Plan as well as national and provincial Roundtables on Environment and Economy have reinforced the efforts of organizations responsible for educational programs such as SEEDS' Learners in Action and Project WILD. Many Canadian provinces now have Conservation

Strategies which support education ministry activity to incorporate environmental education and sustainable development-related activities into school curricula and teacher education programs. There appears to be little to dispute the claim that this official government policy activity within Canada has served to legitimize and reinforce a large number of environment-related activities that occur everyday within Canadian school classrooms.

The *Teacher Thinking and Practice in Environmental Education Project*<sup>1</sup> was conceived as part of a larger program of research designed to study the phenomenon of environmental education in Canadian schools. Originally intended to examine teacher subject matter knowledge in collaboration with Joy Palmer in Britain and Ian Robottom in Australia, the Canadian study has evolved toward teacher thinking. It remains closely tied to Palmer's research on the influence of primary school experiences on young children's understanding of environment-related concepts and Robottom's case studies of environmental education activity in Australian schools. However, given the nature and extent of environment-related activity within the context of Canadian schools, the absence of a direct curriculum mandate for this activity, and a lack of environment-related subject matter knowledge among Canadian teachers it seemed appropriate to begin work in Canada with a focus on the teacher.

The Canadian study focused initially on elementary school teachers because most environment-related activity seems to occur in elementary schools, to be teacher-directed, and to have potential to influence the minds of young children quite significantly. Each of the members of our research team<sup>2</sup> has become interested in why so many teachers are creating environment-related experiences for their students without a specific curriculum requirement. It seemed curious that teachers find time for environmental education in the face of a crowded curriculum where core subjects such as science often struggle for a fair share of school time. We wondered if other societal problems are afforded a similar degree of time and attention within Canadian schools. So, we have begun to investigate what drives or motivates teachers to engage young children in environment-related activities.

The focus of this paper is the methodology and methods which we have chosen to examine teacher activity (i.e., thought and

practice) in environmental education in Canadian elementary schools. The methodology is intentionally qualitative and the methods interpretive by necessity but critical by intent. Our interest is in using our method of inquiry as a means of problematizing the debate about research methodology in environmental education. The steady move toward more qualitative forms of inquiry within educational research must be accompanied by critical debate about those forms of inquiry as well as their contribution toward improving thinking and practice in the field of education. Thus, the purpose of this paper is to discuss our methodological struggle as researchers, that is, to find a way to construct forms of inquiry that would help us understand the relationship between teacher thinking and practice in environmental education. Constructed as it is to address our own politics of method, the paper raises several issues that have confronted our attempts to understand and to help teachers understand the complex of thought and action associated with environmental education in Canadian elementary schools.

### **Research Perspective**

Educational research can take a variety of forms depending upon the perspective taken and the questions asked. Research on teacher thinking has tended to be qualitative in nature (Day, Calderhead, & Denicolo, 1993; Pope, 1993) which is compatible with the research perspective of the new environmental paradigm or worldview (Reason, 1988, 1994). Relating this perspective to environmental education research, Robottom and Hart (1993) argue that different approaches to educational research do not simply represent different strategies for collecting data (i.e., different tools in the universal researcher's tool kit) but rest upon and express different ways of knowing, different epistemologies, each of which subsumes and defines a corresponding set of assumptions about matters such as the nature of truth, the relationship between researcher and participants, and the role of values and ethics in inquiry. Each of these sets of assumptions defines a distinct set of research methodologies according to the values inherent within each underlying paradigm or worldview. Thus, each methodology represents a fairly distinct path to inquiry. Each is shaped by

different purposes, values, and standards, as well as different social and political perspectives on reality and on knowledge.

Robottom and Hart (1993) have proposed, given their view of paradigm incommensurability (see Bernstein, 1983; Rorty, 1979; Skritic, 1990), that certain forms of inquiry which are qualitative (i.e., interpretive and critical), participatory, and action-oriented, are theoretically and practically consistent with environmental education research grounded in ecophilosophy (Fox, 1990; Skolimowski, 1981). I would argue that these same forms of inquiry are compatible with certain views of teacher thinking research grounded in "inside-out" methods (Cochran-Smith & Lytle, 1990; Pope, 1993). Because these forms of inquiry, unlike more traditional applied science educational research methods, include consideration of both human consciousness and political action they are at least capable of responding to moral and social questions about educational programs (see Beyer, 1988; Carr & Kemmis, 1986; Fay, 1987; Polkinghorne, 1983; Popkewitz, 1984) and, as such, are compatible with the demands imposed by research in the field of environmental education.

Although it is beyond the scope of this paper to reproduce the paradigm debate that has occurred recently within educational research (see Gage, 1989; Guba, 1990; Guba & Lincoln, 1994; Husen, 1988; Jackson, 1990; Oberle, 1991; Smith & Heshusius, 1986), the basic problem is that applied science methods systematically and intentionally exclude "subjects" from critical consideration about the substance and method of the inquiry as well as any creative thinking that goes into making sense of the inquiry. In a field such as environmental education which espouses a worldview in which humans are encouraged to actively participate in and to challenge contemporary social and environmental policies and practices, as well as the taken-for-granted assumptions of the dominant worldview, should not the research process encourage participants to challenge traditional methods? In other words, given the socially critical charter of environmental education, how can environmental education research not be qualitative, participatory, and critical? Almost by definition environmental education research must include provision for teachers to learn how to actively inquire into their own practices and to clarify their thinking as a means of extending and developing their own theories, to take responsibility for their own

actions, and to actively participate in the social and political reconstructions required to address intelligently educational as well as social/environmental issues within complex, evolving social situations (Robottom & Hart, 1993).

The point is, that the form taken by the process of inquiry within educational research, matters. Although issues about the appropriateness of method are not uncontested, it seems to make good sense to base decisions about method on notions of knowledge, action, and reality that are consistent with our own developing worldview (Reason, 1988, 1994). Given this perspective, on what counts as environmental education research, this study sought to adopt a critically interpretive methodology which incorporated participatory methods. The study began by searching for narrative inquiry and case study methods which embraced a view of experience-based personal practical knowledge and theory, which valued practitioner-derived experiential knowledge over expert-derived objective knowledge. This stance on method is consistent, we believe, with a broader philosophical claim that the only legitimate path to professional development and change in teaching is through participatory action inquiry by practitioners but supported by researchers who can facilitate a specific focus on praxis (Robottom & Hart, 1993; Schubert, 1991; Wideen, 1994).

Within this perspective the researcher's struggle is to try to understand and to help teachers understand how the complexities and ambiguities of teaching, such as engaging children in environment-related activity, are processed as subjective personal practice theories and actions. This involves learning how to frame questions as in Schön's (1983) problem forming or problem setting. In our study, we began by asking questions such as the following: how can we learn to understand and interpret ways in which teachers "make sense" of and create conditions for learning in the classroom environment? How can we understand the nature, formation, and use of teachers' knowledge and thinking in terms of their construction, reconstruction and reorganization of experience? How can we make sense of and help teachers make sense of the lack of coherence and consistency in their own thinking (their perceptions, assumptions, beliefs, and values) and in their telling of and reflection on stories and autobiographical narratives? How can we deal with the

nonlinearity of teachers' tacit knowledge, the difficulties in reporting teachers' narratives, and the distortion in telling someone else's stories (see Elbaz, 1983, 1990, 1991)? These questions of method demand a deeper understanding of methodology than many researchers seem prepared to engage. Yet they represent a metatheoretical perspective that is essential to qualitative investigation of human thought and action.

### **Methodological Perspective**

The Teacher Thinking and Practice in Environmental Education Project intends to confront our understanding about the phenomenon of educational change on personal and professional levels. This, we assume, involves understanding more deeply the complex relationship of thought and action that characterizes our teaching and learning. We are searching for essences of personal transformation because we believe that both personal growth and professional development are impossible without some reconceptualization of personal values. Our methodological dilemma is how to construct a research process that gets to the essences of teacher thought and action so that we as researchers and teachers can "see" through to the core of values and beliefs that "drive" our teaching and learning.

Educators have been wrestling with ideas about change for many years. Teacher thinking researchers have articulated many of these ideas by focusing on thought as it is related to practice. The difficulty is that much teacher thinking is tacit, that is, much of teacher knowledge is gained through experience and is not articulated clearly by many teachers. Experienced teachers appear to know very well what needs to be done in their classrooms but often find it difficult to describe deeper reasons which they say they simply haven't *thought* about. We know that beneath the surface layers of teaching are fundamental underlying principles of practice and, in fact, an entire view of knowledge and of social order that is being reproduced as classroom or institutional practice (Popkewitz, 1983). But, as researchers and teachers, we have not learned how to get beneath the surface to penetrate our own thinking and ideology. However, certain qualitative methods now

appear useful as a means of understanding without reducing the complexity and ambiguity of teachers' thought and action (Butt, 1984; Calderhead, 1987; Clark, 1986; Connelly & Clandinin, 1985; Day, 1984; Elbaz & Elbaz, 1988; Yinger, 1987). Our struggle as researchers is to discover new methods, to help us find our way through the tangle of human thought to the "drivers" that govern our actions.

Underpinning this study of teacher thinking and practice in environmental education is the proposition that practitioners have theoretical views that guide and interact with their practice. Bernstein (1975) has argued that teachers' pedagogical approaches are related to their views about knowledge and teaching, that is, their epistemological and pedagogical beliefs. And an increasing body of educational research acknowledges the importance of teacher epistemologies in shaping their pedagogical practices (Young, 1980). As Carr (1983, 1993) states, it is difficult to know how any teacher could ever undertake any educational practice without some knowledge and understanding; without some "educational theory." This interactionist view of the theory-practice relationship assumes that all practices have theory embedded within them and that both theory and practice are theory-guided activities, each of which may be undertaken with varying degrees of intelligence and success. This view contrasts with the prevailing notion that the theory-practice gap is a problem of communication and implementation and conceals the fact that *both* research and practice are theory guided, that both are generated out of the experience of practitioners, and that both are solved only by practitioners formulating decisions in light of the framework of understanding that they already possess.

In *Understanding Curriculum*, Pinar, Reynolds, Slattery, and Taubman (1995) associate research on the relationship between teachers' thought and action with four streams of autobiographical and biographical methodology as follows: teachers' collaborative autobiography (Butt & Raymond, 1992), personal practical knowledge (Clandinin & Connelly, 1992; Elbaz, 1983, 1991), teacher lore (Schubert & Ayers, 1992), and studying teachers' lives (Goodson & Cole, 1993). The primary focus in this "teacher thinking" research despite differences in method is "looking at teaching from the inside" (Elbaz, 1991, p. 2) based on a view of



knowledge which gives significance to personal experience as well as the meanings and understandings of human action (i.e., praxeology). This epistemology views knowledge and theory as residing in the heads of real teachers (see Britzman, 1991). Teachers routinely enact theories of teaching and learning in their daily classroom activity. Although such theories may be implicit, they constitute personal practical knowledge -- knowledge which is "contextual, affective, situated, flexible and fluid, aesthetic, intersubjective and grounded in the body" (Britzman, 1991, p. 50).

According to Clandinin (1985) personal practical knowledge is based on a body of convictions, conscious or unconscious, which have arisen from a teacher's experience and which are expressed in a teachers' actions. Schubert (1991), broadens this notion of knowledge to include ideas, perspectives, and understandings of teachers in his definition of teacher lore. Such knowledge he says is, in part, an inquiry into the personal beliefs, values, and images that guide a teacher's own work. Goodson and Walker (1991) argue that articulating teachers' lives is essential to understanding teachers' practices. And according to Willinsky (1989) researchers must keep the embeddedness of the teachers' actions within the practical ideologies of power in educational systems in mind as part of the researcher's critical contribution to the collaborative-interpretive process. However far these researchers wish to extend the arguments, the point is that those forms of educational research that attempt to relate teachers' knowledge and action contribute significantly to models of cognition, meaning, understanding, and knowledge precisely because they represent nonpropositional, prereflective dimensions of meaning that emphasize perceptual interaction and bodily movements (i.e., actions) (Johnson, 1989).

This line of reasoning concerning the relationship between teachers' minds and actions provided direction for the methodological rationale of this study. For example, we began the study by assuming that, in introducing environmental education activity within their classrooms, teachers are engaging in practices which are related to their own understanding, that is, their own personal practical theories or that amalgam of knowledge, beliefs, and assumptions in terms of which they understand and make sense of their educational practice. This epistemological view sees pedagogical knowledge as an interplay of those personal practical

theories on the one hand and the complex of the social, cultural, and educational context within which the individual lives on the other. There is scope for change (i.e., personal professional development) if discrepancies arise between personal theory and professional practice, or between these and the physical or social structures and social relationships of the setting in which the practices occur. If this is true then our research process must involve teachers in the conscious, critical self-appraisal of the adequacy of the knowledge, beliefs, assumptions, predispositions, and values incorporated into their own prevailing theories of their educational practice or in the practices themselves. Change can occur only if it influences the theory in terms of which the practices are made intelligible. Theory transforms practice by transforming the ways in which practice is understood or experienced. Appraisal of such personal practical theory can be emancipatory because it frees people from the mystic of ideology or hegemony, the dictates of unconscious habit, or the compulsion of authority (Kemmis, 1987, p. 26).

This methodological stance implies that certain forms of inquiry are more appropriate than others for research that proposes to understand teacher thinking and practice in environmental education. According to Elbaz (1990) in order to understand the ongoing praxis of a given community (in this case the environment-related thoughts and actions of elementary school teachers) the research method must examine the various forms of discourse that make up the social text of particular groups. The problem is that environmental education is not a well defined subject such as science or mathematics and for which a curriculum mandate exists. This problem is complicated by the fact that environment-related activity within schools may not correspond with many of the defining characteristics of environmental education. In fact, the social text of teachers does not appear to be congruent with the rhetoric of environmental education. Thus, one of the dilemmas for this study is to try to make sense of environmental education activity in terms of teacher discourse. Only then are we able to examine the conceptual categories for consistency with what Bowers (1987) and Greenall-Gough (1994) refer to as the communicative competence of the field.

Our ongoing concern in the Teacher Thinking and Practice in Environmental Education project is that our research process be open to a continuous reconstruction of these dilemmas. The research method should, in other words, facilitate the ability of teachers to have aspects of their own views of the reality of teaching reflected in the prevailing conceptual categories of environmental education as a field. We have tried to create research conditions in which teachers are enabled to at least begin to consider the assumptions, values, and commitments that underlie their thoughts and practices with the view that they will, through their stories of practices and their thoughts, help to problematize the discourse of environmental education. The challenge of the research, once we have clarified our methodological position and direction, is to engage methods of inquiry appropriately congruent with this position.

### **Constructing Stories as Method**

Our interest in this study is “inside out” research (see Cochran-Smith & Lytle, 1993; Elbaz, 1991; Hunt, 1987; Pope, 1993; Schubert, 1987, 1991), that is, in learning how to help teachers develop personally and professionally by understanding what drives their thoughts and actions. We think that, as researchers, we can get closer to the core of teacher thinking and practice if we can find ways to learn collaboratively to help teachers to understand their personal practical theories, assumptions, values, ideologies, and even their worldviews in ways that we and they can interpret. We believe that this process of coming to understand takes time and that it must involve interactive forms of reflection (i.e., reflective conversations) and action. We think that, as researchers, we have to feel our way into a communicative process that becomes increasingly more sophisticated. We must learn how to change our own research process as we develop our capability to help teachers to articulate their reasons for classroom practice in terms of their own theories, core values, and assumptions.

To guide our process of inquiry, as researchers, we began to interact with teachers by asking questions about their environment-related experiences in classrooms. We attempted to focus first on

what was going on and then ask why, in light of Butt's (1989) method of autobiographic inquiry. Butt (1990) asks teachers to ask four basic questions as follows: What is the nature of my working reality? How do I think and act in that context and why? Why, through my worklife experience and personal history did I come to be that way? How do I wish to become in my professional future? These questions guided our thinking about how to frame the questions in our initial conversations with teachers. Our basic interest was in the what and why--that is, the nature of the teacher's experience and the underlying reasons.

In constructing an emerging process of enquiry we have been most influenced by methods of narrative inquiry and by notions of story and teacher lore. While acknowledging some limitations in our attempts to authenticate our method by grounding it collaboratively with teachers in their own context (see Hollingsworth et al., 1993) we have adapted ideas from Elbaz (1983, 1990, 1991); contributors to the International Study Association on Teacher Thinking (ISATT) publications such as Pope (1993), Calderhead (1993), Day (1984, 1990, 1993), Connelly and Clandinin (1985), Gudmundsdottir (1990), Carlgren (1990), Nelson (1993), Somekh (1993), and Lampert (1986); as well as Butt and Raymond (1988, 1992), Goodson and Cole (1993), Goodson and Walker (1991), Munby (1982), Nias (1987), Olson (1988), Polkinghorne (1987), Schubert and Ayers (1992), Woods (1985), and Zeichner (1994). It was interesting to trace how each of these authors described their own struggle with method from interpretive and critically interpretive perspectives. According to Day, Pope and Denicolo (1990), it is only within the past ten years that educational research has taken teachers' thoughts and actions seriously as a legitimate focus of inquiry and source of knowledge about teaching. And it is still acknowledged that teachers' voices and perspectives are overlooked in our attempts to understand teaching and construct teacher research methods (see Cochran-Smith & Lytle, 1990; Goodson & Walker, 1991; Schubert, 1990). In response to these concerns we have, in this study, tried to construct an inquiry process by first establishing a process of communication, that is, by learning how to talk to teachers and especially how to listen sensitively to their views as expressed in their own language. Narrative inquiry provided a process to begin.

The theory of narrative indicates that humans are natural storytellers and that the study of narrative reveals how humans experience and create their lives (Britton & Pellegrini, 1990; Bruner, 1986, 1987; Connelly & Clandinin, 1990). Narrative is defined as “the making of meaning from personal experience via a process of reflection in which storytelling is a key element and in which metaphors and folk knowledge take their place” (Connelly & Clandinin, 1988, p. 16). Narrative accounts portray how teachers come to understand their lives in classrooms. They suggest that teachers actively work and struggle to achieve meaning and understanding. According to Lampert (1985) the way teachers view themselves and their work will only emerge as teachers present themselves in the stories they tell about their work. Elbaz (1990) views this statement as an epistemological claim, that teachers’ knowledge is in fact ordered by story and can best be understood this way. Within this view of knowledge story can be used as data, as method, and as a theoretical backdrop for teaching which allows researchers and teachers themselves to see the connections within a dialectic of thought and action.

Stories are also seen as an appropriate medium for research because they allow access to communities (see Jackson, 1990) and to cultural values (see Barthes, 1985; Campbell, 1972) as well as to models constructed by the mind (see Britton & Pellegrini, 1990; Chafe, 1990). And, as Gudmundsdottir (1988, 1990) indicates, teachers’ curriculum stories are central to their pedagogical content knowledge (see also Shulman, 1986, 1987). In our research, we adopted Elbaz’s (1991) distinction of story from narrative or autobiography both of which she views more positivistically, like objects to be consumed. For her, story is not so linear in form, is less prescribed, and does not assume an authoritative or omniscient narrator; rather a more collaborative, interactive relationship giving only a partial perspective, and thus, is open to criticism (see, for example, Butt, Raymond & Yamagishi, 1988; Goodson, 1988; Goodson & Walker, 1991).

The idea that story is analogous to theory is developed by Winter (1988). In explaining “what is going on” and why, teachers tell stories of events which can be understood as a theory of the situation, that is, a situated naturalistic theory in narrative form. In other words, telling a story can be providing a theory just as

Tolstoy's theory of history is embedded in his story *War and Peace*. Biologist Henry Lickers of Seneca First Nations described a similar relationship at a recent conference of Canadian Network for Environmental Education and Communications (EECOM). He termed the stories of native elders as a means of "how to look" and "how to see" the native perspective as naturalized knowledge systems, that is, a notion of story as situated naturalistic theory in narrative form. For many researchers working in this area of teacher thinking and practice, such as Goodson, Butt, Raymond, Schubert, Ayers, Connelly and Clandinin, articulating teachers' lives is essential to understanding teachers' thought and practice (Pinar, et al., 1995). The test for researchers comes in learning how to listen . . . how to hear . . . how to "see" beyond the superficial.

The notion of narrative knowing through teacher stories of experience was basic to our method of inquiry, though not sufficient. A central challenge to interpretive research method is to get beneath the stories to the core of fundamental values and assumptions that drive them (see Schubert, 1991, Schubert & Ayers, 1992). Constructivist theorists (see Lincoln, 1990; Lincoln & Guba, 1985) classify teacher talk at the level of theory rather than at the core of fundamental assumptions that teachers often use to explain their practice (see Schön, 1987), perhaps because the teachers themselves are unaware of deeper reasons. In our conversations with teachers, we struggled to invent a communicative process which included critical reflection. We tried to penetrate our taken-for-granted thinking toward that hard core of fundamental assumptions which remain intact when teachers choose to focus on the "protective belt" of peripheral theories as the place for experimentation, testing and change. However, we have come to suspect, along with critical researchers (see Carr & Kemmis, 1986) and environmental philosophers (see Skolimowski, 1981) that change at both personal and professional levels requires problematization, reconstruction, and development of the fundamental core assumptions as well as the theories-in-use (see Robottom & Hart, 1993; Schön, 1983; Schratz, 1993, Wideen, 1994). Following this line of reasoning, we suggest that, as critical interpretive researchers, we can get closer to understanding this "core" of teacher thinking if we can devise ways to help teachers help themselves first by establishing narrative ways of

communicating (i.e., through stories) and eventually by talking about our theories, reflectively and critically. However, this is a complex process which requires time and interaction as well as a genuine desire to pursue our understanding to the deeper levels of our values, beliefs, and motives which encompass our worldview. Whether we can really ever learn to penetrate our own ideology or expect it of others in the course of critically reflective inquiry is the challenge of our research program. However, we must begin somewhere, so we have begun with conversations.

### **Reconstructing Conversations as Understanding**

Connelly and Clandinin (1988) suggest a variety of methods that may be useful in helping us understand how teachers make sense of their practices, including interviews, observations, story telling, letter writing, autobiographical writing and so forth. We have chosen to begin our search into environment-related activities of elementary school teachers by engaging them in reflective conversations with researchers. We began this project with conversations because we believe that people in conversation enter a hermeneutic cycle rather than a clearly articulated goal-oriented process (see Rorty, 1979). In other words, we view conversation as a continual questioning of received wisdom through hermeneutical dialogue that contains space for wonder, mystery, uncertainty, and the barely knowable (see Beyer, 1988) rather than rigid categories of knowledge, truth, or epistemology. Within this view of communication, we can accept certain limitations of discourse such as lack of logical consistency and partial coherency as a legitimate part of our struggle for mutual understanding. We can see how personal or experiential reality differs from cognitive or theoretical reality. In fact, according to Hollingsworth et al. (1993), the importance of conversation *is* the struggle to articulate these differences between experience and theory.

In this study we have attempted to problematize our research process. We are determined to learn how to create conditions that enable us to get to know our teachers well enough so they will tell us their stories, to struggle with us to get beneath these stories so that we can “see” motives and beliefs, and further, to begin to challenge

deeply held assumptions and values beneath, including theories-in-use, so that at least the possibility exists that they can be understood. This, we believe, is as close as we can get in research to “seeing to the heart” of the dialectic of teacher thinking and practice and offers the most reasonable and genuine means to transform our own thinking and practice.

According to Florio-Ruane (1989) conversation as a research method is very likely to yield stories as data and stories can provide insight into teachers’ personal practical theories and knowledge. Personal practical theories, evoked through such conversations and relationships are probably authentic expressions of teachers’ values, precisely because they are formed in action, generated in thought and in intuitive perception, thus eliciting memories of stored knowledge (content as well as pedagogical) through not only cognitive but moral, spiritual, and psychological processes as well (Schatz, 1993). Conversations are valuable when they can provide insight into teachers’ ways of knowing and thinking. The challenge is to find ways to get beneath the layers or masks to the essences. The effort is worthwhile, according to Elbaz (1990), because although teachers’ ways of knowing and thinking often have an intuitive, nonlinear, tacit, and incomplete nature, they appear to be at the center of thought and action and therefore should be a major focus of teacher research. The problem for interpretive researchers is to help participants to unravel the complexity of meaning embedded within the presentation of self in everyday life (see Goffman, 1959) within a suitable framework of enquiry that includes an authentic collaborative ethics of participation and the concept of negotiation (Clandinin & Connelly, 1988).

Elbaz (1991) describes researchers’ attempts to develop insight into teachers’ personal practical theories and thinking as a search for only partly patterned and partly organized complexity. This is illustrated by recent attempts by researchers to construct a language to explain this complexity (see Leinhardt et al., 1987). For example, Nias (1987) relates teaching decisions to teachers’ perceptions of context and events. These perceptions are shaped by basic assumptions which are, in turn, based on such things as teacher knowledge, experience, values, and motives. Within the literature on teacher thinking these assumptions are variously



characterized as personal constructs (Kelly, 1955; Olson, 1980; Pope & Scott, 1984; Yaxley, 1991), perspectives (Tabachnik & Zeichner, 1985), beliefs and orientations (Delamont, 1976; Hammersley, 1977), frames (Barnes, 1992; Schön, 1983), images (Clandinin, 1985; Elbaz, 1983), personal practical knowledge (Connelly & Clandinin, 1985), personal practical theories (Goodson & Mangan, 1992) teachers' theories of action (Nias, 1987) and many others (see Pope, 1993). However, in spite of these differences in language a certain common interest in understanding the teacher thinking and practice relationship persists and continues to grow in the teacher thinking literature.

It is encouraging that scholars have begun to recognize teaching as a complex, reflective, thinking activity. Based as it is on a largely unarticulated experiential knowledge base (Schubert & Ayers, 1992; Shulman, 1986, 1987), multiple expectations of the institutions, society, and culture (Goodson & Mangan, 1992), personality (including beliefs, values and ideologies) and multidimensional problems of practice in context (Olson, 1982), researchers face many issues in attempting to understand the complexity of thinking and acting in teaching let alone study it holistically. According to Feiman-Nemser and Floden (1986), we are just beginning to learn how to ask the right questions. For example, whereas teacher thinking researchers once began by asking how they could get inside teachers' heads they are now asking how they can help teachers get inside their own heads. Our early conversations with teachers have resulted in many questions. These questions are centred on certain issues of method which undermine our ability as researchers to understand teacher thinking and practice.

### **Issues of Method in Our Study of Teacher Thinking and Practice in Environmental Education**

As a researcher I sometimes wonder if I can ever really understand even one other person. People tell us what they want us to know and don't tell us the rest. Is it as simple as that? In our conversations with teachers we have interacted for only short periods of time and generally teachers have been very good about telling us their

stories. We have returned our versions of their stories for their scrutiny and most teachers tell us that they are satisfied with our telling, often elaborating or highlighting certain points. But should we be satisfied? At this early stage we are just beginning to understand how to interact with teachers and to build relationships. We probably need more help than we know in trying to reconstruct our conversations. We are concerned about our ability to understand and to help teachers understand the meaning of their stories. In our search for understanding we have begun to raise some of our genuine concerns about method and methodology as a means of initiating a debate about the research process, particularly in environmental education. These concerns are expressed as issues of voice, language, and relationship.

#### *Voice*

Despite differences in purpose and method teacher thinking researchers have been concerned to redress an imbalance which until recently has given us research *on* teaching (i.e., outside-in) in which teachers are viewed as objects of research, knowledge is fixed and expert-derived, and the teacher's story is largely untold. These researchers have tried to adopt an approach to inquiry which focuses on helping teachers develop and extend their own theories and practices (Pope, 1993). For example, Elbaz (1991) has focused on constructing a language and method for research intended to give expression to the teachers' own perspective and "voice." We must learn, she says, to ask not only "who writes" but what kind of discourse is being used and the extent to which it allows for the authentic expression of teachers' experiences and concerns.

From our experience in working with teachers, we were disappointed by the reluctance of teachers to expend the time and effort required to construct their own written narratives. As a consequence, according to many others who have had a similar experience, researchers are left to do the writing and to construct the stories that make sense (Hollingsworth et al, 1993). When researchers assume the role of storytellers many of the problems of qualitative research, especially of narrative forms of inquiry, such as issues of voice, history, and context, must be resolved. The challenge for our work was to be clear about our process so that we could address legitimate quality issues such as authenticity,

trustworthiness, situatedness, and transformation (see Guba & Lincoln, 1989, 1994; Van Maanen, 1988). And we struggled to represent the teachers' voice authentically.

From our experience, we have learned to ask a greater number of critical questions of ourselves. We are more conscious of how our research has attempted to allow for authentic expression of the teachers' voice. For example, we have begun to question the form of discourse (and discourse analysis) that is being used and whether it allows for authentic expression of teacher experiences and concerns. Given the teachers' descriptions of their practices and thoughts we wonder if we have knowledge of environmental education from the outside only and whether environmental education is mostly a political movement that really doesn't exist in schools, at least as conceived in the official language of environmental education. We have questions about the role of teachers in naming and defining their own reality and about how should teachers assume responsibility for communicating their personal meanings concerning areas such as environmental education. We see a need as teachers and researchers to work collaboratively to align our views of the reality of environmental education theory and practice. According to Gudmundsdottir (1991) the teacher's voice is now being heard in a range of publications describing how teachers' quests for meaning and purpose are a driving force in their professional development and practice (Bullough, 1989; Butt, Raymond & Yamagishi, 1988; Clandinin, 1986). The challenge for our research is to create at least some of the conditions for discussion of these questions within the field of environmental education.

From my reading of the teacher thinking research, our initial approach to conversational interview had many weaknesses related to voice and to developing a sense of deeper understanding. As a result of our initial experience, for example, we know that we should have devoted more time to conversations with some of these teachers, as well as more attention and involvement to their actual school experiences. We see the need to engage more seriously in case study work that is beyond the scope of the present study. We need to find ways to encourage teachers to do some writing about their thoughts and practices, their philosophies, their values and beliefs, their worldviews where we detect such an inclination. It seems, from the work of other researchers in this field of teacher

thinking, that these circumstances are rare or unlikely unless teachers are involved in graduate work over a period of time, or unless we happen to come across a few teachers who somehow see the value of writing and interacting over several weeks and months. After a certain point, which became clear to each of us after about 20 to 25 conversational interviews in any one location, we felt the need to focus on revisiting ideas whether by focus group discussion or further conversation.

My experience with interviews was that most teachers are busy people who are more interested in knowing about new materials and ideas than in writing about their experiences and personal practical theories. Teachers that I have interviewed seemed content to have me take notes and develop narratives from our conversations, in spite of my inadequacies in interpretation. During interviews they encouraged me to phrase and rephrase their comments and discourse in the form of their words. I often had to take care not to put my words into their mouths as they struggled to articulate reasons for their environment-related classroom activity. Written accounts of our conversations were later verified by the teachers. My hope is that these teachers are able to locate themselves within the narratives and that these descriptions are believable to them and to readers who work in similar situations, and that I am worthy of the trust that they placed in me to accurately portray their thoughts and practices.

As sincere, caring researchers we try to be conscientious and so we must engage seriously this notion of voice in educational research. We strive to be rigorous and disciplined to this notion of giving voice first by trying to find ways to listen sensitively, to “hear” and “see” teachers clearly, within their context and history, and in terms of what matters to them. We strive to be careful to distinguish between the teacher’s story and the researcher’s story. If our research task is to construct a story about a teacher, then as researchers we must always be clear about where the teacher’s story begins and his/her own story ends. According to Gudmundsdottir (1991) it is a serious interpretive mistake when the teacher’s story becomes the researcher’s story and the researcher does not know it. Although I do not agree with her resolution to this research dilemma through recourse to prior “theoretical” concepts, her distinction between the anthropological concepts “emic” (i.e.,

natives view) and “etic” (i.e., researcher’s theoretical categories) seems a useful way to help researchers think about how to render their own underlying categories (i.e., about environmental education, for example) more explicit and therefore problematic and to let go of these etic perspectives as we come to understand the emic view on its own terms.

### *Language*

We see the “inner world” of teaching as deeply personal. Because we are struggling to understand something so personal, as one’s core of values, one’s worldview, and so complex as to be perhaps only partially understood by the teachers themselves; we decided, following Elbaz (1990) to begin our conversations with an examination of teaching situations rather than from a particular theoretical position. Almost inevitably the conversations evolved from descriptions of what was happening in classrooms to discussions of reasons behind the actions and to the teachers’ core beliefs and value position concerning the education of children within today’s society and environment. Our written descriptions include words such as image, pattern, discrepancy, and dilemma which can address the nonlinear dialectical qualities of teachers’ knowledge and action (Lampert, 1985) through the interplay of their stated reasons and actions.

We encountered many dilemmas in teachers’ minds, dilemmas which touch on the patterned nature of teacher knowledge (Yinger, 1987) by showing underlying consistencies in pedagogical choices (Tabachnik & Zeichner, 1985). We now realize that we need to engage these dilemmas more seriously in our extended conversations if teachers are willing. Images and metaphors (Munby, 1982) speak directly to the integrated holistic nature of teacher knowledge--the personal meanings that penetrate the knowing. We have come to know that we need to focus more on the images and metaphors that emerge in our conversations. Words such as rhythms, cycles, and patterns give us additional constructs in our search for a language that we can use to create a discourse in teacher thinking. We must concentrate our search for these as we struggle to understand and to help teachers understand. Connelly and Clandinin (1986) use the term ‘narrative fragments’ to show how understanding science teaching is made comprehensible only by

reference to a teacher's tacit sense of what pupils need, what they are learning and what they will need later. So we try to make sense of fragments of conversations and use questions that arise from these fragments as a basis for further conversations, as Wolcott (1990) says, to scratch around looking for the obvious that's not so obvious. We also have begun to look for the moral aspects guiding practice (Brown and MacIntyre, 1986; Gudmundsdottir, 1991; MacIntyre, 1984; Noddings, 1987) because we have encountered deep moral positions within teachers' reasons for their environment-related school activity.

### *Relationships*

As teachers, we try to create a caring climate for the good of pupils (Noddings, 1987). So, where Brown and McIntyre (1986) might have expected more technical talk in their examination of professional craft/knowledge, in fact they found that much of what teachers talk about relates to concern for pupils, such things as building confidence, involvement, interest; ensuring that creative talents won't be hindered; creating an enjoyable yet disciplined climate. When we talked to teachers, we tried to create the climate, almost upon first meeting, that helped to establish a sense of genuine caring and trust that is so important for open honest communication. We tried to extend our talk beyond the technical and superficial to expose deeper qualities of caring, compassion and, even passion. We found these qualities abundant in our teacher participants.

We have come to understand that the quality of the conversation probably depends as much on personal qualities of the researcher such as friendliness, sincerity, genuine empathy and understanding as on teacher personality. Quality in communication involves a sensitivity and an open interactive style that invites conversation, as in a sharing between kindred spirits who see things similarly in terms of a common mission or worldview and almost instantly develop the rapport so necessary to penetrate the superficial reasons for teaching about the environment and get straight to the core values that really matter to these people, basic values -- at least what I have come to understand as basic Canadian values from my own experience in middle western Canada as well as those of our researchers in other regions of this country. This was not always easy, especially given the limited

conversations among strangers which characterized this preliminary study. One of the teachers that I interviewed called it peeling away the layers of the onion to get to the core of belief. It is interesting that one of Gudmundsdottir's (1990) case studies captured the same metaphor to describe a high school teacher's pedagogical orientation to a discipline.

*Research as Professional Development: The "Becoming Critical" Dilemma*

Our inquiry into teacher thinking and practice in Canadian elementary school environment-related education has been influenced by a view of research as professional development. Somewhat idealistically perhaps, we have assumed that by engaging teachers in conversations about their practices the thinking associated with these practices we are creating conditions for critical reflection. The question of challenging teachers' thinking about the relationship between personal practical theory and practice as a means of professional development was enticing. A cooperative participatory approach to improving thinking and practice was consistent with our belief in critical praxis and the project was designed to pursue this approach to developing and articulating philosophy as well as practical competence. Our experience has helped to uncover our naiveté about such matters. Perhaps we should have foreseen problems with time and the deep seated connection of teachers to the professional and organizational cultures in schools. We did not allow for sustained interactions with teachers and we wonder whether this is possible under any circumstances.

Teachers are preoccupied with practice and in my experience only certain teachers, and I'm not yet certain how to identify which ones, are willing to devote the time and energy to reflective experiences such as monthly meetings. We began very simply by asking teachers to talk to us about what they were doing in the name of environmental education and why. Each of us had similar experiences in our relationships with these teachers. We allowed our conversations to flow from practical description to personal practical theory and beyond to some deep-seated value positions. How much more than this can you expect from these people? We learned to live within the reality of teachers' lives where humble

people do not give themselves credit for their own thinking and tend to take their own value positions for granted. Their ideas are so fundamental to their practice that they are hidden from their own consciousness. As researchers, we found that we simply had to proceed tentatively, feeling our way into each new interaction and adjusting our conversations to fit the personality and context of each individual teacher.

Each of us, I think, believes that at this stage of our research, that we have learned as much as we can from teachers about their environment-related activity in elementary school. That is, we have learned as much as we can from the teachers' point of view. And that is what we set out to understand. We also believe that from the reactions of teachers to our individual conversations that many of them have learned a little more about their own personal theories or philosophy or value position as a result of having to "come to grips" with their own reasons for acting in certain ways.

### **Conclusion**

Given this interest and the reality of the context within which we must work (i.e., the state of environmental education-related activity in Canadian elementary schools) researchers can do certain things (according to Elliott, 1993) to understand (and develop) what is "going on." According to Elliott (1993), we need to understand that research into teacher's thinking involves a double hermeneutic, in that it constitutes interpreting teachers' interpretation of their professional world. Certain assumptions frame both researchers' and teachers' interpretations and the idea of the research is to understand (and develop) both. Researcher assumptions will determine what are appropriate methods, what constitutes the teacher's story and what patterns or understandings can be drawn from it. If, for example, researchers assume that knowledge is certain and is known through authority, they may presume that their own interpretations of teacher thinking are nonproblematic and that teachers are infallible authorities on their own mental processes. However, if researchers assume that knowledge is personally and socially constructed (Cochran-Smith & Lytle, 1993) they are more likely to reflect on the biases and



assumptions which frame their interpretations because, although they see teachers as capable of reflexive self awareness, they see this happening from a critical perspective, through collaborative dialogue (Elliott, 1993).

For Elliott (1993), the relationship between theory building and interpretation is interactive. We cannot derive theory from data through a straight forward process of induction. Theory is developed only through a succession of interpretive acts rather than through detached (i.e., objective) contemplation of universal essences which exist independently of our interpretive consciousness. According to Elliott, our specific acts of interpretation not only apply a theory of meaning but in turn contribute to its reconstruction in consciousness. And we cannot divorce our act of interpretations from our own value judgments (i.e., standards) or our own theories, which reflect different worldviews. Just as teachers' theories are conditioned by their values so researchers' theories must be critically reflexive of the assumptions underlying particular methods. Through this paper, we have attempted to include a self-reflexive component in this project. We have attempted to articulate practical interest in helping teachers to develop their own ability to think critically about their thoughts and practices through the same process that we, as researchers have engaged in.

We acknowledge our own belief in researching teacher thinking that interpretations of teachers' personal constructions of professional meaning are achieved in dialogue with teachers. We also acknowledge a failure, from a critical perspective, to operate in our conversational interviews at a level which may help teachers to problematize their thoughts and practices through dialogue and questions which generate critical reflection about why certain practices are occurring and why teachers think that they ought to (i.e., justification). More preferable would be an inquiry process which extends these conversations so that teachers can compare their own ideas and reasons (i.e., emerging personal constructs about environmental education) with those of others; so that they can evaluate their reasons in terms of personal criteria which they recognize as provisional and developmental through critical reflection dialogue. However, the reflective process takes time and given our experience, we believe that it is somewhat

naive and unrealistic to believe that our conversational process could manifest a meta-awareness of this personal knowledge and practical theory as a personal construction without a powerful personal transformative experience. However, according to Elliott (1993), it is important to strive toward a process in which “research” and “development” are not viewed as different activities but different *dimensions* of a single unified activity where the “outsider” researcher and “insider” teacher both develop understanding and method.

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