Summaries of Presentations

National Roundtable for Environmental & Sustainability Education in Pre-service Teacher Education 2016

1. In What Ways are Teacher Candidates Being Prepared to Teach about the Environment? A Case Study from Wisconsin

Names of presenters: Scott Ashmann, University of Wisconsin-Green Bay; Becca Franzen, University of Wisconsin-Stevens Point

Research Purpose and Problem
The need to adequately prepare teachers to teach about the environment was the focus of our research. Our purpose was to determine the ways in which Wisconsin's environmental education teacher licensure requirement is being met by each of the 33 teacher education programs in Wisconsin.

Research Objective or Questions
In what ways are teacher candidates being prepared to teach primary and secondary students about the environment? What resources are being used in teacher preparation programs to prepare teacher candidates to teach about the environment?

Theoretical Framework
Time, materials, and space can be viewed as important resources that are needed for the effective preparation of teacher candidates in environmental education (Buchanan 2012). Are other resources also needed? Gamoran et al. (2003) discuss three key elements –groups, practices, and organizational resources. We have found this framework to be useful in our thinking about why some teacher education programs more fully integrate environmental education while others do much less, in particular the discussion concerning resources (material, human, and social).

Methodology / Research Design
Wisconsin teacher education programs acted as a case study. Many of the sources of evidence in a traditional case study were collected in this research, including documents, archival records, and interviews. A survey sent to a key individual within each teacher education program took the place of direct observations. The primary analytic strategy involved a close examination of all relevant elements of the context and inner-workings of each teacher education program as provided by available documentation.

Findings
Data from surveys and an investigation of websites can be classified into two categories: course-based and activity-based. Broadly defined, *course-based* ways mean that environmental education components are included as part of a course and the completion of the course satisfies the requirement. An *activity-based* way means that engaging in an activity will meet this requirement. Five teacher education programs were identified as doing more than "typical" when it comes to preparing teacher candidates with respect to environmental education. A question that was posed during the analysis of

all data gathered in this study was, "Do these five programs that 'stand out' from the others in the state have anything in common?" A close examination shows that each has a driving force at the institutional or department level that facilitates the development of high quality environmental education activities by individual staff or faculty.

Significance
The primary takeaway for us from this study was that every teacher education program, even those that are doing more than "typical," could be doing more with respect to including environmental education in teacher preparation and that the likely candidate(s) for why more is not being accomplished is the absence of a resource – material and/or human and/or social.

2. Sustainability and Teacher Education: Notes from Manitoba and beyond

Name of presenter: Chris Beeman, Ph.D., Brandon University

Co-authors: Laura Sims, Ph.D., Université de St. Boniface; Lee Anne Block, Ph.D., University of Winnipeg; Thomas Falkenberg, Ph.D., University of Manitoba

Teachers play a significant role in educating youth to value a sustainable way of living that respects the human and more-than-human environments of which they are a part. Teacher education can be instrumental in developing values and practices necessary for teacher candidates to develop a pedagogical approach that supports a transition towards sustainability (UNECE, 2012). As these values and practices emerge for beginning teachers, teachers may in turn transform the learning experiences of their students. In faculties of education, this complex process requires a pedagogy that engages with diverse perspectives and is oriented to inquiry, problem-solving, and a systems approach. This paper examines such pedagogies in three Manitoba faculties of education: University of Winnipeg, Université de St.-Boniface, and Brandon University. Our purpose was to find points of correlation and difference between our practices and our contexts. The theory-practice dialectic is explored, as well as factors that constrain and facilitate reorienting teacher education towards sustainability in a Manitoba context. Phenomenological hermeutics was a major research methodology, as was autoethnography. The focus is on the situated practice of three professors at these three different institutions, who intentionally focus on and integrate education for sustainability within their teacher-education courses and professional practice.

Through our collaboration on this paper, linkages between our practices arose, despite our differing theoretical perspectives. As these linkages emerged, our understanding of our positions and practices has deepened and become more nuanced. In the process of writing and talking, we noted that several themes common to all authors emerged. The first theme is the structural nature of the constraints on our teaching practice. That is to say, that which divides or restricts us from what we would like to do often occurs at a cultural and institutional level. Faculties of education, like other institutions, have dominant perspectives. Education for sustainability tends to be viewed as either radical, novel and unproven, or a discipline whose time has long ago passed. Often, education for sustainability is viewed as being a specialized discipline without broad relevance to educational practice. These perspectives cannot envision a relationship with the more-than-human world other than the relationship modern Western culture currently enacts. The second theme that emerges in our work is an awareness of other structures which tend to permit, authorize or legitimate our practice. In all contexts, and despite marginalizing influences, some policies, rules, or governing direction has allowed us to teach and research in this area. In each author's individual section, we have explored these facilitating and

constraining structures. Finally, all of the authors have found themselves in their roles as teachers to be engaged in work involving some kind of transformation, or the shifting of position experienced by teacher candidates, rather than simply the transmission of information. Our own teaching positions at times provoke and at times sidestep this transformative stance.

3. Panel Discussion: Four presentations

A. A whole-school approach to getting outdoors: working within the Ontario EcoSchools framework

Name of presenter: Lindsay Bunce, BSc., HBES, M.Ed, Program Director, Ontario EcoSchools

Ontario EcoSchools is an environmental education and certification program for grades K-12 that helps school communities foster environmental stewardship and reduce their ecological footprint as a school. We work towards the vision that all students and staff in Ontario schools will be engaged in environmental education and practices, developing the knowledge, skills, perspectives and actions needed to be environmentally responsible citizens.

In 2002, the EcoSchools program was developed by the Toronto District School Board. Following its creation, a group of education stakeholders came together to address environmental issues in the formal school system. Seven school boards, York University, and the Toronto and Region Conservation Authority adapted the EcoSchools program and expanded it across the province to become Ontario EcoSchools. Now, a decade later, we are the only voluntary, free certification program in Ontario that recognizes and celebrates schools for their environmental learning and action.

In the early years of program delivery, EcoSchools maintained a strong focus on climate change mitigation through resource conservation. While many elements of the program still link directly to operational efficiency and stewardship initiatives within the school walls, three of the six certification sections present an invitation to teachers to take their students outside to access nearby nature. Through these sections, staff and students are encouraged to be open to exploration and nature connection on their own school grounds through greening projects, stewardship activities and curriculum-linked lessons. The aim is to provide a framework for whole-school engagement that includes a spectrum of options for learning and taking action that fall within a student's sphere of influence.

Through ongoing feedback and annual recognition, our certification program has enabled Ontario EcoSchools to gather strategies and best practices that serve to inform our evolution as an organization and further support initiatives that are being implemented at the school level. By seeking to address identified gaps and celebrating the hard work and dedication of outstanding schools from across the province, we hope to build capacity, encourage participation and inspire action.

As Ontario EcoSchools prepares for our next decade of program delivery, we are mindful of existing and emerging research around the benefits of spending time outdoors as it relates not only to deepening a connection with nature, but also overall student physical activity and mental health.

In this discussion, I will share strategies from certified Ontario EcoSchools that support teaching and learning outdoors, as well as, explore several of the gaps and opportunities that have been highlighted

by our provincial network of 1,765 schools and 52 school boards.

B. The Promise of Higher Education without Borders

Name of presenter: Dr. Don Dippo, Faculty of Education, York University

In Our Common Future (1987) the World Commission on Environment and Development, commonly known as The Brundtland Commission, defined sustainability as meeting the needs of the present generation without compromising the ability of future generations to do the same (World Commission on Environment and Development 1987). Education for sustainable development (ESD) is based on the assumption that people can be educated to act now in the interest of a sustainable future. Conceptually, it insists on recognizing the interrelationships among the social, the economic and the environmental. Pedagogically, it advocates for methods that are inclusive and participatory. This presentation invites us to think about whether and how the principles and practices of ESD can inform the work of the Borderless Higher Education for Refugees (BHER) project (http://refugeeresearch.net/ms/bher/) and can be made relevant and culturally appropriate to students in the Dadaab refugee camps in northeast Kenya.

Borderless Higher Education for Refugees (BHER) is a consortium of universities and NGOs who are working together to deliver university courses, certificates, diplomas and degrees to people living in the Dadaab refugee camps and neighboring communities. The project has three overarching purposes. First, courses are designed with the aim of enabling refugee students to participate in the creation and critique of knowledge, certainly about forced migration, but also about contemporary theories of globalization, nationhood, post-coloniality, environmental sustainability, identity, belonging, and hope, among other things, from within the experience of forced migration. Second, programs offered in Education, Community Health, and Liberal Arts come out of a feasibility study supported by community-based researchers in Dadaab and are intended to improve the quality of life and build local capacity within the Dadaab camps and the local communities. Third, certificates, diplomas and degrees provide transferable/transportable post-secondary credentials to students in the event of repatriation or resettlement.

In 2014-15 and 2015-16, the Faculty of Education at York University offered a Certificate of Completion in Educational Studies (Primary) as part of the Borderless Higher Education for Refugees (BHER) project. More than twenty-five faculty members and graduate students were involved in the process of revising existing York University courses to make them appropriate to the Dadaab context. Some of these courses were offered in a face-to-face format to Dadaab students only. Others were redesigned to be offered in a blended format that included face-to-face and on-line elements. Still others were totally re-conceptualized as courses that could be offered asynchronously to students in Dadaab and in Toronto. Educating for a Sustainable Future was one such course. This presentation will describe the ways in which an ESD framework shaped curriculum design and approaches to pedagogy. The emphasis is on the interconnection among the social, economic and environmental; on the importance of localizing curriculum content and taking a place-based approach to course development; on the challenge of incorporating traditional knowledge where possible and critiquing traditional knowledge when necessary; and, on creating innovative, participatory and inclusive approaches to pedagogy.

C. The Outdoor Experiential Education Field Trip Re-imagined

Name of presenter: Nancy McGee, OCT, PhD (Education) Candidate

Manager, *Education, Training and Outreach, Toronto and Region Conservation*

What's happening to the overnight, environmental education (EE) field trip, and more importantly, the valuable ecosystem learning, community building, and outdoor experiential opportunities that were intrinsic to the EE field trip and core to some school boards' mandates less than twenty years ago? *Well, they're being re-imagined to play an explicit, integrating function between the natural spaces, personal spaces, and community spaces of students' lives, that's what's happening!*

Outdoor education, an aspect of environmental education (EE) as recognized in the Ontario Ministry of Education report, *Shaping Our Schools, Shaping Our Future* (2007), has been the focus of my career in teaching since entering my first practicum in October of 1992. Placement at an outdoor education centre owned and operated by the Toronto and Region Conservation Authority (TRCA), offered to me my first glimpse at how rich a 2.5 to 5 day, overnight outdoor education field trip could be for students, myself included! Also known by many within the field as *outdoor experiential education* (OEE), good OEE ensures that curriculum content is embedded within lessons while setting the stage to maximize the learners' opportunities for experiencing deep, transformative learning moments in nature. Not only does one experience the moment, but OEE students and teachers become equally invested in re-living the moment making personal and interpersonal connections. Community living and sustainable living practices act as immersive experiences, and from year to year, the familiar faces of returning teachers with the unfamiliar faces of their new classes always confirmed what I thought I was witnessing – that the experiences we offered were valued.

But amidst changes in political will, limited financial capacity, administrative constraints, measurement conundrums, and the perception of *never enough time*, the OEE overnight field trip is being challenged. Are these experiences transformative? Are they just a "nice to have" trip away? Do they have a measureable impact on the lives of our students?

In an attempt to better understand the field trip experience *after the trip*, and ensure the learning experiences lived well beyond the trip, TRCA embarked on a pilot to re-invent the OEE field trip. The *Environmental Leaders of Tomorrow* (ELT) field trip experience was designed with three distinct phases: phase 1 – the pre-trip, in-class experience; phase 2 – the 2.5 day overnight, immersive OEE field trip; and phase 3 – the post-trip follow-up (in-class experience). The three phases take place over a 2-month period, with a student survey of ten questions completed during each of the three phases, monitoring student perception and action. In addition to the student surveys, the classroom teacher also completes a questionnaire at the end of phase 3. In this discussion, I will reveal lessons learned over a six year, and 320 classes of participation.

D. Outdoor Pedagogies--Just Do Them!

Name of presenter: Christina Phillips-MacNeil, Seconded Faculty Member & Practicum Facilitator, Faculty of Education, York University

We cannot win this battle to save species and environments without forging an emotional bond between ourselves and nature as well—for we will not fight to save what we do not love. (S.J. Gould, as quoted in Orr, 2004, p. 43)

Both Professor Don Dippo and myself teach sections of a course called, Educating for Sustainable Futures at the Faculty of Education, York University. We share an enthusiasm for infusing

environmental education across all grade levels and subject areas as well as a passion for outdoor education. This quotation resonates with our approaches as we feel that one of the best ways to cultivate an emotional and lasting bond with nature is to simply get out there and do it! There are many studies that speak to the benefits of outdoor learning for our students such as helping to contextualize their learning and increasing engagement as illustrated here:

Students communicate and participate in the classroom too, but when students engage in practical outdoor activities in collaboration with others they learn by doing and participating in a concrete 'real-life' context. This differs from the more abstract classroom situation. (Fagerstam, 2014, p. 58)
or
A student who has a difficult time in the classroom suddenly becomes animated and involved with learning in an outdoor setting. Teachers who frequently use outdoor instruction have dozens of anecdotes that replay the same scenario. (Broda, 2007, p. 15)

As an experienced educator, I can tell you that there are some barriers to taking your classroom outdoors including concerns about safety, accessibility, parental reactions, or administrative concerns. Fortunately, there are ways to overcome these potential challenges with a bit of thoughtful and careful planning. My proposed discussion segment will consider how we might infuse some practical aspects of planning and safety in school contexts such as the co-construction of safety guidelines with students (or TCs in our contexts as teacher educators), practical considerations at the school level such as open communication with the administrative team and obtaining permission forms from parents and/or guardians.

If time permits, I would also like to share a pedagogical strategy that I use to help support messages of hope and positivity when engaging in discussions about sustainability in outdoor contexts. I will 'show and tell' an activity that I was first introduced to at the Cape Breton Highlands Cheticamp campground that I use with teacher candidates. In this activity, we will build a human food web based on local organisms and show the interconnections between organisms using string. After we build our web, we can subject it to various 'disturbances' either natural or human-created, such as deforestation, insect outbreaks and various diseases in animal populations. We can also show possible food web re-building through the introduction sustainable practices such as tree planting initiatives.

4. Learning for a Sustainable Future's *Connecting the Dots* resource

Name of presenter: Susan Elliott, Co-author Connecting the Dots; Consultant Learning for a Sustainable Future; Executive Director The Learning Forum/ Le Forum d'apprentissage, TFS - Canada's International School

Educators striving to link effective strategies to active citizenship need resources directed to their daily practice with students. LSF's **Connecting the Dots**, published in 2013 and reprinted in 2016, acknowledges and addresses this critical need.

The guide is based on a review of effective practices from many educational perspectives, including brain-based learning research, experiential learning, place-based education, inquiry learning and project-based learning as well as considering the transformative impact of new technologies on the classroom. Seven key learning strategies are identified and form the structure of the chapters.
Each learning strategy "dot" can:

- Link environmental, economic and social issues within subjects and across subjects

- Link students to each other, their home life, their schools and their community
- Link knowledge, skills and perspectives through student engagement and action
- Provide a meaningful context to address numeracy, literacy, character and other educational expectations.

Connecting the Dots also shows how these strategies align with 21st century learning skills including collaboration, creativity, communication and critical thinking.

With its clear, accessible format of information, graphics and examples, the resource aims to support the way educators organize learning experiences — the "how to" of learning. The strategies represent some of the best ways that environmental education can connect to formal learning.

This roundtable session will provide a forum to review the guide, with a printed copy available to all participants. We hope also for a collaborative dialogue about current and future ways the guide can be shared, used and connected to professional development opportunities with all stakeholders.

5. Strengthening Environmental and Sustainability Education in a Northern Aboriginal, Pre-service Teacher Education Program

Names of presenters: Sharon Feschuk, Deborah Gibson-Dingwall, Faculty, Northern Teacher Education Program, Reid Dingwall, Northern Lights School Division #113, La Ronge, Saskatchewan
Co-authors: Michelle Hopper, Minnie McKenzie

Project Wet, Canada and the *Council for Environmental Education* certificate programs are integral parts of the bachelor of education degree for the Northern Teacher Education Program (NORTEP) in La Ronge, Saskatchewan. Faculty collaboration and a community-based approach systematically infuses *Project Wet, Project Wild, Below Zero, Growing Up Wild* and *Flying Wild* into the pre-service teacher course outlines through praxis in the professional studies, health, language arts, science and curriculum development teaching methods courses. Environmental program connections to Saskatchewan curriculum learning outcomes are made by the pre-service teachers in each of the courses. This is facilitated through individual pre-service teacher work and networking with environmental program curriculum support teams at Project Wet, Canada, SaskOutdoors and the Canadian Wildlife Federation. These teams have cross-referenced environmental education programs with the Saskatchewan curriculum learning outcomes. As a primarily, Aboriginal and Northern teacher education program NORTEP adapts the environmental programs for Northern and Aboriginal content. A Cree language supplement has been created for *Growing Up Wild*.

Initially, the only environmental program offered at NORTEP was *Project Wild*. It was delivered in a single-day workshop during the science methods class just before the pre-service teachers' four-month school internships. This left little time for the pre-service teachers to reach a level where they felt competent in integrating the *Project Wild* wildlife concepts into the Saskatchewan science curriculum. It also leads the pre-service teachers to view *Project Wild* as just a science program when one of its greatest strengths is the environmental and concept linkages to multiple, interdisciplinary learning outcomes. Shifting the *Project Wild* certification workshop to the introductory professional studies course over a three-week period allowed greater subject area diversity in matching outcomes, environmental and sustainability concepts with peer and instructor support through micro-teaching. Further practice took place teaching *Project Wild* lessons in community school classrooms to allow for deeper connections to the concepts and opportunities for the pre-service teachers to teach cross-curriculum environmental linkages before internship.

All of the environmental programs discussed are now integrated into the identified NORTEP course outlines. Further environmental education linkages are created as the faculty are certified Project Wet and Canadian Wildlife program facilitators who assist the pre-service teachers to infuse environmental and sustainability concepts into lessons in their internship schools. NORTEP graduates receive certification in each program as part of their pre-service teacher education.

References

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Canadian Wildlife Federation, (2009). *Below zero.* Ottawa, ON: Council for Environmental Education.
Canadian Wildlife Federation, (2013). *Project wild.* Ottawa, ON: Council for Environmental Education.
Project Wet Foundation, (2013). *Project wet: Curriculum guide 2.0.* Bozeman, MO: Project Wet.

6. Environmental Education in Teacher Education: A Politics of Inclusion

Names of presenters: Paul Hart, University of Regina; Catherine Hart, University of Regina

The Faculty of Education at the University of Regina has recently embedded environmental education within the core mandate of teacher education. In this presentation we reflect on the process—we describe the politics of change within a faculty/university complex, already always immersed within social values concerning discursive-material production models of elementary, secondary, and post-secondary institutions of education as well as a socio-political climate of government-mandated curriculum and teacher certification. Our 'findings' may be conceptualized in terms of making critical sense of environmental and sustainability education for pre-service teachers within wider framings. Results may be construed in terms of actual program change.

We begin by contextualizing the process as a kind of history of the present, describing changing frames with provincial government-based science education and changes in school science curricula. We also describe provincial framings in change including influences from institutions, including the First Nations University of Canada, Northern Teacher Education Program, the new University of Saskatchewan School of Environment and Sustainability, and community (e.g., Royal Saskatchewan Museum, Regional Centre of Expertise, eco-community initiatives—Craik and Nipawin). Within the Faculty of Education, changes in core program goals are reflected in mandates for social and environmental justice and cultural inclusion, in particular, indigenous ways of knowing.

We then conceptualize the change process in terms of faculty processes and restructuring to accommodate shifting provincial and community priorities. We describe the changes with faculty from an 'insider's perspective.' We portray crucial negotiations with the Saskatchewan provincial government, focusing on teacher certification and major changes in secondary school mandate (in particular, the introduction of environmental science).

Perhaps the presentation should be considered a story of relationships and people with similar views, perhaps worldviews, as issues that are possible 'out there' in policy and praxis and teacher education, precisely because they already exist 'in here' in critical thinking about, as Britzman (2003) says, learning to teach "as a process of becoming, a time of formation and transformation, of scrutiny

into what one is doing and who one is becoming" (p. 31). In concluding, we describe the processes of constructing and implementing courses for all elementary/middle years and secondary science education students in the Faculty of Education—how the courses were conceptualized within the revitalized teacher education program.

Reference: Britzman, D. (2003). *Practice makes practice. A critical study of learning to teach.* New York: State University of New York Press.

7. Experiences Facilitating a Required Environmental Education Course with Becoming Teachers

Name of presenter: Catherine Hart, University of Regina

The Faculty of Education at the University of Regina has recently embedded environmental education within the core mandate of the teacher education program. In this *informal paper* presentation, I propose to describe my own lived experiences as a facilitator of this course.

In this presentation I will begin by describing the faculty context within which this environmental education course is offered. The Faculty Strategic Plan highlights environmental and social justice, as well as emphasizing Indigenous ways of knowing, as fundamental influences that inform all of the courses within the Faculty of Education courses. I will also briefly describe the structure of the current provincial curricula as a context within which we seek ways to imagine how environmental and sustainability education can be infused throughout the mandated subject areas. While there is currently no environmental and sustainability education specific content in the K-10 grade levels, there is now an Environmental Science 20 course. I will share, given the goals of the Environmental Science 20 course, the connections to environmental and sustainability education as content that was formerly separated into Biology, Chemistry and Physics 20-level courses and has been re-envisioned as integrated into Environmental Science, Health Science and Physical Science 20-level courses.

After setting the context, and introducing the provincial curricula, for the mandated environmental education course I will describe the course design that has been put into practice, including specific examples of past course outlines/syllabi, to illustrate the ways in which environmental and sustainability education is being taken up in practical and applied ways. The mandated environmental education course is framed as a content course and thus provides opportunities for students to engage content crucial to making sense of environmental and sustainability issues. However, while concepts and content are vital to becoming teachers' own understandings and ability to engage in conversations of issues that exist, it is also crucial to present theoretical considerations of the ways in which environmental and sustainability education are informed and provide possibilities for putting "theory into practice". I will share the strategies and approaches employed to allow pre-service teachers to develop their own environmental and sustainability content competencies as well as the ways in which they have opportunities to develop professional competencies as becoming teachers.

A variety of challenges face instructors of this course. Challenges faced have included students of all specializations combined into single sections of the course (i.e. Pre-K to 5, middle years and secondary pre-service teachers, with a variety of major specializations, all in the same section) and time constraints (i.e. trying to condense, and yet present as fully as possible, environment and sustainability education in one 12-week course). I will use narratives to describe experiences as well as the ways in

which challenges have been addressed. I will also describe the strategies employed to address these concerns as well as use the challenges faced as opportunities for facilitated discussions within this presentation session that allow for critical reflection by those attending.

8. *Natural Curiosity* as a resource for environmental inquiry

Name of presenter: Haley Higdon, OCT, Project Lead for Natural Curiosity
The Laboratory School at the Dr. Eric Jackman Institute of Child Study, OISE-UT
www.naturalcuriosity.ca

Natural Curiosity is a resource for educators about Environmental Inquiry that was developed by the Laboratory School at the Dr. Eric Jackman Institute of Child Study (OISE/UofT). The resource supports educators in making the shift to Environmental Inquiry through a four-branch framework to learning and teaching that includes Inquiry-based Learning, Integrated Learning, Experiential Learning and Stewardship. This four-branch approach elicits students' natural curiosity about the world and creates a classroom culture of learning that is purposeful, fun, productive, and responsive to students. When a student's imagination is engaged, their learning naturally blossoms. When the same happens for an educator, their practice is transformed. Since its initial launch in 2011, the impact of the resource has been remarkable, gaining widespread adoption in schools, boards, and Ministries of Education across the country and internationally. Natural Curiosity has also been translated into French - both copies are available free to download at our website http://www.naturalcuriosity.ca

We have learned that the first edition of *Natural Curiosity* begins to reflect Indigenous approaches to learning in significant ways. One Anishinaabe Elder – also a retired elementary school teacher – said, after reading the first edition, "I actually cried when I read it. I said to myself, they're finally starting to get it!" With support from TD Friends of the Environment, we have been inspired to create a second edition which highlights Indigenous perspectives to a greater and more meaningful extent. We invite educators to begin considering a journey into Environmental Inquiry that is increasingly informed by Indigenous knowledge. For more information about our second edition please visit our we bsite. http://naturalcuriosity.ca

This roundtable session will provide a forum to review the resource, with a printed copy of the first edition available to all participants. We hope also for a collaborative dialogue about current and future ways the 2nd Edition of Natural Curiosity can be shared, used and connected to professional development opportunities with all stakeholders.

9. Life History and Environmental Education

Name of presenter: Maigan Hominick, Critical Environmental Education, Masters of Educational Foundations Student, University of Saskatchewan

Research Purpose and Questions: The purpose of this research was to investigate environmental education pedagogy throughout history and to look at continuing issues surrounding humanity's understanding of environmental issues. I wonder, why has environmental education failed to produce critical citizens who actively engage in political, social and ecological justice issues? What practices do educators need to undertake to inspire the above critical thought and action in upcoming and future generations of students? My research questions are based around improving student engagement in environmental education and creating an authentic learning environment that changes the way students perceive the world.

Theoretical Framework and Methodology: I have approached my research from a life history and critical pedagogical methodology as I explored work from educators and scholars in the environmental education field.

Findings and Significance: Environmental education has become a passion of mine as I have embarked on my teaching journey. As an educator, I want to try and create experiences for my students that inspire the critical awareness necessary for social and environmental change. The necessary experiences needed for social change are not currently happening in most classrooms. In this paper, I have chosen life histories and other work from individuals who have all pursued environmental education. I have found that many educators were lacking the necessary practices essential to critical environmental education. I have found educators who are working to decolonize education through critical place based experiences and critical ecopedagogy.

Environmental education has progressed from simply experiencing nature, to taking action, and has finally become more focused on challenging oppressive actions related to both social and environmental injustices. However, progress has been limited and more environmental educators need to take a critical approach. Place and experience are extremely significant to authentic environmental education. Certain knowledge cannot be acquired through reading and writing in a classroom as the concepts are too complex. If student experiences of environmental education are in a classroom or are solely from a colonized perspective, true relationships and appreciation for the land will fail to transpire. Through a critical approach it is hoped that students will be able to place themselves on the land and create relationships with the land that promote their sense of being and belonging to the earth. It is hoped that students will be able to take a critical lens towards information presented through dominant sources (such as media).

As educators, we need to approach our practices without putting importance on one set of views and work to decolonize our classroom. We need to challenge discourses presented by dominant society. We need students to create their own understanding around the multiple values placed on Earth. Having students experience the environment directly through critical inquiry is key to achieving this. Students need to be given the opportunity to find their place and to make the connection between social justice and environment. If students are able to be more critical about world issues they may be able to see past what they have been socialized to know. They may acquire a new perspective that challenges hegemonic discourses and be inspired to take action.

10. Education for Sustainability: Making EfS a Core Focus in Pre-service Education at Cape Breton University

Name of presenter: Patrick Howard, Cape Breton University

The purpose of this presentation is to share the process and lessons learned by the Education Department at Cape Breton University through the initiative to make Education for Sustainability (EfS) a core focus area in all Department programming.

The presentation will briefly outline the process that began with a faculty and staff commitment to EfS as a means to re-orient teacher education at CBU to teach to the skills, values and attitudes commensurate with sustainability. The Education Department decided to integrate and embed EfS principles within department curricula, programs, practices, and policies to ensure that the teacher-education programs fit the environmental, social, and economic conditions and goals of the local communities, province and region.

Drawing on the work of Hopkins (2013) and McKeown (2006) as well as UNESCO documents *Guidelines and Recommendations for Re-orienting Teacher Education to Address Sustainability (2005)* and *Good Practices in Education for Sustainable Development: Teacher Education Institutions (2007)* faculty and staff set out on a process to re-shape teacher education at the university.

The presentation will share this journey, lessons learned, developments in curricula, course implementation, program development, and policy that reflect the commitment to EfS. The re-orientation process is ongoing and evolving. Future plans, challenges and new initiatives will be explored.

This presentation may best take place as part of a round table that is conducive to sharing, open discussion and participatory dialogue.

References

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McKeown, R. (2006). Education for sustainable development toolkit. Paris: UNESCO Education Sector.
Good Practices in Education for Sustainable Development: Teacher Education Institutions (2007). Paris: UNESCO Education Sector.
Guidelines and Recommendations for Re-orienting Teacher Education to Address Sustainability (2005). Paris: UNESCO Education Sector.

11. Pre-service Teachers' Perspectives on Education for Sustainable Development (ESD): A survey study at McGill University in Québec

Name of presenter: Ying Syuan Huang, PhD student, Dept. of Integrated Studies in Education (DISE), Faculty of Education, McGill University

Co-author: Anila Asghar, Associate Professor, Dept. of Integrated Studies in Education (DISE), Faculty of Education, McGill University

This study investigates novice teachers' understanding of Education for Sustainable Development (ESD) in Québec, Canada. It also explores the ways in which teacher education programs prepare prospective teachers to integrate sustainable concepts and practices in their teaching at the K–12 levels in Canada. In this presentation, pre-service teachers' knowledge and views about teaching environmental and sustainability education at local schools in Québec will be discussed.

According to UNESCO (2005) Education for Sustainable Development (ESD) encompasses key issues regarding sustainable development as well as participatory teaching and learning methods. In Canada, the Canadian government also developed a document, the *Framework for Environmental Learning and Sustainability in Canada* (Government of Canada, 2002), to promote environmental education in all Canadian schools. The goal is to develop "ecologically literate" Canadian citizens, such that they would "act competently to build a sustainable future for humans and ecosystems (Government of Canada, 2002, p. 7)." To this end, Canadian teachers are expected to integrate the principles, values and practices of sustainable development into all areas of education (Conseil des ministres de l'Éducation du Canada [CMEC], 2012).

However, while teachers in Canada are tasked with an important responsibility to develop students' understanding of critical environmental and sustainability issues, there are currently few studies examining Canadian teachers' knowledge and perspectives on ESD. For example, Blanchet-Cohen and Reilly (2013) found that elementary school teachers in Québec felt that teaching environmental education in a multicultural context like Canada is challenging. Specifically, the teachers said that they often faced challenges such as a clash between different value systems and a lack of common lived experiences with students from culturally and linguistically diverse backgrounds. These challenges often placed them in paradoxical positions when discussing complex environmental issues in their classrooms.

This study examines novice teachers' understandings of and perspectives on ESD in K–12 settings. An online survey has been administrated to undergraduate and graduate students enrolled in teacher education programs at a large Canadian university. Survey results related to pre-service teachers' understandings of ESD will be discussed in this presentation.

This work has important implications for teacher education programs as well as sustainability education initiatives in Canada. In particular, it would inform curriculum development for teacher education courses to promote meaningful teaching of environmental education and support successful implementation of ESD. Educators and researchers would also benefit from a greater understanding of pre-service teachers' knowledge and views about teaching environmental sustainability education at K–12 schools in Canada.

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12. Developing Teacher Candidates' Capacity in ESE

Name of presenter: Hilary Inwood, PhD, OISE, University of Toronto

At the Ontario Institute for Studies in Education (OISE), in Toronto, Canada, we have taken a multi-pronged approach to developing and delivering environmental and sustainability education in our initial teacher program. We formed the Environmental and Sustainability Education (ESE) Working Group in 2008 in anticipation of the release of the EE policy framework, "Acting Today, Shaping Tomorrow" (Ontario Ministry of Education 2009). As Canada's largest teacher education program (with as many as 1000 teacher candidates registered each year), we felt strongly that a clear presence for ESE would support and deepen the creation of a culture of sustainability across the institution. But we faced a significant challenge: how could we best develop our teacher candidates' capacity in ESE without a formal course presence for it?

This presentation will track our ongoing development of OISE's *ESE Initiative* that works to accomplish this goal through course-infused teaching, co-curricular programming, advocacy, research, and community partnerships. We have explored and refined successful ways of reaching hundreds of teacher candidates in recent years: hosting an annual EcoFair and ESE conference; offering events, talks, and workshops by EcoSchools Teachers and community partners; establishing a Community Learning Garden; collaboratively creating environmental art installations; infusing existing courses with ESE content; and developing ESE-focused practica and internship placements. This has evolved into the establishment of an *Environmental Leadership Certificate* (equivalent to a half course) that has helped our teacher candidates prepare for becoming EcoSchools leaders in their future schools.

The *ESE Initiative* has moved us closer to our institutional goal of creating a culture of sustainability in unexpected ways; not only has it helped us to reduce our ecological footprints in terms of behavioural shifts and physical infrastructure improvements, but it has also extended our environmental handprints (the positive impacts we can have) into the wider university and educational communities in which we work in innovative ways. These impacts will be discussed, as will the next steps for continuing to grow this work in the future.

13. Initial Teacher Environmental Education Capacities: What is the Role of Ontario's Faculties of Education?

Names of presenters: Douglas D. Karrow, Brock University; Maurice, Di Giuseppe, UOIT; Xavier Fazio, Brock University

Research Purpose and Problem:

Consensus about what teachers—including Canadian teachers—should know, believe, and be able to do regarding environmental education (EE) was determined as far back as 2005 in the guidelines and recommendations of the UNESCO Chair on Reorienting Teacher Education To Address Sustainability (UNESCO, 2005). In Ontario, Canada, this became manifest in one of the few Canadian provincial EE policy frameworks, *Acting Today, Shaping Tomorrow* (Ontario Ministry of Education, 2009). The framework provided minimal direction to faculties of education in the development of initial teacher environmental education (IT-EE) capacities.

This purpose of this formal paper is to argument for the development of IT-EE capacity, utilizing a generic model of IT capacity involving IT "experiences/natures" and "competencies." The paper considers how IT-EE capacity may be described, indentified, and cultivated within teacher education programs. The paper also explores how IT-EE capacity may influence IT-EE programs, and how coordinated efforts at two levels of action—action at the faculty level and action beyond the faculty—may help operationalize IT-EE capacities.

Research Objective or Question(s):

(a) What IT-EE capacities should teacher education programs instill in initial teachers?

(b) How are these IT-EE capacities "identified" and "cultivated" within such programs?

(c) How do these capacities, developed by teachers during and following their teacher education program, potentially impact such programs?

Theoretical Frameworks:

Grant's (2008) model for generic teacher capacities is used to conceptualize and interpret what IT-EE capacities consist of.

Methodology/Research Design:

Methodologically, the research is a conceptual piece, employing Grant's (2008) generic IT capacity.

Findings:

IT-EE capacity consists of IT "experiences/natures" and "competencies." Faculties of education may review and revise application protocol to reflect more inclusive practices selecting for the "experiences/natures" conducive to greater IT-EE capacity. Furthermore, faculties of education may consider how best to incorporate IT-EE competencies in ITE. Such competencies include:

• *Learning to know*: Understanding the challenges we face locally and globally, and the role that education can play.

• *Learning to do*: Developing practical skills and action competencies in relation to ESD, including the ability to communicate a sense of urgency for change but also inspire hope.

• *Learning to live together*: The importance of partnership, and concepts such as interdependence, pluralism, mutual understanding, and peace. This includes the ability to challenge unsustainable practices across educational systems.

• *Learning to be*: Personal attributes such as autonomy, judgment, and personal responsibility in relation to sustainability (UNECE, 2012).

Significance:

Faculties of education (faculty members, instructors, and students) will be interested in knowing what IT-EE capacities are, how they are identified and cultivated, and the manner such capacities developed during and following initial teacher education potentially impact such programs.

14. Canadian Perspectives on Initial Teacher Environmental Education Praxis

Names of presenters: Douglas D. Karrow, Brock University; Paul Elliott, Trent University; Yovita Gwekwerere, Laurentian University; Darren Hoeg, OISE/University of Toronto; Patrick Howard, Cape Breton University; Julie Ostertag, University of British Columbia; Chris Beeman, Brandon University

Research Purpose and Problem:

This is a panel presentation of selected authors' chapters comprising a book volume to be included in the Canadian Association for Teacher Education's polygraph series, Canadian Research in Teacher Education

Given that the United Nations declared 2005-2014, the *Decade of Education for Sustainable Development* (UNESCO, 2014), the book volume is warranted for the following reasons:

(a) It is timely to engage in an exploration of initial teacher environmental education programs in Canada in terms of accomplishments, set-backs, successes, failures, anticipated and unanticipated challenges, and future directions; and

(b) The book volume would assist in the development of a national perspective on initial teacher environmental education in Canada by:

i. increasing the profile of research, theory, and practice in initial teacher environmental education;
ii. raising awareness about the importance of initial teacher environmental education;
iii. building a network of support for initial teacher environmental educators and researchers;
iv. expanding the possibilities for conceptualizing initial teacher environmental education; and
v. improving communication amongst initial teacher environmental educators and researchers.

Research Objective or Question(s):

Contributing authors responded to the following questions by considering relationships among research, theory, and practice in initial teacher environmental education and how they may be construed.

• What is the environmental education policy context within your provincial/territorial jurisdiction?

• How has provincial/territorial environmental education policy been interpreted and implemented within initial teacher education?
• What particular current(s) of environmental education (Sauvé, 2005) are emphasized within your program?
• What challenges (if any) has your institution experienced in your jurisdiction regarding the implementation of your initial teacher environmental education program, and how have these challenges been overcome through unique/creative curricular and/or pedagogical approaches?

Theoretical Frameworks:

A variety of theoretical frameworks inform selected contributing authors' works.

Methodology/Research Design:

A variety of methodologies, e.g., case study, conceptual, ethnographical, autobiographical, survey, self-study are reflected in contributing authors' works.

Findings: (Chapter contributions to the book volume)

Dr. P. Elliott et al: *Rising to the Challenge: Promoting Environmental Education in Three Ontario Faculties of Education*
Dr. Y. Gwekwerere: *Environmental Literacy for all: Innovating Environmental Education for Teacher Education Majors and Non-Education Majors*
D. Hoeg & S. Barrett: *Science teacher preparation for environmental education*
Dr. P. Howard: *Re-visioning Teacher Education for Sustainability in Atlantic Canada*
Dr. J. Ostertag et al: *Learning to Teach Environmental Education by Gardening the Margins of the Academy*
Dr. C. Beeman: *Contextualizing Education for Sustainability in Teacher Education*
Significance:

Canadian Faculty of Education stakeholders (faculty members, instructors, and students) will be interested in knowing how IT-EE praxis is conceptualized and practiced across selected Canadian faculties of education.

15. Can today's teachers with English degrees teach the hydrologic cycle to grade school students?

Names of presenters: Lynda McCarthy, Michal Bardecki, Ryerson University

In 2013, Inwood, Jagger, and others convened a *DEEPER Provincial Roundtable* that attempted to answer the question: *why has environmental education not been fully implemented in schools, despite a 2009 Ministry of Education policy that incorporated EE into the school curricula?* While the *Roundtable* justifiably felt that ensuring an educated teacher candidate in environmental issues was a huge part of the battle in getting EE taught in the classroom, a deeper question remains: *why is there such a dearth of basic environmental knowledge on the part of the incoming teacher candidates*? Such a deficiency in comprehension makes introducing the basics of EE to these students a monumental effort.

Half a century ago (1960s), teachers prided themselves on having the ability and confidence to teach students the fundamentals of knowledge in all subject areas. One reason for this proficiency was the fact that these educators were the product of parents and grandparents who had been involved, either on the homefront or on the military front, in two world wars and a global depression, where criti cal thinking, resiliency, and common sense were necessary for survival. Thus, these 1960s teachers, often armed with little more than a high school education and a teachers' college certificate, brought their passion, knowledge, good judgement, and practicality to the classroom. And a generation of youngsters were comprehensively taught about environmental issues within the broader context of history, geography, literature, social sciences, mathematics, physical sciences, etc. This educated, engaged voting public was able to critically assess environmental problems and to vote in governments who were able to implement solutions. However, by the late 1980s, there began a downturn in this knowledge-based societal movement and today, the public is woefully ignorant of the environmental issues besetting the world, due in no small part to the woeful ignorance of a student population taught by teachers with little EE knowledge.

In 2016, we are attempting to determine how our current, disengaged society can transit ion back to those seminal, enlightened years of the 1960s and 1970s. We will examine, from a personal experience, some of the historical reasons for the dearth of basic environmental knowledge on the part of the incoming teacher candidates and offer some potential suggestions for addressing this formidable challenge.

16. GreenLearning – Best Practices Integrated into your Pre-Service program

Name of presenter: Mary McGrath, GreenLearning Canada

GreenLearning Canada is a national, non-profit comprised of educators creating free, curriculum-connected, balanced modules based on sound education research. These online education programs focus on energy and sustainability, and empower students to create positive change for our evolving world.

Participants in this workshop will experience a quick tour of our materials with the aim of illustrating why almost every pre-service teacher candidate in Canada should be exposed to what we offer for use in their school Practicum experiences – and beyond.

Involvement of pre-service students
GreenLearning has worked with teacher candidates in three faculties of education in an Internship capacity and we have trained youth as GreenLearning Associates.

Range of grades and subjects
Programs range from grades 4 to 12 and take into account reading levels, appropriate pedagogy and responsible Internet use. Many subject areas are covered with the greatest use in social studies, science and geography classrooms.

Curriculum connections
Each program has curriculum connections mapped out for a number of provinces including Ontario, British Columbia and Alberta.

Professional Development
GreenLearning has teamed up with Boards on multiple occasions to deliver specialized programs that fit the ongoing needs of teachers.

Multi-classroom projects
Some projects include students from many classrooms including our exciting "Climate Dialogue" Project where over 500 students in five boards of education across Ontario research climate change in their community, meet in virtual town halls and then, after creating a white paper for Ontario's MoECC, meet Premier Wynne in a provincial Virtual Town Hall.

Critical thinking and authentic contexts
Our many programs have been developed by education professionals and tested in classrooms; here is a sample:
• Climate Change Where I Live (CCWIL) is a unique approach to teaching and learning about climate change that takes this global issue down to the local level. Students access primary resource materials on climate change and team up with experts to examine climate change in their community, watershed or region through a sectorial lens of agriculture or recreation.
• Oil Sands Education Dialogue (OSED) tackles one of Canada's major challenges – helping students understand the importance and challenges of Alberta Oil Sands development. This new initiative has three modules including an online stakeholder simulation, a module that looks at the implications of the

drop in the price of oil and a module that immerses students in the consultation process between the oil companies and First Nations communities.
• Sustainability Economics and Finance Education Program (SEFEP) is a program that adds a much-needed dimension beyond the basics of financial literacy by broadening students' understanding of the interplay between the economy, environment and society.
• COOL 2.0 is an online education platform with an extensive database of teaching resources about topics like climate change and energy.
• Re-Energy.ca: Students build an actual working model of a renewable energy technology: a wind turbine, a solar oven, a hydroelectric generator, or a biogas generator.
• ...and others such as eCards, EnerAction and Electricity All Around Us

17. Place Matters: A Place-Based Initiative for all Teacher Candidates at the University of Saskatchewan

Names of presenters: Dianne Miller, Barbara Mills, Educational Foundations, University of Saskatchewan

The course syllabus for *Pedagogies of Place*, a compulsory three-credit class for both elementary and secondary teacher candidates at the University of Saskatchewan, is designed with the following broad goals in mind: to provide practical and theoretical "place-based" learning opportunities; to model holistic, experiential, and inquiry-based practice and assessment; to affirm dignity and respect for all life, human and other-than-human; and to facilitate the creation of positive learning communities and teacher identity in and beyond the classroom.

Pedagogies of Place recognizes that place matters in education. Approximately 50% of class time is spent in land-based and community-based "places" outside of the classroom, and technology-based learning is integrated into classroom activities. Classes involve readings, lectures, individual and collaborative projects, and small and large group discussions. Teacher candidates are encouraged to reflect on their own "best places" and "best ways" of learning, knowing, and teaching; to consider practices that incorporate place-based experiences into specific and interdisciplinary subjects; to think about methods that foster engagement for students with exceptional needs; and to look at ways of teaching and learning in diverse contexts, with a focus on First Nations, Métis and Inuit peoples.

As instructors, three of our "best practices" include the following: 1) Sustained exposure to the Treaty 6 land in which our university is located, where teacher candidates have opportunities to initiate relationships with other living beings; to experience arts-based, nature-based, and contemplative-based learning experiences on the land surrounding the university buildings; and to deepen their knowledge about the history of the place of their learning. 2) Visits to schools that specialize in Inquiry-based Learning, Outdoor Education, Ecological Education, and Education for Sustainability, where teacher candidates can observe and discuss alternative ways of knowing, learning and assessing. 3) Opportunities for teacher candidates to become engaged in community-based initiatives involving social justice or ecological responsibility.

Pedagogies of Place integrates the conceptual foundations for the SK Curricula, and the U of S Indigenous Voices Program (see figures 1 and 2 below):

Figure 1. Conceptual Foundations for SK Curricula Program

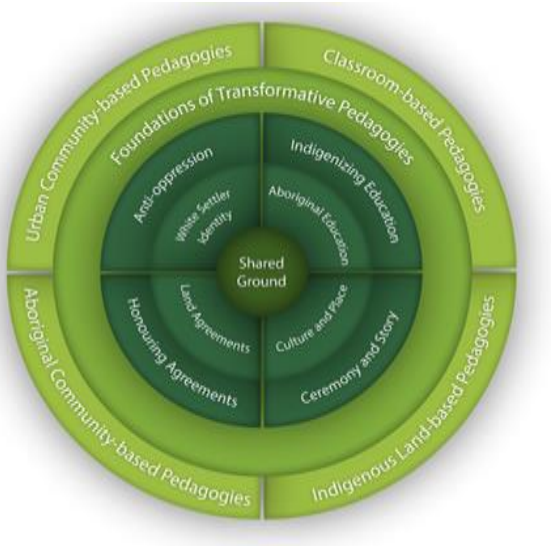

Figure 2. U of S Indigenous Voices

In a final collaborative project, teacher candidates are required to design and present a Place-Based Inquiry experience that demonstrates an integrated understanding of place into teaching materials, within the context of Saskatchewan Ministry of Education curriculum; and to demonstrate a broad understanding of Place-based Pedagogy as it is related to lifelong learners and engaged citizens in diverse contexts, including a specific focus on First Nations, Métis, and Inuit peoples.

The outcomes of *Pedagogies of Place* closely align with ESE's goals of pre-service education; namely, to address "environmental education; education for sustainable development; nature-based learning; outdoor & experiential education; place-based education, eco-justice education; Indigenous education; education for sustainability; humane education; and sustainability for wellbeing."

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18. Urban and Place-based Environmental Education in the Ontario Secondary School Curriculum

Name of presenter: Laila Mnyusiwalla, Environmental Applied Science and Management Program, Ryerson University, Master of Applied Science Candidate

This study reviews the Ontario secondary school curriculum in light of recommendations made by the 2007 Bondar Report, "Shaping Our Schools, Shaping Our Future". It analyzes curriculum expectations and enrolment data for the purpose of reporting upon and providing recommendations for improving urban and place-based environmental education (U&PBEE). It reports on the extent and prescriptiveness of U&PBEE coverage by subject, course, grade, and course progression or pathway.

One of the most significant changes that came from the Bondar Report's recommendations was the integration of environmental education (EE) into all grade and subject curriculum. In this study, the degree to which U&PBEE is present in the mandatory curriculum is determined by applying key word and thematic search criteria to curriculum expectations. The identified expectations are further screened for field study requirements, action outcomes, and prescriptiveness. Field study and action outcomes are important aspects of place-based EE, which help build community connections, stewardship, and action competence. To evaluate prescriptiveness, expectations that *provide opportunities* for U&PBEE study ("indirect") are differentiated from those that *require* its study ("direct").

To provide insight into content outside of the mandatory curriculum, elective courses with substantial U&PBEE content are identified. The enrolment and availability of these courses subsequent to the Bondar Report (2012-2013 school year) is reported upon and discussed. Together, these methods are used to assess the progression and continuity of U&PBEE.

Findings of the curriculum review show 18% of the 675 expectations studied contain some urban EE content. There is significantly more urban EE in grade 9 than in grade 10. No notable difference is found between "academic" and "applied" pathways but themes tend to be compartmentalized by subject (i.e. science-ecology vs. geography-planning). Only 3.3% of the 675 expectations have direct content. Much of the indirect content is found in the optional sections of an expectation (i.e. examples, sample questions). As such, it must overcome the barriers of an overcrowded curriculum, apathy, and lack of resources as well as the feelings of unpreparedness and lack of EE policy awareness felt by educators. Place-based EE content (4.9% of 675 expectations) is less abundant than urban EE in the curriculum. Like urban EE, it is lacking in grade 9 but also in Science courses. A disproportionate number of expectations are found in the applied vs. the academic pathway. The number of expectations involving field study and action outcomes is limited. Analysis of grade 11 and 12 electives with U&PBEE content shows varied course availability with opportunities to continue study in every grade and pathway. Overall, enrolment in elective courses is low.

EE in Ontario does not have its own discrete compulsory courses and despite having been "embedded" in the curriculum, the important arenas of U&PBEE are being applied inconsistently across the mandatory curriculum. Poor enrolment in senior electives show that the focus of students remains elsewhere, fracturing EE's progression in secondary schools.

19. Environmental Education in a Christian Pre-Service Teacher Education Program

Name of presenter: Joanne Nazir, Assistant Professor, Redeemer University College, Ancaster, Ontario

Course Description
Redeemer is a small Christian university college in southern Ontario. It offers undergraduate qualifications in the liberal arts and sciences that are "unabashedly Christ-centred and prepares students to reflect a distinctive worldview in any vocation and place they are called" (Redeemer University College, 2016). One of the programs offered is a B.Ed program designed to prepare teachers for teaching in Christian and secular schools at the elementary/intermediate levels. Working within Redeemer's Christian education framework, I developed an environmental education (EE) course for this program which will be offered for the first time in Fall 2016. The course is designed to provide participants with opportunities to interrogate fundamental EE concepts (e.g. environment, education, care, justice and action) from Christian and other perspectives, along with various curricular approaches by for integrating EE into elementary school settings.

Outline of Course Topics
The course is divided into four sections to be explored in 12 sessions:

- The Growing Need for Environmental Education
- Foundations of EE
  a. The "educational" aspect
  b. Our relationship with nature
  c. Environmental literacy (stewardship, care, justice, action)
- Curricular approaches to EE
  a. Science based approaches
  b. Education for Sustainable Development
  c. Outdoor environmental education
  d. Christian approaches
  e. Aboriginal approaches
  f. Arts-based EE
  g. Whole School approaches
- Future Direction for EE

Course Assessments/Evaluation
The course assignments require students to:

- demonstrate their growing understanding of the fundamental concepts of EE especially how Christian perspectives intersect with and diverge from other perspectives
- Plan a short EE unit for the elementary level.

Class Attendance and Participation	15%
Student seminar/group presentation	25%
Reflective paper	20%
Curriculum development project	40%

Provincial Curriculum Connections
The purpose of the course to build teacher candidates' theoretical knowledge and pedagogical skills for weaving environmental topics and themes into all subjects and all grades as described in the Ontario, Ministry of Education (2009) policy document for environmental education.

Considerations for ESE Integration

Religion especially Christianity remains an influential worldview within the global population. According to the Pew Forum on Religion and Public Life (2010), approximately one third of the global population identify as Christians. In the United States this translates into 79.5% of that country's population and in Canada 68.9%. Furthermore, starting in the last century and continuing today the most rapid conversion to Christianity continues to occur in the global south (Latin America, Sub-Saharan Africa and Asia-Pacific), sites of some of our significant environmental concerns. A review of scholarly literature shows that Christianity has been blamed for contributing to the world's environmental problems (White, 1969) and being anti-environmentalist/environmental education (Zaleha & Szasz, 2015). Bearing this broader context in mind it is important that environmental educators develop educational interventions to engage and include Christians in environmental action and dialogue. Providing dedicated EE courses in teacher education programs that include Christian perspectives as described in this proposal represents one such effort.

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20. Re-Orienting Post-Secondary Educational Practice to Address Sustainability: The "Gravity" of It All[1]

Name of presenter: Dr. Garth Pickard, Professor Emeritus - Faculty of Education, Institute of Energy, Environment and Sustainable Communities (IEESC), University of Regina

Research Purpose and Problem

Identifying the congruence of the organizational structure and culture of Faculties and Colleges of Education in supporting the process of re-orienting teacher education to address sustainability.

Research Question

What indicators exist within Faculties and Colleges of Education that suggest either congruence or incongruence respecting re-orienting teacher education to address sustainability?

Theoretical Frameworks

Thoughtful of UNESCO's global imperative,[2] which reinforces the significance of education for sustainable development and suggests a 'rethink' as to how we relate to one another and how we

[1] (Goodnough, K., et al (Eds) (2013). Inspiration and Innovation in Teaching and Teacher Education. New York, New York: Lexington Books [Chapter 3])

[2] UNESCO, 2014. 'Roadmap for implementing the Global Action Programme on Education for Sustainable Development'. Paris, FR.

interact in social and ecologically just ways, the notion of an "educational gap", which characteristically demonstrates limited professional awareness, perfunctory acceptance, and a deficit of institutional governance policies designed to address sustainable practices, has increasingly been identified as a critical impediment to post-secondary institutional 'change'. Of interest to researching this organizational phenomenon are the theoretical underpinnings of 'consilence' (Wilson, E. O. 1978, 1999, 2014) and 'emergence' (Wheatley, M. 2006, 2007, 2012) theories; both of which provide foundations to better understand institutional growth and transformation into active, working communities of practice, reflecting education for sustainability.

Methodology
Content Analysis (Krippendorff, K. 2013) of interviews, overviews, strategic plans, structure documents, programme descriptions, and class offering are interpreted in juxtaposition with current research/literature on teacher education practices and approaches as they relate to Faculties and Colleges of Education.

Findings
Reluctance to re-orient educational practice is primarily a function of our inability to effectively change or for that matter, believe that we must change our past and present educational practice. Furthermore, the change process is severely inhibited because of institutional and instructional traditions. To change the way post-secondary teacher education institutions perceive their roles in enacting "authentic" sustainability, the academy needs to provide opportunities for faculty: to review policy as it relates to education for sustainability; to embrace 'professional' action learning where interdisciplinary and placed-based experiences are emphasized; to foster ideals and values related to sustainability which reflect community and humility; to identify and provide dedicated funding for interdisciplinary research initiatives associated with education for sustainability; and, to identify classes and 'courses of study' in education for sustainability.

Within most Faculties and Colleges of Education, for example, the idea of community of learners is a mask as the secondary, elementary, and early-childhood folks symbolically "pass in the dark" not interacting, supporting and most importantly, sharing their ideas, needs and uniqueness. In many cases the pre-service students "majoring" in different disciplines do not, for all intents and purposes, have the opportunity to share their knowledge with others in an effort to enhance their awareness of the common relationships among their disciplines.

Significance
Teacher education programs have severed the notions of connectedness from their structure and curricula and have limited and even confused pre-service teachers with respect to what education for sustainable development is. It becomes apparent that there is a critical need for those in teacher education to understand sustainability, community; and, humility (born out of gratitude) as inextricably linked 'organizing' elements in re-orienting teacher education to address sustainability.

21. *Pathway to Stewardship* - A Best Practices Summary

Names of presenters: Jacob Rodenburg, Executive Director Camp Kawartha; Paul Elliott – Professor, School of Education and Professional Learning at Trent University

In 2015 Camp Kawartha received funding from the Foundation of Greater Peterborough in order to develop a community wide stewardship framework. Since then, our organization has been working with local representatives from Public Health, School Boards, Conservation Authority, Land Trusts, Trent's Faculty of Education and environmental educators in order to answer the following questions: How do we foster tomorrow's stewards, today? And how can we teach children to care for each other and the land and water we share? The *Pathway to Stewardship* is a comprehensive strategy designed to foster stewardship and an ethic of environmental responsibility that emerged out of wide spread community consultation and environmental education research.

A steward can be defined as someone who tends to and takes responsibility for, the well-being of all community members, both human and non-human alike. A vibrant community contains healthy people in a healthy ecosystem. A steward works to protect the integrity of both.
The *Pathway to Stewardship* provides a guide and a roadmap towards stewardship based on every stage of a child's development. Using a series of *benchmarks*, or goals for each age group (29 benchmarks in total), this strategy is carefully matched with the developmental needs and abilities of children and youth as they grow from birth to adulthood. It suggests local resources able to support the achievement of each benchmark.

This approach is grounded in extensive research in child development, educational theory, moral development, and the factors promoting mental and physical health in children. Many concepts emerging from the literature echo Indigenous knowledge and wisdom, which we include with great appreciation and respect.

This strategy emerges out of the thoughts, ideas and insights of many local Peterborough leaders. We interviewed more than 75 community leaders from a wide variety of sectors, to learn what childhood experiences helped promote their love of the natural world, and to collect their recommendations for today's young people. These results were overlaid on the literature review to develop the benchmarks suggested in this proposal.

The *Pathway to Stewardship* is a call to action for everyone who plans for, or spends time with children – parents, teachers, relatives, community groups, health professionals and government agencies. It integrates with the Ontario curriculum, and provides many ideas for family activities and community programs. The more broadly this strategy is endorsed and adopted in the community, the deeper the benefit for our children and their world.

This document forms a basis for community discussion – a place to start. It will strengthen from further ideas and feedback. It is our hope that, while the Pathway begins in Peterborough, it can be expanded and applied to other regions as well.

Provincial Curriculum Connections:
We've provided extensive Ontario Curriculum connections in the document attached called *"A Pathway to Stewardship."*

Considerations for ESE integration: We are hoping that this community wide approach to environmental education and stewardship can be used as a discussion point for the conference, either as part of a round table or during a workshop.

22. School Gardens Promoting Hopeful Environmental Education

Names of presenters: Blair Sawa, Peterborough Victoria Northumberland and Clarington Catholic District School Board (PVNCCDSB); Maurice, Di Giuseppe, UOIT

Research Purpose and Problem: Learning gardens are proliferating in schools around the world. Garden-based learning has been shown to promote teamwork, community involvement, environmental stewardship and sustainability, and the development of self-esteem, pride, patience, and general wellbeing (Williams & Brown, 2011). Vegetable gardens, in particular, help students learn about food supply and nutrition, and foster the development of self-esteem, perseverance, and responsibility (Royal Horticultural Society, 2010). However, as with much EE programming, educators face numerous administrative, curricular, and financial hurdles when developing garden-based programs in their institutions (Graham & Zidenberg-Cherr, 2005).

Research Objective or Question(s): This study explores the experiences of students and teachers at St. Peter Secondary School in Peterborough, Ontario. Research questions included: How may gardens promote inquiry learning, cross-curricular learning, and environmental sustainability? What are some benefits and challenges of garden-based learning programs?

Theoretical Frameworks: Several theoretical frames helped inform this study, including inquiry learning (Moyer, Hackett, & Everett, 2007); experiential and place-based education (Lim, Tan, & Calabrese Barton, 2013); cross-curricular learning (Barnes, 2011); and classroom-based learning communities (Bielaczyc & Collins, 1999).

Methodology/Research Design: A mixed-methods case study design was used, including surveys, interviews, and referential documents. Surveys and interviews were used to gather demographic data and teachers' and students' views on garden-based learning.

Findings: The St. Peter program includes an extensive vegetable garden, and facilities to process herbs and vegetables into saleable products whose proceeds were used in social action projects (e.g. KIVA.org). Garden activities motivated students to engage in inquiry learning ("Research was one of the key elements in the creating of the garden. We had to make our own questions and find our own answers."); social action ("We fed the community and gave away extra food to people who need it."); environmental literacy ("Without the environment we would be dead, because plants give oxygen, and we need oxygen to live"); and community-building ("What we were doing with the garden was a risk—it always is—but here we take risks together."). Challenges included garden maintenance issues, administrative hurdles, and lack of motivation: "Motivating some students in both classroom work and experiential activities can be very challenging. Many students have no experience with gardens and have an aversion to soil, touching soil, and working in the soil."

Significance: Enhancing EE in initial teacher education (ITE) and the K-12 school system will require a multi-pronged approach, including re-focusing curriculum, building teachers' EE capacity, and modelling opportunities for place-based and experiential learning, such as school gardens.

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23. A syllabus for Outdoor and Environmental Education: Assessing capacities for preservice teachers

Names of presenters: Erin Sperling, Dr. Doug Karrow, and Darren Hoeg, Brock University

This session shares the course syllabus for Outdoor and Environmental Education at Brock University. The course has been taught via various modes, both as a regular term course and as an intense delivery program, ie. 10 weeks of two hours, and three weeks of seven hours; both on and off campus. The instructors will share their best practices from the course, with a focus on the course assignments and student outcomes. Samples of student products will be shared, along with anecdotal and official reflections on course participation. We will also present a reimagining of the course, in conjunction with an opening for recommendations, based on research work presented in a book chapter to be published by the Canadian Association for Teacher Education (CATE) in 2016. These recommendations include reframing the course through the competency categorizations of *Learning to know*, *Learning to do*, *Learning to live together*, and *Learning to be* (UNECE, 2013). These categories ideally lead to capacity in the essential environmental education traits of holism, envisioning and transformation. With this traits and categories in mind, we will workshop a renewed syllabus for preservice environmental education.

This topic is adaptable to any curriculum area based on the interests of student participant in the course, and in fact, strives to connect across disciplinary boundaries.

Considerations for ESE Integration. A course of this type ideally would be required of all students in a preservice program in order to have the greatest impact.

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24. The E4E projects at Nipissing University

Name of presenter: Astrid Steele, Associate Professor, Nipissing University

Co-author: Jeff Scott, Associate Professor, Nipissing University

Introduction
During the past three years, interested faculty at Nipissing University have offered two yearly programs to encourage EE in classrooms, both locally and further afield; these programs include:

E4E Workshops for Teacher Candidates
Teachers are a vital link in education that focuses on environmental stewardship and sustainability, yet many Faculties of Education offer limited support to teacher candidates in addressing EE issues in the classrooms they are about to enter. As a way to remedy this deficit, and based on the work of our colleagues at another Faculty of Education, E4E Workshops were implemented at Nipissing University

The series of workshops, intended to introduce teacher candidates to a wide range of inquiry-based, hands-on, EE learning opportunities appropriate for both indoors and outdoors, have direct and/or integrated connections to the full range of Ontario curricula.

The four workshops, two occurring in the fall and two in the winter term, run with approximately 24 participants. Learning experiences range from cooperative games, to experimentation, to the more complex use of digital technologies, and are intended for use in all curricular areas from kindergarten to grade 12. In order to achieve a certificate, participants must provide evidence of a lesson taught while on a teaching practicum, that has embedded elements of EE.

The E4E School Project
In the spring, a number of E4E participants have the occasion to work with the E4E School Project - a partnership between the Schulich School of Education and the local school board. This is an opportunity to further explore integrated EE across all school grades and subject areas (OMoE, 2009), and further, to experience the discourse and practice of EE amongst students and educators.

Since 2013, E4E facilitators have collaborated with educators at rural elementary schools (a different school in each of the three years of the project) to develop and implement outdoor and in-class inquiry-based learning experiences for each grade; learning experiences take place at the elementary school as well as the university.

The E4E school project, an outgrowth of the E4E workshops, has allowed us to explore a number of concepts related to EE in school venues including: the use of Learning Stories as forms of assessment (Wien, 2013); the under-valued significance of emotion in learning (McGeehan, 2001); and the social capital generated when an entire school participates in a series of environmental education events (Steele & Scott, 2014).

We would be appreciative of collegial discussions to build on and improve the interrelated E4E projects.

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25. *"I'm Just Going to Buy That";* Confronting Consumerism in Teacher Education

Name of presenter: Astrid Steele, Associate Professors, Nipissing University
Co-author: Liz Ashworth, Associate Professors, Nipissing University

Introduction
As educators at a faculty of education, we found that classrooms can be sites of unabashed consumerism of everything from paper to digital technologies (Glasser, 2004; Jagodzinski, 2007). Teacher candidates invariably purchase new materials for project assignments. We are concerned about this learned, consumer behaviour; lessons of moderation in using the Earth's resources are important elements of sustainability education. Humans are consumers in both a natural and an anthropological sense, yet are capable of sustainable consumerism.

Teacher education needs to address the unnecessary squander of education resources and one way to do so it to provide teacher candidates (TCs) with viable and creative alternatives. In an educational climate that venerates 'new stuff' we want to provide our TCs the opportunity to re-think and re-imagine assignments and projects (Blandy & Fenn, 2012; Wals & Jickling, 2002) that don't call for new materials.

ESE Integration and Curriculum Connections
Inspired by Selby's (2011) proposition three for education for sustainable contraction, we conceived an Art/Science integrated project, based on Ontario curriculum expectations, for which the TCs have to create an Art construction based on a Science theme, and further that it has to be made of re-cycled / re-purposed / *not new* materials. TCs are also required to write a short reflection on their project work commenting on the use of *not new* materials, and on the experience of an Art/Science integration that has an environmental component. The TCs' constructions, process work, and Reflection papers provided insight into their creative thinking, and learning, regarding sustainable consumerism.

We hope that the concepts and ideas they learn from their project with us will carry over into their own future classrooms. We would look forward to the opportunity to share and discuss with colleagues how to further confront consumerism in teacher education.

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26. The Experiences of Selected Teachers in Implementing Place-based Education

Names of presenters: Sampson Twum, University of Saskatchewan; Prof. Dianne Miller, Department head, Educational Foundations, University of Saskatchewan

This study explores the experiences of selected teachers undertaking place-based education (PBE) in a prairie region. PBE is defined and described. Five individual teachers and one teaching team of two who practice PBE were interviewed. Qualitative research method with the aid of interview guide was used to collect data, while content analysis was used in analyzing the data. The findings are reported under four themes that emerged in the data analysis in relation to their experiences: promoting outdoor learning, fostering community engagement, building effective teaching and learning experiences, and addressing curriculum outcomes and assessment. The varied practice of these teachers is instructive for educators interested in holistic, inquiry-based methodologies rooted in local settings.

Keywords: Place-based education, Outdoor learning, Community engagement, experiential learning, curriculum outcomes

27. Education and the pragmatist-inspired classroom: Teacher education and a pragmatist-inspired Adaptive Education model

Name of presenter: Robert VanWynsberghe PhD, Associate Professor, Department of Educational Studies, Education Centre at Ponderosa Commons, University of British Columbia

Having just published a book on the topics of a pragmatist-inspired socio-philosophy of human action and an alternative institutional structure for education, this proposal seeks to outline and discuss its implications for teacher education.

In this presentation, a pragmatist-inspired Adaptive Education model will be presented and explored as well as the theoretical and practical implications for teacher education and making social change for sustainability. The presentation will assert that human experience is a continuous process of adapting one[1]s physical and cognitive etc. actions to new challenges. Habits and creativity re flect the essence of human development and when habits are challenged or frustrated we are forced to embark on a process of inquiry to find a better way of addressing the problem. In short, creativity or creative action is a concept that explains our ability to adapt through inquiry.

The Adaptive Education model argues that the profession of education needs to adopt new, research-driven standards. In our proposal, pre-service teacher education programs will include research components within an entity called the Epistemic Division. In it, new or ongoing research projects will enlist pre-service teachers as research assistants. Practicing teachers, meanwhile, will engage in regular discussion groups designed to elicit classroom experiences and generate inform ation. They will be encouraged to gather feedback from local actors, or initiate their own research.

The presentation will feature a thorough description of the Epistemic Division and the departments within it that will generate and maintain a rigorous knowledge base for educational practice. Each department will be completely described according to the processes we anticipate transpiring in the life of a research project. We detail the processes involved in eliciting ideas, conducting and disseminating research.

Following this, the presentation will touch on a recent effort to apply the Adaptive Education, model a new Master of Education (MEd) program in Education for Sustainability in the Department of Educational Studies at the University of British Columbia.

Evidence will be presented on students' perceptions of the concepts of habits and creativity. Evidence will be provided on how well the MEd program was able to scale-up the focus on habits and creativity to groups, organizations, and institutions. Further, and inspired by Parker Follett and Dewey, evidence on how well collective inquiry was carried out through course-based dialogue will also be detailed.

28. Building the City of the Future: A cross-curricular approach to integrating Environmental & Sustainability Education (ESE) in a Grade 3/4 class

Names of presenters: Jennifer Venalainen, Teacher, Grade 3/4, TDSB; Darya Podolskaya, Teacher Candidate (J/I), Masters of Teaching, OISE/UT

Best Practices: Our presentation will share a case study of integrating ESE into a Grade 3/4 class in the Toronto District School Board.

The host teacher and teacher candidate supported students in a project to design the city of the future, entitled "Toronto 2030: City of Nature," supported by a GO WILD school grant from the WWF. The project stemmed from students' desire to create "more nature" after studying habitats and species at risk, and certifying the school gardens as a Monarch Way station. Students designed and built structures for their model city of Toronto. They wanted to improve the future city by creating more places for nature where people can play, and plants and animals thrive. Students needed to meet the design challenge of adding a green space (living wall, green roof) to their building that was the same or greater area than the building footprint, or build around natural features.

The cross-curricular framework of the project successfully supported student academic achievement, while integrating ESE into the classroom and building a collaborative partnership between host teacher and teacher candidate. Students were highly engaged, and applied grade specific knowledge from a variety of subject areas. The project demonstrates how ESE is applicable to all subjects, and can be connected to the local community as well as having global significance. The dynamic nature of this teaching format enabled rich learning opportunities for planning, assessment, and differentiated instruction.

The host teacher and teacher candidate regularly engaged in reflective practice in order to meet the diverse needs of their students. This presentation will examine the "treasures and troubles" of a cross-curricular project-based approach as a major component of a pre-service teaching placement, from both of their perspectives.

Provincial Curriculum Connections: The project incorporated Social Studies (People and Environments), Science (Understanding Structures and Mechanisms), Visual Arts, Math (Measurement) and Language curriculum content.

Considerations for ESE Integration: STEM and Eco-Schools, Urban Environmental Education (City as a classroom: learning outdoors in the local community, city as a social and ecological system that meets the needs of a variety of inhabitants including people, plants and animals), Active Citizenship, Stewardship and Inquiry-based learning.

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29. Outdoor Environmental Education as a Means of Encouraging Environmental Knowledge, Attitudes, and Behaviours

Name of presenter: Brittany A. Harding, Queen's University, Master of Education Candidate

Research Purpose: Various sources have sought to consider the educational interventions that foster changes in perception of, and attitudes toward nature, with the ultimate intent of understanding how education can be used to encourage environmentally responsible behaviours. These have identified a number of teaching strategies and techniques which can improve the effect education can have on environmental care and responsibility. Some of these include active, ongoing student engagement, emphasis on the local community, and structured, supported goal setting, among others. With these in mind, the current study identified an elementary level outdoor environmental education program incorporating these empirically supported interventions, and sought to assess its ability to influence environmental knowledge, attitudes, and behaviours.

Research Questions:

1) To what degree can participation in this outdoor education program foster change in environmental knowledge, and encourage pro-environmental attitudes and self-reported behaviours?
2) Is change in these variables, or lack thereof, different between male and female students?

Theoretical Framework: The overarching framework selected for the current investigation, Value-Belief-Norm Model of Environmentalism (VBN) (1993), describes environmental behaviour as result of one's values, concern for the well-being of what is valued, and a sense of personal responsibility and subsequent moral obligation to reduce or remove risk to what is valued, all under the perspective of human connection with nature. Guided by previous research, the VBN model, and available age and culture-appropriate measures, student knowledge, attitudes, and self-reported behaviours were selected to be measured in the current study.

Methodology: The study employed a quantitative survey methodology, combining data from a survey measuring knowledge, attitudes and behaviours; and archived data collected by program staff reflecting frequency of environmentally responsible behaviour. Statistical analyses were used to detect change over time and any differences in effect between genders.

Further, a single qualitative item was included in which students provided "*the first three words that come to mind when [they] think of the word nature*". Terms provided before and after the program were compared for differences in theme to detect subtle or underlying changes.

Findings: Quantitative results indicated no significant change in student knowledge or attitudes through the outdoor education program. However, a significant change in self-reported behaviour was identified from both the survey and archived data. Most importantly in this finding is the implication that two independent measures with independent samples of participants drew the same conclusion of positive change in self-reported behaviour. Qualitative results showed subtle changes in students' perceptions of nature through the program, suggesting the need for further investigation.

Significance: Most importantly, the current study demonstrates that prolonged and classroom-integrated outdoor education experiences can have positive impacts on students' self-reported environmentally responsible behaviour. Interestingly, this change was achieved without significant

change in knowledge or environmental attitudes, suggesting that external factors not measured in this study may have played a role in affecting behaviour.