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The *Canadian Journal of Environmental Education* is a refereed journal published once a year. It seeks to further the study and practice of environmental education by providing a thoughtful forum for researchers, scholars, practitioners, and post-secondary students. The publication and distribution of articles and reviews should contribute to Canadian thought and practice in environmental education and/or issues and practices of international importance to this field of study.

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Cover Artwork © by Sheila Karrow
Sheila Karrow is a visual artist and educator from Haida Gwaii, British Columbia. Focusing on artist-teacher relationships in the classroom informed by place and culture, Karrow is currently in her second year of a PhD program in Curriculum Studies at the University of Victoria. Karrow's paintings communicate both a literal and metaphorical understanding of the natural world. She strives for an intimate connection with the subject yet also reveals the unknowable reality of such a form. Carefully rendered images in acrylic and watercolour express a didactic blend of extreme detail with narrative, combining realism, symbolism and abstraction.

Contents

Environmental and Sustainability Education in Teacher Education

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This volume of the *Canadian Journal of Environmental Education* (CJEE) is devoted to Environmental and Sustainability Education in Teacher Education (EST-TE). It was inspired during early conversations amongst organizers of the Research Symposium who wanted to ensure a reputable forum for the publication of research. The Research Symposium was organized and hosted by the Standing Committee on Environmental and Sustainability Education in Teacher Education (the "Standing Committee") of the Canadian Network for Environmental Education and Communication (EECOM), fall 2018, in Cranbrook, British Columbia.

The ESE-TE Research Symposium, the first of its kind since the inception of the Standing Committee in 2017, had several purposes: to provide academic and non-academic participants (e.g., teachers, practitioners, NGOs, ministry personnel, not-for-profits) with the opportunity to share their research with a small but growing community of like-minded stakeholders; to inspire both formal and informal discussions on the status of ESE-TE as a developing field of studies; and to strengthen collaborations through networking. These purposes were derived from some of the strategic directions and actions of the Standing Committee after an inaugural National Roundtable on ESE in Pre-service Teacher Education held at Trent University in spring 2016. At this event, organizers and delegates crafted a National Action Plan on ESE-TE alongside the Otonabee Declaration, a signed agreement calling for mandatory components of environmental education in all Pre-service Teacher Education programs across Canada (http://eseinfacultiesofed.ca/practice-pages/history-ese.html).

Strategic directions and actions do not operate in a vacuum. Those created by the Standing Committee were informed by its mission to advance and support the development of high-quality ESE through research, policy, and professional development in Teacher Education across Canada. Research has always been central to the mission of the Standing Committee, as is reflected in its strategic directions and actions.

Research on the origins of knowledge and research on how disciplinary fields become established (Hirst, 1974; Goodson, 1987, 1985), such as the developing field of ESE-TE, demonstrate that cultivating, nurturing, and celebrating the diverse forms of research and their derivative activities are

critical to advancing a disciplinary field. The developing field of ESE-TE is no exception and is perfectly situated to benefit from such research initiatives.

Approximately 80 attendees, 27 of whom were presenters, participated in the fall 2018 Research Symposium, which was organized as follows: After a short plenary, there were two one-hour sessions to facilitate the sharing of research and practice (praxis) on ESE-TE. Within each of these sessions, there were three or four presentations (organized by common theme, e.g., place-based education) and subsequent discussions. These sessions were followed by breakout groups focussing on expanding work in ESE-TE, sharing resources, and making commitments to concrete actions.

Consistent with the Standing Committee's strategic directions and actions of conducting, supporting, and disseminating ESE-TE research, attendees were invited to submit papers for consideration and review in this volume of CJEE. A general call to other members of the ESE-TE community beyond the Research Symposium was extended through traditional channels, e.g., the CJEE website and other media platforms.

This is the first time in the journal's 23-year history that a volume has been dedicated exclusively to Teacher Education (https://cjee.lakeheadu.ca/issue/archive). This speaks to the efforts of the Standing Committee to realize some of its strategic directions and actions in a relatively short period of time. We are serious about moving the field forward, and one way we will accomplish this is by more formally recognizing the important role research plays in doing this. Research and teaching are coordinated through a dialectic, with one informing the other. For ESE-TE to become a credible disciplinary field, replete with all the qualities that determine a discipline (e.g., distinct history or tradition, unique body of knowledge, unique language and concepts, particular and internal qualities of assessment) (Goodson, 1987, 1985; Hirst, 1974), it must be driven by a vibrant and thriving ESE-TE research community. The fact that the CJEE was receptive to dedicating one of its annual volumes to Teacher Education also speaks to the importance that the editors attribute to this emerging field of ESE-TE. The CJEE realizes the impact teacher educators have on future generations of teachers and their students, and as such the editors felt it was time to dedicate a volume to the topic. We are grateful for this, as those of us who educate teachers *about*, *for*, and *in* ESE know how challenging and rewarding the task can be (Karrow & DiGiuseppe, 2019; Karrow, DiGiuseppe, Elliott, Gwekwerere, & Inwood, 2016).

The Call for Proposals for this issue generated a healthy pool of manuscripts for review, out of which seven were selected for publication. As co-editors, we volunteered to edit the volume under the direction and oversight of editors Pat Maher (Nipissing University) and Blair Niblett (Trent University). A number of experts drawn from the broader community of ESE-TE academics served as reviewers and are recognized as such within the Front Matter of this volume.

The seven manuscripts represent a diversity of authors, each doing research in the developing field of ESE-TE. While much of the authors' research are

completed, some is still in progress. The research itself reflects a variety of methodological approaches, topics, problems, contexts, theoretical perspectives, ontological and epistemological stances, world views, and philosophies. All corresponding authors are teacher educators working in faculties/schools of education across Canada. Some collaborating authors may be non-academics working in institutes or organizations supporting faculties of education. The authors and their collaborators come from British Columbia, Saskatchewan, Manitoba, Ontario, and Nova Scotia. We have widespread geographical representation from across Canada, encompassing both large and small faculties of education. The institutes and the faculty members who teach and research within them, though diverse, are united in their passion and commitment to educate future teachers about environmental and sustainability issues.

For a variety of political, philosophical and pragmatic reasons (Karrow & Fazio, 2015), ESE is not typically recognized as a discipline but rather as an *interdiscipline*. Such claims for "interdisciplinarity" are commonly rationalized on historical, epistemological, and philosophical grounds (Palmer, 1998). This can pose challenges in K–12 schools and faculties of education that prepare teachers to teach distinct subject knowledge. Teacher educators navigate this terrain, with varying degrees of success, from within traditional school-based subjects, such as science, mathematics, social studies, the humanities, and physical education. Many of the contributing authors are teacher educators integrating ESE across these traditional school-based subjects.

In the first chapter, "Environmental and Sustainability Education Pedagogical Approaches in Pre-service Teacher Education," authors **Laura Sims**, **Madeleine Asselin**, and **Thomas Falkenberg** introduce readers to a study reporting on the findings of the effectiveness of pedagogical strategies used in two Curriculum and Instruction courses as part of the pre-service Teacher Education program at Université de St. Boniface, Winnipeg, MB. The authors justifiably cite an appeal made by Evans, Stevenson, Lason, Ferreira, and Davis (2017) for more empirical research on ESE-TE pedagogical strategies because of its scarcity. In addressing the research gap to which Evans et al. point, the authors conduct a case study exploring former students' perspectives on ESE pedagogical strategies employed in their courses and their experiences incorporating these strategies into their own teaching. In this case study, the researchers employed a semi-structured interview protocol to evaluate the experiences of 17 former student teachers. Several themes were derived from the participant interview data: i) examples of community-based learning, providing opportunities to act; ii) facilitating experiential, inquiry-based learning; iii) importance of relationships; iv) sharing the responsibility of learning; and v) constraints or challenges to integrating ESE pedagogical strategies. Researchers found that "modelling, providing opportunities to practice the strategies through planning, experimentation, and facilitating community-based activities helped participants gain knowledge, skills, and confidence in their application and in exploring how to innovate with these strategies in different contexts" (Sims, Asselin, & Falkenberg, 2019, p. 6-27).

In the second chapter—"Pathways, Philosophies, and Pedagogies: Conversations with Teacher Educators about Place-based Education"—authors **Janet McVittie**, **Geoffrey Webber**, **Laurie-Ann Michelle**, and **Dianne Miller** provide a timely review of place-based education (PBE). They are specifically interested in, "How Canadian teacher educators are taking up [place-based education], their understanding of the philosophy and purpose of PBE, and their experience of the rewards and challenges of PBE as they have infused it in their work" (McVittie, Webber, Michelle, & Miller, 2019, p. 36). McVittie et al. report on the findings of a survey administered to eight Canadian PBE champions in faculties of education. The researchers' initial surveys were followed up with individual and/or focus group interviews. Survey and interview data generated the following themes: the participants' pathways to PBE; terminologies for PBE; purposes for PBE; pedagogical practices used in PBE; structures in education and in society that affected faculty ability to incorporate PBE in their Teacher Education programs; and Indigenous knowledge of place. For a clear majority of participants, pathways to PBE derive from environmental education, through their own research or practice. Further, their data seem to confirm the "elasticity of PBE as a term" itself. As for the purposes of PBE, participants provided compelling and passionate accounts of why PBE is so important to their practice; the authors observe: "participants' life philosophies are illustrated in their approaches to PBE, which lead them to particular pedagogical practices" (McVittie et al., 2019, p. 41). Concluding, McVittie et al. add that PBE is amenable to a variety of pedagogical practices, including inquiry and experiential learning. Furthermore, PBE is essential to critically addressing environmental issues, and provoking creative and innovative ways of learning. What's more, participants identified numerous institutional and social structural constraints to PBE, such as university, faculty of education, school division, ministry of education policies and procedures, and the political-economic ideology of neoliberalism. Participants also acknowledged the relationship between Indigenous knowledge and PBE, despite their contrasting ontological premises. In closing, the authors appeal to teacher educators to bring greater critical perspectives to Teacher Education by reasserting three important questions: *What does it mean to be alive in the world? What does it mean to be where you are? What does it mean to learn about the local environment that one is embedded in?*

The third chapter, "Sustainability Learning Pathways in the UBC Teacher Education Program: Destination Cohort," by authors **Patrick Robertson**, **Robert VanWynsberghe**, and **Bruce Ford** describes a unique program involving a dedicated cohort of student teachers in the faculty of education at the University of British Columbia, Vancouver, BC. The cohort was launched fall 2018, and the authors' case study describes the design, genesis, and pathways for infusing sustainability in their program. They also delineate specific activities, outcomes, and impacts of the program to date. The project consisted of three phases: Phase I: Making the Case; Phase 2: Shaping the Case; and Phase 3:

Piloting and Evaluating the Case. In their explanation of the first phase, the authors share the results of a scan of environmental education programs across Canadian faculties of education. A group of stakeholders discussed and identified the pathways that have the greatest potential to impact Teacher Education at UBC; the pathways included: "professional development events and activities, a cohort in the Teacher Education program, an extended practicum, and the community field experience" (Robertson, VanWynsberghe, & Ford, 2019, p. 56). Phase 2: Shaping the Case, the authors design and implement a series of professional development activities connected with the sustainability learning pathways. The success and momentum generated through the professional development pathways motivated authors to develop an application for a new Teacher Education-for-sustainability (EfS) Cohort as part of UBC's Teacher Education program. Phase 3: Piloting and Evaluating the Case, once the cohort was established it was relatively easy to build on and extend UBC's Teacher Education program and their existing community partnerships, e.g., schools, communities, school boards and districts, to galvanize the EfS Cohort. At its "time of writing" the authors acknowledge that a variety of formative and summative evaluation methods, including for example, pre-and post-surveys, teacher candidates' reflections and projects, and program evaluations are to be employed in a comprehensive evaluation strategy. The authors conclude their chapter by examining "successes, challenges, and lessons learned" (Robertson et al., p. 50).

In the fourth chapter, "Creating a Climate of Change: Professional Development in Environmental and Sustainability Education through University and School Board Partnerships," authors **Hilary Inwood** and **Alysse Kennedy** describe a university–school board partnership that seeks to use the EcoSchools program as a template to bridge pre-service teacher with in-service teacher professional development. The initial findings of a three-year case study tracking and documenting early results are summarized. This summary is followed by a detailed description examining this partnership in professional development (PD) in ESE, beginning in 2017 between the Ontario Institute of Studies in Education (OISE) of the University of Toronto and the Sustainability Office at the Toronto District School Board (TDSB). The balance of the chapter outlines a three-year qualitative case study research collaboration between the two partners, examining the involvement of pre-service and in-service teacher participants respectively. Specifically, the authors consider: "What are the learning expectations, experiences, and impacts of pre-service teachers and EcoSchools teachers involved in this TDSB/OISE collaboration?" (Inwood & Kennedy, 2019, p. 76) The three-year study, which is currently in its first year, consists of three phases. Phase 1: investigating the needs and expectations of those involved; Phase 2: investigating participants' experiences with the integrated approach to PD; and Phase 3: examining the impacts of this PD through the teaching and learning of both pre-service and in-service teachers engaged in the collaboration. The chapter summarizes the results of online surveys and focus groups

administered to pre-service and in-service students respectively. It concludes by suggesting that such collaborative PD partnerships could "serve to inspire more university and school board partnership in ESE" (p. 80).

In the fifth chapter, "Activating Teacher Candidates in Community-Wide Environmental Education: The Pathway to Stewardship and Kinship Project," authors **Paul Elliott**, **Cathy Dueck**, and **Jacob Rodenburg** argue that for ESE-TE "to create a truly regenerative future . . . a holistic strategy involving community collaboration with Teacher Education" (Elliott, Dueck, & Rodenburg, 2019, p. 85) is absolutely necessary. They describe a community-wide environmental education program ("Pathways") coordinated between Trent University's School of Education, health and environmental sectors, parents, and a broad spectrum of community groups. The authors have developed a framework of environmental education principles reflecting childhood development stages and age-appropriate "Landmarks" that teachers can monitor. They devote the balance of their chapter to describing the rollout of the Pathways pilot project involving several local community schools. In addition to being exposed to the Pathways framework in their Teacher Education program, teacher candidates have the opportunity to comment on the Pathways program, and observe where feasible, participating school involvement in the program. Although in its early days, one can readily see how such a community-wide approach to ESE provides the important programmatic, philosophical, financial, and emotional support that teacher candidates and early career teachers would benefit from as they begin to infuse their classrooms with ESE. The authors emphasize that teachers are not alone in doing this important work.

In chapter six, "Research Activities of the Canadian Standing Committee on Environmental and Sustainability Education in Teacher Education," authors **Douglas D. Karrow** and **Patrick Howard** summarize past and forecast future research activities of the Standing Committee as an ongoing case study of its activities from 2017 to the present. The chapter consists of a history of the Standing Committee's research activities, a literature review comparing the Standing Committee's ESE-TE research with international approaches to ESE-TE research, the identification and prioritization of the Standing Committee's future ESE-TE research agenda, and a model for developing a research agenda among Standing Committee ESE-TE stakeholders. The authors begin by providing a history of the Standing Committee from 2017 to today, highlighting specific actions that have materialized as a result of the coordinated efforts of Standing Committee members, e.g., see: http://eseinfacultiesofed.ca/. In their conclusion to this first section, the authors outline the specific funding for which a Working Group of the Standing Committee has been applying in order to create a Teacher Environmental and Sustainability Consortium. The second and third sections of the chapter provide a literature review of international ESE research. As there is no comparable literature review for ESE-TE research in Canada, these sections anticipate what research gaps may exist between the field and its sub-field. The

remainder of the chapter is suggestive and anticipatory of future Standing Committee research priorities. In the final section of the paper, the authors outline a model (Foster et al., 2018) for developing a consensus among Standing Community stakeholders for an ESE-TE research agenda.

And finally, in the last chapter—"Wilding Teacher Education: Responding to the Cries of Nature"—**Bob Jickling** and **Sean Blenkinsop** make a powerful argument for revisioning Teacher Education and, furthermore, education as a whole. They pose two questions at the outset to frame the discussion: *What will it take to nurture healers and restorers of the earth?* And second, *What holds us back?* Their unqualified answer to these questions comes in the form of a radically different pedagogy, or "wild pedagogy" that seeks its inspiration from the vast array of teaching/learning experiences outside and beyond formal schooling. To this end they offer tentative answers to the question asked at the outset by outlining two "Teacher Education touchstones." The first is "Learning That is Loving, Caring, and Compassionate." To outline this touchstone, the authors consider the first-hand experience of Arne Naess, Aldo Leopold, and Rachel Carson, who each demonstrate, in contrasting ways, how early life experiences were fundamental in developing personal care, compassion, and love. Concluding their explanation of this touchstone, the authors develop an impressive list of "intertwined traits" and their educational implications for teacher educators. A thoughtful set of ensuing questions for prospective teacher educators and teachers to consider during their daily activities as pedagogues concludes the section. The second touchstone is " Expanding the Imagination." To develop this section, the authors explore the role of what they term "the self-limited imagination"—a "cultural constraint" making it difficult to imagine alternatives (Jickling & Blenkinsop, 2019, p. 131-132). As with the first touchstone, the authors conclude with several provocative questions for the pedagogue to consider during their daily practice. The authors conclude by arguing that a final appeal to deans of education and other leaders in the field to support "wild pedagogies" will be necessary to support teacher educators and the teachers themselves in "wilding Teacher Education."

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Environmental and Sustainability Education Pedagogical Approaches in Pre-service Teacher Education

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Abstract

This qualitative case study examines the effectiveness of environmental and sustainability education (ESE) pedagogical strategies used in two Université de Saint-Boniface pre-service teacher education Curriculum and Instruction courses. The methods used to teach these ESE pedagogical strategies are described. Findings from interviews with former students regarding their perspectives on the effectiveness of these strategies and how they are applying similar strategies in their teaching are presented. Findings suggest that these ESE pedagogical strategies are effective. Questions about efficacy of these strategies, the limitations of their implementation, and the study itself are reflected upon. This study contributes to Evans et al.'s (2017) call for empirical research into the effectiveness of ESE pedagogies and a critical reflection of such research by the researchers.

Résumé

La présente étude de cas qualitative examine l'efficacité des stratégies pédagogiques employées en éducation à l'environnement et au développement durable dans deux cours en enseignement et programmes d'études offerts aux étudiants en enseignement de l'Université de Saint-Boniface. L'article décrit la manière dont ces stratégies pédagogiques sont enseignées et présente les conclusions des entrevues réalisées auprès d'anciens étudiants dans le but de recueillir leurs points de vue sur l'efficacité de ces stratégies et la manière dont ils les appliquent dans leur pratique. Selon les observations effectuées, ces stratégies pédagogiques d'éducation à l'environnement et au développement durable semblent efficaces. L'efficacité et les limites de la mise en œuvre de ces stratégies, de même que l'étude en tant que telle, font également l'objet de réflexions. La présente démarche s'inscrit à la suite des travaux d'Evans et collaborateurs (2017) sur la nécessité de mener des recherches empiriques pour évaluer l'efficacité des stratégies pédagogiques d'éducation à l'environnement et au développement durable et pour poser un regard critique sur le travail des chercheurs dans ce domaine.

Keywords: education for sustainability in faculties of education, pre-service teacher education, ESE in higher education

Mots-clés : éducation au développement durable dans les facultés d'éducation, formation des enseignants, éducation à l'environnement et au développement durable dans l'enseignement universitaire

Environmental and Sustainability Education Pedagogical Approaches in Pre-service Teacher Education

Environmental and sustainability education (ESE) emphasizes social and environmental well-being. It helps students develop knowledge, attitudes, and values so that they can become responsible, active citizens that contribute to a sustainable future (Inwood & Jagger, 2014; O'Brien, 2016). As stated by Block, Sims and Beeman (2016), "[T]eacher education can be instrumental in developing values and practices so that teacher candidates may develop pedagogical approaches that support a transition towards sustainability (UNECE, 2012)" (p. 128). ESE is influenced by various learning traditions that share a belief in promoting a more sustainable and equitable world for all living beings on this planet, such as environmental education, sustainability education, eco-justice education, Indigenous education, and peace education, among others (Anderson, Chiarotto, & Comay, 2018; Karrow, DiGiuseppe, Elliot, Gwekwerere, & Inwood, 2016).

In 2017, Evans, Stevenson, Lasen, Ferreira, and Davis wrote that though sustainability may be mandated within school curricula, ESE is not a mandated component of pre-service teacher education in most countries. Their recent literature review on programmatic approaches finds that:

> There are four key approaches used to embed SE [sustainability education] in pre-service teacher education: (1) across whole curriculum areas, courses or an institution; (2) through dedicated core/compulsory subjects; (3) a component of a core/compulsory subject; or (4) a dedicated elective subject. (p. 411)

In terms of pedagogical strategies used to embed ESE into pre-service teacher education, Evans et al. (2017) identify: "place-based, experiential and/or inquiry methods, and modelling strategies for teaching SE that student teachers can apply in schools" (p. 412). These pedagogical strategies include: "discussion and reflection techniques . . . ; brainstorming . . . ; concept mapping . . . ; place-based outdoor experiences such as field investigations/inquiries or projects . . . ; values analysis; role plays . . . ; problem-based inquiries . . . and problem solving activities" (p. 412). Despite these programmatic and pedagogical strategies used to embed ESE in pre-service teacher education, the reviewers critically note that while "authors report the use of a diverse range of pedagogical strategies . . . they offer little or no critical reflection upon, or evaluation of, these strategies and approaches in terms of their effectiveness in developing the knowledge, skills, values and dispositions required to implement SE" (pp. 413–414). It is this particular finding that provides an important motivation for our research.

Purpose of the Study

Evans et al. (2017) identify a need for empirical research that evaluates the effectiveness of ESE pedagogical strategies used in pre-service teacher education

programs, as well as a critical reflection on this research. To address these needs, our case study examines and critically reflects on the effectiveness of various ESE pedagogical strategies used in two Curriculum and Instruction (C&I) courses in the pre-service teacher education program at the Université de St. Boniface in Manitoba. The study's specific research questions are: i) What are former students' perspectives on the ESE pedagogical strategies used in these courses? and ii) What are their experiences incorporating these strategies in their classroom teaching? These research questions address Evans et al.'s (2017) effectiveness challenge. In the discussion section of this paper, we will address the critical reflection challenge that Evans et al. pose.

ESE Pedagogical Strategies Used in the Pre-service Teacher Education Program

As part of their pre-service teacher education program, study participants had taken curriculum and instruction (C&I) courses in their teachable subjects. Some had taken the C&I Social Studies (Secondary) course (taught by Sims), while others had taken C&I Science (Elementary, Secondary) courses (taught by Asselin). In the following section, we describe the ESE pedagogical strategies that have been used in these courses for the last five years.

The C&I Social Studies (Secondary) Course

In this course, ESE pedagogical strategies are organized into two major assignments intended to model and explicitly teach these strategies to students.[1] Initially, the focus is on using community-based teaching strategies: walking about the neighbourhood as well as brainstorming not only how community, environmental spaces can serve as settings for learning but also how these proposed ideas relate to curricular expectations. For the first assignment, students teach a curriculum-related lesson that integrates local community-as-classroom (Block et al., 2016; Sims & Falkenberg, 2013). Following the lesson, all students analyze how the lesson's activities reflect key ESE strategies as outlined by Kozak and Elliot (2011): learning locally; being integrated and making real-world connections; considering alternative perspectives; learning inquiry-based strategies; providing opportunities to act on learning; and sharing responsibility for learning with students. We discuss how their proposed activities could be adapted to other situations. We also visit educational community-based resources/sites of their choice (e.g., Manitoba Museum) to learn about programs offered at those sites.

The second assignment focusses on engaging students in inquiry-based strategies (Chiarotto, 2011). We use strategic planning and essential questions[2] (Wiggins & McTighe, 2005) to guide learning. To develop skills related to facilitating inquiry-based learning, students are taught how to generate and refine

critical questions and then how to do research with pupils. Specifically, students must plan a curricular unit: they must propose learning-focussed activities that allow for students to explore essential questions coherently and must provide opportunities for meaningful experiences, inquiry-based activities, and opportunities to act upon learning. As part of this process, students must outline how they would facilitate an inquiry-based research process that would be guided by their pupils' questions. Throughout this process, students are invited to connect curriculum to real-world environmental and sustainability issues.

The C&I Science (Elementary and Secondary) Courses

In the C&I Science (elementary and secondary) courses, ESE pedagogical strategies are explicitly taught, and students are asked to practice them. Students learn to use their community and environment as a context and source for experiential learning by participating in field trips. The focus in these courses is on learning why, how, and when it is appropriate and valuable to use field trips for science learning. Experiential learning through scientific experiments is used to enhance students' scientific literacy, curiosity, and engagement. When they are linked to an inquiry process and when real-world connections to multi-faceted science-technology-society-environment issues are made, these experiential learning strategies provide students with opportunities to ask questions and try to find answers in the laboratory and environment (Manitoba Education, Citizenship and Youth, 2006).

Methodology and Methods

This study used an embedded, single-case design with the two courses as the two units of analysis within the single case (Yin, 2009). A purposeful sampling procedure was used to identify study participants. To provide a broad range of perspectives, we invited former students who had taken at least one of the above-described courses within the last five years and who are now teaching in the Manitoba school system. In total, 17 former students participated. Of these, 8 had taken the Social Studies course, 6 had taken the secondary Science course, and 3 had taken the elementary science course. Of the 17 participants, 4 are teaching in their first year, 6 are teaching in their second year, 3 are teaching in their third year, 1 is teaching in their fourth year, and 3 are teaching in their fifth year. Of all participants, 3 have taught (or are currently teaching) early years (Grades K–4), 5 have taught middle years (Grades 5–9), and 10 have taught in senior years (Grades 10–12).

The participants were interviewed in French, in person or by phone, between November 2017 and February 2018, using semi-structured interviews. Organized according to the two research questions, interview questions were tailored to the different C&I courses to explore specific ESE pedagogical

strategies: i) facilitating community-based strategies; ii) encouraging inquiry-based learning and making real-world connections; iii) applying and acting on learning; and iv) sharing responsibility for learning with students. Interviews were transcribed for later analysis.

Data analysis consisted of coding and interpretation processes (Cohen, Manion, & Morrison, 2018). Initially, data was analyzed for evidence of emergent themes. Then, each interview was coded according to these identified themes. Larger domains of analysis were framed by the two research questions. Atlas-ti, a qualitative data analysis software program, was used to select and code data segments, create memos, and build families of codes based on the themes that emerged from the data.

Results

The results section describes research participants' perspectives on specific ESE pedagogical strategies that are used in the C&I courses. This is followed by an exploration of the degree to which participants have applied similar strategies in their own teaching. The results are organized around dominant themes that emerged when analyzing the data. However, participants' quotations are rich texts, often inclusive of various themes. These quotations represent majority viewpoints unless otherwise indicated. Upon participant request, real names were used unless otherwise stated. Participant quotations were translated from French by the authors.

Participants' Perspectives on the ESE Pedagogical Strategies Used in the C&I Courses

When analyzing results, it quickly became apparent that participants were most interested in sharing their perspectives on the community-based, experiential, and inquiry-based strategies used in the courses. These experiences were the most memorable for them and the most transformative in their perceptions of possibility in their practice. Honouring their experiences, results are organized as follows: i) perspectives on learning community-based strategies; ii) perspectives on inquiry-based learning and making real-world connections; and iii) general recommendations for the C&I courses.

Learning community-based strategies. A major focus in the C&I Social Studies course is to experientially teach—and have students practice with each other—how to meaningfully integrate the local community into learning experiences. Significantly, seven of the eight participants stated that this approach was new to them, one said she learned it from her cooperating teacher (a former Social Studies C&I student), and four stated that this was the first time they had gone outside of the conventional classroom to learn.

Seven participants from the C&I Social Studies course remarked that this kind of pedagogical approach had to be lived to be conceived, that is, that they needed it modelled in order to imagine it for their teaching situations. For example:

> We have to live it . . . we're not going to know how to do it with our pupils if we just learn it theoretically. If we hadn't actually gone outside, I never would've thought of doing something outside. It allowed us to think about the possibilities we have. (Stephany)

Natasha revealed how these C&I activities taught her a theoretical and practical structure for integrating her pedagogical practice with the community:

> Learning how to teach in the community helped me understand how young people can relate/build relationship with people in the community, either people coming into the classroom or kids going to the community. . . . You just have to show kids how to do it. Without this course, I wouldn't have known how to do it. (Natasha)

Six participants stated that this enlarged, or transformed, their concept of what "teaching" means. For instance:

> I discovered the possibility and importance of getting outside the classroom . . . it was very interesting, engaging. The projects made me realize that there are different possible approaches with which one can play. . . . The course enabled us to get out of the classical vision with which we've been taught. . . . It's a method you have to learn, for which you have to have some permission to practice. . . . It gives us the courage to try, it opens our eyes to what is possible: we must see an example to follow it. (Meghan)

Interestingly, this sentiment of needing courage or permission to teach in this non-conventional way was echoed by five of the seventeen participants.

With respect to learning *how* to use community-as-classroom, all eight participants from the C&I Social Studies course stated that having this strategy modelled and then creating and experiencing others' activities enabled them to learn, or deepen, their understanding of this concept. Imagining how to adapt these activities for different contexts and levels was useful for many participants. Learning the appropriate administrative steps to take pupils outside (e.g., the permission process needed to leave school grounds) was identified by one participant as useful.

In the C&I Science courses, as in C&I Social Studies, field trips to educational sites (e.g., FortWhyte Alive, St. Boniface Hospital Biolab) are used to learn how these kinds of resources could be employed to enrich and often contextualize students' teaching of (scientific) concepts. All nine participants from the C&I Science courses stated that visiting these sites and experiencing the programming offered made it easier to use these resources and others like them in their teaching. For example:

We visited FortWhyte, I saw everything that they offered. It's easier as a teacher afterwards because you're already familiar with the site and programs, you take fewer risks. (Annick)

Overall, all participants from the C&I Science courses felt it was valuable to see examples of what a field trip might be for different subject areas. One participant commented on the value of experiencing what their pupils would experience. All seventeen participants highlighted these field trips and community experiences as very memorable and engaging.

Inviting guest speakers is another way to integrate the community into classrooms. Examples of what this might look like when teaching Social Studies and Science are explored in the C&I courses. Certainly, participants would have experienced this through previous education courses, notably when discussing sensitive and complex issues in courses (e.g., colonization and its impacts, LGBTQ issues). In having been exposed to alternative, authentic, informed perspectives, participants, particularly those teaching middle and senior years, commented that they learned the value of, and need for, hearing various perspectives when facing complex issues. They recognized that providing similar opportunities was important for developing critical thinking skills in their pupils.

Inquiry-based learning and making real-world connections. In the C&I Social Studies course, teaching inquiry-based strategies focus on developing critical thinking and research skills and are accompanied by learning to plan, guided by curricular outcomes as framed by essential questions.

Participants said that learning how to explore topics in this broad, integrated way was valuable as it helped them be more organized in facilitating learning that was guided by pupils' questions. For example:

The C&I course made me better at grouping things together, organizing objectives into different steps. . . . The project we did led me to understand that it's not just the teacher giving material and pupils creating something from it, but rather getting pupils to look for their own answers. We must be facilitators as much as teachers. (Rachèle)

All participants, to different degrees, recognized that providing opportunities for inquiry-based activities engaged their pupils meaningfully in the learning process. Participants commented that bringing in a Social Studies teacher "from the trenches" to share how she facilitates an inquiry process with her pupils was worthwhile.

In the C&I Social Studies course, part of sharing the responsibility for learning involves students taking leadership roles, teaching each other, and sharing resources. A key aspect of this inquiry-based, focussed planning assignment is having students share and analyze each others' proposed plans.

In the C&I Science courses, Asselin approaches the inquiry process in a few ways. First, at a broad level, in the secondary-level course, she discusses how to integrate research on science-technology-society-environment issues into students' teaching. For example, she explores with the students the importance

of developing a scientific culture with their pupils, so that one day, as citizens, the pupils can make informed decisions about various subjects. Asselin suggests age-appropriate ways to guide learning so that pupils can ask critical questions and explore research topics related to pressing socio-scientific issues, such as climate change, environmental conservation, and health. When queried, all of the participants in the C&I Science courses recommended that she continue conceptualizing science learning within broader societal issues as they found this to be an important part of their learning experience. Of the seventeen participants, four commented that, time permitting, the learning of this concept could be further enriched if students were to receive even more concrete examples and if they were to be given a course assignment based on it.

Second, doing experiential learning activities (e.g., experiments, dissections, demonstrations) in the courses shows students how hands-on activities can help their pupils' understanding of scientific concepts and can contribute to scientific curiosity. All participants from the C&I Science courses commented that they found it very useful to plan, prepare, and share an experiment with their class colleagues as it made them more confident and gave them practical ideas and resources that they now use in their teaching. For instance:

> Having to prepare an experiment . . . seeing that I'm able to do research, finding something that works . . . that was encouraging. I think that actually experiencing/living the demonstrations, others' experiments, reinforces the value of experiments. (Jaclyn)

General recommendations for the C&I courses. General recommendations by participants were to continue teaching in this aforementioned way and to make sure to: i) explicitly stress the importance of ESE, reminding students that we educate within the larger context of creating responsible citizens; ii) give many practical examples and resources; and iii) explore how to adapt these strategies for different age groups and environments (urban, rural).

Overall, all seventeen participants found that the ESE pedagogical strategies taught in the C&I courses have been worthwhile for them. In what follows, examples of how these former C&I students are integrating these ESE strategies into their teaching practices are shared.

Participants' Experiences Incorporating These ESE Pedagogical Strategies Within Their Teaching

When participants were queried as to how they are using these ESE pedagogical strategies in their teaching practices, their examples show that they are integrating these strategies in various ways. Reflecting themes that emerged during data analysis, results are organized as follows: i) examples of community-based learning, providing opportunities to act; ii) facilitating experiential, inquiry-based learning; iii) importance of relationships; iv) sharing the responsibility of

learning with pupils; and v) constraints or challenges to integrating ESE pedagogical strategies.

Community-based learning, providing opportunities to act. Participants are using their local natural and built environment and community as learning contexts in various ways in Social Studies, Science, and other classes. All participants shared how they take pupils outside to learn. Examples of participants using specific locations and events to explore topics include:

Social Studies (high school):

- Walking to school division's outdoor classroom, settling into the tipi, making a fire, preparing bannock. "The pupils loved it! They saw a real tipi after learning in class how to build one" (Meghan).
- Going to St. Boniface archives to study primary sources.
- Going to Brookside Military Cemetery where "we were greeted by five veterans. . . . The kids wanted to continue talking to them, it was concrete, human" (Meghan).

Science:

- Going to Planetarium, Science Gallery. "The kids were so invested. We've lots of newcomers, it's so amazing to see their faces, kids who've never done something like that before" (Janelle; Grade 2).
- Retrieving samples for testing from the outdoors. "At Oak Hammock Marsh we took water samples to see the different organisms. . . . In the lab, we did lots of tests: pH, oxygen content . . . : it was really cool. In the afternoon, we snowshoed/hiked to observe different animal tracks" (Kelsey; Grade 10 Ecology).

Math (high school):

- Visiting FortWhyte to measure trees using trigonometry.
- Creative planning. Stephen plans to create an escape room to promote critical thinking, group work.

Work-life (high school):

- Going to the mall to explore different jobs: "each place welcomed us with open arms . . . the pupils really enjoyed it" (Phil).

Media Studies (high school):

- In Stephany's class, walking around their Francophone town to look at types of advertising, languages used (English/French). In December, going to Operation Red Nose (bilingual) press conference before beginning a journalism unit.

Some former students undertake activities outside, where the environment (soil, snow, river) becomes part of the learning experience. (See examples

below.) Others participate in activities that otherwise they could do inside a conventional classroom (e.g., play language games).

- Going outside to create art with what could be found in nature (Danya; Grade 6).
- Planting the *three sisters* (squash, corn, beans); comparing Indigenous agricultural systems with imported European ones.

> Outside, getting kids to work the soil, for some it's a first . . . some are totally disconnected from nature. . . . Seeing this ancient practice, better in terms of respecting the earth, is something that I find important; . . . kids need to practice what they're learning, it's the best way to learn, it makes teaching more interesting. (Meghan; History 11)

- Walking along the Seine River, observing flora and fauna, appreciating nature, studying ecology (Phil; Science).

For participants, the benefits of learning in and from the community and the environment are numerous. These include pupils being able to live and witness concepts in environments where they genuinely occur, which pupils find engaging. As one participant noted:

> Getting out of the classroom is more inspiring, it's better for creativity. Outings allow us to see unknown facets of some young people, sometimes who might be a little difficult in class, they give you a chance to create a bond that would be impossible to make in class. (Annick)

Their numerous examples, of which only a sample could be included here, show how these experiential, community-based strategies are transferable to teaching all sorts of things. Their words attest that community members are willing and even enthusiastic to participate in the learning process.

All participants invite community members to speak to their pupils. In their interviews, they explained how these guests allow for broader discussions to occur, exposing pupils to alternative perspectives. For example:

> Inviting people from the community . . . was always something special. Normally they arrived with tools of their trade . . . the paramedic arrived with his ambulance bag-of-things, the young people get on board very quickly. (Phil)

The role of the community is also evident when it comes to pupils being able to act upon their learning, an important part of ESE. Occasions for pupils to act upon their learning often, if not always, occur in human or natural environments; examples of these include: trying to influence their school community itself (e.g., awareness-raising campaigns around recycling or bullying) or trying to contribute with the more general public (e.g., community improvement initiatives, fundraising for disaster relief). One participant identified this step to act-on-learning as challenging.

The authenticity of learning in and from the community can be used to influence pupils' sense of identity and agency. Many participants noted that a fundamental part of learning in and from the community is relationships. Meghan, Natasha, Rachèle, and Stephany all talked about how living meaningful experiences in a French community helps pupils—both immersion and Francophone by birth—develop a Francophone cultural identity and a sense of belonging. These experiences include volunteering with recently-arrived Francophone refugees, participating in the Francophone improvisation league, participating in the Conseil Jeunesse Provincial, and writing letters in French to municipalities and organizations. This building of relationships, and how it contributes to the development of a francophone cultural identity and a sense of belonging, are key factors for ensuring the longer-term viability of our minority Manitoban Francophone community.

Facilitating experiential, inquiry-based learning. For teaching concepts at all levels, all participants from C&I Science courses use experiential and hands-on activities, such as experiments, dissections, and technological problem-solving (design process).[3] They notice that these pedagogical strategies help their pupils better understand concepts and enhance their scientific curiosity. They also observe how highly motivating these strategies are. One participant, who is now teaching middle years, talked about how she links brain development with adolescent well-being, a prevalent concern for her. Activities include doing a brain dissection with Biolab, building a model brain for their classroom, and doing workshops on anxiety (facilitated by the guidance counsellor). Other examples of applying experiential strategies to Science teaching include: hypothesizing and experimenting if air takes up space (Janelle; early years); exploring a unit on optics by using mirrors, light, colours, and by doing an eye dissection (Melissa; middle years); doing experiments on the five types of chemical reactions (Kelsey; senior years).

Relating science issues to society, many participants—particularly those teaching at middle and senior years—explicitly discuss ethical concerns pertaining to science with their pupils. For example, one participant does debates on biogenetics, organ transplants, and other ethical issues with her biology class. Miguel, a high school teacher, discusses questions about "designer babies" in genetics; when discussing ecosystems, he talks about ethical and human implications of climate change, exploring what we can and should do to help those affected.

In their Social Studies and Language classes, many participants use age-appropriate simulation games, role-playing and debates to explore multiple perspectives on, and impacts of, historical events, topics, and current issues. These activities are experiential and provide opportunities for pupils to explore topics about which they are interested. Examples participants gave included: engaging in role-plays where pupils choose a stakeholder or affected group, research that perspective, and argue and present it; doing activities such as Kairos' blanket exercise, which presents Canadian colonial history from Indigenous

perspectives; and debating controversial real-world issues chosen by the pupils. Participants do research projects for which their pupils choose topics, create guiding questions, research these questions, and share their findings.

Importance of relationships. A fundamental underlying aspect that emerged during initial interviews was the importance of establishing healthy relationships to integrate these ESE pedagogical strategies and topics in a meaningful way. As is true with university-level learning contexts, participants stated that good, respectful relationships between teachers and pupils, and among pupils, help create healthy, safe, positive learning environments. Within these environments, diverse perspectives are more likely to be shared, which in turn enriches discussions and deepens understanding about complex issues. Three participants explained how good relationships with pupils enable teachers to tailor learning to meet pupils' needs and interests. Natasha said: "Without a relationship of trust, learning won't go far. We need to know our young people's interests to be able to get them involved." These three participants were not alone in feeling that fostering good relationships helps to provide meaningful learning experiences for pupils. Positive relationships with people and places in community help facilitate collaborations and, as Rachèle and Meghan noted, are more likely to result in getting their pupils to care about issues: "how can you feel concerned about something if you've no connection with it?" (Rachèle)

Sharing the responsibility of learning with pupils. Participants often share the responsibility of learning with their pupils. This sharing of responsibility is manifest in many ways depending on grade level and subject area. For co-constructing curriculum, nine participants provided examples where pupils have voice as to the topics to be explored. As for evaluation, seven participants shared, through discussion with their pupils, how they determine evaluation criteria, course content, forms of representation, and assignment due dates. Five participants explained how they create class rules and decide on classroom-management strategies together with their pupils.

Overall, participants communicated that when they teach in this sharing-responsibility way, their pupils are more engaged and more motivated to learn, resulting in a positive learning environment with fewer classroom-management problems. They remarked that this sharing of decision-making often makes pupils feel more responsible for their learning.

Constraints or challenges to integrating ESE pedagogical strategies. Not surprisingly, participants identified challenges that inhibit teaching in the aforementioned ways. These include logistical constraints (e.g., lack of time, finances, transportation, supervision, cumbersome administrative process) and limited access to certain resources and opportunities (e.g., lab equipment, supplies; French-language programming at educational sites). Contextual challenges include physical proximity to sites, resources, and teaching in an unsupportive climate (e.g., resistance from parents and/or

administration; school having other priorities). Participants identified pupils' lack of readiness as a potential challenge for discussing certain topics. Four participants described how the breadth and diversity of pupils' abilities and maturity within a specific grade level sometimes make it challenging to create appropriate, engaging activities for all learners. Three participants commented that classroom management could be more challenging in less-structured environments, such as when teaching in community settings. Depending on grade level, a particular curriculum might lend itself more or less easily to teaching certain topics.

Discussion

Different scholars have identified certain ESE pedagogical strategies as particularly impactful in pre-service teacher education in terms of their influence on students' future teaching practice: experiential, community-based, and inquiry-based strategies (e.g., Evans et al., 2017; Inwood & Jagger, 2014; Karrow et al., 2016). These strategies are intentionally used in the C&I courses taught by Sims and Asselin, and the research study presented here suggests that, at least in the perception of the study participants, the way these strategies were used when the participants were enrolled in these courses had an overall positive impact on the participants' actual teaching practice. In this section, we discuss what the study findings contribute to the effectiveness question posed by Evans et al. (2017). We then discuss the research findings in light of existing scholarship to address Evans et al.'s (2017) critical reflection question.

The Effectiveness Question

In this section, we discuss the effectiveness of the use of the described ESE pedagogical strategies in the C&I courses in terms of influence on participants' understanding of teaching and learning of Social Studies and Science and on their use of these pedagogical strategies in their own school teaching.

Overall, results suggest that modelling, providing opportunities to practice the strategies through planning, experimenting, and facilitating community-based activities helped participants gain knowledge, skills, and confidence in their application of these strategies and in exploring how to innovate with these strategies in different contexts. These findings parallel the benefits suggested by Inwood and Jagger (2014) and Evans et al. (2017) for these ESE pedagogical strategies.

All seventeen participants remarked that community-based strategies, in particular, were memorable and impactful. These research findings support Kozak and Elliot's (2011) and Inwood and Jagger's (2014) assertion that experiencing community-based strategies and going *outside* the conventional classroom open up possibilities previously unimagined by participants. For six participants, doing so opened up their concept of what "teaching" means. Far

from simply delivering curriculum, they learned that they could be positive influences on pupils' lives, on the viability of their community, and on their environment. Inwood and Jagger (2014) write that "including experiential forms of learning in initial teacher education . . . takes a more holistic approach that involves 'the heart, the hands, the head and the spirit' in learning" (p. 33). Community-based strategies engender hope (Block et al., 2016) and, as our own findings suggest, are enjoyable and interesting to live.

Regarding the efficacy of ESE pedagogical strategies used to teach inquiry-based learning, results show that they did facilitate student learning. Particularly effective in the C&I Science courses were experiential learning activities, including modelling scientific experimentation.

Learning to use the local community and its environment as sources and contexts for learning resonated with participants. The numerous examples they provided speak to how they are using these community-based strategies in their teaching to: reinforce/present concepts with experiential learning; explore complex, real-world issues leading to learning about how our communities and society work (Kozak & Elliot, 2011).

For developing the specific skills (e.g., critical thinking, research) necessary to support inquiry-based learning (Chiarotto, 2011), greater attention could be placed on teaching students how to generate and refine critical questions. Findings from this study clearly show that experiential activities are effective in facilitating longer-term learning. Consequently, specifically in the C&I Social Studies course, more experiential activities could be incorporated into teaching inquiry-based processes, for example practicing observational skills outdoors.

Reflecting on the importance of providing opportunities for students to apply and act on learning, perhaps an aspect that makes these community-based and inquiry-based strategies impactful is that they lead to a sense of agency, providing opportunities for students to act on issues they care about through their professional practice. Influencing their pupils' sense of identity and belonging by enabling meaningful experiences in Manitoba's Francophone community is evidence of such action. As two participants (Rachèle and Meghan) observed, if you have connection with something, you will care and do something about it.

Relationships emerged as an important theme in terms of the efficacy of these strategies. Jickling, Blenkinsop, Timmerman, and De Danann Sitka-Sage (2018) call for teacher education that involves learning that is loving, caring, and compassionate so that humans may develop rich relationships with each other and with members of the more-than-human world. They argue that these relationships of reciprocal care would be part of overcoming the alienation that exists between many humans and the natural world. Participants such as Annick, Janelle, Phil, and Rachèle, amongst others, shared that using these ESE pedagogical strategies can contribute to the building of these healthy relationships. As testified by participants, in using experiential, community-based, inquiry-based strategies, teachers and learners can discover

different facets of one another; learning can be tailored according to learners' interests creating positive, respectful learning environments that contribute to the sharing of diverse perspectives. As a result, learners are more engaged in the learning process. For some participants, such as Natasha and Meghan, witnessing the communities' openness to collaborating with pupils has been profoundly inspiring and meaningful for them as educators as it has been for their pupils. Responding to Jickling et al.'s (2018) call, examples such as meeting veterans, Indigenous Elders, and scientists can lead to building understanding and empathy.

UNECE (2012) provides certain recommended competencies for educators in ESE. Learning the aforementioned ESE pedagogical strategies helped with the development of these competencies. For instance, participants' used the ESE strategies to: create opportunities for sharing diverse perspectives and experiences; connect learners to their local, global spheres of influence; and use their natural, social, and built environments as contexts for and sources of learning. Participants' words and actions show that they learned how to be facilitators and participants in learning processes. The breadth of how they have applied their learning in their teaching contexts shows creativity, innovation, and a commitment to engaging in ESE.

The Critical Reflection Question

First, the study itself raises the methodological question of the limitations of the findings. While a range of former students were invited to participate in the study, participants self-selected themselves into the study. Former students who did not work as teachers did not qualify for the study, and some potential participants might have decided not to participate because they did not find the employed ESE pedagogical strategies particularly effective for them. Furthermore, the study was designed to exclusively explore former students' *perceptions* of the strategies and their impact on their learning and own teaching practice.

Second, the findings on the first research question provide for some critical reflections on the use of the ESE pedagogical strategies used in the C&I courses that this research studied. Participants recommended a more extensive exploration on how to frame curriculum that uses an environment and sustainability lens during the C&I courses. Indeed, this would be beneficial as it could help clarify broader purpose within their professional practice, exploring how students could meaningfully contextualize specific (often locally-relevant) subjects within larger, pressing real-world issues (e.g., climate change, biodiversity loss, mass migration). For the C&I Science courses, this could mean deeper engagement with how to contextualize scientific learning with science-technology-society-environment issues. For the Social Studies course, this could involve a greater focus on the environmental and social impact of human behaviour. As one participant's challenge suggests with regards to the step to

act-on-learning, providing concrete examples of what the implementation of particular strategies looks like, and how they translated to opportunities for pupil action, could help students better imagine possibilities. The responses by participants to the first research question demonstrate that it is not possible to talk about the effectiveness of a particular ESE pedagogical strategy, but that one always has to consider how a specific strategy was implemented, which is in itself situational and always idiosyncratic.

Third, the claim of the relative effectiveness of the ESE pedagogical strategies needs to be seen in light of the challenges that participants face in their teaching context. Almost a third of them expressed a need for encouragement or permission to use ESE pedagogical strategies, particularly community-based ones, in their teaching. This finding is not surprising considering the current educational climate, which includes an emphasis on test scores, a reluctance to teaching controversial issues, and a long history of teachers shaping classroom practices based on perceptions of community values (e.g., Chikoko, Gilmore, Harber, & Serf, 2011; Evans et al., 2017). Consequently, it is important for pre-service teacher education courses concerned with ESE pedagogical strategies to inform students of supportive existing policy (e.g., Manitoba Education, 2016), provide theoretical foundations for integrating ESE pedagogical strategies, and explore how to negotiate the potentially delicate space of integrating ESE topics and pedagogies so that they can respond if and when faced with resistance.

As participants' responses demonstrate, one of the biggest challenges in implementing certain ESE pedagogical strategies, particularly community-based ones, is teachers' ability to adequately accommodate the diverse needs of learners and manage pupils' behaviour in less-structured environments, both of which are integral to the proposed ESE pedagogical strategies. ESE-focused pre-service teacher education courses cannot be ignorant about this challenge; they need to address these concerns about physical and pedagogical challenges head-on. For our C&I courses, that could mean, for instance, teaching students how to plan integrating concepts from the Universal Design for Learning, described as a proactive method for designing and delivering flexible approaches to teaching that address student diversity (Meyer, Rose, & Gordon, 2014).

Conclusion

It has been affirming to us as teacher educators to see that what we considered and observed anecdotally to be effective strategies are indeed effective in the sense that our students (at least those that participated in the study) are applying similar strategies in their teaching. In times where global news is so bleak (e.g., Worldwatch.org), this is wonderfully inspiring and hopeful. It inspires us to be more creative and critical in our thinking, and to go deeper with ESE

concepts in our practice. In particular, it inspires us to make community-based learning as inclusive as possible and to further develop opportunities to act on learning through environmental stewardship and activism (Anderson et al., 2018; Block et al., 2016; Inwood & Jagger, 2014). These pedagogical strategies facilitate relationship building with communities and places; they help develop love and empathy so that we all contribute to the well-being of all, forever; they provide opportunities to hear a variety of perspectives on multiple issues; they promote curiosity and develop skills necessary to pose critical questions and to do research that can lead to informed action. All of these are essential in learning to deal with the complexities of the environmental and sustainability issues we face.

This case study contributes to Evans et al.'s (2017) call for empirical research into the efficacy of certain ESE pedagogical strategies used in pre-service teacher education by examining the longer-term impacts of the use of these strategies in Social Studies and Science C&I courses.

Notes

[1] Herein, the term "student" refers to university-level learners and the term "pupil" refers to K–12-level learners.
[2] Wiggins and McTighe (2005) propose using "essential questions"—ones aimed at stimulating thought. These provoke inquiry and become a means of addressing questions central to understanding key issues.
[3] Technological problem solving seeks solutions to practical problems. It requires the application of scientific knowledge in various ways (Manitoba Education, Citizenship and Youth, 2006).

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Pathways, Philosophies, and Pedagogies: Conversations with Teacher Educators About Place-Based Education

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Abstract

Place-based education (PBE) promises greater social and ecological justice at a time of great planetary need. This paper explores the experiences and beliefs of eight teacher educators from Canadian teacher education faculties who were invited to give their perspectives on PBE as they theorize and deliver it in their teacher education programs. Analysis of their interviews identified the participants' pathways to PBE, their terminologies for PBE, their understanding of PBE's purposes, their pedagogical practices, their sense of the structures (systemic attitudes and administrative supports or exigencies) that affect PBE, and their integration of Indigenous knowledges of place. The participants demonstrate a deep philosophical approach to place that could enhance environmental and perhaps Indigenous education more broadly.

Résumé

À une époque où les besoins planétaires sont criants, l'éducation axée sur les réalités locales pave la voie à une plus grande justice sociale et écologique. Le présent article explore les expériences et convictions de huit formateurs qui enseignent dans des facultés d'éducation canadiennes; ils ont été invités à expliquer leur conception de l'éducation axée sur les réalités locales et la manière dont cette notion est abordée dans les programmes de formation. L'analyse de ces entrevues a permis de comprendre l'approche des participants, la terminologie qu'ils utilisent pour définir l'éducation axée sur les réalités locales, leur vision des objectifs poursuivis, leurs pratiques pédagogiques, leur perception des structures (attitudes systémiques et mesures de soutien ou exigences administratives) qui influencent ce type d'éducation, ainsi que leur intégration des connaissances autochtones sur les réalités locales. L'approche philosophique réfléchie rapportée par les participants pourrait bonifier l'éducation à l'environnement et peut-être, de manière plus générale, l'éducation autochtone.

Keywords: place-based education, teacher education, Indigenous knowledges, environmental education, education for sustainability

Mots-clés : éducation axée sur les réalités locales, formation des enseignants, savoirs autochtones, éducation à l'environnement, éducation au développement durable

Introduction: Place-Based Education and Teacher Education

As environmental degradation threatens the ongoing existence of humanity and persistent inequities in education contribute to widening economic disparities, re-evaluating the purpose and orientation of schooling is urgent. However, what is more likely to be evaluated with increasing frequency (as noted by Broadfoot, 1996; Gruenewald, 2003; Webber & Miller, 2016) is student performance on a narrow range of measures, mostly related to literacy and numeracy. Teacher performance is subsequently evaluated on how well their students do on standardized tests. These achievement standards are typically separated from local contexts and wider social and ecological concerns. While acknowledging an increasing corporate orientation to schooling and technical rational approaches to learning, as educators in an institution of teacher education, we are interested in promoting life-affirming pedagogies and practices that engage teacher candidates in the big questions that encourage them to become lifelong learners able to transform the current system of education. Advocates for place-based education (PBE), such as the participants in this study, argue that a re-imagination of teacher education must start with foundational inquiries: What does it mean to be alive in the world? What does it mean to be where you are? What does it mean to learn in relation to the local environment in which one is embedded? These are questions that concern us, and drive us to investigate how PBE is being taken up in teacher education across Canada.

The term "place-based education" entered the education lexicon in the late 1990s. Although it was first introduced within environmental education (EE), it was quickly taken up by the Rural Trust in the United States (Smith & Sobel, 2010) to encourage students to revitalize their local communities (Haas & Nachtigal, 1998; Theobald, 1997). Gruenewald's (2003) pivotal paper invited teachers to include critical pedagogy regarding social justice issues alongside the environmental emphasis that had, until then, dominated PBE. He asserted: "Place . . . foregrounds a narrative of local and regional politics that is attuned to the particularities of where people actually live, and that is connected to global development trends that impact local places" (p. 3). This foundational understanding of place is one we use throughout this paper: A place is any area within the local community that supports student learning about their worlds.

Social and environmental injustices exist in place. Gruenewald (2003) remarked that there was a greater tendency for urban teachers than for rural teachers to take up critical pedagogies that address social injustices. Although there were examples of urban programs that integrated environmental concerns, and of rural programs that took up critical pedagogies for social justice, he noted that these were exceptions. Both goals—social justice and ecological care— are needed in both rural and urban contexts. Framing his critical approach to PBE as decolonization and reinhabitation, he promoted students "learning to recognize the disruption and injury [to place] and to address their causes" (p. 9), thereby working to live well in their places. Similarly, Calderon (2014) noted

that taking up a critical pedagogy of place offered promise for addressing Indigenous issues. In some manifestations, PBE resonates with Indigenous ways of teaching and learning through its focus on community and relationships with the land (Sutherland & Swayze, 2012). However, Tuck, McKenzie, and McCoy (2014) argued, "though earnest in attempts to acknowledge colonial histories of particular places, the place-based and broader environmental education literature has replicated some of the very problematic assumptions and imperatives of settler colonialism" (p. 15). Drawing on the discourse of settler colonialism, Tuck et al. described PBE as a form of colonization, indicating how settler colonialism works by making Indigenous land into settlers' property. In lieu of PBE, Tuck et al. offered a direction for land education: "land education calls into question educational practices and theories that justify settler occupation of stolen land, or encourage the replacement of Indigenous peoples and relations to land with settlers and relations to property" (p. 8). It would seem that PBE and land-based education are built on different ontologies, with PBE emerging from Euro-American ontology and land-based education coming out of Indigenous relational ontology.

Seawright (2014) classified PBE as either liberal (e.g., focussed on individual connection to community); critical (focussed on disruption of the status quo as advocated by scholars such as Gruenewald [2003] and Calderon [2014]); or as situated in Indigenous epistemologies (Cajete, 2005; Coulthard, 2010; Deloria, 2001; Seawright, 2014; Simpson, 2011, 2014). The latter is most often associated with land-based education, which gives primacy not only to relationships with all beings but also to learning from the land (see McCoy, 2014; Paperson, 2014; Simpson, 2011, 2014; Tuck et al., 2014). However, Seawright included land-based education under the general category of PBE, despite Tuck et al.'s dismissal of PBE.

While researchers such as Greenwood (2010a) examined how teacher education programs can generally take up PBE, and Azano and Stewart (2016) explored teacher education courses that focus on place-consciousness, minimal research to date has investigated what teacher education programs do in relation to PBE. Webber and Miller (2016) found very little that specifically addressed PBE within the teacher education literature and noted that Canadian teacher education programs, in general, are organized around disciplinary subject matter and methods of teaching in response to and further entrenched by provincial certification requirements. Integrated, interdisciplinary, experiential, and inquiry-based approaches to teaching and learning—hallmarks of PBE—are difficult to incorporate in such a regimented system. A further difficulty is that PBE encompasses, or is associated closely with, a broad range of educational orientations and practices: rural education, outdoor education, EE, land-based education, community education, service learning, and so on (Greenwood, 2010b; Webber, 2017). It is therefore difficult to assess how PBE is taken up in teacher education programs.

While our interest is primarily in growing the capacity of teacher education and PBE to help people learn to live well in their environments, we note that an evaluation of over 100 American schools with place-based programs concluded that "place-based education fosters students' connections to place and creates vibrant partnerships between schools and communities. It boosts student achievement and improves environmental, social, and economic vitality" (PEEC, 2010, para. 5; see also Howley, Howley, Camper, & Perko, 2011; Powers, 2004; Smith & Sobel, 2010; Sobel, 2004). Notably, schools with place-based programs meet or exceed state-mandated standards in the United States (Demarest, 2015). There exists relatively little research into the state of PBE in formal education programs in Canada.

PBE has the capacity to support students to take environmental action and work toward social justice for marginalized peoples. It has the potential to address issues of reconciliation with Indigenous peoples consistent with the Truth and Reconciliation Commission's Calls to Action (Truth and Reconciliation Commission of Canada, 2015). We are interested in how Canadian teacher educators are taking up this work, their understanding of the philosophy and purpose of PBE, and their experience of the rewards and challenges of PBE as they have infused it in their work. Our research is a preliminary investigation into what Canadian teacher education programs do with respect to PBE and offers the diverse perspectives of teacher educators interested in further animation of the field.

We first address the methods of the research, then present a summary and analysis of the interviews, which helped us understand how some Canadian teacher educators are taking up this work in teacher education programs. Although participants were not specifically questioned about the integration of Indigenous knowledges of place, for some participants their relationship to the original inhabitants was an important aspect of their work. We highlight these Indigenous connections because they align with the need to address Indigenous sovereignty when teachers consider what place means to them and to their students. The experiences of all these teacher educators contribute to a richer understanding of PBE, which can then influence and support Canadian teacher educators in both undergraduate and graduate teaching programs, and in turn will influence the next generation of teachers, school leaders, and teacher educators.

Methods

This paper emerges from a larger mixed methods research project that aimed to understand the current state of PBE in Canadian teacher education programs. For the initial part of the project, we surveyed champions of Place-Based Education. Faculty members were identified through snowball sampling: We invited faculty whom we knew were involved in PBE, and those whom they

believed were champions of PBE, to take the survey. Those surveyed were invited to participate in follow-up interviews, and eight agreed. This paper emerges from the interviews. Participants were sent the questions in advance, and the interviews were conducted individually or in small focus groups by one of three researchers through video conferencing during the summer of 2017.

All participants have been assigned pseudonyms for the purposes of this paper. Alex and Brady were interviewed individually (Transcripts 1 and 2, respectively); Charlie sent an email response (Transcript 3); Dana, Everly, and Finlay were interviewed together (Transcript 4); and Genoa and Hayden were interviewed together (Transcript 5). As much as possible, identifying information regarding the participants has been removed; however, those who work in the field of environmental or place-based teacher education in Canada may recognize some participants; fortunately, participants noted they were not concerned about anonymity. Participants were invited to correct and revise the transcripts for accuracy.

The interviews were qualitative, semi-structured, and analyzed following Braun and Clarke's (2006) recommendations. The conversations reflected the diverse interests and backgrounds of the members of each group. After transcription and verification, the interviews were coded. Throughout the coding process, we used constant comparison (Kenny & Fourey, 2014): when we found a code in one interview, we went back to see if it had been present in prior interviews we had read, and we were sensitive to it appearing in future interviews. We then took the most similar codes and put them into categories. In the following section, we delineate the categories we found: the participants' pathways to PBE; terminologies for PBE; purposes for PBE; pedagogical practices used in PBE; and structures in education and in society that affected faculty ability to incorporate PBE into their teacher education programs. We were alert to instances where participants discussed the integration of Indigenous knowledges of place, which further clarified and animated our interest in its relationship to PBE. In our conclusion we address the question of whether PBE, EE, and Indigenous education might be usefully linked in teacher education programs in Canada. We argue that taking a philosophical approach to PBE is a powerful strategy for supporting teachers in taking up EE and Indigenous knowledges.

The Participants

The participants taught and conducted research in faculties of education in Canadian post-secondary institutions from a variety of regions in Canada. Six of the eight participants were hired in subject area disciplines; the other two were hired for their environmental expertise, one in PBE, and the other in EE specifically. Two worked primarily in graduate education.

Pseudonym	Transcript	Province or region of country	Subject area	Research Interests
Alex	1	Maritimes	mathematics	21st Century Learning, Assessment
Brady	2	Prairies	English	Indigenous education, Curriculum Theory
Charlie	3	Maritimes	English	PBE, bioregionalism, Education for Sustainability
Dana	4	ON	science	EE
Everly	4	ON	science	EE, Land-based Education, PBE
Finlay	4	ON	art	EE
Genoa	5	ON	EE	PBE
Hayden	5	BC	EE	EE

Table 1 Participant Profiles

Findings

Participants' Pathways to PBE

For six of the participants, EE was the pathway to PBE, which fits with the genesis of PBE (Smith & Sobel, 2010). As they discussed their interests and research areas, four specifically noted research in EE, with these four and others mentioning bioregionalism, sustainability, and place-conscious education—all of which are connected to EE. Only two participants did not mention EE as a research area. Brady, while eschewing the moniker PBE, noted: "Curriculum as wayfinding takes human beings as newcomers to these places with the new-comers' responsibility to learn from the places and their inhabitants on how to best live in these places" (Transcript 2, p.1). Her focus on learning from the land, and from the people who had sustained themselves there, suggested an interest in EE, but she did not use this term. Alex, on the other hand, stated she researched 21st Century Learning which, as described in the Framework for 21st Century Learning (n.d.), suggests the skills required for the 21st century are creativity, collaboration, and innovation.

All participants noted taking their teacher candidates to "natural environ-ments," but also, over half the participants identified PBE locations as any place outside of the classroom, natural or built, where student learning might be enhanced. This practice fits with the PBE literature, which emphasizes learning in local places to support students in developing knowledge of themselves, their history, their culture, and of the ecological and social justice issues in their

communities (e.g., Smith, 2002; Smith & Sobel, 2010). The six participants who were subject area specialists were able to draw EE issues and sometimes Indigenous issues into their teaching of their subject area by taking their students to various locations outside of university classrooms.

The ease with which EE could be included in subject disciplines was noted by most of the participants, with Dana wondering how to entice her colleagues into undertaking the practice of taking students out into the local environment. On the other hand, several noted that subject area silos were competition for the creation of courses in EE and PBE.

The pathways considered here are only those of our select sample; it is likely that other PBE practitioners came to the field through other pathways.

Participants' Choices of Terminology

The elasticity of the term PBE is recognized in the literature with community education, outdoor education, adventure education, service learning, and so on, all coming loosely under the umbrella of PBE (Furman & Gruenewald, 2004; Greenwood, 2010b; Webber, 2017). Not all eight champions of PBE who agreed to be interviewed used the term PBE to describe their work, with Brady saying that she did not draw on PBE literature. Brady had reacted against earlier liberal (as described by Seawright, 2014, p. 560) forms of PBE. In contrast to the liberal forms, her uptake of place meant:

> learning to live with each other and learning to survive and learning to go on in that place, learning from the place and with other inhabitants of that place. It is a shift away from the human-centric notion of stewardship, a liberal idea of responsibility to the other. (Transcript 2, p. 1)

The other participants either connected to the term PBE through their environmental work or connected with it because they took their students to learn in local places. Charlie and Genoa were most comfortable about using the term PBE to describe their work. Genoa articulated the need for a philosophical examination of the big questions of life through getting to know and critically engaging with his place. For other participants, a variety of terms were used alongside PBE. Four of the eight participants located themselves strongly in EE, while one used the term Education for Sustainability instead of EE. Other terms that participants used were outdoor education and nature education, associating these with PBE, but not necessarily with their work.

Genoa asserted that PBE is a way to live one's life:

> I think that all of my teaching, research, and outreach for the last 20 years has been focussed around the concept of place-based education. I don't see place-based education as a teaching methodology so much as I see it is a philosophical orientation toward living and learning. (Transcript 5, p. 2-3)

For Brady and Genoa, relationship to place is a philosophy of living, and thus, they believe, it is important for children to develop. One's philosophy affects one's purposes for taking up PBE.

Participants' Purposes for PBE

All participants commented on the importance of getting students out of classrooms and into the best places for learning (Sharp, 1943). They considered PBE as a way to locate teaching and learning in places other than classrooms—in places more suited to the concepts being learned, and more suited to the students doing the learning.

Alex drew on place to engage her students in relevant learning and to be creative and innovative in their math teaching practices, such that they could support 21st Century Learning in their classrooms. The focus of her teaching and research was how to resolve the need for creative and innovative people for the 21st century against the current assessment and evaluation practices which, through their narrow focus on technical aspects of literacy and numeracy, tend to limit creativity and innovation. For Alex, getting her students outside of the normal indoor classroom supported them in their creativity, innovation, and ability to collaborate.

Charlie noted the purpose of his teaching, and the program in which he taught, was sustainability education, and that there was a required undergraduate course that addressed teaching for sustainability; as well, he observed that sustainability principles were integrated across the undergraduate curriculum. Indigenous education, on the other hand, was an elective in his teacher education program. Because of the unique culture of his place, "culture, heritage, future growth, and development is at the forefront of almost everything that happens. Advocating for PBE activities, initiatives, and courses is not a hard sell here" (Transcript 3, p. 1). He identified as being a PBE researcher and teacher but noted this research was on the margins at academic conferences.

Genoa viewed the purposes of PBE in philosophical terms:

> what does it mean to be where you are? What does it mean to learn in relation to the local environment that one is embedded in? So my teaching and research has always come from the perspective that the most interesting educational questions are big educational questions such as "what does it mean to be alive in the world?" (Transcript 5, p. 3)

Brady described curriculum as wayfinding (as cited earlier in this paper), and that wayfinding should support newcomers in learning from inhabitants of the land. Inhabitants, for her, meant human and other-than-human (Transcript 2, p. 1).

For Brady, as for Genoa, place was her philosophy for living and teaching. She described how she challenged students to study their places, by asking them to

dig down deep and search all the way up and go out in all the directions and to
see all of those sets of relationships with that place and how it affected who they
are and the kind of teacher they are and the kind of teacher they want to be.
(Transcript 2, p. 8)

Everly also invited his students to inquire into their places:

I always take them out and we look at the history of the campus from a billion years
ago through to the present day. And I show them evidence of the story that the land
has to tell us and I talk about the Indigenous people who were on the land, and so
on. We look at fossils. And I talk about the importance of understanding the stories
that you can tell in the place where you're teaching. (Transcript 4, p. 2)

We see from these participants how place is fundamental to their teaching,
to their lives, and to their understanding of and communicating about the value
of place. They address who lived there in the past, and who is living there now,
and they work to develop respectful relationships with those who live/d in those
places. These participants' life philosophies are illustrated in their approaches to
PBE, which lead them to particular pedagogical practices.

Participants' Choices of Pedagogical Practices Within PBE

Participants discussed a variety of pedagogical practices they used. Experiential
education was specifically mentioned by only two participants, but all partici-
pants used the term "experiences" to describe students getting into and under-
standing place. Experiences are integral to experiential education, but they are
not the only requisite; experiential education requires teachers to prepare stu-
dents for, to support them during, and to facilitate the learning after the experi-
ences (Dewey, 1938; Kolb, 1984). Brady described how experiential learning
involved recognizing the need for receptiveness in students' learning:

[To] learn from the land and Elders requires the learners to be humble and . . . to
open their eyes to a really different way of learning, teaching, and experiencing
things and places. For this to work, there has to be a real openness to learning in the
way that you're going to be taught. (Transcript 2, p. 14)

Dana connected experiences in place with holistic education, commenting
on the role of emotion for student memory and its connection to hands-on
learning: "And even if they go back [in memory] into a boring Grade 9 class, 10
years down the road, they'll still remember planting trees, or, whatever it was"
(Transcript 4, p. 15-16).

Inquiry, where students have to find out both who they are and what their
connections to the land are, was an important process to all the participants,
along with, at the very least, recognizing that there were people in the land now
known as Canada before settlers. Everly noted that the required Indigenous/
environmental education course in his program is inquiry-based: after visiting

several locations, the instructors supported students by giving "them a range of [inquiry] topics to choose from, but they were all typical topics where there is an environmental focus, but it also needed to be place-focused and have an impact in some ways on Indigenous peoples in Canada" (Transcript 4, p. 6). Brady justified her work with students through her philosophy that they need to know the land, to learn from the land, and to learn from those that have been on that land from time immemorial.

Genoa expressed concern regarding the fracturing of PBE into pedagogical practices. He worried that PBE would be narrowly interpreted by teachers and that it would not introduce a philosophical orientation towards life, one that supported people in locating themselves in meaningful ways to history, politics, and a more caring and healthy future for their places.

PBE is taken up by the participants in this study as finding better places than classrooms for learning particular concepts, drawing on pedagogical practices that support inquiry and experiential learning, critically addressing environmental issues, and provoking creative and innovative ways of learning. All participants drew on places outside of classrooms for experiential, holistic, or inquiry learning. Most participants view PBE as a means not only to explore the purposes of formal education and teaching but also to learn how to live well in a place.

Participants' Views of Structures That Affect PBE

Every participant addressed structures that affected their ability to teach environmental issues in out of classroom locations. By structures, we mean all those institutional norms and attitudes that tend to create lines within which educators are expected to operate. Having lines can be helpful; for example, it is useful to have a safety checklist before taking children to a place, even though having to use the checklist hinders spontaneous innovations. Examples of structures that affected our participants are university policies and practices (e.g., support from either or both of their teacher education colleagues and their university administration); teacher education policies and practices (e.g., teacher candidate field experiences, provincial certification requirements); school division and ministries of education policies and practices (e.g., curricular documents, budgets); and the impact of neoliberalism on education. Interestingly, for research on PBE, only one participant noted that his community supported students and teachers teaching and learning about place: Charlie noted (as cited earlier in this paper), that PBE was not difficult to implement in his community where people valued culture, heritage, and local growth.

Almost all the participants noted support from either or both of their teacher education faculty peers and their university administration, with almost all saying that both their initiatives and the courses they created were approved, and sometimes there were even funds to support innovative teaching. Finlay summarized this best:

I've had some opportunities to do professional development with my colleagues in this area of ESE and when I do and I introduce them to notions of place-based, it's like little lightbulbs go off, you know, in their heads. . . . But again, it would go so much farther if our administrative team, our leadership team, said, "you know what—this is a fantastic idea, why don't we implement it more broadly, across the program" but, there's never been any kind of endorsement like that for it. (Transcript 4, p. 8)

Dana and Everly noted the influence that their deans had on what they could do, with Dana remarking on the struggle she had with her dean, and Everly saying: "as much as we now have a greatly supportive dean, she's new. And the dean who was in place when we were reviewing our course was less supportive and needed much more persuading to have a course" (Transcript 4, p. 5). Brady described using a "Study Tour" course that was designed to take students to exotic locales; her intention was to take students to local places; this was "such a radical idea at the time" (Transcript 2, p. 3) that it took a long time for Brady to get all the necessary approvals.

Both Finlay and Dana noted that there was support for them to create innovative and interesting courses; however, there was no uptake of systematic changes within their faculties of education. Dana said she and one colleague had been lobbying for the inclusion of environmental place-based initiatives, but "they're [colleagues and administration] quite happy for you to take students outside; they're very supportive of our initiatives if we want to do it on our own. But it's not faculty-wide" (Transcript 4, p. 7-8). Brady noted that working with faculty and teachers could be challenging because, when taking teachers and professors to places to learn, "for them to all of a sudden be in a situation where they don't know everything, where they are the learners, is challenging" (Transcript 2, p. 14).

Making spaces in teacher education programs for PBE and EE can involve competition for time within programs. Dana stated that, with 40 people teaching in her faculty, new courses on PBE competed against courses that other people championed. Similarly, Brady noted that time tabling hindered participation in PBE courses: "if they [teacher candidates] all had taken our Institute [place-based summer program] they would not be taking courses that had been set up for them by other faculty members (on language teaching and special education)" (Transcript 2, p. 4). However, almost all participants, despite some frustrations, spoke about support from colleagues, with Alex noting: "So we kind of have this nice team, and we're not necessarily explicitly place-based education, but we are complementary to each other and developing" (Transcript 1, p. 8).

Six of the eight participants explicitly noted the need to integrate Indigenous issues and perspectives into EE and PBE. Dana noted the competition, in her program, between finding space for courses addressing Indigenous education and EE; the others hoped for integration between Indigenous education and EE.

Teacher education programs involve field experiences, that is, placing teacher candidates in schools. Two participants identified that, since placements

were based on criteria that did not include exposure to PBE, teacher candidates who want to take up PBE are not necessarily mentored. This gap between theory and practice was the incentive for the eco-mentor program developed by one participant, and adopted by two other participants. These three participants had noticed that placement with current in-service classroom based teachers could hamper teacher candidates' efforts to become place-based educators.

Provincial teacher certification requirements were identified as a structure of importance, with the teacher educators wanting teacher certification boards to require some focus on EE or PBE. Teacher certification boards still require teachers to have the majority of their courses in how-to-teach in subject-specific areas, with two participants stating that new required B.Ed. courses focussed on language arts (especially for English language learners) and special education, which their provincial certification boards had added to teacher certification requirements.

Standardized testing, most often emerging from ministries of education, was also noted as interfering with the ability to teach in innovative ways, with Alex specifically noting this as a concern in her research area of 21st Century Learning. However, Alex relayed that taking students into the community or to natural areas contributed to teacher candidates learning their math in relevant and exciting ways, and supported them in developing the capacity for creativity, innovation, and collaboration. As well, research on PBE in the United States suggests that PBE can support students doing well on standardized tests (Demarest, 2015).

Participants believed that provincial ministries of education have much catching up to do to ensure that EE and sustainability education, including both ecosystem health and social justice, are required within curricular outcomes. Hayden, whose career has focussed on EE, argued for environmental issues to be integrated throughout all coursework and not conceptualized as a specific subject area. Genoa and Hayden agreed that PBE and EE were forms of critical education and should be taught in integrative ways. Hayden noted that his province had recently released all new curricula, and it was very difficult to find anything relating to environment or sustainability education. A change in curricular outcomes that specifically mandated PBE would assist in normalizing the practice.

A significant structural barrier identified by the participants was neoliberalism. Neoliberalism is an approach to life and politics that suggests governments should neither be involved in the economy nor regulate industry; a fundamental neoliberal belief is that individuals work for rewards. The subsequent deregulation of corporations in most countries around the world has affected environmental legislation and worker rights, despite the neoliberal belief that the free market will ensure corporations act responsibly (Orlowski, 2015). Neoliberalism has led to reducing funding to public institutions (including education) and increasing standardized measurements for student and teacher performance across Canada (Orlowski, 2015). This has led to the issues that Alex identified,

with standardized tests interfering with the concepts promoted in 21st Century Learning. Hayden told the story of a graduate student teaching in an elite urban school who, when introducing concepts or activities for environmental health, was challenged by some of the students who wondered how this would fit on their resumés.

Participants' Views of Indigenous Knowledges of Place

In keeping with taking up the Truth and Reconciliation Commission Calls to Action (2015), we explored the participants' views of settler colonialism and Indigenous place. We found that most participants referred in some way to Indigenous education. For example, they noted that Indigenous knowledges was important to their faculties of education, with some remarking that programs were now being or had just been developed for Indigenous students, and others remarking that courses with Indigenous content were required for all students. Brady, having had connections with Indigenous peoples from her childhood, had integrated Indigenous knowledges into all her teaching, addressing this in a deep way with the places to which she took her teacher candidates, and supporting them in learning both from the people there and from the land itself. She was able to draw on her community relationships to support her students to learn from Elders in appropriate places. Everly noted that, in his teacher education program, they had managed to integrate Indigenous knowledges of land with EE in one required course that includes several visits to the land. In the other universities, education for Indigenous students was separated from EE, with four of the participants noting these separate Indigenous programs were land-based.

Nonetheless, there are complexities that emerge between PBE and land-based education programs. As noted in the introduction, Tuck et al. (2014) described PBE as a form of colonization, indicating how settler colonialism makes Indigenous land into property. Bang et al. (2014) stated, in opposition to the idea of land as property: "Land is, therefore we are" (p. 45). PBE has the potential to provide a rich philosophy to undergird teacher education in Canada. But, teachers need to more deliberately address land within an Indigenous world view to unlock this potential. The substantially different belief systems about land (as relational, and therefore not owned by humans) and place (human attachment) is a challenge that place-based educators must continue to address.

Conclusion

There is public resistance to the research showing climate change is happening. In the face of this, the Intergovernmental Panel on Climate Change 2018 report cited 6,000 works by scientists and concluded that: we are now in a climate crisis with only 11 years remaining to reduce our greenhouse gases to

below-2010 levels; and we only have until 2050 to be at zero emissions. Not only do many resist the compelling evidence for climate change, there is also general ignorance regarding the research that shows the planet is losing biodiversity at anywhere from 1,000 (Centre for Biological Diversity, 2018) to 10,000 (World Wildlife Federation, 2018) times what would be a normal background rate. These issues are compounded when we acknowledge the interrelatedness of social and ecological justice issues. More than ever, we must take action; we must educate children and the general public about the need for change. Indigenous peoples, as Dei (2000) noted, knew how to live sustainably on the lands they occupied. By integrating Indigenous knowledges into PBE, both EE and social justice can be addressed. Most of the participants argued for the need to integrate Indigenous knowledges into their EE, with some already doing this. As Brady noted, we have much to learn about our places from those who have lived there sustainably for a long time.

From the work that the various participants are doing, some clear suggestions have emerged. Although the participants were often frustrated with the lack of systematic supports for environmental and sustainability education in their institutions, they all did find support. Importantly, some faculty had looked beyond their institutions and had worked together "up the chain" to create change. For example, the eco-mentor weekend workshop program upheld connections with school divisions while also supporting teacher candidate learning. As a starting point for changing certification requirements, place-based teacher educators can work toward creating advanced qualification certificates in PBE through provincial teacher certification bodies. As well, integrating environment and Indigenous knowledges into different subject area silos, through PBE, is another way to move forward. This can be supported by working with teacher educator colleagues and with provincial curriculum writers.

The participants showed commonalities spanning the field of teacher education to include the promotion of integrated, interdisciplinary, and inquiry-based programming connecting students to their places. A call to heal our places focusses our gaze on the essential links between the fields of EE, Indigenous education, and critical pedagogies, as referenced in the literature and discussed by participants as major pathways to (and as emerging out of) PBE.

Clearly, more work needs to be done to integrate EE with Indigenous knowledges of place (Seawright, 2014; Simpson, 2011, 2014), with Dei (2000) pointing out that the Indigenous knowledges of a place closely align with sustainability. PBE offers a philosophical approach to connecting teacher candidates to the place where they are studying or to their home places, and to the Indigenous knowledges there.

The perspectives of the teacher educators who participated in our study offer a glimpse into the diverse ways PBE is taken up in teacher education programs in Canada. Their work suggests crucial linkages can be made between PBE, EE, and Indigenous education. They advocate a reorientation to education

that grapples with the big questions: What does it mean to be alive in the world? What does it mean to be where you are? What does it mean to learn about the local environment that one is embedded in? Such questions are a starting point for healing the people and places often marginalized by a rigidly structured, fractured education system. We thank those teacher educators naming and living alternative ways forward, noting how they remain open to learning from and with their places.

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Sustainability Learning Pathways in the UBC Teacher Education Program: Destination Cohort

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Abstract

With the recent and dramatic changes to our K–12 curriculum in British Columbia (B.C.), there is an essential need for pre-service teacher education to lead the transformation of practice in our schools and communities. Education with sustainability as a core foundation is also gaining traction in B.C. and around the world. At the University of British Columbia (UBC), we initiated the Sustainability Learning Pathways in Teacher Education Project to explore possible pathways for the growth of sustainability in our education system. The project has culminated in a new Education for Sustainability teacher education cohort at UBC that launched in September 2018. In this paper, we share the story, consider the challenges, and imagine the possibilities as we work to transform teacher education with sustainability in mind.

Résumé

En Colombie-Britannique, les programmes scolaires de la maternelle à la 12e année ont récemment fait l'objet d'une grande refonte; dans ce contexte, il est primordial que la formation des futurs enseignants soit aux premières lignes de la transformation des pratiques dans nos écoles et nos collectivités. Le développement durable comme fer de lance de l'éducation gagne aussi la faveur en Colombie-Britannique et ailleurs dans le monde. À la University of British Columbia (UBC), nous avons lancé le projet « Sustainability Learning Pathways in Teacher Education » (parcours d'éducation au développement durable dans la formation des enseignants) pour explorer différentes manières de faire plus de place au développement durable dans notre système d'éducation. Le projet a débouché sur l'inscription d'une nouvelle cohorte à l'UBC en septembre 2018. Le présent article raconte l'histoire de ce projet, examine les défis à relever et imagine les possibilités qui permettront de placer le développement durable au cœur de la formation des enseignants.

Keywords: education for sustainability, pre-service teacher education, sustainability learning pathways, educational transformation, environmental and sustainability education, place-based learning

Mots-clés : éducation au développement durable, formation des futurs enseignants, parcours d'éducation au développement durable, transformation de l'enseignement, éducation à l'environnement et au développement durable, éducation axée sur les réalités locales

Introduction and Purposes

> When I received the announcement about a new cohort starting in September at UBC called Education for Sustainability, I literally cried. I felt like it was meant to be, my timing in applying to this program couldn't have been any better. This was the cohort I had been waiting for. (Education for Sustainability Cohort Applicant, 2018)

The opportunities to transform pre-service teacher education, where the formal process of becoming a teacher begins, are vast and exciting. In British Columbia (B.C.), our K–12 education system is changing dramatically. Over the past decade, we have completely redesigned our K–12 curriculum to align with changes to education occurring globally. In the meantime, the hard work of transforming the educational practices in our classrooms and communities, through professional development (Pro-D), mentorship, collaboration, and other means, continues. Our work in this project is premised on the assertion that teacher education must contribute to the global social movement of sustainability. To aid this process in B.C.'s education system, we launched the Sustainability Learning Pathways in Teacher Education at the University of British Columbia (UBC) Project. This project responds to the growing need to develop sustainability learning pathways (SLPs) in teacher education.

Our main objective for this paper is to consider the successes, challenges and lessons learned from an exploratory case study of the priority pathway of establishing a new teacher education cohort focussed on Education for Sustainability (EfS) in UBC Teacher Education. According to Yin (2003), an exploratory case study is one that aims to develop research questions or determine the feasibility of a desired approach. The cohort launched in September 2018, and this case study describes the cohort's design and genesis as well as other potential pathways for infusing sustainability in teacher education. It also outlines the activities, outcomes, and impacts of the SLPs in Teacher Education at UBC Project to date.

Based on our research, design, and implementation efforts so far, we offer principles, concepts, approaches, and lessons learned that help inform ways to wrestle with the complexity of EfS in teacher education. We seek to inspire the transformation of teacher education programs toward more place-based, community-connected, and collaborative approaches and processes among participants and course facilitators. Adaptive, rather than prescriptive, we endeavour to recommend pathways-inspired approaches responsive to the shifting perspectives of pre-service teachers and universities related to EfS, thus allowing for the ongoing co-development of the movement.

We begin our case study with historical background and context, and then summarize the pathways framework and process that led to the approval of a new EfS B.Ed. cohort at UBC. The paper explores successes, challenges, and lessons learned before identifying some next steps. Ultimately, this process

represents an awakening as we seek to activate sustainability learning pathways in teacher education, supported by those entering the field: "I believe that Education for Sustainability goes beyond 'waking up' to what the world needs, and into action" (EfS Cohort Member, 2018).

Background and Context

Invigorated by the Decade of Education for Sustainable Development (2005–2014), the United Nations Educational Scientific and Cultural Organization (UNESCO) reaffirmed the importance of sustainability through its 17 Sustainable Development Goals (SDGs), one of which is dedicated to "Quality Education" (UNESCO, 2014). UNESCO estimates that 69 million new teachers will be needed worldwide in the coming years (UNESCO, 2016). These teachers, evidenced by the quote below, will have a profound impact on K–12 education if we prioritize sustainability:

> Society is facing a variety of environmental challenges, and the biggest barrier to overcome is creating behaviour change within society itself. I hope to inspire the next generation by helping them to become informed and responsible citizens, who care deeply about their world and want to make it a better place. (EfS Cohort Member, 2018)

Internationally, the EfS literature (see Sipos, Battisti, & Grimm, 2008; Mezirow, 2009; Cranton & Taylor, 2012; Alvarez-Garcia, Sureda-Negre, & Comas-Forgas, 2015; Evans, Stevenson, Lasen, Ferreira, & Davis, 2017; Harmin, Barrett, & Hoessler, 2018) is coalescing around EfS as a crucial driver for transformative learning and social change toward a sustainable future. UNESCO states that education provides the opportunity "to learn the values, behaviour, and lifestyles required for a sustainable future and for positive societal transformation" (UNESCO, 2015, p. 3). Formal education is particularly important in providing "a place to explore, extend and deepen human understanding in ways which are simultaneous, rigorous, ethical and illimitable" (Rieckmann, 2012, p. 128; see also McCoshan & Martin, 2012). Transformative learning is often cited as critical in empowering individuals to adapt their world views (Sipos et al., 2008), develop an awareness of normalized (but unsustainable) habits, and disrupt these habits by striking out in novel ways (Moore, 2005; Rieckmann, 2012). It supports lifelong learning and working with other parts of society to create a culture of "curricular, pedagogical, policy, and institutional changes [which] are necessary to produce meaningful, transformative behavioral change in the wake of complex . . . challenges" (Glasser & Hirsh, 2016, p. 121). As voiced by the teacher candidate below, transformative learning also relates to recognizing the need to fashion social institutions that are made amenable to constant reform through learning, connections, engagement, and dialogue:

Sustainability, to me, is about creating learning environments with connections to where we live, the people around us, and the society in which we exist. I am interested in how sustainability can be brought into the classroom in a variety of ways that will demonstrate the interconnectedness of humans and the natural world, and that we all have an important role in sustaining these connections. (EfS Cohort Member, 2018)

Even though teacher education in Canada is a provincial/territorial jurisdiction and is therefore highly contextual, the Council of Ministers of Education of Canada (2012) states that "There is modest but promising progress toward reorienting teacher education to address education for sustainable development" (p. 3). Into this context of potential change emerged the National Roundtable on Environmental and Sustainability Education (ESE) in Pre-Service Teacher Education and its seminal conference in 2016 that brought together researchers and teacher educators. A National Action Plan resulted (Karrow, Bell, DiGiuseppe, Elliott, & Inwood, 2018), as did a formal partnership between the Roundtable and the Canadian Network for Environmental Education and Communication (EECOM). This multi-sectoral partnership takes the form of a Standing Committee on Environmental and Sustainability Education in Teacher Education (ESE–TE), which focusses its efforts at research and advocacy.

In British Columbia, K–12 education has included a significant focus on environment and sustainability for decades. In 1971, the British Columbia Teachers' Federation (BCTF) set up a Task Force on environmental education (EE). It recommended an interdisciplinary, developmental, and community-based approach (BCTF, 1971, 1972). This was followed, in 1991, by a special report that suggested "the need to allow teachers to develop exciting programs that integrate goals of several subject areas" (BCTF, 1991, p. 44). A provincial resource and framework for relating EE to existing curricula, *Environmental Concepts in the Classroom*, was published in 1995. It called for the integration of environmental concepts into K–12 education (BC Ministry of Education, 1995).

Two decades later, the 1995 document was revisited and posited a new framework for environmental learning in B.C. Entitled *Environmental Learning and Experience (ELE): An Interdisciplinary Guide for Teachers* (BC Ministry of Education, 2007), this document was informed by advances in research as well as by the Kyoto Protocol, Montreal and Johannesburg Summits on Sustainable Development, and the proclamation of the United Nations Decade of Education for Sustainable Development (UNDESD) from 2005–2014.

More recently (2012–17), B.C. has completed a comprehensive redesign—indeed, transformation—of its provincial K–12 curriculum. Notably, the new curriculum contains an enhanced focus on place, sustainability, Indigeneity, and transdisciplinarity, thus putting greater emphasis on place-based, community-connected, and inquiry-based learning. According to the BC Ministry of Education, "educated citizens understand the importance of learning about the environment" (BC Ministry of Education, 2016, n.p.). Further, through this new

curriculum, students are expected to "develop awareness and take responsibility for their social, physical, and natural environments by working independently and collaboratively for the benefit of others, communities, and the environment" (BC Ministry of Education, 2015, n.p.). Importantly, this is articulated as the "ability to initiate positive, sustainable change for others and the environment, to analyze complex social or environmental issues from multiple perspectives" (BC Ministry of Education, 2015, n.p.).

The new B.C. Science Curriculum takes a place-based approach to learning, where students:

> develop place-based knowledge about the area in which they live, learning about and building on First Peoples knowledge and other traditional knowledge of the area. This provides a basis for an intuitive relationship with and respect for the natural world; connections to their ecosystem and community; and a sense of relatedness that encourages lifelong harmony with nature (BC Ministry of Education, 2016, n.p.).

There are also strong and specific foundations for sustainability in the redesigned B.C. curriculum, from a focus on sustainable resources and practices in the elementary grades to sustainable systems in secondary sciences. Two new courses were also developed for senior secondary, entitled Environmental Science 11 and 12, both of which have a deep focus on sustainability.

With the transformation of the curriculum comes the need for Pro-D, resources, and support to implement these changes. Teacher education must also transform in its practices and institutions to help model and enact this transformation. By late 2015, we began looking closely at the Teacher Education Program at UBC and considering what learning pathways, including a teacher education cohort, might exist or be developed to support the broad demand for and infusion of sustainability and, ultimately, the transformation of the program and K–12 education in B.C.

Theoretical Framework, Methodology, and Limitations

In light of the complexity involved in transforming educational practices and institutional structures and processes that perpetuate them, our project was grounded in a pathways framework. Specifically, we set out to explore and enact sustainability learning pathways in teacher education at UBC. An SLP is a collection of sustainability-oriented courses, activities, or experiences that students pursue as part of their disciplinary major or program of studies. Pathways may be embedded within existing programs or offered as a separate entity, such as a minor (Marcus, Coops, Ellis, & Robinson, 2015).

Building on the work of Marcus et al. (2015) at UBC, we identified the following pathways as most frequently encountered in post-secondary education programs:

1. Cohort: a group in the same program and clustered around a core programmatic focus
2. Core Course: course(s) that students are required to complete for a degree
3. Elective Course: an optional course that meets the criteria for any program
4. Pro-D Activities: offerings for students, faculty, mentors, and other interested community members
5. Practica: experiential learning opportunities in schools and community settings where students work with other mentors
6. Minor, Certificate, or Diploma: a focused program of less depth than a major (generally 3–5 courses)

This paper provides an exploratory case study on those pathways we have pursued to date that documents the process and progress of our work related to SLPs in teacher education at UBC. We adopt the notion that a case study enables researchers to circumscribe the main entity for which data are being collected (VanWynsberghe & Khan, 2007). Used here to signal a conceptual focus on immersive pathways in teacher EfS, our case provides "instances in action," which is also important to the research because it encourages triangulation within and across cases, potentially advancing theory, generating new typologies (George & Bennett, 2005), and constructing working hypotheses (Kenny & Grotelueschen, 1984; George & Bennett, 2005).

As the authors are deeply embedded in the case in question, we recognize our bias toward more favourable reflections on the process and pathways implemented thus far, while attempting to fully embrace the challenges we have encountered. We acknowledge that a fulsome evaluation of project outcomes and lessons learned—the focus of our research in the coming months—will be enormously valuable.

Sustainability Learning Pathways in Teacher Education Project at UBC Project

Our story picks up in 2016, with a proposal to the University Sustinability Initiative (USI) for funding to support a research endeavour entitled *Sustainability Learning Pathways in Teacher Education at UBC.* The USI's Pathway Grant Program was designed with the goal of developing new undergraduate sustainability pathways at UBC; our project was accepted.

The project sought to explore, design, pilot, and evaluate SLPs in the Teacher Education Program at UBC. Specific goals of the project included:

1. Identify one or more SLP(s) to positively impact EfS and teacher education at UBC and beyond.
2. Catalyze engagement, dialogue, and collaboration within the Faculty of

Education, participating departments, and community partners regarding these SLP(s).
3. Develop, pilot, and evaluate one or more SLP(s).

With over 800 students, UBC's Teacher Education Program is the largest in Western Canada. The development of one or more SLPs in the program had the potential to rapidly improve the infusion of sustainability in B.C. education, support implementation of the new B.C. curriculum related to sustainability and other priorities, and increase collaboration through the Faculty of Education's research and program offerings.

The Sustainability Learning Pathways in Teacher Education at UBC Project was designed as having three phases: Phase 1– Making the Case; Phase 2 – Shaping the Case; Phase 3 – Piloting and Evaluation. As implementation of the pilot year of the EfS Cohort was delayed until 2018–19, this paper focuses primarily on the key activities and highlights of the first two phases of the project.

Phase 1 – Making the Case

The project began with a research phase, notably an environmental scan of teacher education programs across Canada and beyond. To gather an initial sense of current SLPs in teacher education programs at UBC and across Canada, we scanned selected university programs for their presence in teacher education programs, using key search terms such as Sustainability Education, Environmental Education, Outdoor Education, and Place-Based Education. Note that this scan was based on a website analysis of program marketing and was not intended to be exhaustive; rather, it endeavoured to find relative areas of strength and leadership to inform UBC's planning. The findings summarized the presence and extent of sustainability learning pathways in various teacher education programs.

The scan and subsequent engagement of internal and external stakeholders discussed below led to the identification of pathways with the most potential to impact teacher education at UBC. These pathways included professional development events and activities, a cohort in the Teacher Education Program, an extended practicum, and the community field experience. Anecdotally, our administrators reacted strongly to our demonstrating that UBC was not currently a leader in sustainability education, particularly in teacher education and were very receptive to our findings. They too valued and deemed feasible a teacher education cohort as well as new course offerings, Pro-D activities, and enhanced teacher education practica.

Compared to other pathways, as evidenced in the quote below, the cohort model has a gravitas that is attributable to its intrinsically social character. The cohort forms one of the first and closest circles for gaining the skills associated with teaching. Much more than a mere cluster of people brought together

for a program, the cohort is designed to purposefully enable the instantiation of public pedagogical approaches, including place-based and community-connected experiential opportunities. As one cohort member explained:

> I chose the Education for Sustainability cohort because my most memorable and impactful learning experiences have been through experiential and active participation. Through my professional experience, I have observed how learning environments which connect people to one another and places, can support the development of a healthy community. (EfS Cohort Member, 2018)

Phase 2 – Shaping the Case

The research and engagement process continued in 2017 with the planning, design, and pilot implementation of selected SLPs, including several Pro-D events and offerings in the Faculty of Education and in the community. We also brought forward an application for an Education for Sustainability cohort in teacher education. This cohort application had to be accepted by various committees and departments in the Faculty of Education.

Piloting Professional Development Pathways

Various SLP Pro-D activities supported by the project were designed and implemented in 2017. In May, we attended the Canadian Network for Environmental Education and Communication's conference in Wolfville, Nova Scotia. There, we convened an interactive presentation for post-secondary and K–12 educators from across Canada that shared the results of our scan, explored pathways at our respective institutions, and envisioned approaches to expanding pathways through collaboration among researchers and teacher educators in Canada.

Importantly, our work at this event led to an invitation for our team to join the Standing Committee for Environment and Sustainability Education in Teacher Education (ESE–TE). One of us had already participated in the National Roundtable of the ESE–TE, and the union seemed mutually beneficial. Joining this growing circle of widely respected post-secondary and community educators focussed on EfS in teacher education provided academic credibility to our efforts at UBC and presented the opportunity to collaborate nationally to learn about and promote sustainability in education. For example, we became aware of the DEEPER guide (Inwood & Jagger, 2014) as well as the Trent University Indigenous and Environmental Education course in their Teacher Education Program.

In October 2017, our team designed and implemented an innovative, half-day Pro-D event, Sustainability and Place-Based Learning: Priorities, Possibilities and Practice, for over 225 teacher candidates at UBC Vancouver. This mandatory event was built into the curriculum of the program (through a core course), and we supplied a preparatory reading list. Participants from virtually all elementary cohorts explored sustainability education and place-based learning in their emerging practice, including a technology-supported,

experiential exploration of the UBC campus. Participant evaluations of the session were extremely positive, with one individual declaring, "What an amazing experience. It was so lovely to explore campus, making connections to sustainability in a contextual way. Loved it!" Another participant also confirmed its value: "I actually learned a lot about the importance of implementing sustainability in classrooms and across the curriculum" (October 2017 Event Participants).

In December 2017, SLP team members convened four experiential Pro-D workshops that we delivered at two UBC Teacher Education conferences. These workshops engaged close to 100 elementary and secondary teacher candidates at UBC, as well as teachers from local school districts, in learning about sustainability, place, and related topics. They were deemed hugely valuable by participants. For example:

> Most useful session so far in the program. Place-based learning naturally brings together theory and practice. It was a great, hands-on approach to experiencing place-based education (for sustainability) and it was a great way to open our eyes to the vast resources for learning here on campus. (Workshop Participants, 2017)

To support our Pro-D events and activities, a teacher resource package was provided to participants with lists of organizations and other resources for implementing sustainability in practice. By creating the resource package, we intended to demonstrate that doing sustainability through place-based approaches, such as was modelled in the workshops themselves, could be easy, collaborative, and highly engaging.

Application for an Education for Sustainability Cohort

Building on the positive momentum of our Pro-D pathways implementation and extensive engagement and consultation with leaders in the Faculty of Education and prospective school district and community partners, we developed an application for a new teacher education cohort at UBC Vancouver. This application was accepted in the spring of 2017, but institutional processes delayed the pilot of this priority pathway for one year. Promotion of the new EfS Cohort began in spring 2018, and the inaugural program year launched in September 2018.

Our cohort team collaborated to develop the following overall goals and priorities for the EfS Cohort:

> The Education for Sustainability cohort supports, informs and inspires teacher candidates, and their students and mentors, to develop deeper knowledge, understanding and competencies related to education for sustainability. Core aims of the cohort also include development of an ethic of stewardship and care for people, place and planet, formation of deep connectedness to the environment and the systems that sustain us, and cultivation of healthier, thriving communities.

> Grounded in ecopedagogy through inquiry, collaboration and action, the cohort enacts the B.C. curriculum with a focus on place-based, experiential and community-connected approaches to learning. (UBC Teacher Education website https://teach.educ.ubc.ca/education-for-sustainability-new-cohort/)

The summer of 2018 featured an intense series of design and development meetings as our cohort team and partners collaborated to create guiding frameworks, instructional strategies, course plans, readings lists, and other foundations for our pilot year. Importantly, this process engaged all four departments in the Faculty of Education, each of which contributes courses to the Teacher Education Program and, therefore, needed to support the cohort by aligning these courses with the overall vision of sustainability.

Strong interest in the cohort by successful program applicants, who provided preferences for the cohort to which they wished to be enrolled, led to a full complement of 35 teacher candidates joining the EfS Cohort for their program in our pilot year. As voiced in the quotes, EfS appeared to resonate as a calling for at least some program applicants:

> Sustainability is at the center of my values and at the very core of my life. I cannot think of a better job, than sharing my passion for sustainability with youth. I want children to understand that the status quo is not immutable, that it has been created by (a small group of) people, and can be re-imagined and re-created by them. (EfS Cohort Member, 2018)

Another one agreed, stating that, "Education for sustainability is my calling. I desire to connect people to this land and to the environment, and I'm excited to be learning from and with people who want the same" (EfS Cohort Member, 2018).

Growing Community Partnerships

Relationships built over years of collaboration with our school district partners, including Surrey, North Vancouver, Burnaby, and West Vancouver, have been a key success factor in building a successful teacher education cohort. We are also actively growing partnerships with a wide variety of community partners, notably through the Classrooms to Communities (C2C) Education Network, that share a commitment to EfS in teacher education. These partners are excited to be supporting the pilot year. Notably, all of our partner school districts have a strong commitment, in policies and practices, to sustainability at a systems and classroom level. It should be mentioned that cohorts typically work with one or two districts, but there was extensive interest among local school districts, and so we developed formal partnerships with four districts. Beyond our alignments with the new provincial curriculum, we were also confident that there was broad recognition of the global sustainability movement and the important role that EfS can play in teacher education. This interest in EfS and community connections also appeared to be strong in our cohort participants: "I am interested in

place, but I am mostly interested in sustainable communities. I see schools as a basis for community and wonder how we, as teachers, can support community development" (EfS Cohort Member, 2018).

A few further words should be shared regarding our school district relationships. As mentioned earlier, we consulted with a variety of districts on the feasibility of a cohort partnership. Indeed, two of these districts provided letters of support for our application. However, the cohort team was already highly regarded in these districts from a teacher, community, and government perspective. It is not a stretch to understand these relationships as legitimating factors for support from both the districts and the university. Noteworthy is the fact that building relationships is one of the recognized interpersonal competencies for a sustainability practitioner (Wiek, Withycombe, & Redman, 2011; Rieckmann, 2012).

Successes, Challenges, and Lessons Learned

The *Sustainability Learning Pathways in Teacher Education at UBC* initiative has been remarkably successful to date in meeting the goals envisioned for the project. There have also been challenges, as with any ambitious project in a university context, and a range of lessons learned that can inform future endeavours of this kind.

Making the Case

The previously mentioned environmental scan provided some introductory data that also motivated senior leaders in the Faculty of Education at UBC. The scan findings are not exhaustive, however, and it would require ongoing research and engagement to sustain their currency and deepen the analysis. It is recommended this process be continued and, with resources, more primary data sought. Our participation in the previously mentioned ESE–TE Standing Committee makes it possible to explore emerging trends and hear about institutional innovations, and perhaps primary data could be collected more easily. Indeed, mapping the networks of practice related to EfS in our institutions, provincially and across Canada, is highly recommended as we continue to build a community of EfS research and practice.

Engagement, Consultation, and Collaboration

The engagement and consultation process, designed to identify and build support for SLPs at UBC—including the cohort pathway—has been successful to date, but the work continues. The success is a combination of increased awareness and support for sustainability in the Faculty of Education, especially among the Dean, Associate Deans, Directors, colleagues, community partners, and teacher candidates. It has been important to demonstrate student demand and

other support through Pro-D events, and it has been especially strategic to link our work with the new B.C. curriculum and school districts, as well as with provincial networks with a long history of sustained work in environmental and sustainability education.

The emergence of inter-departmental politics in the UBC Faculty of Education was an expected challenge in the process, particularly regarding the approval of a new cohort in teacher education. Many faculty members believe their fields of interest are "cohort-worthy," and the committees that govern teacher education are sensitive to balancing ongoing support with new entries. As the UBC Teacher Education Program is shared by four departments, collaboration can sometimes be challenging (UBC Faculty of Education, 2018). We attempted to demonstrate support and collaboration by submitting our application from two departments. Future success is predicated on continued faculty and university-level communication and collaboration, and evidence of success and organizational learning. As such, our connection to the USI continues to be a priority. On a positive note, there appears to be a shared interest among many faculty members across departments at UBC for sustainability, and this bodes well for deeper collaboration in the years ahead.

Beyond UBC, the project has also led to increased engagement and relationship building with post-secondary educators across Canada, including the ESE–TE Standing Committee. As this special volume attests, this national network is growing in representation and influence, and the SLPs at UBC Project has provided a key Western Canada perspective, narrative on sustainability in teacher education, and potential influence on EfS practices more broadly that will continue to grow for years to come, given appropriate institutional support.

Pro-D Pathways

As explained previously, our Pro-D activities have been very successful and have demonstrated the growing demand for SLPs in teacher education at UBC and across Canada. The challenge now is to sustain momentum and support for these kinds of activities, as Pro-D has the potential to engage a wider audience at UBC, in our partner school districts, and across B.C. and Canada. Funding, as always, is critically needed to sustain and grow these activities. Our team intends to continue sharing our project with a national audience, which recently included the 2018 Research Roundtable on Environmental and Sustainability Education in Teacher Education. The spring of 2019 also saw us facilitating invited presentations on this topic in Germany, England, and Scotland, and our work will be featured at the 2019 C2C Conference at UBC Vancouver.

The EfS Cohort's Pilot Year, Related Pathways and Potential Impacts

The new EfS Cohort in teacher education at UBC is the most significant outcome of the project. It has the potential not only to impact K–12 and teacher education

in B.C. and across Canada but also to influence sustainability in education more broadly in the coming years. With a keen focus on sustainability education that attracted strong interest and a full complement of teacher candidates in its inaugural year, the EfS Cohort will support its members (and all of the mentors, colleagues, and students they work with) to champion sustainability in their practice.

We now plan to leverage additional pathways in our program, notably the Extended Practicum and Community Field Experience (and all their related partnerships) as well as additional Pro-D pathways in collaboration with the Faculty of Education, school districts, and community partners. These pathways are integral to the EfS Cohort, and we seek to grow collaboration with teachers and organizations that share a commitment to sustainability. Doing so challenges us to effectively document, evaluate, and report on the cohort's pilot year about these interconnected pathways, especially as we aspire to maximize the impact of our project and funding.

Extended practicum. All teacher candidates in the program participate in a 10-week, school-based practicum. This practicum ideally places teacher candidates with mentors in school districts who share a commitment to sustainability and helps UBC and the USI to build relationships with this network of supportive educators. This is a significant challenge, as mentors with such a background, let alone a passion for sustainability, are not currently widespread in our schools and communities. Research tells us that a lack of alignment between the intentions of a teacher candidate and the beliefs and practices of their mentors can be hugely detrimental to the development of EfS practices in novice teachers (Ormond et al., 2014).

To counter this, we plan to increase awareness, engagement, and collaboration among our teacher candidates, school-based mentors, and community partners with a strong focus on sustainability education through cohort activities, enhanced outreach, and targeted engagement. With appropriate resources and support, we can intentionally build a strong community of aligned mentors and model how the extended practicum can be optimized around sustainability as a core priority.

Community field experience. Another pathway that the EfS Cohort activates is the Community Field Experience (CFE), a required three-week, community-based practicum for all teacher candidates. Having just finished their extended practicum in schools, cohort members share their newly-refined EfS ideas, understandings, and competencies with the community-based educators and organizations involved. As such, the opportunity for modelling EfS is extended to these informal educators and community partners. Here, as well, it can be challenging for teacher candidates who find themselves in a placement that is not supportive of their intentions to deepen their experiences and practices related to EfS.

Our team also intends to pursue focussed outreach and engagement activities to influence the CFE aspect of the cohort experience by enhancing the program's connections with this community-based opportunity, ensuring

that more sustainability-related organizations are available to host EfS Cohort teacher candidates for their CFE. We aim to establish lasting relationships with aligned organizations that enhance the CFE experience through a rich focus on sustainability. Funding and the ongoing support of the community and Teacher Education Program at UBC will be critical to building and strengthening these relationships.

Enhanced Pro-D activities. A variety of enhanced and extended Pro-D activities, both internally at UBC and with our school districts and other partners, are made possible by the EfS Cohort. Our activation of Pro-D SLPs in 2017 affirmed the need for such offerings, and the cohort has enabled us to broaden the reach of such events and activities to include mentors, colleagues and other interested educators, and EfS Cohort alumni. In 2018–19, we held several Pro-D opportunities in collaboration with our partner school districts and community supporters.

In the coming years, we intend to provide Pro-D activities focussed on sustainability, place, and experiential learning with the broader community of teacher candidates at UBC, partner school districts, and community organizations to further "institutionalize" these activities locally and regionally. With the support of provincial partners, including the BC Ministry of Education, we aim to expand these activities at a provincial scale. The greatest challenges, as with much of our work, will be to secure sustained funding and nurture strong partnerships necessary for these vital Pro-D activities.

Evaluating and reporting. As we reflect on the pilot year of the EfS Cohort, it is imperative that we continue to effectively document, evaluate, and share the successes, challenges, and impacts of the cohort and associated pathways (Phase 3 of our project). Effective evaluation will be critical to demonstrating the power of a pathways approach at UBC and in other faculties and institutions, and to influencing EfS practices in B.C. schools and communities.

At the time of writing, a variety of formative and summative strategies are being employed to evaluate the cohort and other pathways in implementation. We are documenting and sharing the cohort's activities, while more formal evaluation methods (e.g., pre- and post-surveys, teacher candidates' reflections and projects, course and program evaluations, interviews) are being employed in a comprehensive evaluation strategy. Participant quotes and testimonials, such as those shared in this paper, are being gathered with permission from cohort members. A final report and other artifacts will then be developed to communicate and celebrate the successes, challenges, and lessons learned from the pilot year of the EfS Cohort and related pathways. For now, we are deeply gratified by the initial reflections, such as the one voiced here, of our inaugural cohort members:

> This cohort has so far proven to be an incredibly valuable and important learning experience for me. I feel like this cohort speaks to a part of who I want to be as a teacher and is providing the tools and learning on how to get there. Thank you! (EfS Cohort Member, 2018)

Conclusion and Next Steps

Education in B.C., across Canada, and around the globe is transforming. Pedagogies and learning experiences that focus on place, community, and sustainability are at the heart of this transformation. Teacher education is particularly essential to transforming education and enacting a vision of thriving, sustainable communities. This exploratory case study argues for the transformational potential of teacher education in the broader area of education for sustainability.

While the process of applying for approval of a new cohort has been an exercise in ongoing relationship building and the navigation of university politics, there were, as noted above, some key synergies involved. These included a new provincial curriculum, established collaborative relationships, aligned mandates, and a maturing sustainability movement with numerous provincial leaders across education sectors. We believe the outcome of a cohort, focussed strongly on EfS, is one that all parties can rally around to help transform teacher education at UBC, and elsewhere.

The cohort also opens up significant potential to influence additional, related pathways, including enhancing the extended practicum and community field experience elements of the program and expanding Pro-D activities to influence other cohorts, colleagues, and partners. To leverage these opportunities, we must continue to monitor, evaluate, and evolve the program as we reflect on our learning. In its inaugural year, we have had only a small amount of funding to sponsor community-based field experiences. Our community partners have graciously provided complimentary venues, facilitation, and transportation. We are currently convincing administrators in the Faculty of Education and partners that funding for such core program elements and Pro-D offerings is critical to sustaining the vision and long-term impacts of the cohort. So far, we have won sympathy but little funding.

As the transformation of K–12 education continues in B.C. and around the world, so too must teacher education continue to evolve. As evidenced in the quote below, our new EfS teacher education cohort at UBC resonates with those moving into the profession to help transform our practices. As the model grows, we will continue to collaboratively build on its guiding frameworks, enhance its practices, overcome its challenges, and maximize its potential. Working together with colleagues and supporters across Canada and beyond, we are excited to pursue this and other promising pathways toward transforming K–12 and teacher education with sustainability in mind.

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Notes on Contributors

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Bruce Ford leads Metro Vancouver K-12 Education Programs, supporting K-12 teachers, students and partners to make sustainability personal, action-oriented, local and fun through curriculum-connected field experiences, teaching tools, professional development workshops, and youth leadership programs.

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Creating a Climate of Change: Professional Development in Environmental and Sustainability Education through University and School Board Partnerships

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Abstract

With over eight million students, teachers, and professors in Canada, both pre-service and in-service K–12 teacher education are key to addressing the climate crisis through Environmental and Sustainability Education (ESE). Yet these approaches to professional learning in ESE are often delivered in isolation, with little precedence for bringing pre-service and in-service teachers together. This article explores this type of integrative professional development by introducing an innovative collaboration between a large Canadian pre-service teacher training program and an urban school board's EcoSchools Program. It presents the initial findings of a three-year case study that tracks the impacts of this partnership; with some early successes already identified, this may prove to be an innovative addition to the research on how university/school board partnerships can effectively support professional learning in ESE.

Résumé

On compte plus de huit millions d'élèves, enseignants et professeurs au Canada : il est donc essentiel, en vue d'affronter la crise climatique, de former les futurs enseignants et les enseignants en exercice de la maternelle à la 12e année dans le domaine de l'éducation à l'environnement et au développement durable (EEDD). Pourtant, les approches de perfectionnement professionnel en EEDD demeurent souvent des initiatives isolées. Qui plus est, les enseignants en formation et ceux en exercice sont rarement réunis dans ces projets. Le présent article explore une approche intégratrice du perfectionnement professionnel où une collaboration novatrice a été établie entre un important programme canadien de formation des enseignants et le programme ÉcoÉcoles d'un conseil scolaire urbain. L'article présente les conclusions initiales d'une étude de cas d'une durée de trois ans qui s'est penchée sur les effets de ce partenariat. Certaines réussites sont déjà évidentes, et il serait novateur de les intégrer à la recherche afin d'examiner l'efficacité des partenariats entre universités et conseils scolaires pour soutenir le perfectionnement professionnel en EEDD.

Creating a Climate of Change: Professional Development in Environmental and Sustainability Education through University and School Board Partnerships

The urgency needed to bring about significant shifts in addressing climate change has never been more clear, as evidenced by the latest report from the International Panel on Climate Change (2018). This prestigious panel of environmental scientists has given humanity just over a decade to limit increases to greenhouse gases (GHG) and atmospheric temperature before irrevocable damage is done to the ecosystems on our planet. This makes the critical role of education clear to those working in this sector; every aspect of formal and informal education, from elementary to post-secondary, in school and community settings, must contribute to a wide-scale transformation toward environmental sustainability. With an estimated eight million students, teachers, and professors involved in formal education systems in Canada (Statistics Canada, 2014), this offers a means to bring about social, cultural, and environmental change through curriculum, pedagogy, and infrastructure improvements in schools, colleges, and universities.

Pre-service and in-service teacher education both play a critical role in getting educators on board to actively contribute to a radical shift through the concepts and practices of Environmental and Sustainability Education (ESE). In recent years, there have been a range of initiatives and programs developing capacity in ESE with pre-service teachers (Hopkins & McKeown, 2005; Greenwood, 2010; Nolet, 2013; Inwood & Jagger, 2014; Karrow, DiGiuseppe, Elliott, Gwekwerere, & Inwood, 2016) and practicing teachers (Fien & Rowling, 1996; Wade, 1996; Ernst, 2007; Liu, Yeh, Liang, Fang, & Tsai, 2015), yet there is little precedence for integrating these groups. Could bringing pre-service and in-service teacher education together for ESE offer greater benefits, complexity, or depth to these areas of professional learning? Could integrating them potentially help to bring about systemic change in education in regard to environmental sustainability more quickly, broadly, or deeply?

This article shares an exploration of this type of integrative programming by focussing on the establishment of an innovative collaboration between a graduate-level teacher training program in Canada's largest faculty of education and one of the country's most active EcoSchools programs in a school board. It also presents the initial findings of a three-year case study that tracks the impacts of this partnership in professional development (PD), begun in 2017, between the Ontario Institute of Studies in Education (OISE) at the University of Toronto and the Sustainability Office at the Toronto District School Board (TDSB). The partnership integrates PD in ESE for pre-service teachers with that of practicing (in-service) teachers, aiming to amplify the benefits of this type of professional learning for both, while minimizing its challenges. As many of OISE's pre-service teachers get hired by the TDSB upon graduation, it offers the

potential of increasing the number of new teachers in the TDSB dedicated to implementing ESE with K–12 students, thereby contributing to the expansion of their EcoSchools Program. Over time, this may be one of the ways that a school board and university partnership can contribute to the cultural shift of Toronto into a more sustainable city. As this partnership is still in its early stages, as is its accompanying research study, this first report on this case study will outline its origins in hopes of inspiring similar types of partnerships across Canada. Our aim is to document and analyze the project as it unfolds over its three-year duration, sharing our observations, analysis, and insights into its implementation with a wide audience.

Starting Points for ESE in Teacher Education

The TDSB and OISE have been simultaneously developing their approaches to ESE for pre-service education and in-service (K–12) teachers for many years, so it is surprising that this collaboration has not happened sooner. Its inception can be attributed to the rapid development and success of the TDSB's EcoSchools Program on the one hand, and OISE's ESE Initiative on the other, each of which has a unique foundation that has informed the beginning of their new collaborative approach to PD.

Growing the TDSB's EcoSchools Program

The TDSB's EcoSchools Program was founded in 1998 by Richard Christie and Eleanor Dudar as a way to shift Canada's largest school board toward sustainability. With over 200,000 students, 15,000 teachers, 35,000 staff and 575 schools, the TDSB offered a generative context in which to experiment with a large-scale implementation of the EcoSchools movement in Canada. Originally focussed on energy conservation, waste minimization, and schoolyard greening, these forward-thinking program leaders convinced TDSB managers and trustees of the environmental and economic benefits that would come with students and teachers turning off lights and sorting waste into recycling streams. Its EcoSchools Program grew rapidly, from 11 schools in the first year, to over 427 schools at its peak. This impressive growth was supported by a formative partnership with Evergreen, a national non-governmental organization (NGO) dedicated to greening school grounds, whose staff helped to nurture the program's development.

Over the years, the TDSB's EcoSchools Program has grown to support six major goals: fostering leadership and teamwork; conserving energy; minimizing waste; caring for and creating vibrant school grounds; improving student achievement through ecological literacy; and contributing to healthy, active, safe, and sustainable school communities (TDSB, 2018). Four staff run the program, which includes supporting and certifying EcoSchools at the bronze, silver, gold,

or platinum levels; designing and delivering PD for EcoTeams across the city; running annual student conferences; creating print and online resources; and supporting a range of partnerships with NGOs. They were generous in sharing the program structure and resources to help establish the Ontario EcoSchools Program in 2005, which is now an NGO with 11 staff and 1,600 certified EcoSchools across the province.

As the TDSB's EcoSchools Program expanded, the board established a Sustainability Office, in which the program is now located. This has led to growing support for a wider range of sustainability measures, such as establishing outdoor classrooms and gardens in schoolyards, mapping and planting trees on school properties, and building high-performance green buildings. In conjunction with the EcoSchools Program, the TDSB began installing solar panels on school roofs; these are now found in over 300 schools. The solar installation was a stroke of brilliance; substantial income has been generated from selling energy back into Ontario's power grid and from the sale of carbon credits. This now fuels the Environmental Legacy Fund, which provides dedicated funding for sustainability projects at the board level—underwriting some of the costs of its EcoSchools Program, such as cycling education programs, water bottle refill stations, and bike racks—as well as funding for PD in ESE for teachers and staff. As many school boards own large numbers of buildings and acres of green space, this is a funding model built on green energy infrastructure improvements that deserves further study for its potential economic benefits. It certainly provides environmental benefits: There has been a 21% decrease in overall GHG emissions at the TDSB since 2001, suggesting that the sustainability practices instilled as part of the EcoSchools Program have been successful.

Establishing the ESE Initiative at OISE

As the EcoSchools Program began to flourish, the roots for ESE were being laid at OISE. As the largest faculty of education in Canada, OISE offered a variety of pathways to teacher education in the early 2000s, including undergraduate and graduate degrees in consecutive and concurrent formats, graduating approximately 2,000 new teachers each year. When the Ontario Ministry of Education began investigating the establishment of a new policy framework in Environmental Education in 2006, OISE teacher educators Hilary Inwood, Jane Forbes, and David Montemurro saw an opportunity to integrate ESE into its undergraduate Bachelor of Education program. Starting with a modest set of extracurricular workshops, they formally established the ESE Initiative in 2008 to provide pre-service teachers with learning of ESE as it had a minimal presence in OISE's teacher education program. With support from Associate Dean Mark Evans and Program Director Kathy Broad, Inwood became OISE's Lead in ESE in 2009, and the initiative quickly expanded. By 2012, over 1,000 pre-service teachers and graduate students were engaging in different aspects of ESE each year through

workshops, talks, special events, elective courses, and graduate student training.

Now celebrating its first decade, the ESE Initiative has established an inventive set of ways to ensure that OISE pre-service teachers are well-grounded in ESE, preparing them to become active EcoSchools teachers and environmentally literate citizens (Inwood, 2019). In addition to delivering over 20 extracurricular events each year, the Initiative hosted an ESE conference and EcoFair for graduate students from 2012–16. These events have been supported by many ESE-focused NGOs in Toronto, including Natural Curiosity, Evergreen, FoodShare, and Learning for a Sustainable Future. This success led to the establishment of two school-based cohorts of pre-service teachers focussed on ESE, one embedded in a local elementary EcoSchool (centred on Social Justice and EcoJustice Education), and another located in a secondary school (based on Global Education). As of 2015, there are mandatory core courses in ESE that all pre-service teachers must take to graduate, as well as elective courses in this area. For the last five years, the Initiative has planted and nurtured an urban educational garden at the front of the OISE building. It has also developed a walking art gallery with over a dozen student-created eco-art installations that encourage the OISE community to use the stairs (rather than take the elevator) as an energy conservation measure and to support health and well-being. Research projects have run in alignment with some of these activities, contributing to scholarship in ESE (Inwood, Miller, & Forbes, 2014; Inwood & Jagger, 2014). All of these components have offered paid training for students, who help to plan and implement the wide range of activities of the ESE Initiative.

Working through the Challenges

Despite the great strides that the TDSB and OISE were making in bringing ESE to their educational communities, each reached a point where sustained growth was proving to be challenging. For the TDSB, the intense workload on their staff made providing year-round PD for EcoSchools teachers untenable, even though teachers were requesting help to deepen their expertise in ESE. With few in-house PD opportunities, teachers were unable to learn from other educators or strengthen their professional learning networks in this area. The EcoSchools staff also puzzled over how to continue to grow the EcoSchools Program without getting new teachers involved each year; the number of schools involved in the program had plateaued, and the staff struggled to support the existing ones, let alone enticing new teachers to get involved.

There were also challenges at OISE; while pre-service teachers were excited about the possibilities that ESE offered and eager to try it out in their teaching, they were not often seeing it modelled in their practice teaching blocks, which is critical to learning how to teach any subject. In addition, in 2014 the ESE Initiative lost its administrative home and financial support in a major reconfiguration of OISE's teacher education programs, putting it at risk of being shut down

altogether. How could it continue to operate its programming, advocacy, and research programs without administrative backing? For both organizations, these challenges proved daunting, with no clear solutions, despite a body of literature that catalogued similar issues.

Looking for Precursors in ESE in the Teacher Education Literature

Both organizations were drawing on developments in ESE in formal education settings as they developed their innovative programs. The TDSB team drew inspiration from the models provided by the EcoSchools organization in Europe (www.ecoschools.global), which had been established in 1994 in response to the needs identified at the United Nations Conference on Environment and Development (Cincera, Boeve-de Pauw, Goldman, & Simonova, 2018). One of a number of organizations worldwide that are dedicated to using schools as sites for environmental learning, the TDSB's EcoSchools Program is part of a movement also referred to as "green schools" in the US and China, "sustainable schools" in the UK and Australia, and "enviroschools" in New Zealand (Foundation for Environmental Education, 2010). This movement has been studied in other countries since its inception (Henderson & Tilbury, 2004; Mogenson & Mayer, 2005; Birney & Reed, 2009), but has not been as often researched in Canada, as noted by Fazio and Karrow (2013).

Fazio and Karrow's (2013) study is of particular interest in that it examined an EcoSchools Program in an Ontario context similar to the one in Toronto. One of its findings was that teachers identified PD opportunities as a support needed for teaching about the environment, "providing them time and professional growth opportunities to work together and network with other schools, [which] would go far in developing learning resources and capacities to support school-based EE practices" (p. 650.) This aligned with the calls for teachers' PD in the Ontario Ministry of Education's (OME) (2009) policy framework in Environmental Education (EE) called Acting Today, Shaping Tomorrow. In it, the OME identified actions that should be taken in conjunction with school boards to support teachers' professional learning in EE (though as many in Ontario would acknowledge, this has not materialized as broadly or deeply as it should have).

Calls for professional development in ESE in pre-service and in-service teacher training began far earlier than the OME's (2009) policy; for example, in 1999, the Ontario Teachers' Federation and the Canadian Teachers' Federation both adopted resolutions pertaining to education for sustainability (Council of Ministers of Education [CMEC], 2000). The same year, Charles Hopkins was named the UNESCO Chair in Reorienting Teacher Education Towards Sustainability, based at York University. (In his previous roles as TDSB principal and superintendent, he was very supportive of the founding of the TDSB's EcoSchools Program). A year later, the Pan Canadian Network of Faculties of Education Supporting Sustainability and Stewardship was formed, leading to discussions

about ESE in pre-service teacher education (though it is unclear how long this group lasted). The CMEC's (2000) research report on Education for Sustainable Development (ESD) in Canada noted a lack of pre-service teacher education in this area; this was substantiated by Lin's (2002) study that found little evidence of implementation of EE/ESD in Canadian faculties of education from 1976–96, and by Beckford in 2008.

Inspired in part by the UN's Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability (Hopkins & McKeown, 2005), a growing interest was seen internationally in regards to in-service and pre-service teacher education in ESE, though the literature shows these two areas being treated distinctly. While some aspects of in-service teacher education in ESE have been explored over the last few decades (Ham & Sewing, 1988; Hart, 1990; Lane, Wilke, Champeau, & Sivek, 1994; Fien & Rowling, 1996; Wade, 1996; Ernst, 2007; Liu et al., 2015), a greater emphasis has been placed on pre-service teacher education in ESE (McKeown-Ice, 2000; Cutter-Mackenzie & Tidbury, 2002; Heimlich, Braus, Olivolo, McKeown-Ice, & Barringer-Smith, 2004; Van Petegem, Blieck, Imbrecht, & Van Hout, 2005; Ferreira, Ryan, & Tilbury, 2007; Gooch, Rigano, Hickey, & Fien, 2008; Greenwood, 2010; Nolet, 2013; Franzen, 2017; Evans, Stevenson, Lasen, Ferrerria, & Davis, 2017). In Canada, a small body of scholars have called for more pre-service teacher education in ESE (Hart, 1990; Russell, Bell, & Fawcett, 2000; Pickard, 2007; Alsop, Dippo, & Zandvliet, 2007; Beckford, 2008) and, more recently, have experimented with ways to implement it (Puk & Stibbards, 2010; Inwood & Jagger, 2014; Zhou, 2015; Ormond, Zandvliet, McClaren, Robertson, Leddy, & Metcalfe, 2014; Karrow et al., 2016). These studies and programs may have helped to improve the presence of ESE in Canadian pre-service teacher education programs, as evidenced by research conducted in the past eight years (CMEC, 2012; Sims & Falkenberg, 2013; Falkenberg & Babiuk, 2014).

What has been missing from the ESE literature, however, are references to the integration of in-service and pre-service teacher education, despite the deep body of literature in teacher education that identifies the benefits of connecting pre-service and in-service teachers in school-based cohorts and practice teaching blocks. It is surprising that there has been so little written about this in regards to ESE, as Powers (2004) proposed that having in-service teachers who implement EE matched with pre-service teachers would be helpful for the latter's understanding; she also recognized that this was limited by the number of in-service teachers available to serve as potential role models. The UNESCO guidelines prepared by Hopkins and McKeown (2005) had also recommended strengthening partnerships between teacher education programs and schools to support ESD. Ferreira and Ryan (2012) offered a "mainstreaming change model" for improving EE in pre-service teacher education that would bring together teacher education institutions with schools to work toward whole-school approaches to sustainability. These authors reinforced the importance

of a range of partnerships and networks in EE, including with school boards, as one of six factors that were critical to the successful integration of EE into pre-service programs (Ferreira et al., 2014). As part of our team's work, we investigated the impacts of partnerships in practica between pre-service and in-service teachers in relation to ESE (Inwood et al., 2014). This study found a range of positive outcomes for both, including an increase in environmental teaching, more frequent outdoor learning, and greater enthusiasm for supporting K–12 students' environmental activism. This provided evidence that these types of partnerships can simultaneously be an effective form of teacher education and professional development. Moore, O'Leary, Sinott, and O'Connor (2019) supported this more recently by recommending the extension of "communities of practice" to involve teachers, higher education institutions, and local industry.

Integrating Professional Development in ESE

Evidenced by the growing literature, we perceived that there were benefits to bringing in-service and pre-service teachers together for professional learning, and so we began to consider what an integrated model might look like. While two of the lead educators, Hilary Inwood from OISE and Pam Miller from the TDSB, had done workshops and talks for each other's institutions, their ESE programs had remained independent. This began to change in late 2013 when OISE received accreditation by the Ontario College of Teachers to offer in-service courses in ESE (called "Additional Qualification" courses). These summer courses for teachers were intense, involving three weeks of full-time study, and yet were fully enrolled in the first few years. As a result of seeing a high demand for more PD opportunities, Richard Christie, Senior Manager of the TDSB's Sustainability Office, posited an intriguing idea in the fall of 2015: Could pre-service and in-service teacher education in ESE be integrated year-round at OISE? While the prospect of offering PD in ESE for a few thousand pre-service teachers and TDSB teachers seemed daunting at first, the opportunities this potential collaboration offered proved hard to resist. It took almost two years of negotiation between the two organizations to develop a set of guidelines for the project, resulting in a new administrative home for the ESE Initiative at OISE. Its funding comes from the board's Environmental Legacy Fund (described earlier) that could be adopted by other school boards and universities, manifesting systems-thinking as a way to facilitate systemic educational change.

Now two years into the TDSB/OISE collaboration in PD in ESE, it is running year-round for in-service and pre-service teachers. There have been over 30 ESE professional learning events offered in this period, from lectures, workshops, and field trips, to conferences, EcoFairs, and year-end celebrations of EcoSchools learning. An Action Research Team focussed on ESE has been formed, involving 14 teachers and early childhood educators. Initial feedback from both groups has

been very positive: Pre-service teachers are inspired to be meeting, networking with, and learning from experienced EcoSchools teachers; in return, the teachers are finding OISE students eager to volunteer in their classrooms and help with their EcoSchools teams, activities, and events. But we want to know more about what is transpiring: What are the learning expectations, experiences, and impacts of pre-service teachers and EcoSchools teachers involved in this TDSB/OISE collaboration? This key question is at the heart of a three-year qualitative research study that has begun to explore this innovative partnership in PD in ESE.

Exploring an Integrated Approach Through Case Study

As both the collaboration and research study are in their early stages, it is too early to provide definitive answers to our broad research question. Our team has begun to collect data by building two qualitative case studies in three phases. One case will focus on examining the experiences of OISE pre-service teachers who are engaged in this ESE PD programming, while the other case will focus on the experiences of in-service TDSB teachers. The two cases will work in tandem: The first phase of the study, which is underway, is investigating the needs and expectations of those involved; phase two will investigate their experiences in this integrated approach to ESE PD. Phase three will focus on the impacts of this PD through the teaching and learning of both the pre-service and in-service teachers engaged in the collaboration. A qualitative case study methodology is at the heart of our study, drawing on the work of Yin (2002), Stake (1995), and Merriam (1998) as we seek to understand how those involved are making meaning of their experiences and the impacts that this integrated model of PD in ESE may have on their teaching.

Data Collection Methods

Data collection methods across all three phases will be diverse; these will include online surveys, focus group interviews, and informal feedback about participation in ESE PD via feedback forms, photos, videos, and work samples from a range of ESE events. Archival records (i.e., annual reports, budgets) will also be utilized. Yin's (2002) principles of data collection informed our methods, which include using multiple sources of evidence to triangulate the data and increase construct validity; creating a case study database to clearly organize the data; and maintaining a chain of evidence to cite evidence from the data appropriately. We recognize the limitations to this multi-phase qualitative study. There may be bias from the perceived power dynamics between the pre-service and in-service teachers and researchers; therefore, online surveys will be anonymous, and focus group sessions will be conducted by members of the research team not directly engaged with those participating. We are aware that by collecting data only from those engaged in the ESE collaboration, the study will

miss further exploring the motivations and barriers of those who choose not to be engaged with it.

Initial Findings from the First Year of Study

While our case study is still in its early phases, we have accessed archival materials in building an understanding of each organization's early beginnings in ESE, and we have collected data through two online surveys and three focus groups (two for pre-service teachers, another for in-service teachers). What follows is a summary of our initial findings.

Summary of Responses from Pre-Service Teachers

The demographics of those who have responded to the online survey of pre-service teachers aligned with those of the Teacher Education programs at OISE. The majority identified as female, had a median age of 25 years old, and were training to teach at the primary-junior level (n = 23). Climate change is the environmental issue/challenge that about half of the respondents self-reported being most aware of; the other half flagged recycling/waste and water issues as their main interests. When asked to rate their initial knowledge of environmental issues when they began at OISE, over half reported having a moderate-to-good or high level of knowledge. The majority of respondents did not have a background in ESE, but stated they were very interested in learning more about ESE as part of their pre-service teacher education. Focus group participants (n = 16) cited promoting sustainability, encouraging mental health and wellness, fostering connections to nature, and inspiring students as their main reasons for wanting to know more about ESE. One participant commented that she was influenced by passionate ESE teachers because "seeing their passion and all the work they're doing . . . inspired me to do the same thing that they did for me." The connections between social justice issues and ESE was the most popular topic these participants wanted to learn more about.

When asked where pre-service teachers expected to learn about ESE, the majority felt this learning should take place in their teacher education program through mandatory courses, extra-curricular events, in their teaching practica, and in elective courses (in order of preference). When asked where they had been involved in ESE in their teacher education program to date, the majority reported mostly in extracurricular events and mandatory courses. One focus group participant raised an important point about the effectiveness of mainly extracurricular ESE programming:

> I like the workshops; I wish [we had] that in our courses. . . . I just think that the people who are interested are always going to come to the events . . . it makes me worried about teachers who don't even have any idea about ESE that they might not be getting any of that information.

The majority of pre-service teachers reported that they chose to attend ESE events because they wanted to deepen their existing knowledge about ESE, get activity ideas for practicum, have hands-on learning experiences, and meet others interested in ESE. This last motivation suggests there is a social aspect to ESE that participants considered important. This latter emphasis was also found in the focus groups, as participants acknowledged their desire to not only work collaboratively but also to connect with local environmental-related organizations and teacher education programs around the globe.

Half of the survey respondents had some expectations for the ESE PD they attended: they wanted to learn new ideas and activities to integrate ESE into classrooms; acquire and share knowledge about ESE and environmental issues; and make connections and network with like-minded people. Focus group participants mentioned the importance of bringing ESE into classrooms to support K–12 students to become environmentally-responsible leaders in the future. Most of the respondents who attended ESE events agreed that their expectations were met for various reasons, with the most common reason being that "the event provided new information and resources" and encouraged participants to "make connections with other teachers and students." They were happy to learn alongside all kinds of people, including fellow OISE students, practicing teachers, and elementary or secondary students. Their preferred mode of ESE learning was in-person, opposed to online or through print resources, which aligned with the responses of the focus group participants. Types of learning experiences within ESE were ranked, with outdoor learning as the top response, followed by interactive workshops, conferences, video/documentaries, then talks. Interestingly, there was low interest in learning about ESE online generally (which contradicted their assertion that online resources were helpful to them). Overall, the most common response about best resources was related specifically to activities, workshops, skills, contacts, and websites that could be incorporated into the classroom with K–12 students.

Summary of Responses from In-Service Teachers

Over half of teachers who responded to the EcoSchools survey to date (n = 58) have been teaching for more than 10 years, are between 41 and 55 years old, and did not have any ESE training as part of their undergraduate or teacher training. The majority of participants had been working in and contributing to a certified EcoSchool for 5–10 + years (many at the platinum level), and half rated their confidence in their role as an EcoSchools teacher as high. The majority of respondents were delivering ESE in their classrooms, as well as helping to run their school's EcoTeam. Almost every respondent rated their level of interest in making ESE a greater part of their teaching practice very highly on a five-point Likert scale, reporting that they wanted PD opportunities in ESE to support their work with the EcoSchools Program.

The majority valued the PD opportunities they have had in EE in the TDSB, including the EcoSchools Kickoffs, workshops, accessing the EcoSchools website and digital newsletter, ESE conferences, and Additional Qualification courses. Not surprisingly, their preferred timing for PD in ESE was during school hours (with teaching release time), but just under half signalled that after school or weekends were acceptable. They chose the fall as the time when professional learning in ESE was most useful, and summer as the least. These teachers' favourite mode of PD in ESE was overwhelmingly in-person learning; online learning was ranked last. Half wanted to learn in outdoor spaces, and a third identified both OISE and learning at their school as their preferred locations. The majority reported that they liked a combination of individual and group learning experiences, including workshops, talks by expert speakers, conferences, and the EcoSchools fall Kickoff event. Feedback on the Kickoffs highlighted that they wanted more time to learn from, and collaborate with, other EcoSchools as well as more time to try out more hands-on learning. The EcoSchools newsletter was reported as being useful by most of these educators, with many appreciating the links to resources, campaign and lesson ideas, information on environment issues, and event notices.

Discussion and Conclusion

What do these initial findings tell us about the learning needs and expectations of the pre-service and in-service teachers involved in the first year of this collaborative approach to PD in ESE? Granted that these are still small survey numbers; hence, we will continue to encourage participation in the survey throughout the end of 2019. The demographics of those who have responded to the online surveys from both groups are fairly representative of those in OISE's teacher education programs and the teachers in elementary education in the TDSB; this makes us wonder what might be done to engage a wider group of pre-service and in-service teachers in this PD program. There is recognition that the respondents have been those eager to participate in PD in ESE (rather than those who are not), but this is appropriate for this study given its focus on those who are engaged in this collaboration. The two groups demonstrate a strong level of self-efficacy in terms of their experience and expertise with environmental issues (for the pre-service teachers) and ESE (for the in-service teachers); despite this high level of comfort, they are choosing to seek out more professional learning in this area. As well, both groups would prefer to have this learning woven into their daily schedules, rather than added on top of it.

There is some initial confirmation that the PD we have led is headed in the right direction; both pre-service and in-service teachers articulated that they prefer in-person learning, rather than online offerings, and enjoy accessing learning through interactive workshops, expert talks, and conferences. Both groups have expressed their preference for learning in community, with social aspects being a

preferred mode. This confirms what we have been hearing anecdotally from pre-service teachers—that they have been getting so much out of connecting with EcoSchools teachers and learning from their expertise and experience. More data are needed on this aspect moving forward. We are also discovering the gaps in our programming, as many expressed the desire to do more PD outdoors; there is some nature-based and Land-based learning included in the PD programming, but this should be increased. Both groups have expressed that they would like to have ESE PD worked into their daily schedules more effectively. While we concur that this would be advantageous, it is problematic in that it is costly for TDSB to release teachers from their classroom duties, and it would mean that pre-service and in-service teachers could not access the potential benefits of learning together because of differing schedules.

As this collaborative partnership, integrative programming, and multi-phase study continues between OISE's ESE Initiative and the TDSB EcoSchools Program, our team will document and analyze what is needed in PD in ESE for pre-service and in-service teachers learning together. We hope that this model may serve to inspire more university and school board partnerships in ESE. Certainly, more research is needed to better understand professional learning in ESE across the country, and the critical roles educators play in instilling awareness, knowledge, and activism in K–12 students in relation to environmental sustainability.

Notes on Contributors

Dr. Hilary Inwood is a teacher educator, researcher, and artist who leads the *Environmental & Sustainability Education Initiative* at OISE, University of Toronto. Her research focuses on developing teachers' knowledge and skills in environmental literacy and environmental art education, extending beyond classrooms into school gardens, outdoor education centres, parks, and galleries.

Alysse Kennedy is a doctoral candidate at OISE, University of Toronto, and an occasional teacher with the Toronto District School Board. Her research investigates meaningful pedagogical approaches to teaching about the environment in accessible and relevant ways. She helps to coordinate professional learning for the *Environmental & Sustainability Education Initiative* at OISE.

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Activating Teacher Candidates in Community-Wide Environmental Education: The Pathway to Stewardship and Kinship Project

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Abstract

To create a truly regenerative future, simply reforming teacher education to prioritize Environmental and Sustainability Education (ESE) will not create the wide-ranging changes in the education system needed to meet the environmental challenges facing humanity. A holistic strategy involving community collaboration with teacher education stands a better chance of achieving this. This article provides an overview of a community-wide project to foster environmental stewardship in children from birth to Grade 12. This collective impact model approach will create a climate that supports teacher candidates in their efforts to improve their practice in ESE. We argue that teacher candidates who learn to collaborate with their community as a source of expertise and encouragement are more likely to create positive and lasting change in ESE.

Résumé

Pour créer un avenir véritablement régénérateur, il ne suffit pas de mettre au premier plan l'éducation à l'environnement et au développement durable dans la formation des enseignants; cette seule réforme n'entraînera pas, dans le système d'éducation, de changements d'une ampleur suffisante pour relever les défis environnementaux qui attendent l'humanité. L'intégration de la collaboration communautaire à la formation des enseignants constitue une stratégie holistique ayant plus de chance de porter fruit. Le présent article trace les grandes lignes d'un projet communautaire conçu pour encourager la responsabilité écologique chez les enfants, de la naissance à la 12e année. Cette approche, fondée sur un modèle d'effet collectif, permettra d'aménager un climat propice pour soutenir les futurs enseignants afin de les aider à enrichir leur pratique sur les sujets touchant l'environnement et le développement durable. Les futurs enseignants qui apprennent à recourir à leur communauté comme source d'encouragement et d'expertise sont plus susceptibles de provoquer des changements positifs et viables dans le domaine de l'environnement et du développement durable.

Keywords: community, stewardship, teacher education, collaboration, partnership

Mots-clés : communauté, responsabilité écologique, formation des enseignants, collaboration, partenariat

<center>Introduction</center>

The urgent need to revise our relationship with the planet, in response to the multiple and growing threats to our life support system, should inform and influence every aspect of human activity. The slow speed at which this is happening in most sectors is frustrating and perilous. As E. O. Wilson (1993) wrote more than a quarter of a century ago: "What humanity is doing now in a single lifetime will impoverish our descendants for all time to come" (p. 37). Almost 30 years ago, Orr observed that education has been part of the problem and that it now needs to become part of the solution (Orr, 1991), later remarking, "We should worry a good bit less about whether our progeny will be able to compete as a 'world-class work force' and a great deal more about whether they know how to live sustainably on the earth" (Orr, 1993, p. 433). Those of us involved in education need to do our utmost to ensure priorities in this sector change to reflect the scale of the challenge. Teacher educators have a key role to play in transforming education as they prepare the next generation of teachers (Hopkins & McKeown 2005; McKeown & Hopkins, 2007; McKeown & Nolet, 2013). This was recognized by UNESCO (2014) when they envisioned teacher education in which:

> ESD is integrated into pre-service and in-service education and training for early childhood, primary and secondary school teachers, as well as teachers and facilitators in non-formal and informal education. This may start with the inclusion of ESD in specific subject areas but will ultimately lead to the integration of ESD as a cross-cutting issue. It includes ESD training for head teachers. (p. 35)

We agree with Lowenstein, Martusewicz, and Voelker (2010) that we are only likely to succeed in this endeavour with the help of the wider community. Involving the community will promote more integrated curriculum links to real-world experiences and blur the boundaries between formal, non-formal, and informal learning contexts (Sauvé, 2017, Summers, Childs, & Corney, 2005; Tal, 2004). It is equally important that the school system becomes more receptive to changes in practice (Astbury, Huddart, & Theoret, 2009; Gadotti, 2010; Hopkins, Damlamian, & Lopez Ospina, 1996; Robertson & Krugly-Smolska, 1997; Smith, 2007; Stevenson, 2007).

Teacher candidates represent one of our best hopes for a sustainable future (Alsop, Dippo, & Zandvliet, 2007; Hart, 2010; Nolet, 2009). New entrants to the teaching profession are often committed, enthusiastic practitioners who are determined to make positive contributions to the lives of young people and ultimately to the life of the community (Campigotto & Barrett, 2017). Neophyte teachers are thus a conduit for change in the education system; they bring novel approaches, fresh perspectives, and new priorities into their classrooms and the school system. Relatedly, teacher educators are well-positioned to encourage progressive and reflective practices over a wide range of educational praxis, including in Environmental and Sustainability Education (ESE) (Fawcett, Bell, &

Russell, 2002; Hopkins et al., 1996). Specifically, they can encourage, support, and nurture teacher candidates who may be willing to disrupt the status quo by refocussing education to prioritize ESE (Dippo, 2013). Yet, while teacher educators are well-positioned to do this in theory, in actuality, encouraging a change of practice in schooling through this route can be extremely challenging (Chubbuck, Clift, Allard, & Quinlan, 2001; Ferreira, Ryan, & Tilbury, 2007; Ormond et al., 2014) This is, partly, because for their teacher candidates to incorporate an ESE approach into their teaching, they need to have the confidence and knowledge base to do so (Brashier & Norris, 2008). It cannot be assumed this is the case because they may personally lack subject knowledge and in many pre-service education programs, they receive little, if any, guidance in ESE (Blatt & Patrick, 2014; Inwood & Jagger, 2014; Karrow, DiGiuseppe, Elliott, Fazio, & Inwood, 2016; Puk & Stibbards, 2010).

In the face of this lack of guidance, there have been many calls to reform teacher education to give greater priority to ESE (Ashmann & Franzen, 2015; Berger, Gerum, & Moon, 2015; Bowers, 2012; Dippo, 2013; Falkenberg & Babiuk, 2014; Ferreira et al., 2007; Howard, 2012; Karrow et al., 2016; Nolet, 2009; Pickard, 2007; Sims & Falkenberg, 2013). Formal calls for such reforms have come from bodies such as UNESCO (Hopkins & McKeown, 2005) and the Council of Ministers of Education, Canada (2012). Evidence indicates that progress in this endeavour is slow and provisions patchy (Falkenberg & Babiuk, 2014; Ormond et al., 2014; Pedretti, Nazir, Tan, Bellomo, & Ayyavoo, 2012). Johnston (2009) examines the difficulty teacher candidates encounter when trying to do environmental education because it does not fit neatly into the curricular silos they feel obliged to respect, and Ormond et al. (2014) describe the problems and resistance that their teacher candidates experienced when trying to engage in EE/ESD work during placements.

Some progress has been made, however. Examples of responses to calls for reform include the following: Berger et al. (2015) describe a course that educates teacher candidates about climate change; DiGiuseppe et al. (2016) explain the curricular and extracurricular developments made in teacher education programs at three institutions in Ontario; Elliott, Bell, and Harding (2018) share their experiences developing a course that integrates ESE and Indigenous education. No Canada-wide review of the provision of ESE content in teacher education has been undertaken since Lin's study (2002), however, so there is no comprehensive picture of current provision.

Although the Ontario Ministry of Education requires all teachers, at all grades and in every curriculum subject, to infuse environmental education into their teaching (Ontario Ministry of Education, 2009), there is inertia resulting from norms of practice handed down from one generation of teachers to the next. Limitations imposed by managerial practices, structures, and routines, an emphasis on other priorities, or lack of leadership can create an environment in a classroom, school, or school board where innovative ESE practice is not well supported or is even actively discouraged (Greenwood, 2010). Thus,

teacher candidates, as well as newly certified teachers, may find themselves in a school environment where ESE is not prioritized. They may feel deterred from enacting approaches they have been introduced to in their pre-service course and which they themselves would choose to adopt (Brown, Bay-Borelli, & Scott, 2015; Chubbuck et al., 2001; He & Cooper, 2011; Saka, Southerland, & Brooks, 2009; Strom, Dailey, & Mills, 2018). When new teachers do try to make changes, lesson plans may not be approved, or their intention to do something outside of the norm may be thwarted either by a lack of support from their school-based mentor (Associate Teacher) or by the difficulties navigating bureaucratic hurdles, such as those encountered when attempting to arrange an off-site class visit (He & Cooper, 2011). Regardless of their reticence to innovate, it is clear that many new teachers adopt the practices found in a school rather than implementing different approaches they have been exposed to in their pre-service program (Allen, 2009; Brown et al. 2015; Chubbuck et al., 2001).

To maximize the impact that new teachers can have by bringing an ESE-focus to their work in schools, a number of elements may need to exist more or less simultaneously. Initially teacher candidates need an introduction to ESE pedagogical ideas during their pre-service program. Such program content needs to be for all teacher candidates, irrespective of the grades of students they intend to work with (Karrow et al., 2016). The introduction should include concrete examples of how to infuse ESE into their work and its potential to enrich the curriculum. However, this approach will achieve limited success if teacher candidates encounter resistance or ambivalence from associate teachers when they take up their school placements. Thus, it is important to influence the environment that teacher candidates encounter in schools by devising and implementing a strategy for promoting ESE among existing members of the teaching profession. This can involve piloting curriculum innovations and providing professional development opportunities for teachers in schools. If experienced teachers can be helped to see the potential benefits of prioritizing ESE as a way to enrich the school experience and increase its relevance to students (Hart, 2010), they are more likely to feel encouraged to do so, and will ultimately be better positioned to mentor teacher candidates in this work. The final piece in the jigsaw is the involvement of the wider community in ESE work so teachers and schools do not have to bear the burden alone of preparing the next generation to be responsible stewards of the environment. Support from organizations and individuals in the local community will make the work of schools easier, more effective, and more rewarding. If students' families can also be encouraged to participate, as seen in the Ensemble Prévenons l'Obésité Des Enfants (EPODE) approach to tackling childhood obesity (Borys et al., 2012), the benefits should be greater and the learning further disseminated.

For community involvement in education to be effective, the relationship between school and community needs to be strong. Yet while schools exist to serve a community, they often function somewhat in isolation from it. Delegating most of the education of children to professional educators has become

the norm in most societies, but there has always been a degree of disquiet with this arrangement among some educators who make efforts to reach out from the school sector to build relationships with local communities. The most visible example of this in North America is, perhaps, the use of co-op placements for high school students, the main purpose of which may be the preparation of young people for a life of work. There are many other examples of ways in which communities can become involved with schools, including sports-based collaborations; art and drama projects; young business initiatives; and visits from First Nations Elders. The time is ripe to build school–community links to help nurture young people who care for and about the environment and who will help to create a sustainable future (Flowers & Chodkiewicz, 2009; Lynch, Eiulam, Fluker, & Augar, 2017). Such links have the potential to stimulate a re-evaluation of the purpose of education and thus to ensure that teacher candidates encounter a nurturing environment in which to develop ESE praxis.

As regards re-evaluating education, the UNESCO Global Action Plan (2014) has set two objectives:

> Reorienting education and learning so that everyone has the opportunity to acquire the knowledge, skills, values and attitudes that empower them to contribute to a sustainable future.

> Strengthening education and learning in all agendas, programmes and activities that promote sustainable development. (p. 14)

The part that communities can play in achieving these objectives is acknowledged in UNESCO's program of recognizing Regional Education for Sustainable Education Networks (UNESCO, n.d.) and the Global Action Plan's Priority Action Area, "Transforming learning and training": "Actions in this Priority Action Area include developing a vision and a plan to implement ESD in the dedicated learning and training environment, in partnership with the broader community" (UNESCO, 2014, p.18). It follows that successful ESE is often conceptualized as one that prepares young people to become active citizens within their community (e.g., Aguilar, 2018; Chawla & Cushing, 2007; Zachariou & Symeou, 2009), so the direct involvement of the community in ESE is entirely compatible with the desired outcome. We argue that only with community involvement can ESE be entirely successful and will now examine a project that has attempted to do this.

This article reports on a project in one community in Ontario, Canada, that uses the collective impact model (Kania & Kramer, 2011) to implement the UNESCO vision of an educational experience that will provide all young people with key opportunities that nurture the attitudes and the skills for responsible stewardship of the environment. This approach involves multiple stakeholder organizations in a community working to a common agenda, using a shared measurement system to assess outcomes, engaging in mutually reinforcing activities, maintaining regular communication, and designating a coordinating

"backbone support organization" (Kania & Kramer, 2011, p.40). As this project rolls out, we hope teacher candidates on placements in schools will encounter practices and philosophies that make them feel secure in their efforts to prioritize ESE in their teaching. The project aligns with the key characteristics of environmental education that successfully engages communities, published by the North American Association for Environmental Education (2017): it puts the community at the heart of environmental education; it is based on sound environmental education principles; it works with collaborative and inclusive relationships, partnerships and coalitions; it supports capacity building for ongoing civic engagement in community life; and it makes a long term investment in change.

The Pathway to Stewardship and Kinship Project

The Community

The Pathway to Stewardship and Kinship is a collaboration between educators (including teacher educators), health and environmental sectors, parents, and a broad spectrum of community groups. It is a framework that aims to inspire the whole community of Peterborough to identify opportunities to collaborate at every age and stage of a child's development (birth to Grade 12), with the explicit aim of raising environmentally-engaged and community-oriented citizens.

The Greater Peterborough Area includes the City of Peterborough (population 80,000) and the largely rural County of Peterborough (population 120,000). The region is 90 kilometres from the Greater Toronto Area conurbation in the Canadian province of Ontario. It is part of the traditional territory of the Michi Saagiig Anishnaabeg people on land recognized by the Williams Treaty. In 2016, the region was designated by UNESCO as a Regional Centre of Expertise on Education for Sustainable Development. This recognized the many organizations in the region who are working to support the area's transition to sustainable practices. Among these are the local First Nations communities (Curve Lake, Hiawatha, Alderville, Scugog), district school boards (Kawartha Pine Ridge, Peterborough Victoria Northumberland Clarington, Trillium Lakelands), Trent University, Fleming College, Peterborough Public Health, Otonabee Conservation Authority, community organizations promoting sustainable practice (GreenUP, For Our Grandchildren, Sustainable Peterborough), and an outdoor and environmental education centre (Camp Kawartha). In the early stages of the project that became the Pathway to Stewardship and Kinship, a framework was envisaged that would consolidate and focus the resources of these organizations, in collaboration with local government administrations, to help to ensure young people growing up in the region receive consistent and coordinated opportunities to develop meaningful and lifelong relationships with their natural and human communities. This will lay the foundation for fostering citizens who are motivated to adopt and promote sustainable lifestyles.

The Project

Since 2015, a working group of educators from a variety of fields, including teacher education, has developed a framework to promote collaboration between formal education and the community to deliver comprehensive environmental, health, and sustainability programming across sectors. The working group recognized that there are ESE initiatives being delivered by several local organizations, but that there was little connectivity between them. This meant programs tended to operate in isolation from each other, and awareness of them in the formal education sector was patchy. For example, experienced teachers, as well as new teachers and teacher candidates, would not necessarily be aware of the ESE opportunities on offer from local community organizations. The working group responded by developing an overarching framework to guide the strategic delivery of ESE experiences through each stage of a child's development. In future the framework will support the efforts of the school system in ESE work by promoting collaboration with the local community. It will thereby nurture an environment in which teacher candidates will feel that the prioritization of ESE is normal, anticipated, and supported.

As a first step to devising a framework, a committee consisting of educators, teacher educators, Indigenous leaders, public health officials, and conservationists began to research best practices in ESE, healthy childhood development, and stewardship education. Based on Tanner's (1980) and Chawla's models (1998) of environmental sensitivity research, committee members interviewed 80 cross-sectoral community leaders, each identified for their professed interest in the environment. Semi-structured interviews were conducted with the aim of determining if memorable childhood experiences had influenced interviewees' care about and advocacy for the natural world, and, if so, what the nature of those experiences were, and at what age they occurred. The interview questions probed how people came to develop an ethic of care and concern for the environment. Each interviewee answered a set of standard questions exploring both their childhood experiences in the natural world and their view of how ESE ought to occur throughout the stages of a young person's life. Interviews lasted between 45 and 90 minutes. Interview responses were examined for similarities, and the frequency of responses were graphed to illustrate trends based on age (early years, middle years, teen years). Findings from the interviews were compared with the results of meta-research on studies examining similar factors (e.g., Ardoin, 2006; Gruenewald 2003; Chawla, 2007a, 2007b, 2009, 2015; Louv, 2005; Palmer, Suggate, Rowbottom, & Hart, 1999; Wilson, 2008; Kelsey, 2016) and were used to identify principles and themes that could provide a feasible framework for the community. Involvement of community leaders in the interviews served a second purpose of engaging influential people in developing the plans, and a third of establishing a tone of respectful collaboration and shared ownership in the project—essential factors in community development.

The term "stewardship" was discussed at length, and the committee came to realize that there are philosophical challenges associated with it. In particular, some of the First Nations educators consulted felt that stewardship implied entitlement or dominion over the earth. Instead, they suggested the term "kinship," believing it to be more appropriate as it exemplifies the idea of "Nwikiikaanigana" (an Anishinaabe word with the approximate meaning of "all my relations")—a term that captures the idea that all of life is part of one, interconnected family. The committee chose to incorporate this concept in the project, thus naming it "The Pathway to Stewardship and Kinship," and further refining and defining the intended meaning of the term stewardship as "a sense of connection to, caring about and responsibility for each other and the natural world" (Dueck & Rodenburg, 2017, p.5). In this sense, stewardship involves taking personal action to enhance the well-being of both human and natural communities. Education for stewardship and kinship involves providing young people with appropriate tools and experiences at each age to help them come to know, respect, protect, and love (as we would for any relation) the life systems that nurture us all.

The Framework's Principles

The Pathway to Stewardship and Kinship framework is structured around clearly articulated principles and themes that emerged from literature-based research and were validated by the interview responses from community members. They can be summarized as follows: enriching and deepening the relationship between young people and the natural world from an early age; providing access to mentors who model respect and awe for the natural world; developing age-appropriate action skills to protect and enhance the local environment through hands-on involvement in meaningful projects; recognizing the interdependency of humans and the natural world; and providing leadership opportunities for older students, to foster empowerment, agency, and hope.

The principles and themes for each age group are matched with the developmental needs and abilities of children and youth as they grow from birth to adulthood (Table 1) to identify "Landmarks" (or key experiences). Foundational to stewardship education is the notion that every young person should have the opportunity to attain each of the Landmarks (Dueck & Rodenburg, 2017). The Pathway project also gives details and contact information for community-based resources available to help support the realization of each Landmark experience. There is a total of 30 Landmarks in the framework, each simply expressed. They are linked to the Ontario curriculum and can be met at school, home, or in the broader community. Each two-year age span focuses on three or four Landmarks, such as "meeting your plant and animal neighbours" in Grades 1 and 2 and "planning a community action project" in Grades 7 and 8.

Ages 3 to 6	
Core Stewardship Principle	**Stewardship Opportunity**
Deepen relationships and understanding.	Choose an outdoor place to explore, play in, and visit regularly.
Reinforce and expand the developing sense of empathy.	Plant, tend, and harvest something that can be eaten.
Cultivate sensory awareness of nearby nature.	Identify natural sounds and smells. Explore micro-environments.
Ages 7 to 12	
Develop outdoor skills.	Try non-motorized activities, such as hiking, survival skills, orienteering, birding, astronomy.
Plan and implement a simple community-based project.	Create a small naturalized area. Manage a school composting project. Plan a stream cleanup.
Ages 13 and older	
Deepen understanding of how modern lifestyles affect the environment.	Calculate ecological footprint. Research how your country's lifestyle consumes global resources, and how this compares with other countries.
Expand abilities to understand and empathize while responding to social/environmental issues.	Find a local hero who is working to protect the environment and arrange for them to speak at your school. Help with a community tree-planting project.

Table 1. Examples of themes from the Pathway to Stewardship and Kinship.

Piloting the Pathway

In preparation for an anticipated community-wide rollout, four elementary schools and several pre-schools were recruited to pilot-test the Pathway project during the 2018–19 school year. Participating classes received a start-up package of support materials, including colourful posters to motivate and track activities, an extensive list of community support opportunities, and a small budget to pay for materials, experiences, and program support. Each class received start-up questionnaires for teachers and parents to assess attitudes toward ESE, gauge current ESE-related behaviours, and identify barriers to engagement. Each age grouping (six in total) received a unique questionnaire with questions related to the Landmarks for that age. Questionnaires were completed by participating educators and parents of participating children. Follow-up questionnaires at the end of the pilot phase assessed changes in attitudes and behaviours, and gauged the effectiveness of the supports.

In addition to the personalized support that each teacher in the pilot could select, collective resources included access to a project website, guidebook, newsletters, and hands-on workshops for sharing skills and ideas. Examples of successful community links utilized included:

1. A kindergarten class supported on walks to a nearby natural area by enthusiastic members of a local naturalists' club;
2. A community-supported zoo loaning small "foster animals" to primary classes for students to care for and develop positive relationships with;
3. A university ornithology professor introducing junior students to methods of monitoring bird populations so students can participate in "Citizen Science";
4. An outdoor equipment company providing a discount to a school for the purchase of two class sets of snowshoes—one for older students, one for primary students—so student "buddies" could learn to snowshoe together;
5. A popular outdoor educator working with teachers and their classes to explore the many opportunities to use the schoolyard for adventure, discovery, and inter-disciplinary learning.

Teachers responded positively. They recognized the physical and mental health benefits of outdoor activity, and they appreciated community support not only in bringing new experiences to their classes but also in building collective momentum toward an important and positive community goal.

Teacher Candidates' Involvement

Teacher candidates at Trent University have been introduced to the framework at several points during its development. This has occurred in classes that are part of a core course taken by all teacher candidates: Indigenous Education and Environmental and Sustainability Education (for details see Elliott et al., 2018) and during extra-curricular workshops as part of an Eco-Mentor program (Bell, Elliott, Rodenburg, & Young, 2013). The Eco-Mentor program has run since 2011 and is an example of an early ESE collaboration between teacher education and the local community; it is run by education faculty and staff from an outdoor education centre and features guest presentations from a wide range of community members involved in ESE (DiGiuseppe et al., 2016). As the Pathway project developed, teacher candidates were asked to evaluate and comment on the appropriateness of the principles and Landmarks and to reflect on how these related to their own experiences growing up. They were asked to envisage how it might help to bring a greater focus to ESE work in their placement schools. Once in its final form, they were asked to evaluate the framework's usefulness as a support for new entrants to the profession. The overwhelming response was that it would be of great value.

Bearing in mind that all teacher candidates take this course and are made aware of the provincial requirement that all teachers of all grades are expected to infuse environmental education into their work, it is not surprising that they would deem a carefully devised framework with specific Landmarks to be a valuable resource. The links to community-based resources further reassure them that there are people in the wider community well-placed to assist them in this work. As the pilot scheme began, some teacher candidates found themselves

working alongside teachers involved in the pilot, and so gained first-hand experience of its potential benefits.

This kind of experience will increase as the pilot expands to involve more schools. At least one teacher involved in the pilot scheme is also a part-time instructor in the teacher education program, so this will further enhance the links between the framework and teacher candidates. The hope is that once a school becomes involved in the Pathway project, teachers, parents, students, and the wider community will come to recognize the benefits of a collaborative approach to environmental education.

The Pathways document will be shared with teacher candidates every year, and they will be encouraged to make use of it during practica and in their future careers. The nature of the framework lends itself to use by an individual teacher whether or not they find themselves in a school that is utilizing it. Also, some teacher candidates will work directly with community partners during the alternative setting placement that is a core component of the program, so with the framework now in place for guidance, it is hoped that this will further strengthen the collaboration between the community and the program.

Conclusion

As is often the case with collective impact community projects, word-of-mouth has been the most effective way of communicating about and promoting the project. Numerous schools have adopted the framework on their own initiative, even without the financial support available to schools formally involved. They see links between the Pathway project and emerging educational priorities in child-centred learning, self-regulation, community partnerships, and sustainability. Although the project is being recognized as valuable among many teachers and schools, collaborators continue to work on it to develop effective community-support of the project. A priority is to build teachers' confidence in their use of outdoor and community-based learning experiences. This will be done using Professional Activity days and in-class mentoring, as well as by sharing ideas and success stories via traditional and social media.

Central to the philosophy of the project is that teachers should not be doing this work alone. As well as community organizations, the involvement of parents, guardians, grandparents, and other adults in the lives of young people to nurture a generation of stewards is crucial. To improve awareness and enhance continuity with the Landmark experiences for young people when they are at home and in informal settings, future plans include developing adult-support networks.

Collaboration on the project with teachers and other adults will be reviewed and then the framework refined and further developed. This will include responding to feedback from the questionnaire surveys. Over 700 questionnaire responses have been submitted, to date, and are being analyzed. The findings

will help to inform targets for adults wishing to stimulate changes in the behaviour of young people. Targets such as increasing young people's outdoor time; levels of physical activity; environmental awareness; and community involvement. At the end of the pilot phase, focus groups involving teachers, other adults, and students will also help to determine the effectiveness of the strategy, identify future priorities, and provide guidance on future adjustments and improvements.

The involvement of teacher education has been central to the project from the outset. This model for promoting ESE has gained interest from our teacher candidates who show a ready willingness to engage with it. Among teacher candidates who are already parents themselves, there has been an immediate recognition that the framework can help to inform not only their work as teachers, but also as parents. Plans are underway to embed the framework more securely in the teacher education program to maximize teacher candidates' understanding of it and to capitalize on the insights it provides to aspects of child development. With ongoing support from the local school boards, we envisage a time when all schools in the region will adopt the Pathway. With the achievement of this goal, it will be possible to guarantee that all teacher candidates on practicum placements will be learning in an environment where the framework is used. They will then be able to gain first-hand experience of using it with their students.

While shifting political tides in Ontario herald uncertainties for future funding support, there is an undeniable foundation of interest and commitment within the community to keep moving forward with the project. We hope that our stakeholder organizations will be in a position to entrench the Pathway Landmarks into their ongoing budgets and programming. To our knowledge, this is one of the first systematic, community-based and comprehensive plans involving teacher education to foster a culture of environmental stewardship in mainstream, contemporary Canadian society. We hope that its dynamic, multi-disciplinary nature, grounded in research and community wisdom, with a focus on the public school system as a critical hub for transformative community development, will serve as a model that may be adapted for use by other communities.

Acknowledgement

Notes on Contributors

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Research Activities of the Canadian Standing Committee on Environmental and Sustainability Education in Teacher Education

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Abstract

This ongoing case study reports on the research activities of the Canadian Environmental and Sustainability Education in Teacher Education (ESE-TE) Standing Committee. A history of the Standing Committee's research activities, a literature review comparing the Standing Committee's ESE-TE research with international approaches to ESE-TE research, the identification and prioritizing of the Standing Committee's future ESE-TE research agenda, and a model for developing a research agenda amongst Standing Committee ESE-TE stakeholders comprise the work. Recommended future research consists of redefining ESE; reviewing Canadian and international ESE-TE research literature; and examining potential Canadian and international ESE-TE research topics including: connecting the social and the ecological; teacher "identity" and "agency"; community-based ESE; teaching/student learning and belief systems; and challenges in applying research to practice.

Résumé

Cette étude de cas (encore en cours) présente les activités de recherche du comité permanent canadien sur l'éducation à l'environnement et au développement durable (EEDD) dans la formation des enseignants (FE). Elle trace l'historique des activités de recherche du comité permanent, recense les écrits comparant les travaux du comité avec ce qui se fait à l'international dans ce domaine, établit les projets de recherche à venir du comité permanent pour en déterminer la priorité, et propose un modèle pour convenir d'un programme de recherche parmi les parties prenantes du comité permanent. On recommande notamment de redéfinir l'éducation à l'environnement et au développement durable, de procéder à une revue de la recherche canadienne et internationale sur l'EEDD-FE, et d'examiner d'éventuels thèmes de recherche sur l'EEDD-FE (au Canada et à l'international), notamment : les liens entre les questions sociales et écologiques; « l'identité » et « l'agentivité » de l'enseignant; l'EEDD dans la collectivité; les systèmes d'apprentissage et de croyance des enseignants et des élèves; le défi d'appliquer la recherche à la pratique.

Keywords: Canadian ESE-TE Standing Committee, EECOM, environmental and sustainability education, teacher education, research

Mots-clés : comité permanent canadien sur l'éducation à l'environnement et au développement durable dans la formation des enseignants, Réseau canadien d'éducation et de communication relatives à l'environnement (EECOM), formation des enseignants, recherche

Research Activities of the Canadian Standing Committee on Environmental and Sustainability Education in Teacher Education

University teacher education[1] programs have an essential role in the preparation and ongoing professional development of teachers to support ESE learning from pre-kindergarten to Grade 12. Research into such programs enhances our knowledge base, mobilizes knowledge, and increases the profile of ESE-TE, an emerging field of study. Programmatic and research-driven ESE-TE activities are necessary to reorient teacher education for a sustainable future. Teachers are key to transforming the education of society. The annual reports of environmental and social injustice (Worldwatch, 2015) underscore the necessity of ESE-TE.

The purpose of this paper is to chronicle and reflect upon the research activities of the Canadian Environmental and Sustainability Education in Teacher Education (ESE-TE) Standing Committee ("Standing Committee") of the Canadian Network for Environmental Education and Communication (EECOM), from its inception to today.[2] We chart a possible future for these research activities by considering a model for the development of a consensual research agenda among members of the Canadian ESE-TE stakeholder community.[3]

The paper is organized to address four questions that reflect our objectives:

1. What is the history of the research activities of the Standing Committee from its inception to the present?
2. How does Canadian ESE-TE Standing Committee research and international ESE-TE research compare?
3. What are possible future Canadian ESE-TE research priorities?
4. How might a consensual research agenda among Canadian ESE-TE stakeholders be developed?

The overall method of research chosen is a case study. The case under examination is the Standing Committee, the body responsible for the coordination of national ESE-TE research, practice, and advocacy for policy development. The research mandate of the Standing Committee serves as the single unit of analysis and, as such, qualifies as a holistic single-case design (Lockmiller & Lester, 2017). This is an ongoing case study and, for the purposes of this paper and its inquiry, a literature review on the status of international ESE-TE research is included. This is consistent with Merriam's (1998) case study design:

> Literature review is an *essential phase* [emphasis added] contributing to theory development and research design. Theoretical framework emerging from literature review helps mold research questions and points of emphasis (As cited in Yazan, 2015, pp. 148–49).

The findings of the literature review will support future work on the case study.

The literature on case studies references two approaches. The first has been commonly referred to as a "rapid review" (Khangura, Konnya, Chushman, Grimshaw, & Moher, 2012), and the second, a "historical review" (Hamilton, 1990). A rapid review is "a form of evidence synthesis that may provide more timely information for decision making compared with standard systematic reviews" (Khangura et al., 2012, p. 1). Given our timeline, this "method" proved useful. Second, a rapid review is supported through a historical review, or what Hamilton has referred to as curriculum history (Hamilton, 1990).

At this juncture, it is important to address the issues of *nomenclature* and *navigation*. Regarding the former, we clarify our use of the term ESE. Its history is complex and controversial, and we highlight here four points for consideration:

1. From our perspective (recognizing this is highly contested and debatable), the term ESE is the culmination of a history of evolution of terms reflecting complex, nuanced, and contested political, conceptual, methodological, philosophical, and axiological influences.
2. For simplicity, we are using ESE to reference a variety of traditions—e.g., environmental education (EE), education for sustainable development (ESD), sustainability education (SE), place-based education (PBE), ecojustice education (EJD)—while appreciating the saliency of the first point.
3. Where appropriate we may use terms other than ESE, reflecting a historical moment and/or the researcher's predilection for a term.
4. Despite the debate over nomenclature, ESE is the term the Standing Committee has decided to adopt. It reflects our attempt to bridge the well-established discourses of EE, ESD, and others, while dropping explicit references in the latter to "development," which have been convincingly problematized by many (Le Grange, 2017; Sauvé, 1999 ; Jickling, 1997, 1992).

Finally, regarding the matter of *navigation*, here is a map of the terrain to follow. Part I provides a history of the research activities of the Standing Committee from 2017 to today and describes establishing the Standing Committee as a research community. Part II presents a literature review organized by comparing the Standing Committee's ESE-TE research with international approaches to ESE-TE research. This requires two antecedents:

1. Adapting the seminal works of Gough (2012), Hart and Nolan (1999), and Palmer (1998) to *identify* and *characterize* historical trends in international ESE research according to positivist, interpretivist, and critical research paradigms.
2. Basing projected *anticipations* for ESE-TE research, as TE is a sub-field of the broader ESE field (Pipere, Veisson, & Salite, 2015), on previously identified trends in international ESE research.

Completing the two antecedents facilitates a comparison of the Standing Committee's ESE-TE research with international ESE-TE research. We consider only the research activities of the Standing Committee since 2017, recognizing there is an emerging body of Canadian ESE-TE whose origins predate the research activities of the Standing Committee. Next, in Part III we prioritize a future Standing Committee ESE-TE research agenda. In Part IV, we introduce a model to develop a consensual research agenda among Canadian ESE-TE Standing Committee stakeholders. Part V concludes the paper by summarizing our findings and outlining next steps.

Part I: History of the Research Activities of the Standing Committee

Research and knowledge building are core objectives in the Action Plan adopted at the conclusion of the National Roundtable 2016 on ESE-TE ("National Roundtable 2016"). The Action Plan contained the foundational goal to institute a pan-Canadian body to organize, coordinate, promote, and support the future development of ESE-TE. Up to that time, no formally organized pan-Canadian body of ESE-TE stakeholders existed to further the previous core objectives. With the mission to create a new pan-Canadian body on ESE-TE, the organizational and political structure was in place to support ESE-TE as an emerging field of study and practice in Canada. It was recognized early that research would play an essential role in furthering the emerging field (Goodson, 2002), building upon a well-established history of ESE-TE research; while not exhaustive, we recognize the works of: Towler (1981); Hart and Nolan (1999); Russell, Bell, and Fawcett (2000); Lin (2002); Puk and Behm (2003); Hopkins and McKeown (2005); Swayze, Creech, Buckler, and Alfaro (2012); Dippo (2013); Sims and Falkenburg (2013); Sauvé (2005); Beckford (2008); Inwood and Jagger (2014); and Karrow et al. (2016). Therefore, promoting research is central to the mission of the pan-Canadian coordinating body, the Standing Committee, which was created in accordance with the National Action Plan.

The Standing Committee is committed "to advancing and supporting the development of high quality Environmental and Sustainability Education (ESE) through research, policy, and professional development in Teacher Education (TE) in Canada" (http://eseinfacultiesofed.ca/about.html). It may be argued that each strategic direction in this statement relies on the establishment of a robust and vital research tradition. Establishing a vibrant field of ESE-TE research grounds the emerging field as a contributor of knowledge that expands understanding while informing professional practice. Inquiry and discovery are meaning-making and contribute to thoughtful and relevant professional practice that evolves to meet real needs in real-time. In the pursuit of meaning, inquiry shapes policy and provides evidence by which hearts and minds may be transformed. One has only to read the Otonobee Declaration, signed by the National Roundtable 2016 attendees to ratify the National Action Plan, to understand the importance and

the sense of urgency communicated in that document. (http://eseinfacultiesofed.ca/pdfs/events-pdfs/National % 20Action % 20Plan % 20(July % 202016).pdf)

Creating a Research Community

National Roundtable 2016, held at Trent University, brought together for the first time diverse individuals representing universities, environmental and sustainability NGOs, public schools and school districts, national ESE groups, provincial bodies, non-formal education sites (including parks, nature reserves, and outdoor education facilities), and early childhood education representatives, among others. Each had an expressed interest in ESE as it relates to teacher preparation and professional development. National Roundtable 2016 marked the first steps in the creation of a *research community*. Since 2016, the establishment of a pan-Canadian research community is well underway. A website has been created that provides an online presence, a point of contact, a repository, and an archive for relevant curriculum and research connected to ESE-TE (Environmental and Sustainability Education in Teacher Education, n.d).

In 2018, the Canadian Network for Environmental Education and Communication (EECOM) Conference, held at the St. Eugene Mission, Ktunaxa Nation in British Columbia, featured the first ESE-TE Research Roundtable since establishing the Standing Committee. Approximately 40 presenters from across Canada shared their work on a variety of topics related to ESE-TE. Such an event facilitates connecting researchers and practice professionals from within existing diverse communities, resulting in an ethos that is mutually supportive and creates the generative conditions for collaborative creativity and the forming of partnerships. To this end, members of the Standing Committee have begun to draw key academic and non-academic individuals together to secure funding to create a pan-Canadian Teacher Environmental and Sustainability Education Consortium (the "Consortium").[4]

The Consortium would have two main objectives. First, it would establish a formal research *network* by strategically organizing and expanding partnerships and creating a physical presence through a research centre of Teacher Education for Environmental and Sustainability Education. A second objective would prioritize knowledge mobilization by establishing a special interest group within the Canadian Association for Teacher Education of the Canadian Society for Studies in Education and coordinating contributions to their annual national conference.

The Consortium would develop two key characteristics of community: *learning* and *influence.* In doing so, community members are provided with the support to mobilize research findings, and build forward momentum toward knowledge and awareness. The ability to influence the field of teacher education grows commensurately with the establishment of a vibrant research community.

Currently, the Standing Committee is leading research on ESE-TE programs across Canada, including surveys and interviews to update and build on previous research (Falkenburg & Babiuk, 2014; Swayze et al., 2012; Lin, 2002; Towler, 1981). The inquiry is designed to reveal what Canadian faculties, schools, and departments of education are doing to respond to Canadian commitments to UNESCO Education for Sustainability initiatives, the UN Sustainability Development Goals, and the long-standing calls for increased environmental education and increased ecological literacy for Canada's citizens. This important research will not only provide essential baseline data but will also highlight the diversity of approaches and further serve to connect individuals, institutions, and programs to continue to build the ESE-TE community and foster its emerging identity. Evidence of this can be seen in the recent appearance of publications dedicated to featuring research and practice in ESE-TE (Karrow & DiGiuseppe, 2019; Karrow et al., 2016; Inwood & Jagger, 2014).

The future looks bright as strong, inquiry-minded leadership is in place to promote the shared values and vision held by many individuals across the country. With the support of community and collective spaces to network, share, and build the knowledge needed, an emerging field of research and study in ESE-TE is being realized in Canada.

Part II: A Comparison of the Standing Committee's ESE-TE Research with International ESE-TE Research

History of International ESE Research and its Character

The history of international ESE research and its character is well established and documented. The international works we consulted include Gough (2012), Reid and Scott (2012), Scott (2009), Hart and Nolan (1999), and Stevenson, Brody, Dillon, and Wals (2012). While this citation is not exhaustive, it is relevant and focussed (Maxwell, 2006). Several of these works, although not all, appear in the most recent *International Handbook of Research on Environmental Education* (Stevenson et al., 2012). Collectively, these international researchers have chronicled the major trends in ESE research and characterize the nature of that research.

Palmer (1998) has astutely noted that environmental education research has enjoyed three historical "paradigms," summarized in Table 1. Subsumed under each time period—positivist, interpretivist, and critical (approximate and overlapping)—we compare each of the research paradigms according to orienting philosophy, the derivative ontological and epistemological positions, definition(s) of ESE, the aims of ESE research, and methodological approaches. It is to be understood that any attempt to analyze "history" can be fraught with biases, generalizations, and oversimplifications. Historical research periods are not discrete, but fluid and to some degree contemporaneous.

Comparison Criteria	Time period (Approximate)[a]		
	1970s-1990s	1980s-2010	2000s-present
Research paradigm	*Positivistic* "Research is defined as investigating, employing systematic methods to study or interpret phenomena. It is data-based and employs valid observations with an intent to generalize results or build new models" (Iozzi, 1981, p. xiii).	*Interpretive* Research is defined as looking "for assumptions and meaning beneath the texture of everyday life" (Schubert, 1986, p.1).	*Critical* "Research is viewed as an enactment of power relations; the focus is on the development of a mutual, dialogic production of a multi-voice, multi-centered discourse. Research practices are more inscriptions of legitimization than procedures that help us get closer to some 'truth' capturable via language" (Lather, 1991, p. 11).
Philosophy	Liberalism	Existentialism	Postmodernism
Ontological position	Focus on the individual.	Focus on intersubjectivity.	Focus on the power structures of society: denigration of the subject. Focus on oneness of all entities in the cosmos, "living" and "non-living" (Le Grange, 2017, p. 101).
Epistemological view	Knowledge is linear, universal, consistent, and coherent, and the subject of knowledge is either culturally and historically disembodied or invisible and homogeneous and unitary (Gough, 1994). The "unknown" is considered to ultimately be resolvable.	"Knowledge is non-linear, and co-constituted through plurality, and dissent, and conflicting knowledge claims are central and inevitable components to understanding knowledge construction, deconstruction and reconstruction processes" (Ward, 2002, p. 29). The "unknown" is accepted.	No final knowledge. "The contingency and historical moment of all readings means that, whatever the object of our gaze, it 'is contested, temporal and emergent'" (Lather, 1991, p. 111).

Definition of term(s)	*Environmental Education* "Environmental Education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems and motivated to work toward their solution" (Stapp et al., 1969, pp. 30–31).	*Sustainability* "Engaging people in existential questions about the way human beings and other species live on this Earth" (Jickling & Wals, 2008, p. 18), and empowering them to work individually and collectively toward their visions of more sustainable communities and societies.	*Post-sustainability* "Becoming imperceptible: the disappearance of the atomized subject— rather than subjectivity being individual it is ecological; an 'I' that is embedded, embodied, extended, and enacted" (Le Grange, 2017, p. 102).
Aim of research	". . . efforts to identify relationships among environmental knowledge, attitudes, and behaviors" (Hart & Nolan, 1999, pp. 25).	"Questions are being asked about the fundamental intents and purposes of the research, and about methods and methodologies as well as epistemologies and ontologies" (Hart & Nolan, 1999, p. 1–2). Shift toward an examination of how learning shapes beliefs and how those beliefs influence behaviour change (intellectual and emotional engagement).	To deconstruct inscribed and privileged forms of research as inscribed sources of power. The focus is on understanding, interpretation, and experimenting with expressive means and genres to challenge structured approaches to research.
Methodological approach(es)	Quantitative: largely descriptive and inferential, some experimental and quasi-experimental.	Qualitative: hermeneutics and descriptive or interpretive phenomenology, narrative, ethnography (duo and auto).	Varieties of approaches including quantitative, qualitative, feminist, Indigenous, and postcolonial, e.g., action research, participatory action research.

a   Although the times periods—positivistic, interpretive, and critical—are portrayed chronologically, to this day, the vast majority of ESE research is quantitative, belonging to the positivistic research paradigm.

Table 1. Environmental education research paradigms (adapted from Gough, 2012; Hart and Nolan, 1999; and Palmer, 1998).

Over the past 40 years, ESE research reflects the more general tendencies of education research writ large as it adapts to the larger social-political realities of the time period. More specifically, during the 1970s, most ESE research was oriented to scientific positivism in what Palmer (1998) has referred to as the positivistic research paradigm. Inherent to this is a philosophy of Liberalism espousing the importance of the individual. Most ESE research of this time period set out to examine, because of its view of the purpose of education (to improve the lot of the individual), how it could instill within the individual the knowledge, attitudes, and skills necessary to respond appropriately to changing environmental phenomena. Hence, a disproportionate amount (90 %) of ESE research since the 1970s has been directed toward quantitative studies aiming to examine the general phenomenon of "behaviour change" (Gough, 2012).

To reflect the larger societal change, during the 1980s ESE research evolved, moving from the positivist paradigm to the interpretivist paradigm. Such an interpretivist research paradigm aimed to uncover the assumptions and meanings that undergird everyday life. The backgrounding philosophy was Existentialism, with its more inter-subjective ontology. Moreover, epistemology shifted toward being non-linear through "plurality," "dissent," and "conflicting" knowledge claims that contributed to its construction, deconstruction, and reconstruction. The definition of ESE expanded to include the meaning of life in relation to society and nature. Such existential motivations oriented toward a vision for life that was more "sustainable." It is no coincidence that such an expanding definition for ESE coincided with the discourse on sustainability (1980s–2010). During this time of expansion, ESE research assumed two primary roles: one, to examine the fundamental purposes and aims of its own research activities, where questions about worldview, philosophy, ontology, and epistemology became meta-organizing principles; and two, to foster an interest in "learning" as the principle phenomenon in shaping beliefs, which in turn, influences behavior change along intellectual and emotional dimensions. Methodology shifted to becoming more qualitatively oriented through a variety of research designs including, for instance, hermeneutics, phenomenology, narrative inquiry, and various forms of ethnography.

Lastly, the critical research paradigm emerged during the late 1990s, shifting its focus from the shared and intersubjective construction of "meaning" to an examination of the roles that society and its institutional structures use to create, share, and monopolize "power." Research was viewed as one way to enact power relations. As such, research was viewed as circumspect, as one more "inscription of legitimization," rather than as "the procedures followed to obtain truth" (Lather, 1991, p. 111). The principle orientation to ontology was an acceptance that *being* and its examination through metaphysics were replaced with a critical and all-consuming examination of the manner people "are" through power. The epistemological stance on knowledge was that it is "contested," "temporal," and "emergent" (Lather, 1991, p. 111). It is interesting and revealing, according to our

research, that there are a few individuals (Jickling & Sterling, 2017) beginning conversations about the need to redefine the ESE term [post-sustainability]. Methodologically, while research tends toward more qualitative methods, facilitated through such research methods as action research and/or participatory action research, there is a growing acceptance that all methodologies, and various research designs, are useful in answering a variety of questions.

Trends in and Anticipations for ESE-TE Research

With an overview of the history of international ESE research in hand and a description of its character, we are now in a position to anticipate how the sub-field of ESE-TE may reflect larger ESE research trends. This is based on the reasonable assumption that international ESE research, as the overarching field, has subsumed within it several sub-fields, of which ESE-TE research is one (Pipere, Veisson, & Salite, 2015; Hart & Nolan, 1999; Reid & Scott, 2012). It should be added, that while the history of international ESE research is relatively new, at 40 years, the history of ESE-TE is even more recent. To date, there are few comprehensive reviews of the sub-field of international ESE-TE research, with the exception of the work of Pipere et al. (2015), that specifically examine the development of teacher education research for sustainability education. Yet Pipere et al's bibliometric review is limited to work exclusively published in the *Journal of Teacher Education for Sustainability*. A more comprehensive review of the literature on approaches to embedding sustainability in teacher education has just recently been published by Evans, Stevenson, Lasen, Ferreira and Davies (2017).

Based on this rapid review of the international ESE research, we observe the following:

1. We note a variety of research paradigms: positivistic, interpretive, and critical.
2. The previous research paradigms reflect more philosophical (metaphysical: epistemological and ontological; and axiological), theoretical and methodological perspectives.

From the previous obversations we anticipate that international ESE-TE research may have greater tolerance and acceptance of research diversity, in response to 1. and 2. (above) in addressing the research questions being posed (recognizing too that the nature of research questions will also reflect these paradigms). Research questions will increasingly diversify, selecting appropriate research methodologies and research designs to address these questions. We anticipate greater diversity of marginalized voices, e.g., gender, Indigenous, race, ethnicity, class, sexual orientation, and body size. We also anticipate definitions of ESE and ESE-TE may change to reflect such paradigmatic diversity, over time.

Comparison of the Standing Committee's ESE-TE Research with International
ESE-TE Research

To date, most of the research activities of the Standing Committee have been directed at mapping ESE-TE practices across Canada (Karrow & DiGiuseppe, 2019; Karrow et al., 2016). To a large extent, these have been descriptive studies of ESE-TE programs in various Canadian faculties of education. The *modus operandi* has been to provide descriptions of existing ESE-TE programs. These may serve as models for others, to be experimented with at different sites. Such studies are essential to the Standing Committee's research agenda as "they provide possible pathways, apparent success factors, challenges to explore, and opportunities to create the conditions, relationships, and networks to transform the contexts in which they are embedded" (H. Inwood, personal communication, July 24, 2019). Notwithstanding these efforts, (of which we have been a part), the assumption is that distinct programs, *without* regard for their complex social-political-economic operating contexts, could be replicated at different institutions. While well-intentioned, such anthologies of practice are sometimes adopted uncritically, without due consideration of the complex and nuanced realities of any given institutional context, e.g., what works in one faculty of education may, for a variety of reasons, does not work in another; and, conversely, what doesn't work in a faculty of education might work in another (Greenwood, 2010; Rickinson, 2005). Further empirical research into the effectiveness of such descriptive research and its general application is necessary.

The anticipations we summarized in the previous subsection regarding what we might expect of Canadian ESE-TE research are examined in relation to the research activities of the Standing Committee. To date, the Standing Committee has undertaken two research initiatives to survey Canadian ESE-TE scholars about their ESE-TE research (Karrow & DiGiuseppe, 2019; Karrow et al., 2016). While the sample size is small (limiting generalizations about the character of Canadian ESE-TE research) and limited in time frame (since 2016), there are several important findings worth highlighting. The Call for Proposals asked for researchers to share their experiences with ESE-TE programming (research on programming). Across the two research initiatives, 21 manuscripts (excluding introductory chapters) were reviewed and published, representing a variety of Canadian provinces/territories sharing ESE-TE research. These have been analyzed and classified as to their research paradigm.

Not surprisingly, almost two-thirds, or 15 out of 21 manuscripts, fall within either an interpretive or critical research paradigm with the balance—about a third, or 6 manuscripts—aligning with the positivist research paradigm. This seems to confirm our anticipation that international ESE-TE research might demonstrate a diversity of research paradigms. Despite this small sample size, Standing Committee research appears to support this anticipation. Research falling within the positivist paradigm has concerned itself primarily with

developing, in the language of "competencies," the knowledge, skills, and attitudes (dispositions) necessary to bring about significant behaviour change required to respond to various environmental problems. Most of these works have used some form of case study research; however none were experimental or quasi-experimental. Research falling within the interpretive paradigm has chronicled educators' and students' meanings of their ESE programming. Examples of research aligning with the critical paradigm have exhibited varieties of shared experiences, representing diverse voices and perspectives. The results from our limited research to date point toward many of the anticipations we have for international ESE-TE research; however, further research is necessary to confirm and expand upon these preliminary findings.

Part III: Identifying and Prioritizing the Standing Committee's Future ESE-TE Research Agenda

The comparison of our anticipations about international ESE-TE research and the Canadian ESE-TE research we have undertaken to date is suggestive. Next, we identify those gaps in the research as catalysts to stimulate ongoing conversation between various stakeholders. In Part IV, these "conversation catalysts" will articulate a future ESE-TE research agenda of the Standing Committee.

Initiating a Conversation about Future Standing Committee ESE-TE Research Priorities

First, there are a few in the field who are interrogating traditional definitions of ESE by considering alternate philosophies, theoretical frameworks, concepts, and language. Some of these individuals were mentioned previously (see Jickling & Sterling, 2017). Nonetheless, there is a need to contribute to this conversation about redefining ESE to reflect current critical research paradigms.

Second, there is a need to provide a selective and/or comprehensive review of international ESE-TE research and Canadian ESE-TE research, elaborating and confirming some of the preliminary work introduced here. Our inferences, through "anticipations" of international ESE-TE research, remain only that. There is an opportunity for Canadian ESE-TE researchers to take a lead on this important research initiative in collaboration with international researchers. There is also the need to examine international research topics to further inform international and Canadian ESE-TE research. This important work has been initiated by some, such as Hart and Nolan (1999); Hart (2010); Gough (2012); Stevenson et al. (2012); Ardoin, Clark, and Kelsey (2013), and Rickinson (2005). This work demonstrates a need for future ESE research on such topics as connections between the social and the ecological; teacher "identity" and "agency"; urban, digital, interdisciplinary, community-based,

and marginalized ESE; teaching/student learning and belief systems; and limitations and challenges in applying research to practice. These may also have some bearing on future Canadian ESE-TE research.

Part IV: Developing a Consensual ESE-TE Research Agenda Among Standing Committee Stakeholders

In this section, we explore a model to develop a consensual research agenda among Canadian ESE-TE stakeholders. The model we adapted was originally developed within the clinical nursing profession. We chose it for its consultative approach, a similar organization-stakeholder relationship, and its contemporary status (Foster et al., 2018).

Description of the Process

Working group of the Standing Committee on ESE-TE. Acting on one of the items of the National Roundtable 2016 Action Plan—to survey Canadian faculty of education ESE-TE practices—it was suggested by one of the authors of this paper that a Working Group on ESE-TE Research (the "Working Group") of the Standing Committee be struck. Several Standing Committee members and general members stepped forward to assist. To date, Working Group members have been invited to assist as reviewers of research proposals for conferences, research roundtables, and publication opportunities.

In 2017 the Working Group developed a survey tool to assess the status of ESE-TE in Canadian faculties of education. Originally, the survey was going to recast Lin's (2002) survey; however, through extensive research and consultation, a newly developed bilingual (English/French) survey reflecting the evolution of the field was incorporated into their assessment. Two versions of the survey were tailored to the unique perspectives of two survey populations: deans and faculty members. Currently, the survey of faculty is being conducted; the survey of deans will follow. Important base-line data informing future research priorities will result from these surveys.

Review of the literature and existing processes. Concurrent with the previous activities, through the work of this manuscript, a "rapid review" of the literature has been completed. One of the future research priorities identified through this rapid review is the need to conduct a selective and/or comprehensive literature review of Canadian and international ESE-TE research. According to Foster et al. (2018), it would be prudent for us to consult with other organizations, our parent organization (EECOM), the Environmental Education Special Interest Group of the American Association for Studies in Education (AERA), the Canadian Association for Teacher Education (CATE), Learning for a Sustainable Future (LSF), and other organizations who may have data-driven mechanisms for setting research priorities. Regardless, it will be important for us to remain

transparent and consultative through this step of the process. Developing opportunities to establish consensus among organizational leaders will also be important.

Developing a model of research priorities. Results of the *National Survey on Canadian Faculty of Education ESE-TE Practices* (DiGiuseppe, Karrow, & Kool, 2019), mechanisms used by other ESE organizations, and priority-setting methodologies (such as this one) will be used by the Working Group to draft a proposed model for ESE-TE research priorities. The consensus among Working Group members, Standing Committee members, general members, EECOM, and other participating organizations will be facilitated either through telephone/video conferences or through a face-to-face partnership network meeting to be hosted as part of EECOM's annual conference in the spring of 2021, in Toronto, Ontario. A one-day Research Symposium in advance of the annual conference is planned for this purpose.

Member feedback. It will be important for the Working Group to solicit member feedback on ESE-TE research priorities through face-to-face or virtual forums as part of the Research Symposium, in advance of EECOM's annual conference in 2021. Promotion of this symposium will take place through calls for proposals to attend the EECOM conference. This model will be presented to attendees, inviting them to comment on research categories/subcategories. A draft of the model, reflecting attendees' feedback, will be evaluated. The initial electronic survey will be administered shortly thereafter, with respondents being recruited through an email invitation from our Standing Committee membership.

Obtaining membership consensus on the final model. Analysis of the survey data will be provided through a summary of the results. The Working Group will make recommendations to the Standing Committee and the general membership, to adopt the research priorities. It may be necessary to prioritize the shortlist of research interests and establish a timeframe for their investigation.

Operationalizing a Future ESE-TE Standing Committee Research Agenda

Once a model for the prioritized research agenda is finalized and appropriate and adjusted timelines have been determined, stakeholder researchers will be required to familiarize themselves with components of the research agenda. This is necessary to optimize the overall research agenda itself (Foster et al., 2018). Careful and thorough communication of the research agenda will be facilitated by the Working Group.

Communicating the agenda. The research agenda could be advertised and promoted through various means, such as through the Standing Committee's and EECOM's websites; social media; publications in academic and practitioner journals; and newsletters. It could also be integrated into future research roundtables or networking partnership meetings as well as into presentations at conferences and annual meetings.

Enhancing research strategic goals. As "research" is one of the Standing Committee's mandates, it would be necessary to communicate the research agenda and priorities to the Standing Committee and the EECOM Board. Foster et al. (2018) have recommended assigning "guardianship" of the research agenda and priorities to the Working Group (p. 26). Furthermore, it is recommended that the research agenda be promoted during a future EECOM conference (and other related conferences), and the research agenda and priorities remain current and relevant to the Standing Committee's mission, vision, and strategic priorities.

Advocating with external audiences and potential funders. To implement this research agenda, it will be necessary to explore external audiences for potential research funding. These will include foundations, NGOs, ministries, teachers' federations, colleges of teachers, and federal and provincial agencies. It may be necessary to develop a formal process for funding research projects that address one or more of the priorities through collaboration between an internal foundation and an external enterprise. The Standing Committee has recently approved such a formal process for the vetting and approval of future research proposals.

Recognizing no model is perfect or complete, we propose this as a starting point to solicit feedback from our membership. We view this as the catalyst stimulating future conversation about *how* to identify and prioritize a research agenda, and *what* that research agenda may consist of.

Conclusions

Since its creation in 2017, the Standing Committee has taken bold steps to establish itself as a leader in Canadian ESE-TE. Consistent with its mission, vision, and strategic priorities, it has taken definitive steps to nurture and cultivate an emerging ESE-TE research community. Documentation of the Standing Committee's ESE-TE research activities, while anticipating future research initiatives, and their relationship with international ESE-TE research, has helped establish ESE-TE as a viable, credible, and important field of study. Preliminary results of our literature review suggest there is great capacity for conducting more critically-oriented research as much ESE and ESE-TE research continues to disproportionately affiliate with the positivistic research paradigm. Such critical research will be invaluable to tackle challenges with redefining ESE in an emerging era of post-sustainability, to support in-depth literature reviews of Canadian and international ESE-TE research, and to explore a diversity of topics, including: connections between the social and the ecological; teacher "identity" and "agency"; urban, digital, interdisciplinary inquiry, community-based and marginalized perspectives on ESE; teaching/student learning and belief systems; and limitations of and challenges in applying research to practice. These initial steps will be furthered through Foster et al.'s (2018) model to develop a research agenda through broad-based community stakeholder consultation, a priority of the Standing Committee in the near future.

The Standing Committee is currently securing sources of funding to back the ongoing mission of supporting the emerging field of ESE-TE. Additionally, it continues to explore international collaborations in an effort to advance the field in Canada and more broadly. Ultimately, through these initiatives and actions, ESE-TE will gradually attain the status and profile it requires to educate a future generation of teachers and children about the ecological and social challenges we face now and in the near future.

Notes

[1] Teacher education includes "preservice teacher education" (prior to certification) and "inservice teacher education" (post certification).

[2] The authors recognize that research on Canadian ESE-TE predates the Standing Committee's inception in 2017. The reasons for delimiting our survey of this history to this time period are provided in the paper.

[3] The stakeholder community has yet to be defined and may include: provincial Ministries of Education, Colleges of Teachers, faculties of education, teaching federations, deans of education, boards of education, relevant non-governmental organizations (NGOs), etc.

[4] At present, the Consortium does not exist. We are currently reapplying for federal funding to support it.

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Wilding Teacher Education: Responding to the Cries of Nature

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Abstract

The first climate change conference was held in 1979 in Geneva and sponsored by the World Meteorological Organization. Since then there have been many other initiatives and accords along the way. Each report appears to present an evermore grim picture than the previous one. Cumulatively, we have had more than enough science to know what to do, and yet we still hurtle towards catastrophe. From an educational perspective, this paper explores two questions: What will it take to nurture healers and restorers of the earth? And what holds us back? These questions are examined, as they relate to teacher education, through the lens of "wild pedagogies." Two new touchstones explicitly for teacher educators are developed in response.

Résumé

La première conférence sur le changement climatique s'est tenue en 1979 à Genève, sous l'égide de l'Organisation météorologique mondiale. Depuis, de nombreuses autres initiatives et ententes ont vu le jour, mais le portrait de la situation semble néanmoins s'assombrir d'un rapport à l'autre. Malgré le fait que nous ayons accumulé plus de données scientifiques qu'il n'en faut pour connaître la direction à prendre, nous filons toujours tout droit vers la catastrophe. Dans une optique éducative, le présent article explore deux questions : Que faudra-t-il faire pour enseigner à protéger et restaurer la nature? Quels sont les obstacles qui nous en empêchent? Comme ces questions sont en lien avec la formation des enseignants, elles sont examinées sous le prisme des « pédagogies environnementales non directives ». En réponse, deux nouveaux « principes de base » ont été expressément élaborés pour guider les formateurs des enseignants.

Keywords: environment, education, wild, wilderness, wild pedagogies, touchstones, teacher education

Mots-clés : environnement, éducation, nature, monde sauvage, pédagogies environnementales non directives, principes de base, formation des enseignants

Preamble

In this essay, we draw on our own conversations and experiences to work out a philosophical narrative for teacher education—one that can provide the disruption required to effectively respond to issues of our time. The writing itself is also an integral part of this inquiry and the process of working out our ideas.

As Laurel Richardson asserts, "*Writing is a method of discovery*, a way of finding out about yourself and your world" (2001, p. 35). So, too, it is for us.

We also provide a nod of gratitude to those whose work has directly influenced our thinking. However, we want our narrative to do work within teacher education communities—to encourage experimentation and activity. With this in mind, we have tried to foreground our ideas and reduce, to the extent we can, burdensome referencing.

Finally, this essay builds on *Wild Pedagogies: Touchstones for Re-Negotiating Education and the Environment in the Anthropocene* (Jickling, Blenkinsop, Timmerman, & Sitka-Sage, 2018). That book was largely written for practitioners and learners. Here we have developed new work, primarily in the form of two touchstones, written explicitly for teacher education. We provide a summary of the earlier work to create a context.

Seeking a Response

Two days before the annual conference of the North American Association for Environmental Education, in October 2018, the International Governmental Panel on Climate Change released its *Special Report: Global Warming of 1.5 C* (IPCC, 2018). At the same time wildfires raged in California—and other places. Shortly after that, the WWF released its *Living Planet Report* suggesting that more than 60% of the total numbers of amphibians, reptiles, mammals, fish, and birds that existed just 40 years ago are now lost (WWF, 2018). For many, a gloom descended over the frequently upbeat and forward-looking event.

What struck us was that this *Special Report* moved climate change from a distant abstract catastrophe to a phenomenon within a more concrete and tangible timeline. We have, it reported, just 12 years to radically change the course of carbon and other emissions to avert the worst outcomes (IPCC, 2018). It has become apparent that—as if wildfires and hurricanes aren't enough—timelines for change are so urgent that climate change will likely influence our lives dramatically. But, the consequences facing our children and grandchildren are catastrophic. In the meantime, nature is crying.

If this evidence is pointing towards the need for significant change and not just mere tinkering, then education must be at the heart of that project. Change does not happen by naming the possible goal and hoping the populace gets there. To move people, a culture even, from where they are—ontologically, ethically, metaphysically, practically—to somewhere else involves teaching and learning. If we are to heed the warnings, it will be a challenge to get to somewhere that is more ecologically and socially equitable, relational, viable, and sustainable. Teacher education programs must rise to the challenges. To disrupt the current pace of environmental destruction and climate change, we cannot continue to do the same things that we've been doing; we cannot continue to be the same people; and, we cannot continue to be the same teachers.

Of course, there are many superb teachers who push limits and disrupt the status quo. As Wayne Au remarks, even in the face of high stakes testing there will be teachers who find ways to do what they call "real teaching" (2011, p. 39). We expect this special issue will shine light on some of the alternatives and offer bold paths forward. From this short but evocative expression of our present situation, two questions arise for consideration in teacher education programs: First, what will it take to nurture healers and restorers of the earth? And second, what holds us back?

In this paper, we begin examining these questions through lenses of what we call wild pedagogies. This approach intends to offer some theoretical grounding through the reconceiving of education—and here specifically teacher education—in a "wilder" form. It also aims to support practice through a series of "touchstones" that are concepts and questions intended to support and challenge the work of wild pedagogies.

We first summarize the evolving idea of wild pedagogies and, second, develop two touchstones to help teacher education programs and participants grapple with the two questions posed above.

Wild Pedagogies

Wild pedagogies is a relatively new idea that has been discussed by a growing and international group of educators since 2014. Together we seek to explore and expand this idea as an agent for significant educational change. In 2018, the book *Wild Pedagogies: Touchstones for Re-Negotiating Education and the Environment in the Anthropocene* was published as a provisional gathering of ideas resting on two premises: First, the modernist relationship to the natural world must change, urgently; and second, education is a necessary, even fundamental partner in the project.

The combination of "wild" and "pedagogies" arose from a timely confluence of two projects. One project sought ways to refresh perceptions and discussions of human and nature relationships by re-examining notions of nature, human, wildness, and wilderness. The other project was driven by the frustratingly difficult task of enacting meaningful educational change. What unites these projects and gives some shape to ideas about wild pedagogies is the core aim of problematizing control—as it relates to, for example, educational structures, teaching and learning styles, creation of knowledge and understanding, hierarchies, and relationships both among humans and between humans and the more-than-human world.

In problematizing control, we are not suggesting a free-for-all, or the elimination of all controls. Rather, we mean looking critically at the aspects of control—implicit or explicit—that limit imaginative possibilities for humans, and diminish the wondrous range of beings with whom we share the planet. This includes looking at aspects of control in Western, European, and increasingly

globalized conceptions of education. It also includes looking at discourses about human relationships with the more-than-human world that "attempt" to place humans in positions of dominance and control (Abram, 1996).

Wildness, Wilderness, and the Self-Willed

The idea of "wilderness" has received much criticism for its role as an agent of colonialism. It has been used to disenfranchise people and cultures the world over (e.g., Cronon, 1996). We recognize that wilderness can be presented in a way that reduces its value to that of a backdrop for human-centred, self-serving, and colonial ends (Stewart, 2004). We join in these critiques.

Despite these liabilities, wilderness persists as a potentially useful concept. For those who travel to and live in the remote regions of the world, there are still places where more-than-humans flourish and where humans enter on terms that are more equitably dictated; wilderness is more than just an idea. At the same time, physical wildness is being located and encountered much closer to home—even in urban areas—by those who are looking.

Inspired by Deleuze and Guattari's (1994) idea that concepts are constantly being created and recreated, it seems timely to think again about what wilderness is becoming or could become. We argue that a robust conception of wilderness does not necessarily rely on the disenfranchisement of people from their homelands (Jickling et al., 2018).

In making this renewed case for wilderness, we appeal to the Old English etymology. Here the word "wildoerness" can be said to derive from "wil," which in turn can be linked to wild or willed. "Doer" can be linked to beast, and "ness" is linked to place or quality. Putting these together suggests that wilderness can be thought of as a place of wild beasts, or more evocatively, *self-willed land* (Foreman, 2014). When this idea of self-will is juxtaposed against domestication, where "domesticate" is used in the sense of humans bringing others under control (Livingstone, 1994), the inherent agency of wilderness is given weight. Its wildness is celebrated; it informs us; and indeed, it teaches us if we watch, listen, and feel.

We acknowledge that wilderness and domestication should not be thought of as absolute qualities; wildness occurs in varying degrees, perhaps along a continuum. Capacity for self-will, or wildness, hints at concepts like freedom, flourishing, self-determination, and intrinsic value. For wild pedagogies, it also helps to problematize ideas related to control while at the same time acknowledging the wild *agency* of the more-than-human world.

A Wilder Form of Teacher Education

In gathering ideas about wild pedagogies, we suspect that we are giving a name to what many teacher candidates already know about. As teacher educators ourselves, many of our most inspiring candidates come with educational experiences acquired outside of formal schooling. Some have been outdoor leaders, wilderness guides, environmental educators, or interpreters. Others have been involved in social justice issues and worked with the homeless, the marginalized, and those with special needs. Still others have been involved in community educational projects, cross-cultural settings, or have worked abroad. What seems to unite their enthusiasm is a passion for making a difference and a knowing-sense that mainstream education is, at best, incomplete.

These candidates have learned through experience that some of the most significant learning is encountered outside of formal education, or at the very margins of their schooling, by brave, insightful, and rebel teachers (Blenkinsop & Morse, 2017). Sadly, these students often struggle with a teacher education system that has pushed to the side most of what they value. As it turns out, most of their transformative experiences, as students and as informal teachers, do not fall into the prescribed teachable subjects.

Perhaps the keyword is "prescribed." When framed using this term, student learning and student-teacher learning must serve the ends of the education process based on predetermined outcomes—and preferably those that are measurable. There is a great deal of research that suggests curriculum content and pedagogical strategies are bent to align with testable outcomes as learning that is less amenable to testing is edged out (see, for example, Au, 2011; Jickling, 2015; Smith, 2016). Even in education faculties, there can be enormous efforts made to prescribe and control the education of teacher candidates (Jickling, 2009).

Despite curriculum control, testing pressures, and deeper cultural constructs, many committed teachers find ways to resist, to create space for what they consider a meaningfully transformative—even a wilder kind of—teaching. Many educators are finding ways to act in solidarity with the marginalized, to bring the voices of the voiceless to their students, to push back against the often implicit and anti-environmental orientations of the cultures in which they are immersed. They are enacting pedagogies that are less objectively oriented and more co-constructed, less human-expertly known and more epistemologically spontaneous, less universal and testable, and more place responsive. In short, they are wilding their practices. But can teacher education programs keep up with these developments, or even show leadership?

We prefer to present wild pedagogies as a heuristic—that is, as an agent for discovery rather than as a rigid framework or plan of action. As such, this heuristic represents an invitation to any individual or group to experiment with conceptions of education within their places in the world, particularly those who share concerns about control. We anticipate multiple responses, and these are

reflected in the pluralized use of wild "pedagogies." Our work to date provides small inklings into a broad array of possibilities.

Touchstones

Crucial to any success of wild pedagogies will be the formation of concrete links between ideas and practice—that is, developing pedagogies on the ground. We need to understand that social systems are often hostile to change and subject to forces that bend actions back in the direction of the status quo. It is easy to lose sight of progressive, and indeed rebellious, aims as we try to work out how change might manifest itself in what we do (Blenkinsop & Morse, 2017). We have been developing what we call touchstones to aid in this process.

The six previous touchstones (Jickling et al., 2018) serve as reminders of what wild pedagogues are trying to do, especially when engulfed by the fog of daily demands, or when stuck. As such, they serve as reminders—place-holders to return to over and over again, to regain focus, to suggest ways forward, to animate imaginations, to act as agents of exploration, discovery, and change. Touchstones are typically most effective when thought of as stimuli for exploration rather than destinations. They play out in places and are context-dependent. They need to be continually revised and developed. With this impulse in mind, we develop two new touchstones for thinking about and enacting teacher education.

The touchstones that follow are framed by the earlier questions: What kind of education will be required to nurture healers and restorers of the earth? And what holds us back?

Teacher Education Touchstone # 1: Learning That is Loving, Caring, and Compassionate

We believe that humans are able, if given the opportunity, to develop rich relationships with myriad members of the more-than-human world. And, that these relationships of reciprocal care are part of overcoming the alienation that exists between many humans and the natural world.

In the search for care, one line of inquiry has been to look at significant experiences of historical figures and to seek common elements in their development. How have they learned about and fostered relationships with more-than-humans? These common elements, in turn, direct us to opportunities for reconsidering the pedagogy, content, and emphases in teacher education programs. Here we look at formative experiences in the lives of Arne Næss, Aldo Leopold, and Rachel Carson.

Consider the Norwegian eco-philosopher Arne Næss, famous for coining the term "deep ecology." He was explicit about the origins of his empathy, compassion, and solidarity:

My standard example has to do with a non-human being I met 40 years ago. I looked through an old-fashioned microscope at the dramatic meeting of two drops of different chemicals. A flea . . . landed in the middle of the acid chemicals. To save it was impossible. It took many minutes for the flea to die. Its movements were dreadfully expressive. What I felt was, naturally, painful compassion and empathy. But the empathy was *not* basic. What *was* basic was the process of identification, that "I see myself in the flea." If I were alienated from the flea, not seeing intuitively anything resembling myself, the death struggle would have left me indifferent. So there must be identification for there to be compassion and, among humans, solidarity. (Næss, 1988, p. 22)

Næss repeatedly points to this experience as one that shaped the contours of his thinking. In recognition of his empathy for and affiliation with the flea, he began to see, encounter, and even be in the world differently. He continued to wrestle with these revelations, developing his theory of ecosophy, for more than four decades.

For Næss, ecosophy is rooted in deeply intimate relationships that shift one's self-concept from an egotistical "self" to the more expansive "Self" as expressions of identification, relationship, and compassion. The accompanying "Self-realization," as he called it, can be described as an ecological approach to being-in-the-world. But first, he needed to have an experience; there needed to be a context out of which this realization could arise.

For teacher educators, this raises intriguing possibilities. If Næss is correct and there is a basic experience of identification with the other that is necessary for empathy, then it is important to provide opportunities for having those experiences. Such opportunities could encourage both latent empathy and the work of moving from self to Self-realization. This will likely involve pushing back on how most teacher candidates understand their worlds and position themselves therein.

We asked teacher candidates, for example, to spend significant time in a particular place, focussing on the local community. This was a familiar activity for many, but we felt we could expand and enrich it dramatically during a nearly two-year program. Part of the work was having these candidates begin thinking differently and being differently in these places. We encouraged them to consider the activity, agency, and vibrancy surrounding them—to recognize that these are places of birth, life, and death, places where beings feed and clean themselves, and where they exchange information. These are cultural places where intruding humans don't speak the languages or understand how things happen. However, with care-full observation and time, candidates can begin to notice that there is an order to everything, that morays are created and maintained, and that lives are lived in richness and complexity. In short, this work challenges some of the teacher candidates' implicit understandings of expertise, communication, learning and understanding, and the value of other-than-human beings. In light of such cultural challenging, we now turn to the well-known American conservationist, Aldo Leopold.

Leopold encountered the limits of his cultural conceptions on the day he watched a wolf die. Working as a wildlife "manager," he recounted the day he and some colleagues spotted a wolf crossing a river:

> In those days, we had never heard of passing up the chance to kill a wolf. In a second we were pumping lead into the pack, but with more excitement than accuracy. . . . When our rifles were empty the old wolf was down, and a pup was dragging a leg into impassable slide rocks.

> We reached the old wolf in time to watch a fierce green fire dying in her eyes. I realized then, and have known ever since, that there was something new to me in those eyes—something known only to her and to the mountain. (Leopold,1966, p. 138–39)

Early academic influences shaped Leopold's schooling. A Yale School of Forestry graduate, he understood the world to be a resource for human use, and our responsibility was to use it wisely. From his perspective at that time, the world was most certainly not made up of independent agents—such as wolves and mountains—with ideas and viewpoints of their own. This encounter with a different kind of knowing shook him to his core; up until this moment, knowledge was the purview of the learned and hierarchically superior humans.

Then there was the dying wolf. This moment fell outside of his normal experiences and his school-taught abilities to explain. He wrestled with this disturbing experience for the rest of his life. As Leopold's thinking evolved, he eschewed ideas that rested on the presumption of human dominance. What is more, he gave us the idea that "We can be ethical only in relation to something we can see, feel, understand, love, or otherwise have faith in" (1966, p. 251).

In Leopold's case, we hear more clearly how the cultural norms of schooling might act to obscure this basic experience of care and compassion. Allowing care to flourish means undoing some of the explicit and implicit constructs of institutional schooling and then rethinking how candidates create themselves as teachers. For us, this has led to having teacher candidates design lessons that are tied directly to particular places and that actively engage with the natural world as a co-teacher. This move to encountering other living beings as active, agential teachers has helped them to disrupt their definitions of knowledge, and who "has" it. It brings more-than-humans into the discussion as part of the learning and knowledge process. We have found that this often leads to rich questioning and discussion as candidates develop a criticality towards implicit assumptions about self, subject, classroom, and institution.

Criticality is also part and parcel of Rachel Carson's famous work, *Silent Spring* (1962). Her bold, heartfelt, and challenging critique of the pesticide DDT challenged the *status quo* of the time. However, it is important to remember that she was a nature writer and lover long before she was an activist. It is a matter of some conjecture as to whether Carson had such a single and defining transformative moment as those described above. What is clear is that Carson thrived

during her rural childhood on the family farm. Here she rambled extensively, sometimes with her mother, and developed her senses of curiosity and care. In a story for the children's *St. Nicholas* magazine she wrote confidently, with the deep knowledge of the humble observer, and a staggering intimacy for a girl of just thirteen:

> Soon our trail turned aside into deeper woodland. It wound up a gently sloping hill, carpeted with fragrant pine-needles. It was our discovery, Pal's [her dog] and mine, and the fact gave us a thrill of exultation. It was the sort of place that awes you by its majestic silence, interrupted by the rustling breeze and the distant tinkle of water. Near at hand, we heard the cheery "witchery, witchery" of the Maryland yellow-throat. For half an hour we trailed him until we came out on the sunny slope. There in some low bushes, we found the nest, containing four jewel-like eggs. To the little owner's consternation, we came close enough to snap a picture.

> Countless discoveries made the day memorable: the bobwhite's nest, tightly packed with eggs, the oriole's aërial cradle, the frame-work of sticks which the cuckoo calls a nest, and the lichen-covered home of the hummingbird.

> The cool of approaching night settled. The wood-thrushes trilled their golden melody. The setting sun transformed the sky into a sea of blue and gold. A vesper-sparrow sang his evening lullaby. We turned slowly homeward, gloriously tired, gloriously happy! (Carson, 1999, p. 10)

The particularly of Carson's knowledge hints at intimate relationships with her surroundings. Her writing also alludes to the agency of her cohabitants and their roles as teachers and co-knowers. And, learning during these days on the trail could be joyous.

With this understanding of Carson's childhood, we can reconsider her later book, *Silent Spring,* about the dangers of using pesticides. The teacher educator can begin to trace the influence that her encounters and immersion in a living place had—beginning as a child—on her deepening curiosity, care, and love for her world. These qualities find expression in her beautifully written prose. But in *Silent Spring* we also notice that the care and wonderment of a nature writer become active, even activist. Carson, the scientist, names troublesome truths about chemical use and bears witness to a problem that her culture would prefer to ignore. We sense that this process of caring, naming, and responding to critical issues of our time also has significant ethical implications for teaching. And it will be challenging to do.

Remember that the first public reaction to Carson at the time of her book's publication was vilification. Her work describing the concentration of toxic materials in food chains was criticized before the public as inaccurate and emotional, in *Time* magazine (1962). The journalist assured the readership that while some pesticides may be dangerous, many are "roughly as harmless as DDT" ("Pesticides," p. 47). The major concern expressed by the *Time* writer was that Carson's outburst in *Silent Spring* would do little good for the things that she

loves while risking considerable harm by alarming the "nontechnical public" (p. 48). She was being marginalized, among other things, for breaking from a rigorous style of purely discursive and rational argumentation (Greenwood, 2018). Fortunately the nontechnical public was capable of understanding the ecological concepts and was moved to action themselves through evocations of Carson's activism.

Silent Spring went on to become a prizewinning bestseller. Fortunately, Carson was able to withstand the onslaught, supported by her empathy, deep understanding, and skill as educator, writer, and scientist. Here, too, there are lessons for teacher educators. Just as Carson was marginalized for straying into the subjective territories of emotions such as care and compassion, so too can educators. We live in a time where evidence-based inquiry, learning, and evaluation are given primacy. As teacher educators, we can see that the kinds of experiences that can nurture "loving, caring, compassionate, and competent healers" (Orr, 2017, p. x) are at best undervalued, and often marginalized.

When surveying the above examples, it is possible to trace some entwined traits:

- They share something deeply visceral, relational, and intimate.
- They are profoundly sensual and arise out of first-hand experience; they require being-in-the-world. They remind us that we are always and already in-the-world.
- They evoke care through emotional engagement, empathy, and identification. This care can also evoke sadness, disenchantment, and anguish (the latter being important to recognize as teacher educators).
- They are relational—ecologically, biotically communally, Self-realizationally.
- They point to understandings that aren't located solely in individual humans. They aren't just descriptive, analytical, logical, falsifiable, or narrowly rational. They exist and are inextricably part of the beings we all are.
- The care they hold includes responsibility and inspires activism. This care can lead to questioning core cultural assumptions, and it can inspire dedication to changing the environmentally problematic way things are. This will take time.
- And, many of these examples reveal listening to, learning from, and engaging with ways of knowing and speaking that arise in the more-than-human world.

Such a collection of traits has significant educational implications for teacher educators. What does the practice of education look like if we take these insights seriously? If, as Michael Derby suggests, "We have come to experience 'school life' and learning as fundamentally prosaic; characterized by fragmentation, emotionless and exacerbated by the privileging of epistemic foundations such as anthropocentrism, reductionism, linear causality, and dualism" (2015, p. 25), then there is a lot of work to do.

We finish our study of Touchstone #1 with some questions that can act as supportive agitations and critical reminders to those who seek to wild their practices:

- Given that the collection of traits described above cannot be abstracted, reduced, or taught in isolation from the world, what did I do today that required teacher candidates to be experientially present in their learning?
- The outcomes described in the experiences of historical figures are wild; they defy prediction and control; they just arose from the experiences and were suddenly present (e.g., Gutiérrez, 2016; Jickling, 2016, 2015). What can I do this semester to create spaces where transformative experiences can arise?
- What have I done in a teacher education context to accommodate experiences that exist beyond the capacity of language to fully describe and evaluate?
- Given that analyses of transformative experiences may only be possible in hindsight, inclusion will require more than market-driven and outcomes-oriented visions of education. What imaginative and creative approaches am I using to describe this aspect of my daily work in teacher education?
- Even though the kinds of understanding that we have been talking about cannot be measured, they still exist. How can I create a positive space in my evaluation scheme to honour this existence?
- Even though some understandings are educationally unmanageable, they can still be transformational. Indeed, the facility to care may be a prerequisite to transformation. What opportunities do I provide teacher candidates to nurture care for other humans and the more-than-human world?
- Have I allowed the teacher candidates opportunities to encounter the other, to feel care, and to notice how self vs. Self-realization is enacted?
- Have I considered how to hold space for teacher candidates as they encounter a range of emotions that appear in response to burgeoning care? What kinds of skills and supports can I offer as candidates act in ways that are, at times, contrary and threatening to the systems in which they live and work?

Teacher Education Touchstone #2: Expanding the Imagination

We believe that the ecological world has changed dramatically and that public education has to change in response. Future teachers can no longer be trained for a system that leaves students ill-prepared to respond to current crises and imaginatively unable to create new responses.

To understand the role imagination plays in supporting or hindering the creation of innovative schools and practices, we draw on research from a pretty radical public school in Maple Ridge, British Columbia (Blenkinsop, Maitland, & MacQuarrie, 2018). In that work the authors, all key members of the school's creation team, identified four ways that policy can hinder innovation. The way most relevant to this discussion was identified as "self-limited imagination." We

believe this thread has important implications for development of wild pedagogies as part of teacher education.

The emergence of self-limited imagination was a surprise. But it is a clear response to our early question: What holds us back? Although a surprise, once named, its presence became visible all over the place. Self-limited imagination is not a case of something that has been thought of before yet is ignored for a good reason. Nor is it something that is deemed impossible. This was more about alternatives not being imaginable at all! It was about people not having the experiential materials, the flexibility of mind, the institutional permission, the cultural range—whatever the blinder—to bring an idea into consciousness. This was about imaginary limits. When something beyond these imaginary boundaries was offered, the response was often complete blankness, or the muttered "I have never even thought of that . . . ." So, how do we expand our imaginative range?

The idea of a self-limited imagination is striking. When not addressed, it stands to thwart far-reaching, or radical, innovation—and indeed to obstruct wild pedagogies. Perhaps the "self-limited" part of this discussion is a misnomer. As we explored the idea, it became clear that imaginative limits are also contained within cultures and cultural systems. So, what "cultural limitations" might be present in the Canadian public school system, in teacher education programs, and in universities? Perhaps imagination is not as broad and flexible as suggested by quotidian understanding. For the rest of this paper, we explore imagination, its possibilities, and its limitations as the basis of a touchstone for teacher educators.

In its first year of existence, the faculty and research team at Maple Ridge Environmental School decided that it was important to give students significant amounts of unstructured playtime in the forest, working on forts.[1] Research (Sobel, 2001) suggests that time with nature, child-centredness, and constructing forts are important, even necessary, parts of building environmental relationships. However, something odd began to happen within a month of having an hour per day in the "forts village." Systems of currency and governance began to develop in the fort village. Soon it became akin to an authoritarian police state, with one older boy assuming the role of leader supported by a posse of henchmen and bodyguards. The buildings became jails, casinos, and shopping complexes. Resources were hoarded by particular members of the leadership group. The natural world became a resource for individual enrichment, and particular areas of the village were denuded of life. It is important to note that not all the student voices were in line with the macro-narrative at play; however, those outside voices tended to be those of younger, more marginalized players.

As this authoritarian community structure became manifest, teachers began to engage more actively. As a result, governing committees and councils were created, and the shape of the village changed; interestingly, the change was minor. Even the teachers were having a hard time imagining what a different

kind of community might look like. Like the children, they had to use the governance and community making tools that were available to them—from the culture in which they, too, were immersed. Teachers and students alike were imaginatively limited to the cultural and experiential realities of their lives. These realities did not seem to include, for example, more equitable, eco-centric villages in action. Intriguingly, even after spending enormous amounts of time in the natural world, the quiet voices of both the marginal children and the natural world were being ignored.

Outcomes such as these have important implications. As this example shows, teacher educators will need to recognize their culturally-bound imaginative limits. And, an important part of our pedagogical work will be to expand the range of cultural tools available to teacher candidates. For Russian psychologist Lev Vygotsky (1978), human development is a sociocultural event. For him, we are born into a culture that offers psychological and sense-making tools that help us to understand and then position ourselves within our world. Tools such as language, story, and even humour are incorporated into the selves that we become. These tools assist us in understanding the world and help us belong to the cultures and communities in which we find ourselves. Not only do we gather these sense-making tools and begin using them, but in the process of gathering and using we are also being shaped by the tools themselves. The languages we learn to speak and the foundational stories we are told shape who we are in the world. But they also limit what we can think and imagine.

Indigenous/Greek scholar Thomas King illustrates these points in another way. In his Massey lecture series *The Truth About Stories* (2008), he suggests that all we are is stories. In ways that seem to resonate with Vygotsky, King shows us how we become those stories that: we are immersed in; our culture chooses to tell us; we tell ourselves; and are told to us by marketers, politicians, family, and teachers.

King illustrates his discussion by placing the Genesis creation story side by side with an Indigenous creation story. The contrast reveals possibilities for enacting radically different ways of being-in-the-world.[2] And, it suggests that Indigenous knowledge can provide a countering to Western hegemonic forms of control. The Genesis creation story presents an omnipotent, all-knowing, male God who makes all the decisions, whereas the Indigenous story presents a female Ancestor in conversation and negotiation with already existing animals and birds. For King, these foundational stories have deep implications for the cultures they sustain. Each foundation offers possibilities. Each assists individuals in making sense of the world, but neither is opening the entire panoply of what it might mean to be human. There are limitations to each, and as a result those who are shaped by these stories and languages are limited as well in, among other things, their imaginative capacities.[3]

For teacher educators and wild pedagogues this challenge of expanding one's imagination, and those of their teacher candidates, is difficult. However,

there are some things to consider. We can help teacher candidates name this limitation and respond to it in practice. This might, in turn, act to de-centre teacher as expert and open the space for risk-taking, for pedagogical exploration, and humility. If we are imaginatively limited by our histories then none of us has the whole answer. This might leave more space for the unusual, the crazy, the spontaneous, and the "it just won't work" to find fertile ground in which to prosper. The best ideas for responding to our changing world may just come from these places.

We might take a hard look beyond our cultural norms to seek ways of teaching and being that are different. This is not about appropriating others' pedagogical styles, but about expanding our own—allowing us to offer more tools to our teacher candidates. We might adapt ourselves, and help teacher candidates to adapt, to what Blenkinsop (2012) suggests, is a Foucauldian stance of "hyperactive pessimism." Here the challenge is to increase one's vigilance and self-reflexivity in everything related to practice. For example, knowing how ineffective modern Western education has been in engaging in environmental matters, one can *expect* to misstep along the way; we must be vigilant. Other missteps can include our "normal," "common sense" intuitions. When we realize that intuitions have grown out of our histories, we can understand why many of our first impulses are likely ones that have been shaped by the very *status quo* that we seek to challenge. The point is that we have to watch everything we do, and we should expect to find in our practices things that we would rather not do.

We should also expect that while imaginative capacity will always be limited, there are ways to expand our reach. This will require: a humble orientation; a willingness to change; an active gathering of ideas about how to be-in-the-world, both within one's cultural reality and beyond; a constant expanding of the tools that are being made available; a careful consideration of the stories, metaphors, and languages one is using; and a thoughtful engagement in an ever-widening range of experiences. The last consideration is proposed not to create students who run thoughtlessly through hundreds of new adventures, but because the imagination also relies on the "stuff" with which it has to work. This includes ideas, concepts, experiences, encounters, etc. It is up to teacher educators to carefully consider their learners and offer wilder possibilities for expanding their imaginative potential.

With that, we finish with some questions that wilder teacher educators might want to consider:

- What did I do with my practice today that pushed outside the students' previous experiences and my own imagination?
- What new "stuff," experiences, and stories did I add to the mix? How are students taking up, working with, and being changed by these diverse cultural tools?
- Did I notice my proclivity to "not do" the seemingly unusual, or limit the

teacher candidates seeking to do the unusual? If so, did I make a considered attempt to provide space for the unusual to happen?
- What cognitive, physical/cultural, and natural tools are teacher candidates working with right now? And, what new ones can I introduce? Where might I look to find future additions?
- Where are the edges of my experience, my imagination? How do they limit my ability to imagine different kinds of education?
- What are sources of inspiration (e.g., experiential, trans-cultural, literary) that I am seeking to support and enhance my pedagogical changes and development?
- Do I have a sense of the edges of imagination that exist in my school, community, larger culture? And, how are these being engaged and explored with teacher candidates?

Conclusion

Our goal is not to undermine or discourage good work that is already occurring. We hope, rather, that committed and determined educators can see something of themselves in this paper. We hope they will take this as an affirmation of their work, a recognition that they are not alone, and an encouragement to go on, and go further. And, we hope that their work will serve as exemplars for others. The kind of cultural change required is still a way off.

We want to stress that this work is meant to be seen as a heuristic rather than a fixed plan. Make it your own and revise things to suit your own needs and places.

In this spirit, we have taken our previous work and wondered how it might function in the context of teacher education. This has led to the development of the two new touchstones presented here. We have just scratched the surface and limited this iteration to the work of individual teacher educators. This seems a good place to start. Exceptional individuals can often find ways to do good work and help others (Astbury, Huddart, & Théoret, 2009; Au, 2011).

We invite those in leadership positions—deans, chairs, department heads—to consider what touchstones they would like to live by. Wild pedagogies might be just one way that the boundaries between teachable subjects can be made more permeable, and little "cracks in consent" can be worked (Marino, 1997). There is a lot of hope in this conclusion, but as David Orr (2011) reminds us, hope is a verb with its sleeves rolled up. Thank you for what you do, and good luck.

Notes

[1] See the Maple Ridge Environmental School: https://es.sd42.ca/. For other related research, see Blenkinsop, 2012; Blenkinsop and Piersol, 2013;

Blenkinsop, 2014; Blenkinsop et al*., 2018.

2 Our interest in this concept mostly arises from Arne Næss (1988) and comments by First Nations colleagues, most recently by Leanne Betasamosake Simpson (2017). However, other readers will undoubtedly wish to trace this back to Heidegger's "being-in-the-world" (1962).

3 A discussion about Indigenous concerns with the concept of "wilderness," and some possible alignments with wild pedagogies can be found in the book, *Wild Pedagogies* (Jickling, et al. 2018).

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Review

International Perspectives on the Theory and Practice of Environmental Education: A Reader. Edited by Giuliano Reis and Jeff Scott. Cham, Switzerland: Springer Nature, 2018, ISBN 978-3-319-67731-6

Reviewed by Rebecca L. Franzen

> "The world changes according to the way people see it, and if you alter, even by a millimeter, the way people look at reality, then you can change it." – James Baldwin

Reis and Scott, both professors of education at Canadian universities, attempt to change how people see the world through *International Perspectives on the Theory and Practice of Environmental Education: A Reader.* The editors have brought together a group of authors and collection of stories that aim to change the reader, inspiring them to take action and influence others in regard to environmental education (EE). By presenting multiple perspectives, the text challenges readers to explore their own understandings of EE and, potentially, change their own practice.

International Perspectives on the Theory and Practice of Environmental Education: A Reader provides many perspectives from across the globe on the theory and practice of EE. The third volume in a series titled *Environmental Discourses in Science Education*, the text includes 16 chapters written by 37 authors coming from Australia, Brazil, China, North America, and more who have contributed their ideas and passions as experts on subjects ranging from early childhood to higher education, in both formal and non-formal settings. The text is divided into four parts: EE and teacher education, EE outside walls, EE in the context of schools, and EE research and poetry. Each part includes implementation strategies, research, policies, and theory. Discussion questions are provided at the end of each chapter so that the book might be used as a course text.

One way to change how people see the world can be through having a connection to place. Through its mode of inquiry and introduction to cutting-edge issues, the book repeatedly offers readers opportunities to explore new ideas and experience personal growth, particularly regarding their connection to place. From the very start, the authors encourage the reader to have an open mind through the inclusion of the "cantico," impressing upon the reader that we must all look after each other. Throughout the text, the contributing authors pose questions for the reader to consider about getting closer to the environment, developing compassion, and considering how connection to place might vary by location. This idea of connection to place is woven through the entire book as the authors of each chapter provide suggestions for transferring the ideas presented therein to the reader's context.

Another route to change can be through taking a critical perspective of EE. The authors encourage the reader to take a critical perspective of environmental

education in several ways. For example, chapter 2 explores how EE can be used as a practice of environmental reconciliation by linking ecojustice education to Indigenous education, while chapter 15 discusses the relationship between the processes of citizenship construction and EE. Considering the current political situation, particularly in the United States, an analysis of EE literature's use of words and ideas related to "citizenship" causes the reader to think critically about their own meaning of the word and understanding of the goals of environmental education. Educators might change their own practice by incorporating critical perspectives of EE into their curriculum in order to address issues of injustice and explore avenues toward inclusivity.

The reader is challenged to reflect on their own thinking—not only does the text present different ideas that might push the reader's comfort zones, but each chapter provides discussion questions that prompt readers to further consider the most important components of each chapter. For example, the questions on page 45 get the reader to think about how they might modify lessons to include art, to consider what challenges they might face integrating more EE in their curriculum, and to examine how one might model sustainable behaviour. Reflecting on their own thinking might cause the reader to further change their own perspective on and practice in EE. Chapter after chapter provides a unique perspective and new ideas for the reader to consider.

While these varied perspectives and global voices provide numerous strategies, research, policies, and theories of EE, they seemed to differ in definitions and meanings. In other words, it could prove beneficial for authors to include definitions in order to allow for clarity by the reader. To further clarify, the editors could compare and contrast the writings through a final chapter. Such a concluding chapter could serve as a final call to action, reinforcing the book's goal of changing people's perspectives.

EE is a diverse field that can lead to change. Originating in nature study and conservation education, EE has evolved in many forms, e.g., sustainability education. This text allows the reader to see even more opportunities for EE, including findings from research, examples from practice and policy, and guiding theories. By pushing the reader to consider their own connection to place and critical perspectives on EE as well as to reflect on their own thinking and practice, this text pushes the edges of the field. It sparks curiosity and challenges the reader to consider what they might do to improve their own practice. It just might alter the way people look at reality.

This book also helps to fill a gap in resources for higher education. Faculty members in higher education could use chapters as readings for undergraduate and graduate level courses for formal and non-formal educators. Its questions for reflection could help guide student reading and discussions. Finally, the book also supports higher education as it aims to foster conversations that promote international collaborations and a way to "envision new teaching and research agendas" (p. v).

Artist's Statement
Paradoxes in Place-Based Curriculum Informed by Metaphor

How can we teach students about the changing landscape while instilling hope and a sense of responsibility to and for the natural world? Using the arts to explore outdoor education, students experience an intimate learning experience; metaphor in art offers a deeper way to understand nature. Metaphor can replace language by visually representing many different facets of an experience through knowing, feeling, imagination, and insight. Offering metaphorical comparisons using self-identity and tidal pool observations provides students with the opportunity to look deeper into a life form, to study it, to learn of its place in the eco-system, and its role in Haida culture. When students spend time in nature and respond through artistic expression, relationship building takes place. Relationship building creates a "caring for" and "responsibility to" the natural world.

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