



# Tensions and Opportunities: A Baseline Study of Teachers' Views of Environmental Education

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The paper reports on a study designed to produce a portrait of teachers' self-reported views of environmental education in Ontario. The mixed method study consisted of an on-line survey (N=377), supplemented by a series of in depth interviews with a volunteer sample (N=24) of the survey respondents. In addition to providing a reasonable and helpful portrayal of what is happening in environmental education at a classroom level in Ontario, further data analysis revealed the existence of certain tensions within participants' views and reported practices. These tensions we believe, partly explain the limited practice and challenges of environmental education in Ontario classrooms. We have interpreted these tensions as important entry points or opportunities for positive intervention, and discussed how they can be used to stimulate pedagogical development in the field. At an international level, we believe the paper provides deeper insights about the nature of environmental education and its relationship to schooling from the perspectives of teachers.

Keywords: environmental education; teachers' views; teacher professional development

## Introduction

Worldwide, many jurisdictions have developed policy urging the inclusion of environmental education at the K-12 level (Australian Government Department of Environment and Heritage, 2005; Danish Ministry of Education, 2009; North American Association for Environmental Education, 2004; Welsh Assembly Government, 2008). In Ontario, Canada, a major report released in 2007 by the Ontario Working Group on Environmental Education, identified 'the environment' as a key issue in modern societies. By 2009, in direct response to this report the province's Ministry of Education developed a policy framework mandating the inclusion of environmental education (EE) into all provincial school curricula (Ontario Ministry of Education, 2009, p. 9):

Ontario's education system will prepare students with the knowledge, skills, perspectives, and practices they need to be environmentally responsible citizens. Students will understand our fundamental connections to each other and to the world around us through our relationship to food, water, energy, air, and land, and our interaction with all living things. The education system will provide opportunities within the classroom and the community for students to engage in action that deepens this understanding.

Yet despite these seemingly positive efforts at the administrative level, environmental education still continues to struggle to find expression in Ontario classrooms (Fazio & Karrow, 2011). Since our interests lie in promoting the practice of environmental education in K-12 classrooms, we were puzzled by this disconnect and embarked on a search to understand the reasons behind it. A review of the relevant academic literature suggested several possible reasons for this state of affairs including: the complex nature of environmental education (Jickling & Wals, 2008); the gap between the rhetoric of environmentalism and the reality of schooling (Stevenson, 2007); and inadequate professional development opportunities for teachers (Pedretti & Hodson, 1995). However, in searching the academic literature we also noted that there were few reports of empirical studies tracking teachers' views of environmental education. Research into teacher thinking as a means of informing educational change is well documented in the broader educational literature (Clandinin & Connelly, 2000; van Manen, 1997). The underpinning assumption is that teachers' views of the content and nature of a subject are complex, often founded upon implicit theories and personal practical knowledge. It is teachers' internal perceptions rather than external constraints (Hart, 1996) that most often inform their pedagogical practice. In a comprehensive review of environmental education, Hart and Nolan (1999) noted that while studies into teacher thinking are crucial, it remains one of the most under-researched areas within environmental education.

We therefore designed our study to produce a portrait of teachers' self-reported views of, and practices in, environmental education in Ontario, with the larger goal of tapping into teachers' ideas for improvement in the area. The study consisted of an on-line survey (N=377), supplemented by a series of in depth interviews (N=24) with a volunteer sample of the survey respondents. The research questions that guided our work included: (1) What are teachers' views about the environment and environmental education? (2) What are teachers' reported practices of environmental education? (3) What are the tensions they experience in implementing environmental education in their classrooms? Although our study focused on Ontario teachers, the results provide deeper insights into the nature of EE and its relationships to schooling from the perspective of practicing teachers that may be applicable to international settings. While we acknowledge that EE is a complex endeavor with many different agendas, approaches, and ideologies, and that it is often contextually based (Stevenson, Brody, Dillon & Wals, 2013); we also contend that teachers around the world face similar struggles and need to make comparable decisions (Shulman, 1986). Seen in this light, our study presents a point of reference for engaging

in critical analyses of discourses and practices in the field, and presents possibilities for addressing tensions and ambiguities across views, practices and contexts.

### **Theoretical Framework**

Many perspectives impact mainstream conceptions and practice of environmental education. Of these, three main ideas form the theoretical foundation for this paper.

#### ***The Complex Nature of Environmental Education***

For some scholars (e.g. Jickling & Wals, 2008; Orr, 2004; Sauvé, 2005) complexity is an innate characteristic of environmental education, traceable to the disparate strands from which it is derived. Environmental education in its intricacies draws ideas from more established disciplines like science, philosophy, sociology and education. This complexity is on the rise. Recent scholarship within environmental education has caught the interest of myriad 'other voices' like feminist, interpretivist, critical, post-modern and placed-based theorists (e.g. Gruenewald, 2004; Russell, 2005). In a commendable attempt to map the field, Sauvé (2005) has suggested that there are at least 15 different currents at work in environmental education today. These are: naturalist, conservationist/ressourcist, problem solving, systemic, scientific, humanist/mesological, value centred, holistic, bioregionalist, praxic, socially critical, feminist, ethnographic, eco-education and sustainable development/sustainability currents. In developing her typology of currents, Sauvé identified two philosophical issues that are pivotal to any discussions of environmental education. These are educators' underpinning views of: the character of the human-nature relationship, and the nature of education. These issues are important because they inform the philosophy of EE that teachers' espouse and influence the kinds of curriculum experiences they ultimately create for their students.

While some (e.g. Hart & Nolan, 1999; Sauvé, 2005) view theoretical complexity within the field as a potential strength, Disinger (1998) has pointed out how it can hinder the development of pedagogy for environmental education, since overarching theoretical frameworks for environmental education often contain poorly elucidated and even contradictory ideological elements. For example, there is a range of possibilities for the human-nature relationship, which environmental education programs can endorse. Elements exist within the ideological pool from which environmental educators draw to support positions ranging from the anthropocentric (people as natural stewards of the environment) (Bonnet, 2007) to the ecocentric (nature having an intrinsic value over which human interests have no precedence) (Naess, 1988). In developing this paper we acknowledged the inherent complexity of the nature of environmental education but were mindful of the problems this entails. Sauvé's (2005) summary of currents was useful in framing the study, and as a source of categories for developing data collecting instruments to begin cataloging teachers' views and practices of environmental education.

#### ***Stevenson's Gap***

While some scholars have concerned themselves with the theoretical complexities and inconsistencies within environmental education, others (e.g., Hart, Jickling & Kool, 1999; Stevenson, 2007) have focused on the contradictions within schools, which can act as barriers to the development of pedagogy and the successful implementation of environmental education programs. These scholars argue that a gap exists, where mainstream schooling, with its practices mired in tradition and positivist thinking, is antithetical to the implementation of environmental education that is theoretically fluid and diverse in its scope and implementation.

In this regard, Stevenson (2007) has identified four areas of contradiction: (a) philosophical intent- where schools act primarily as agents of social reproduction or maintaining the status quo, whereas environmental education demands a revolutionary approach which seeks

societal reform; (b) classroom pedagogy- schools are biased toward individualistic, content based approaches whereas environmental education requires cooperative strategies with an emphasis on creative and critical thinking; (c) school organization- schools are biased towards assembly line efficiency and certification which is antithetical to the appreciation of ambiguity inherent in environmental education and (d) curriculum ideologies- schools tend to be biased towards providing knowledge that is technical-rational or high status, which is often at odds with other knowledges that may be intrinsic to environmental literacy. For us, these areas of contradiction explain in part, systemic and ideological issues that challenge the enactment of EE in classrooms. Within the study we assumed the existence of Stevenson's gap and sought to better understand how it manifests itself at the classroom level.

### ***Diversity of Pedagogical Expression***

The existing literature suggests that environmental education can employ a diverse range of pedagogical strategies. For example, Russell, Bell and Fawcett (2000) describe a multiplicity of avenues Canadian educators seem to be utilizing to provide environmental education. They allude to the use of formal and informal strategies and the existence of hybrid pedagogies containing elements of critical pedagogy, indigenous knowledge, populist ideas and post-structuralism. Supporting this notion that EE is open to diverse pedagogical expression is the broad idea that environmental education can be *about*, *through* and *for* the environment (see for example Fien, 1993; Lucas, 1979; Palmer, 1998). Fien (1993) further suggests that, comprehensive programs should contain all three aspects. Education *about* the environment suggests the use of cognitive, content based strategies which emphasize knowledge about natural systems, processes and their management. It seeks to bring the 'facts' about environmental issues and topics to the surface. Education *through* the environment suggests the use of direct experiences with the environment as a means of education. It works on the assumption that appreciation for the environment is fostered through direct contact with it. Nature studies, field studies and some forms of place-based education are examples of education *through* the environment. Education *for* the environment suggests the use of eco-political and transformative strategies. It seeks social change through an overt agenda of values education aimed at promoting behaviors compatible with the sustainable and equitable use of resources. According to Fien, all three components, rather than working at odds with each other, can act in tandem to develop a sensitive environmental ethic and the necessary skills to participate in environmental protection and improvement.

Although dated, the *about*, *through* and *for* conception of EE has remained a wellspring for environmental educators. Palmer (1998), for example, has proposed an updated model for environmental education, which in addition to supporting pedagogically diverse strategies of education about, through and for the environment, suggests grounding of programs within a framework of formative life experiences aimed at encouraging the development of ecological thinking and behaviors. In Ontario, current educational policy (Ontario, Working Group on Environmental Education, 2007) assumes the existence of pedagogical diversity in environmental education. Indeed, EE is defined as "education about the environment, for the environment and in the environment" (p.6) and is positioned as a cross-curricular initiative to be taught as a part of all subjects by all teachers. Although we were uncertain about the ideological consistency of combining diverse elements, we conceded that for the majority of environmental educators, the possibility of a diverse pedagogical expression is an accepted norm and tried to keep open to instances and examples of its emergence within the analyses of the data.

### **The Study**

This nationally funded study employed a mixed methodology (Tashakkorie & Teddlie, 1998): an online survey (N=377) followed by a series of in-depth interviews (N=24) with a volunteer

sample of the larger survey group. According to Creswell and Plano Clark (2007) this type of methodology is most suitable for exploring phenomena about which little is established, but where several possible explanations exist.

### ***The Survey***

The survey was developed over one year through ongoing reading of the literature, consideration of existing studies and ongoing discussion among members of the research team about matters most salient to the context. The research team consisted of a combination of education scholars and graduate students with deep interests in promoting the scholarship and practice of EE for K-12. Using established survey design methods (Fowler, 2001) we identified major constructs related to teachers work that we determined were most salient to study with respect to EE, that is teacher beliefs, practices, experiences, education and perceived challenges. Specific items (questions) were then developed to fill out each of these constructs. The process was not linear but took place through a highly reflexive back and forth inquiry process among members of the research team. We focused on designing items to be good measures, in particular ensuring that the wording and layout of questions would provide reliable and valid data. After items were designed, they were clustered into themed sections and piloted.

The survey consisted of 93 items divided into sections. It is important to note here that the survey was quite extensive and the results obtained will be used for several papers. For the purposes of this paper we draw only on the following sections of the survey data: participant demographics (e.g., gender, years teaching, subject, level, location of school rural, urban, suburban); teacher beliefs about EE; reported practices of EE; school contexts; teacher education/professional development in EE; and challenges to EE. The majority of the questionnaire consisted of 5-point Likert-scale responses ranging from *strongly disagree* (1) to *strongly agree* (5), along with a *neutral* response (3). Sample likert-scale items related to teacher beliefs about EE included: "Environmental education should mainly be about: nature study, raising student awareness, environmental activism", while items related to practices asked teachers to respond to statements such as: "environmental education is a high status topic for me, I frequently use outdoor education centres to promote environmental awareness, environmental education should include a social justice component." Items related to school practices and context included: "In my school environmental education IS mainly about nature study raising student awareness." To ascertain challenges or tensions we asked participants to respond, using the 5-point Likert scale, to statements such as: "I encounter challenges in environmental education due to: assessment issues, the interdisciplinary nature of environmental education, aligning my environmental education curricula to existing ministry expectations, and *other*".

In each section of the questionnaire, respondents were invited to add comments in prose form. Participants expanded on issues that they felt were not adequately addressed by the survey questions. Many of the open-ended comments espoused (often with great passion) the centrality of environmental education, and requests for more support. The final instrument was pilot tested with a small sample (12 participants) of the test population. We then refined our questions based on the responses from the pilot test. Items were refined with respect to ambiguous meanings, unclear wording, ease of reading, redundant items, and suggestions regarding missing items and layout of the questionnaire. The refined survey<sup>1</sup> was posted online on a popular survey hosting platform, where it remained open for response by all Ontario teachers for eight months. The call for participants for the study was widely advertised across the province in a variety of forums including established teacher forums, popular teacher magazines and personal contact lists.

### ***The Interview***

Within the survey respondents were invited to volunteer for an in-depth interview intended to allow them to expand on answers given in the survey, and to provide opportunities for the

emergence of ideas, which may not have been anticipated by the survey instrument. These semi-structured interviews served to augment survey data. Interview conversations allowed us to probe tensions, struggles or contradictions regarding environmental education that were identified in the “perceived challenges” section of the survey. Twenty four such interviews (17 telephone interviews, 7 in person) were conducted with volunteers from across the province, lasting anywhere from 20-60 minutes. The transcripts were transcribed and coded.

### ***Analyses and Limitations***

The online platform, which hosted the survey, automatically collated the data and generated a variety of standard descriptive statistics. Further to this, statistical procedures, suitable for non-parametric data were carried out. The statistics generated were useful in two distinct ways. Firstly, they helped to develop the in-depth interview questions. Secondly, they were used in tandem with the qualitative interview data to provide a portrait of the EE landscape in Ontario. The in-depth interview data was qualitatively analyzed through inductive-deductive modes of analysis (Patton, 2002). This means that we combined an a-priori template of codes (derived from the theoretical framework) with a grounded theory inductive approach (Charmaz, 2005). This hybrid approach allowed for the emergence of themes directly from the data while still using codes from a framework. For the purposes of this paper, we report on teacher beliefs, practices, and reported challenges and tensions that emerged from survey and interview data. Specifically, we focused on uncovering those tensions that are salient to teachers work with EE and to identify those that represent important entry points or opportunities for positive intervention. Within the paper the reporting of direct quotes is followed by a pseudonym and subject area, while responses to open-ended survey questions are identified by a respondent number.

There are a few limitations to note about the study. Firstly, although there was a seemingly large response to the survey (N=377), this number represents but a small proportion of the total number of Ontario teachers<sup>2</sup>. Also since participation in the survey was self-selecting and voluntary, it tended to attract a non-parametric sample of respondents, that is, most participants were strong advocates of environmental education. Based on these points, we caution the extent to which generalizations to all teachers, based on study data can be made. Secondly, within this paper, we have presented elementary and secondary data combined. Although we recognize that the needs and contexts of elementary and secondary teachers are often different, we purposely chose to do this in order to present a broad picture of the Ontario landscape. Furthermore, we were aware of the statistical implications of dividing an already small sample into elementary and secondary groupings and chose not to do this. Simply put the sample number would be too small to have any statistical power. Rather we plan to conduct further studies in the future that will differentiate between the needs, views, practices and challenges of sub-groupings of teachers. In spite of these limitations, we believe the analyses presented here, are a reasonable indicator of what is going on in the province with respect to environmental education in terms of teacher perspectives and reported practice. It also supports the viability of researching teachers' views of environmental education.

### ***The Participants***

The total number of respondents to the survey was 377. Of these, 69% identified themselves as female. The majority of respondents possessed both an undergraduate degree (81.6%) and a bachelor of education degree (82.2%). A significant minority possessed a graduate degree: 27.1% at the master's level and 2.8% at the doctorate level. In terms of age, the majority of the respondents (60.1%) were between 31-50 years old. Many were experienced teachers, with 56.5% reporting more than 10 years teaching experience, and 25% reporting 5-10 years teaching experience. Only 18.5% of the respondents were beginning teachers with less than 5 years teaching experience. The survey was open province wide but 36.3% of the responses came from

the city of Toronto (this is not surprising since Toronto has approximately 42% of Ontario's population). Responses came from 43 different cities and towns in Ontario. Overall, 58% of the respondents identified their school as urban. Sixty-eight percent of the respondents worked within public English school systems, 23.3% within Catholic English schools and 5.2% in independent schools. A slightly greater proportion of secondary level teachers (54%) chose to respond to the survey than those at the elementary level (46%).

## Results and Discussion

### *A Portrait of EE in Ontario*

Table 1 summarizes respondents' main views and reported practices with respect to the environment and environmental education. Since the data shown here is ordinal, and it cannot be assumed that the distance between rating categories is the same, two measures are reported on Table 1: rating average<sup>3</sup> and modal rating<sup>4</sup>. From these results it is clear that respondents hold decisive opinions about the issues under study.

Notably, respondents seem to possess a sense that the human caused environmental degradation is an urgent problem, and are of the opinion that multi-level action is needed to address it. Overwhelmingly, study participants considered themselves allies of environmental causes (rating average= 4.29) and agreed that environmental education is a high status topic to them personally (4.09). They also seem to believe that they are doing a good job at implementing environmental education in their individual classrooms (3.54), specifically reporting fair levels of success in getting students interested about the global (3.40) and local (3.55) environment. Figure 1 provides more detailed information on the self-reported frequency of environmental education in classrooms. Ninety two percent of respondents reported engaging in some form of environmental education in their normal teaching practice. However this engagement seems to be of variable frequency since only 47% percent reported that environmental education occurs at least once a week in their classrooms.

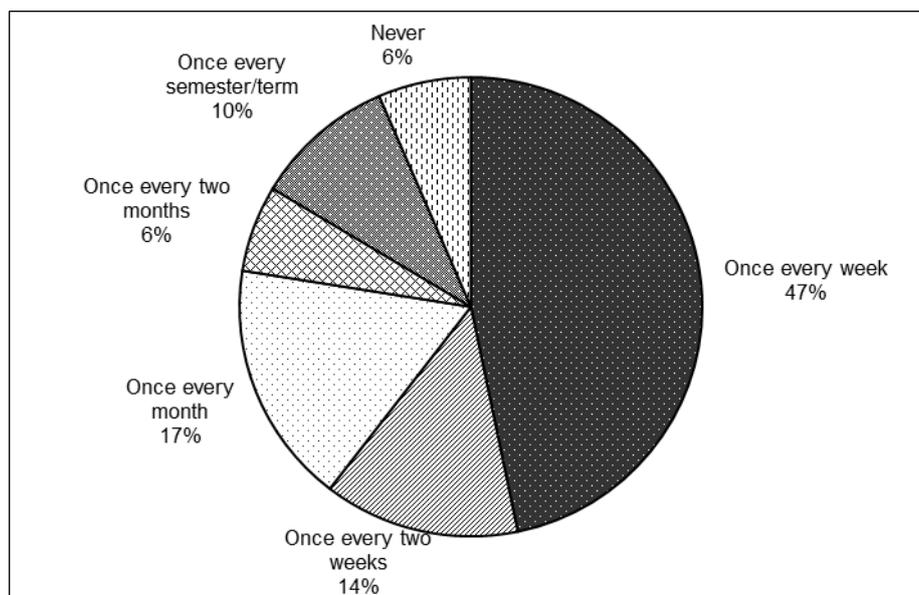


Figure 1. Reported Frequency of EE in Classrooms

Table 1. Teachers' Views and Reported Practices

Statement	Rating Average	Modal Rating
<i>The Environment</i>		
The dangers of environmental degradation are often overstated.	2.00	Disagree Strongly (44.3%)
Environmental action at an individual level is futile.	1.60	Disagree (57.2%)
Corporate expansion is a major cause of environmental degradation in the last 50 years.	3.89	Agree (47.1%)
Governments should do more to alleviate environmental degradation.	4.38	Strongly Agree (54.1%)
Technology can reduce the environmental impact of economic development.	3.61	Agree (50.3%)
I am aware of environmental issues affecting my local community.	4.32	Agree (48.7%)
I consider myself an ally of environmental causes.	4.29	Agree (52.2%)
I make opportunities to be close to nature.	3.87	Agree (38.5%)
<i>Environmental Education (Views)</i>		
Environmental education is a high status topic for me.	4.09	Strongly Agree (39.0%)
In classrooms teachers should advocate a particular stand with respect to environmental issues.	3.43	Agree (40.6%)
Environmental education should include a social justice perspective.	4.20	Agree (49.7%)
Environmental education should include an action component.	4.36	Agree (50.6%)
Fieldtrips and activities outside the classroom are essential to environmental education.	4.46	Strongly Agree (58.2%)
Visits to Outdoor Education Centres should be an essential component of environmental education.	4.47	Strongly Agree (60.1%)
Outdoor education should be about connecting children to the natural environment.	4.58	Strongly Agree (60.4%)
<i>Environmental Education (Practice)</i>		
Environmental education is generally well implemented in my classroom.	3.54	Agree (46.9%)
I am successful in getting my students concerned about the GLOBAL environment.	3.40	Agree (46.6%)
I am successful in getting my students concerned about my LOCAL environment.	3.55	Agree (56.2%)
Field trips with my class are central to my environmental education goals.	3.38	Neutral (29.6%)
I frequently use Outdoor Education Centre visits to promote environmental awareness.	2.85	Disagree (29.5%)
In my school, environmental education is mainly about raising student awareness.	4.07	Agree (62.4%)
In my school environmental education is mainly about developing critical thinking skills to evaluate environmental issues.	3.75	Agree (53.5%)

The survey data also indicated that educators hold decisive opinions about the ideal nature of environmental education and how it should be practiced in schools. Table 1 outlines some of these views. Most conspicuously, they believe that: in classrooms teachers should advocate a particular stance with respect to environment (3.43); environmental education should include social justice (4.20) and action components (4.36); and outdoor education is an essential component of environmental education (4.46). Outdoor education is viewed as necessary for connecting children to the natural environment (4.58).

Participants passionately expanded on their views in open ended comments and interviews. For example:

This [the environment] is the most important issue of the coming century. Though I'm concerned about desensitization through repetition and hypocrisy. (Respondent 330).

To me, the most important part of environmental education is developing in students the skills so that they do something as they get older to help improve the environment or work with the environment, or be aware of the environment. (Interview with Julian, Geography Teacher).

I believe that if the teacher feels passionate about environmental issues s/he can pass on their sentiments to their students. As a holistic educator I believe in transformational learning. Through their learning experiences students need to be transformed into better human beings who can be stewards of the environment. Through my involvement in environmental committees, I have provided opportunities for students to become sensitized to environmental issues. (Respondent 123).

However, some respondents expressed frustration with the status quo and with policy that in their view is not forceful enough:

Given the ever-decreasing window of opportunity to act (before we've truly reached the 'tipping point' and it simply becomes too late), if we don't act NOW, it will be too late for our children and any attempt at EE will thus be a total waste of time. I believe that you cannot call yourself an environmental educator unless you first publicly demonstrate your commitment to change in your own life. Further, to be an environmental educator, you must also demonstrate that you are seeking to change the lives of your peers, because if you don't make drastic changes in the here and now, it will soon become 'too late.' (Respondent 1, formatting in original).

The bottom line is that we cannot afford to keep our students in the dark. If we don't teach students about their environment and the many stresses currently facing ecosystems, we are leading them to believe that there are no environmental problems, and we can all carry on over-consuming and wasting resources in a 'business-as-usual' manner.' (Respondent 191).

Based on the findings of the survey (Table 1 and Figure 1) and qualitative data reported above, participating teachers support the inclusion of environmental education in schools. However, as the literature suggests, these views are complex and varied. Our analyses suggest that there are three dominant ideologies or 'currents' (Sauvé, 2005) expressed by these teachers: the naturalist current which centres on human relationships with nature, and may be cognitive (learning about nature), or experiential (being in nature); the value-centred current which asserts that our relationship to the environment is moral or ethical in nature; and the problem-solving current which emphasizes action to effect change in a particular local milieu. Educators in this latter group wrote and talked about activism, change and transformation as important goals of

EE. Each of these three ideologies implies different pedagogical approaches, goals, and issues for consideration. For example, those teachers who reflected a more naturalist view talked about bringing their students outdoors and “immersion in natural environments” (Respondent 54) so that students could connect to nature, and feel inspired. They were saddened by the increasing closures of outdoor education centres, and the increasing challenges of taking students beyond the classroom walls. Careful examination of the values-centred ‘current’ raises questions about value orientations and adoptions of particular value stances. For example, are value orientations negotiable (Tan & Pedretti, 2010), what value positions do or should educators adopt? How do educators navigate the slippery slope between relativism and indoctrination? Should curriculum include teaching ethical and moral reasoning frameworks? A problem-solving ‘current’ raises questions about the nature of action and problem-solving. For example, what actions are feasible or appropriate for students to engage in? Who decides? What becomes clear in this study is that environmental education means different things to different people, and therefore is manifested in practice, in many different ways. We are not suggesting that this is necessarily a problem. Rather, we are concerned that teachers are not provided with opportunities to interrogate and explore different orientations to environmental education so that their environmental education practices are deliberate and underpinned by particular assumptions and assertions.

### **Tensions and Opportunities in Environmental Education**

The findings of the study as reported thus far are not very surprising. Indeed, many of these findings mirror those reported in other papers about environmental education in schools (e.g. Eames, Cowie & Bolstad, 2008; Ernst, 2009; Fazio & Karrow, 2011). However secondary analyses of the data and reflection on our preliminary analyses revealed several tensions within teachers’ views and reported practices, which we believe may represent important entry points or opportunities for positive intervention. Below we identify and discuss four of these tensions.

#### ***Environmental Educators: A Marginalized Minority***

While study participants were generally confident in their support for environmental education, they were equally certain that their passion for the subject is not shared by the majority of their colleagues. Indeed, they expressed the belief that within schools they (the participants) exist as a marginalized minority who are commonly caricatured as ‘weird, tree hugging idealists’. For many, this unflattering portrait is source of disenchantment and disempowerment. According to one participant:

I find many of the staff at the school where I work, don’t really seem to care very much about environmental issues. And they are not role modeling, because they don’t care, they’re not really very good role models to the students. I still see teachers throwing pop cans in the garbage and not recycling their paper. With my green team I’ve put Re-use Boxes for paper that’s only been used on one side, pretty much in every classroom and every office space in the school. But I can’t convince people to use one sided paper in their printers. I feel that I’m the only one that goes collecting one sided paper for my printer. I don’t have a lot of support at my school from the other staff. So that’s hard, because you feel you’re one person against everybody and trying to change people’s views. (Interview with Flora, Teacher/Former Outdoor Educator).

While additional studies need to be done to explore the nuances of this tension, for us, it represents a practical manifestation of the complex nature of environmental education. As outlined earlier, environmental education is philosophically multifaceted consisting of complex and sometimes competing ideas. Seen in this light, it may not be surprising that the majority of teachers, mired in the practical realities of schooling, have not become deeply engaged with it.

For those who have, a limited capacity to bridge perceived impermeable borders with colleagues, may explain their marginal status in schools. For this group, among other things, the tension seems to indicate a need for more professional development opportunities. The notion that teachers need to be engaged with philosophical questions associated with environmental education if they are to become engaged with the subject has been suggested. According to Hart, Jickling and Kool (1999):

Often, educational guidelines are prescriptive documents that lay out a means by which teachers can plan programs, prepare lessons, and develop learning materials without any necessity for examining their own educational philosophy. This lack of engagement often translates into lack of ownership of the program and consequently lack of commitment (p.107).

In addition to allowing for opportunities to interrogate associated ideologies, it is our belief that professional development opportunities should be oriented towards nurturing environmental educators and scaffolding their development into strong communities of practice which can serve as catalytic points of change in schools. In agreement with Wals and Dillon (2013) we suggest that such opportunities should focus on creating spaces where transformative learning can take place. Transformative here refers to “becoming critically aware of one’s own tacit assumptions and expectations and those of others” (Mezirow & Taylor, 2009, p. 4), taking these into account, and making appropriate changes to one’s ways of thinking, valuing and doing. Spaces for transformative learning should ideally allow for pluralism, minority and diversity perspectives; respectful disagreement and differences; and deep consensus. At the same they should provide space for creative thinking and self-determination; take into account contextual differences among teachers and schools; and be minimally distorted by power relations.

### ***The Dearth of Environmental Education Opportunities for Teachers***

Across the study a number of items were included to investigate the barriers to effective environmental education. Participant responses indicated the perennial challenges that educators generally face as barriers to education also acting here: an overcrowded curriculum, lack of curriculum resources and difficulties in aligning environmental education with existing official expectations. However one set of results that we thought were noteworthy, and a possible entry point for intervention, came from an item designed to explore the sources of teachers’ environmental knowledge. Figure 2 shows that majority of participants (over 75%) attributed their environmental education knowledge to personal studies rather than professional sources. Indeed, professional teacher education opportunities, such as Additional Qualification (AQ)<sup>5</sup> courses and Preservice courses, were only cited by 10-12% of respondents as providing a source of environmental education.

Teachers’ disappointment with current educational opportunities for environmental education was further indicated by their response to another survey item which asked them to identify topics in which they needed additional education. A wide range of topics received high positive rating averages including: content knowledge (3.78), pedagogical strategies (3.96), assessment techniques (3.71), curriculum development (4.09) and the use of outdoor education facilities (3.97). When asked about the kinds of developmental opportunities they would like, 30% of respondents chose “time at school to plan with colleagues”; 38% wanted a “full day in-service workshop”; 21% indicated they would like an opportunity to “visit an Outdoor Education Centre”; and 11% chose “action research”.

These results suggest that teachers who are passionate about the environment generally believe they are acting in isolation, and primarily use personal knowledge to inform their practice. They believe they are doing their best in the face of very little external professional support. However they seem to hunger for appropriate educational opportunities that will allow

them to grow in their knowledge and practice of environmental education. For us, these results represent another practical manifestation of the complex nature of environmental education (Disinger, 1998; Sauvé, 2005) and one possible explanation why environmental education is struggling in classrooms.

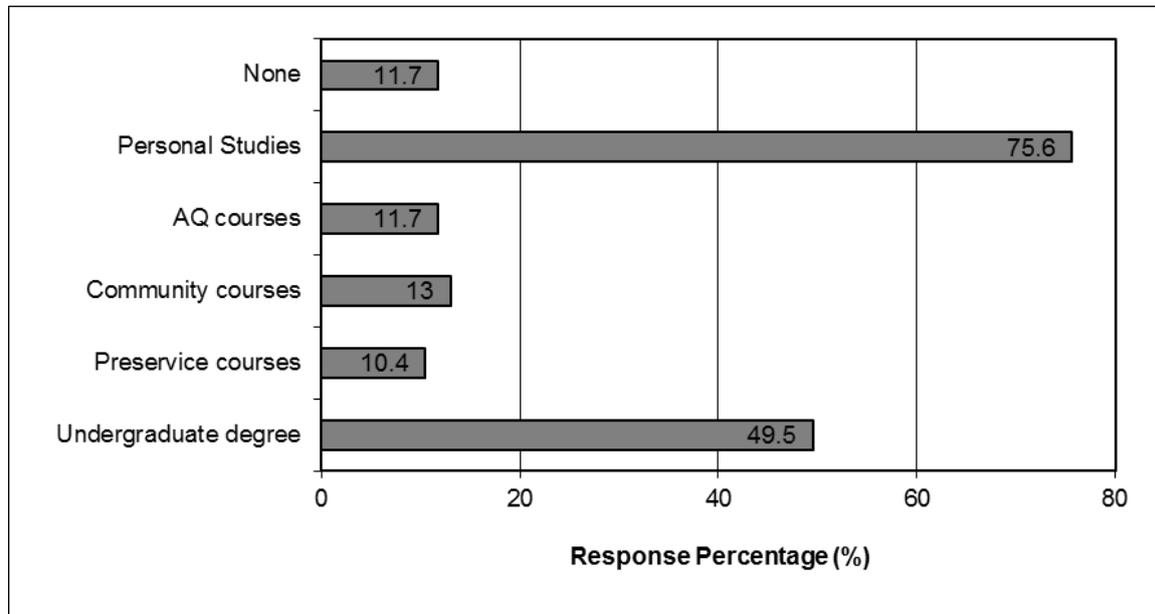


Figure 2. Sources of Teachers' Environmental Education

Even if they are convinced about its necessity, many teachers may still lack the knowledge about environmental issues and the pedagogical strategies requisite for effectively delivering an environmental education program. A possible intervention here would be to provide more appropriate pre-service and in-service environmental education opportunities for teachers. Ideally, it seems that these experiences should provide opportunities to: explore the nature of environmental education; build content knowledge about environmental issues; and develop pedagogy for environmental education. They should also take into account preparing practicing and future teachers for what Wals and Dillon (2013) refer to as coping for teaching in the 'at risk' society. According to these authors, the complexity of modern life and the severity of environmental problems means that EE today should allow for engagement in hybrid learning opportunities, which blur the lines between disciplines, formal and informal education; and encourage intergenerational and intercultural exchanges. We argue that for educators such opportunities are crucial if they are to engage with EE in meaningful ways and go on to develop realistic pedagogical strategies for it.

### ***The Gap between Beliefs and Practices***

Several items on the survey explored teachers' views of the ideal nature of environmental education (theory) and their actual practices in classrooms. In one such item, participants were asked to respond to a paired list of topics in two ways: "EE should be about" and "In my school EE is about". A simple display of the rating averages obtained in response to this item seemed to suggest the existence of a gap between what respondents believe environmental education should be and what it is in actuality (Figure 3).

We further analyzed the data in Figure 3 to determine if the differences were statistically significant. Analyses using the Wilcoxon Rank Test<sup>6</sup> confirmed statistically significant directional gaps ( $p < 0.0001$ ) between teachers' ideas about the ideal nature of EE and their practices for seven items. These findings suggest that teachers have higher expectations for environmental education than what usually occurs in classrooms. It also indicates, that while raising student awareness about the environment is important, teachers also believe that other aspects: such as critical thinking, the influence of technology, the effect of global trade flows and environmental activism, should receive greater emphasis in practice.

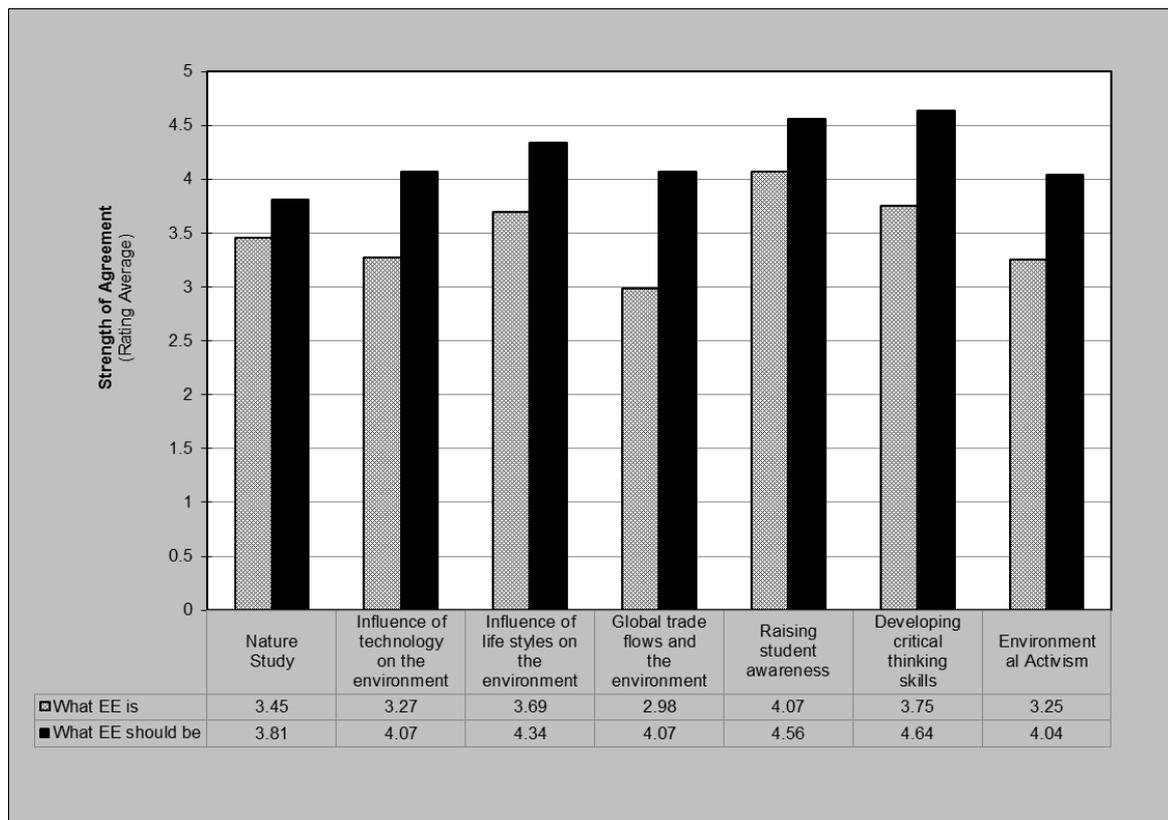


Figure 3. The Nature of EE in Schools

Table 2. Wilcoxon Rank Test (Showing the gap between theory and practice)

Factor	$n_{s/r}$	$z$	$p$ (1-tail)
Nature study	162	-5.4	< 0.0001
Influence of technology on the environment	182	-10.56	< 0.0001
Influence of lifestyles on the environment	176	-9.87	< 0.0001
Global trade flows and the environment	218	-12.22	< 0.0001
Raising student awareness	144	-8.82	< 0.0001
Developing critical thinking skills	199	-11.65	< 0.0001
Environmental activism	190	-10.63	< 0.0001

The existence of gaps between what teachers believe and what they do in practice, in itself, is not surprising (Korthagen, Kessels, Koster et al., 2001). A more crucial aspect is to understand why specific gaps exist in order to suggest how they might be bridged. Our findings add to the understanding of how these are manifested at the classroom level. Teachers' ideal visions of environmental education often involve ideas about education, which are at odds with what Stevenson (2007) calls the practical realities of mainstream schooling. These realities include: schools acting as sites for reproduction rather than reconstruction; classroom pedagogy that emphasizes the individual rather than the collective; school organizations that are antithetical to the ambiguities of EE, and curriculum ideologies that privilege acquisition of content knowledge. The teachers who participated in this study seem to hold the foundations of a theoretical orientation towards environmental education that is progressive, emphasizes creative and critical thinking, and involves complex pedagogy. For example, Figure 3 shows that they hold the view that activism should be a greater part of EE than what currently exists. The conclusion is also supported by the results in Table 1, where teachers name social justice, an action component and experiences beyond the classroom as valuable aspects of EE. However within the confines of traditional classrooms, when faced with the challenge of implementing these ideas, they revert to a more traditional practice. To be fair, implementing pedagogy that goes against traditional practice and systemic structures already in place, is a conundrum well established in existing educational literature (e.g. Alsop & Bencze, 2010; Roth & Calabrese Barton, 2004; Pedretti et al., 2008). Rather than indicting teachers for not fully acting on their beliefs, our findings indicate that more detailed work is needed to explore gaps that hamper the implementation of environmental education, and assist teachers in developing practical pedagogical strategies to bridge them.

### ***An Intrinsic Link between Environmental and Outdoor Education***

As noted earlier, study participants view outdoor education as an intrinsic component of environmental education necessary for connecting children to the environment and helping students to understand the role of nature in their lives (see Table 1). In addition to the statistical data summarized in Table 1, in depth interviews provided considerable evidence to support this perceived link. According to one teacher:

I think part of environmental education is getting kids to be comfortable in nature. Having them understand that they can enjoy being in nature, they don't have to be afraid of it. That it's a place where they can have fun, outside, enjoying the shade on a hot day, or learning the names of plants, or growing a garden and watching things change, or looking at animals. Just sort of giving them that experience, outdoors. And helping them understand a bit about their relationship with nature, like for instance, a food web, or an energy pyramid. (Interview with Allison, Kindergarten teacher).

Other teachers described the role of outdoor education as providing students with opportunities to:

...experience life, and it gets them to experience the environment, which many of them don't because they are stuck in front of a PC or one of the little Game Boys and things all the time. (Interview with Joshua, teacher).

...connect with their own sort of natural sense of place, understand their role in an ecosystem. The belief that the more kids are exposed to a natural setting, the more they feel part of it, the more they understand it, the more they care and respect for their world and environment. The opportunity to connect with real life situations, which is outside of the classroom. (Interview with Karen, teacher).

Our findings support the prevailing premise that there are diverse pedagogical avenues and currents (Sauvé, 2005) for pursuing environmental education in the context of outdoor education. However, participants' views about outdoor education predominantly reflect a strong naturalist current, emphasizing the importance of place and immersion in the natural world (in other words, environmental education *through* the environment). Outdoor education experiences seek to develop in young people a sense of affiliation with the places where they live (Gruenewald, 2003; Smith, 2007), and enhance "young people's familiarity with what is beautiful and worth preserving in the territory they call home" (Smith, 2007, p. 192). Without this affiliation to nature (or place) it is argued that students may not develop the forms of care that are required for environmental and social stewardship.

However despite enthusiastic support for the connection between outdoor and environmental education, 52% of respondents admitted that limited professional knowledge about outdoor education and lack of experience are barriers to their work with environmental and outdoor education. Lesser cited barriers included: issues of access, cost and liability. More specifically, these findings lend empirical support to the theories of scholars like Lucas (1979), Fien (1993) and Smith (2007) that education *through* or in the environment is a necessary component of environmental education, along with education *about* and *for* the environment. Yet despite much positive endorsement, a search of the existing academic literature reveals a dearth of rigorous and decisive research mapping the link between outdoor and environmental education. Indeed, while for many the link between the two is patent and positive (Russell, Bell & Fawcett, 2000; Sauvé, 2005), for others the relationship between outdoor education and EE is ambiguous and the compatibility between outdoor education and EE is questionable. They argue that simply being in the environment (outdoor education) does not equate to positive learning *about* and *for* the environment and suggest that a more nuanced approach is needed to bridge the gap between the two (see for example, Loynes, 2002). Additionally, partly because of rising operating costs and liability issues, in many jurisdictions worldwide, outdoor education is at risk. Increasingly many programs and facilities are being cut and fewer new opportunities created (Dillon, Rickinson, Teamey et al., 2006). For us then, the finding that participants in this study strongly endorse the link between outdoor and environmental education presents an opportunity for further exploration that is largely untapped in environmental education research. Such work may expand the pedagogical landscape of environmental education and assist in strengthening environmental education as a whole.

### **Implications**

The study reported on in this paper sought to establish a portrait of Ontario teachers' self-reported views and practices with respect to environmental and outdoor education. Overall, the results obtained support the viability of researching teachers' views of environmental education. It is clear to us that teachers hold decisive views about environmentalism, and the nature/practice of environmental education. These have several implications worthy of further consideration.

Firstly, there is a need for more research that focuses on environmental educators. For example in exploring the gaps between teachers' beliefs and practices, detailed studies are needed of why teachers do not include action or agency more frequently in their lessons when they clearly believe it to be a vital part of environmental education. The study also suggests the existence of a strong link between outdoor and environmental education. Further research is required to explore this link. More studies focusing on barriers to the use of outdoor opportunities would be helpful, since teachers believe outdoor experiences are intrinsic to environmental learning. Ideally such research should go beyond explaining the gaps and barriers, seeking instead to bridge them in ways that are realistic, practice oriented and relevant to teachers. Furthermore, these studies should be conducted in a naturalistic setting, over time, and in schools and informal education settings.

Secondly, there is a pressing need for more professional development opportunities for environmental educators. The analyses indicate that most teachers' knowledge in this domain comes from personal studies/interest. Furthermore, the data suggests that various types of interventions may be necessary for different groups of educators – that is, those who are not particularly committed to environmental education may have different needs from those who are committed but need help in deepening their understanding and practice in the area. Research tells us that teacher confidence, content knowledge and pedagogical content knowledge are critical to teacher praxis (Dickerson, Dawkins, & Annetta, 2010; Van Driel, Verloop, & De Vos, 1998). For many teachers opportunities are needed to deepen understanding of the nature and content of environmental education. Opportunities are also needed for developing pedagogical strategies for intrinsic components of environmental education paying particular attention to for example, developing the necessary skills in decision making, critical thinking, action, and outdoor pedagogy. Further, schools might want to consider “whole school approaches” to EE (Henderson & Tilbury, 2004) and the nurturing of strong communities of practice within schools and beyond.

Thirdly, environmental education needs to be an important component of pre-service and continuing education programs for teachers (Læssøe, Schnack, Breiting, & Rolls, 2009; Ontario Ministry of Education, 2009; UNESCO-UNEP, 1990). Again, there are many ways in which this can be accomplished (and in some faculties of education, some of these strategies are already in place): lobbying for environmental education as a teachable subject; integrating environmental education across all subjects in elementary and secondary programs in a coherent way; and offering Environmental Studies courses for teachers that are more intense in content and pedagogy.

What seems clear to us is that many teachers who are committed to environmental education have their own ideas about environmental education. Although some ready-made plans and kits exist to assist teachers, these may not fully take into account teachers' ideas, the complex nature of the subject, or the practical realities of schooling which hamper pedagogy for the subject. As such, rather than providing more tailor-made resources, those interested in promoting environmental education should consider supporting research and opportunities to nurture the development of strong communities of environmental educators in schools. Teachers indicated that time in schools to work with colleagues and opportunities to develop curriculum are sorely lacking. If we are indeed to make significant strides in environmental education, we must provide teachers with more expansive opportunities for ongoing education along with opportunities to work in collegial communities, develop curriculum, and examine practice.

### **Endnotes**

- <sup>1</sup>. A copy of the survey questionnaire can be obtained by contacting the primary author.
- <sup>2</sup>. For 2008-2009, it was reported by the Ontario Ministry of Education that there were 114,872.91 FTE (Full Time Equivalent) teachers working in Ontario.
- <sup>3</sup>. Rating average indicates the average response to the statement on a rating scale of 1-5 where 1 represents strongly disagree and 5 strongly agree.
- <sup>4</sup>. Modal rating is the most commonly occurring category.
- <sup>5</sup>. In Ontario, Additional Qualification (AQ) courses are offered to teachers as a form of ongoing professional learning activities (to enhance knowledge, increase qualifications and skills, etc.).
- <sup>6</sup>. The Wilcoxon Rank Test is used on non-parametric data to compare the magnitude as well as direction of differences between two groups.

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