

International Explorations in Outdoor and  
Environmental Education

Douglas D. Karrow  
Maurice DiGiuseppe *Editors*

# Environmental and Sustainability Education in Teacher Education

Canadian Perspectives

 Springer

# **International Explorations in Outdoor and Environmental Education**

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Douglas D. Karrow • Maurice DiGiuseppe  
Editors

# Environmental and Sustainability Education in Teacher Education

Canadian Perspectives

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## Series Editors' Foreword

This book, the third in our series, focuses on a topic close to our professional hearts and experiences – environmental and sustainability education in pre-service teacher education. As former teacher educators who, for many years, taught environmental education related subjects to pre-service teachers, we are both very aware of the issues facing the implementation of environmental education in teacher education institutions as we have faced many of the issues discussed by the authors in this book. Sometimes, one of us was the only faculty member teaching in the area. At other times there was a team, but after a while the momentum was lost. As discussed in these chapters, engagement of faculty beyond close colleagues is often difficult as they are engaged in their own pursuits and passions. Even now, we see how our own institutions are struggling to respond to the Sustainable Development Goals SDGs (United Nations 2015) and make them meaningful in university practices as well as teaching. The responsibility for this is with all of us as educators writ large, as Charles Hopkins and Katrin Kuhl argue (in this volume),

This cannot be the responsibility of any one person or one department. We must recognise that we are speaking of examining the very purposes of education and reorienting each discipline to contribute to a coherent and effective outcome. We must understand that to accomplish this, no single teacher, discipline, or department can do it all, or can 'own' ESD.

An edited collection, this volume reflects a range of different perspectives on preservice teacher education and professional development opportunities for teachers from a Canadian perspective, but the issues discussed are similar to those experienced by teacher educators in many countries. Many of the chapter authors have examined the issues at a micro level whereas others have looked at the bigger picture – the institutional, political, philosophical, and ontological issues confronting implementing EE in preservice teacher education. This volume is a good complement to earlier work (such as Ferreira, Ryan, and Tilbury (2006), Ferreira et al. (2009) and Steele (2010) which reviewed and advanced sustainability in preservice teacher education in Australia), and to current and future research, which is contributing to a developing body of research in environmental and sustainability education in preservice teacher education.

The importance of teachers and teacher education in implementing environmental and sustainability education has been recognised since the Belgrade Charter (UNESCO 1975) and the 1977 Tbilisi Intergovernmental Conference on Environmental Education (UNESCO 1978). These early recommendations were framed around the belief that all teachers need 'to understand the importance of environmental emphasis in their teaching' and so 'environmental sciences and environmental education [need to] be included in curricula for pre-service teacher education' and that 'the necessary steps [are taken] to make in-service training of teachers in environmental education available for all who need it' (UNESCO, 1978, pp. 35–36). More recently, Sustainable Development Goal 4 (United Nations 2015) has called for education programmes and practices to be reoriented to ensure that, by 2030, all learners acquire the knowledge and skills needed to promote sustainable development. Sadly, as many of the authors in this volume (and others such as Evans et al 2017, Ferreira et al 2009, Gough 2016) report, much teacher education is still not addressing environmental and sustainability education, although there are glimmers of hope.

The arguments in this volume exhibit many of the tensions that have plagued establishing environmental and sustainability education (ESE) in Preservice Teacher Education (PTE) since the 1970s, some of which were identified by Hopkins et al. (2005)<sup>1</sup>:

- ESD is seen as a political priority by governments, not an educational one.
- When governments (national, provincial/state or local) act on ESE it is generally through the environment ministries not education.
- Even when in curriculum and policy documents, EE tends to be recommended not mandated.
- Environmental education (EE) and Education for Sustainable Development (ESD) are often seen as similar or even interchangeable.
- Teacher certification guidelines do not mention sustainability.
- Teacher education institutions lack the institutional climate that supports the creativity, innovation, and risk-taking necessary to support transformative efforts to re-orient education to address sustainability.
- Teacher education institutions are filled with people passionate about their own areas, and EE/ESD is seen as marginal by most academics.
- EE initiatives are currently championed by enthusiastic individuals not holistically in most institutions.
- Institutions or faculty members who undertake ESE programmes are rarely rewarded or recognised.
- Lack of or inadequately trained professionals who are knowledgeable about ESE.

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<sup>1</sup>While the convention throughout this book is to refer to Environmental and Sustainability Education (ESE), Hopkins and McKeown (2005) and Hopkins and Kuhl (in this volume) follow UNESCO documentation and refer to ESD. The UNESCO convention has been followed in this Foreword when UNESCO documentation is being referenced. Elsewhere in this volume the two terms are seen as interchangeable.

- Should EE be a separate subject or a cross-curriculum area? Or an overall purpose of education systems?
- How can universities re-orient themselves towards the Sustainable Development Goals (SDGs)?
- Insufficient or inadequate funding and material resources.

Charles Hopkins and Katrin Kuhl (Chap. 2) argue that having Education for Sustainable Development (ESD) as a purpose of education in the Sustainable Development Goals (United Nations 2015) 'is a significant change from the very early attempts to address sustainability within formal education' as education became a 'forgotten priority' after the UN Conference on Environment and Development (UNCED) (1992) because ESD tended to be taken up by ministers of the environment rather than ministers of education, often presented or perceived as a newer, yet similar form of environmental education (EE). Fortunately, at the close of the United Nations Decade of Education for Sustainable Development 2005–2014 (UNESCO 2005), in the Aichi-Nagoya Declaration on Education for Sustainable Development (UNESCO 2014a), member states reaffirmed that ESD was a vital means of implementation for sustainable development, identified their education systems' roles in implementing sustainable development, and launched the global action programme on education for sustainable development (GAP) (UNESCO 2014b).

The Aichi-Nagoya Declaration (UNESCO 2014a) also recognised that ESD could be seen in various ways: as sustainability education, joining a host of other societal issues that needed addressing; as another discipline to be added to already overcrowded curricula; or as an overall purpose of education systems engaging all aspects of education, both formal and informal. These multiple conceptualisations of ESD continued the confusion in teacher education institutions that had previously been noted by Hopkins et al. (2005), and continues to remain in many institutions – as evidenced by many of the chapters in this volume and UNESCO (2016) who reported that only 8% of 66 countries surveyed integrated sustainable development into their teacher education. Stronger efforts are urgently needed to assess concepts inherent in ESD and global citizenship for teacher preparation and professional development.

While Lucie Sauvé (Chap. 4) argues that teacher competencies in EE need to be supported: 'teachers must receive adequate education about fundamentals and contents, as well as about appropriate approaches and strategies for environmental education', several other authors in this volume draw attention to how EE is not occurring in the majority of faculties of education in Canadian universities, and where it is occurring, it is because of the passionate and dedicated efforts of a few committed faculty members (see, e.g. Karrow et al., Chap. 7). They also note that, across Canada, EE is underprioritised in Ministry and College policy and accreditation guidelines. David Greenwood (2010) summarises the situation in Canada (and many other places) but also provides a glimmer of hope that is reflected by the authors in this volume, when he writes,

Environmental and sustainability education are marginal to teacher education discourse if they are part of it at all. However, the professional autonomy available to faculty members does make it possible to create space at the grassroots within the otherwise regulated system



to pursue educational aims that are neglected by convention and by design. Over time, grassroots work can begin to change local cultural practices and can coalesce into meaningful changes in policy. (p. 144)

Several of the authors in this volume grapple with the age-old problem of where does ESE fit in the overcrowded school – and preservice teacher education – curriculum. Many accept its place as a cross-curriculum priority of some sort or through discrete electives, but Karrow et al. (Chap. 7) argue for EE being recognised as a teachable subject in preservice teacher education programs in order to elevate its profile and attract more students. Another approach that is proposed is to make EE a key aim of an entire preservice teacher education program. Maurice DiGiuseppe et al. (Chap. 9) discuss the pros and cons of separate course (with EE afforded the same curricular status as mathematics, language arts or science education) or infusion across the curriculum, whereas Ying-Syuan Huang and Anila Asghar (Chap. 17) note that EE has largely become an individual effort rather than a cross-curricular integration.

The article by Evans et al. (2017) is a reference point for the final chapter. While limited in its engagement with the extent of ESE in teacher education programmes because of the researchers' narrow selection criteria (recent studies, such as Vega-Marcote and Varela-Losada (2016), and book chapters were omitted), it does provide a catalyst for comparisons and continuing conversations. The authors in this volume have documented some seemingly intractable challenges in their efforts to embed ESE in preservice teacher education, but they also tell of some successes. Where Evans et al. and the authors in this volume agree is that there is a great need for further research on programmatic approaches employed in preservice teacher education programmes; the theoretical frameworks undergirding and informing those approaches; curricular emphases and outcomes employed in these programmes; and the lived experiences of the students, instructors, administrators, and policy-makers. This is particularly so as we all work together towards achieving the targets of the SDGs by 2030, and teacher educators have a particular role in ensuring that preservice teachers everywhere are provided with opportunities to think critically and creatively on environmental issues; making informed judgements about those issues; and engage in pro-environmental behaviours (Wals et al. 2014) that they can then share with their students.

This is an important book for starting, and continuing, conversations around re-orienting teacher education to address sustainability that have been too long in gestation. We are confident that teacher educators around the world will find this volume of interest to their practice at all levels.

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# Preface

Following the United Nations' declaration of 2005–2014 as the *Decade of Education for Sustainable Development*, various provincial ministries of education throughout Canada enacted policies mandating environmental sustainability education (ESE) within K-12 education settings. In general, these policies require faculties of education—responsible for the education, and in most cases, certification of teachers—to make ESE a component of preservice teacher education programs, in the belief that improved preparation will greatly assist teachers in enhancing ESE in K-12 classrooms.

This book has its origins in the presentations at the inaugural National Roundtable on Environmental and Sustainability Education in Canadian Faculties of Education (Roundtable 2016), which took place June 14–16, 2016, at Trent University in Peterborough, Ontario. Roundtable 2016 brought together over 70 participants from across Canada, including educators, researchers, policy-makers, consultants, and community organisations. Over the course of 3 days, participants took part in keynote addresses, research colloquia, networking socials, and collaborative inquiry activities. Roundtable 2016 resulted in the publication of a National Action Plan containing action-oriented recommendations for enhancing Environmental and Sustainability Education in Preservice Teacher Education (ESE-PTE), and a position statement titled 'The Otonabee Declaration', in which delegates articulated their views regarding environmental degradation, the critical need for enhancing ESE-PTE, and, the role educators, children, youth, educational institutions, policy-makers, and Indigenous communities play in enhancing ESE-PTE in Canada. It should be acknowledged that while National Roundtable 2016 focused on PTE, the mandate of original organisers was formalised through the Environmental and Sustainability in Teacher Education Standing Committee of the Canadian Network for Environmental Education and Communication (EECOM) and naturally expanded to include the more encompassing term, 'teacher education', as reflected in the book's title, *Environmental and Sustainability Education in Teacher Education: Canadian Perspectives*. The significance of this is explained in the first chapter (Chap. 1). All works herein, with the exception of the concluding chapter (Chap. 19), were originally presented in some form during National Roundtable

2016. The majority of chapters in this book are previously unpublished and original, some have been slightly revised since presentation, and five are re-published chapters originally appearing in a previous book publication, *Canadian Perspectives on Initial Teacher Environmental Education Praxis*, the focus of which was an examination of the dialectical relationship between theory and practice.

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# Abbreviations

ACAP	Atlantic Coastal Action Program
ACDE	Association of Canadian Deans of Education
ACFE	l'Association canadienne pour la formation des enseignants
ADHD	Attention Deficit Hyperactivity Disorder
AERA	American Educational Research Association
ANOVA	Analysis of Variance
AQ	Additional Qualification
AQPERE	Québec Association for the Promotion of Environmental Education (Association québécoise pour la promotion de l'éducation relative à l'environnement)
ATST	Acting Today, Shaping Tomorrow: A Policy Framework for Environmental Education in Ontario Schools
B.Ed.	Bachelor of Education
BC	British Columbia
BGS	Brundtland Green Schools
CATE	Canadian Association for Teacher Education
CBU	Cape Breton University
Centr'ERE'	Interdisciplinary Research Center
CFE	Community Field Experience
CIDA	Canadian International Development Agency
CMEC	Council of Ministers of Education, Canada
CSQ	Centrale des syndicats du Québec
CSSE	Canadian Society for the Study of Education
DEEPER	Deepening Environmental Education in Preservice Education Resource
DESD	Decade of Education for Sustainable Development
E4E	Educating for Environment
EDD	l'éducation au développement durable
EE	Environmental Education (Éducation environnementale)
EECOM	Environmental Education and Communication
EEDD	d'éducation à l'environnement et au développement durable

EJE	Ecological Justice Education
ELC	Environmental Leadership Circle
ESD	Education for Sustainable Development
ESE	Environmental Sustainability Education
ESTE-PTE	Environmental Sustainability Education-Preservice Teacher Education
FIE	formation initiale des enseignants
FLAP	Fatal Light Awareness Project
FNMI	First Nations, Métis, and Inuit
FRQSC	Fonds de recherche du Québec–Société et culture
GBL	Garden-Based Learning
GEM Report	Global Education Monitoring Report
GMOs	Genetically Modified Organisms
GPA	Grade Point Average
ICT	Information Communication Technology
IEPO	l’Institut d’études pédagogiques de l’Ontario
IISD	International Institute for Sustainable Development
INTEI	International Network of Teacher Education Institutions
I-S	Intermediate-Senior
IUCN	International Union for Conservation of Nature
JK	Junior Kindergarten
K-12	Kindergarten to Grade 12+A22
LEED	Leadership in Energy and Environmental Design
LSF	Learning for a Sustainable Future
NAAEE	North American Association of Environmental Educators
NEP	New Ecological Paradigm
NGOs	Non-government Organisations
O/EE	Outdoor and Environmental Education
OEE	Outdoor and Experiential Education
OISE-UT	Ontario Institute for Studies in Education at the University of Toronto
OME	Ontario Ministry of Education
OSM	One Square Metre
OTC	Ontario College of Teachers
PR	Participatory Research
PBE	Place-Based Education
PEB	Pro-Environmental Behaviour
PEEC	Place-based Education Evaluation Collaborative
PISA	Programme for International Student Achievement
P-J	Primary-Junior
PoP	Pedagogies of Place
PPS	Participatory Problem Solving
PTE	Preservice Teacher Education
PT-EE	Preservice Teacher Environmental Education
SDGs	Sustainable Development Goals

SE	Sustainable Education
SENSE	Sustainability Education in Nova Scotia for Everyone
SEPN	Sustainability Education and Policy Network
SES	Socio-Economic Status
SMEs	Small-to-Medium-Sized Enterprises
SOSSOF	Shaping Our Schools, Shaping Our Future
SPF	Sustainability Projects Fund
SSHRC	Social Sciences and Humanities Research Council
STAO	Science Teachers Association of Ontario
STEM	Science, Technology, Engineering and Mathematics
STSE	Science, Technology, Society and Environment
TC	Teacher Candidates
TD FEF	TD Bank Group's Friends of the Environment Foundation
TDSB	Toronto District School Board
TE	Teacher Education
TEIs	Teacher Education Institutions
TEKW	Traditional Ecological Knowledge and Wisdom
TPB	Theory of Planned Behaviour
TRC	Truth and Reconciliation Commission
UBC	University of British Columbia
UK	United Kingdom
UN	United Nations
UNCED	UN Conference on Environment and Development
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEVOC	International Project on Technical and Vocational Education
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Sustainable Development
UOIT	University of Ontario Institute of Technology
UQAM	Université du Québec à Montréal
USB	Université de Saint-Boniface
VBN	Value-Belief-Norm
WEEC	World Environmental Education Congress
WGEE	Working Group on Environmental Education

# About the Editors and Contributors

## Editors

**Douglas D. Karrow** is Associate Professor in the Department of Educational Studies, Faculty of Education, Brock University. He teaches in preservice and graduate education programs. His research interests focus on environmental and sustainability education from the standpoints of preservice teacher education, curriculum, and pedagogy. Additionally, he is currently researching the philosophical insights of Martin Heidegger and their application to teacher education, environmental and sustainability education, and education theory writ large. His recent publications include the book *Canadian Perspectives on Initial Teacher Environmental Education Praxis*, several book chapters published in Springer series, and journal articles published in *Philosophy of Mathematics Education Journal*, *Brock Journal of Education*, *Alberta Journal of Educational Research*, *Environmental Education Research*, *Canadian Journal of Science, Mathematics and Technology Education*, and *Journal of the Canadian Association for Curriculum Studies*. Currently, he is Co-Chair of the Environmental Sustainability Education in Teacher Education Standing Committee of the Canadian Network of Environmental Education and Communication (EECOM) and a participating faculty member of Brock University's Environmental Sustainability Research Centre.

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and the development and provision of digital learning resources in secondary and postsecondary education. His most recent publications include the book *Canadian Perspectives on Initial Teacher Environmental Education Praxis*, and a chapter in the Routledge Teaching and Learning in Science series. Dr. DiGiuseppe is a former president of the Science Teachers Association of Ontario (STAO) and a recipient of the Prime Minister's Award for Teaching Excellence in Science, Technology, and Mathematics.

## Contributors

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# Chapter 1

## Environmental and Sustainability Education in Teacher Education: Canadian Perspectives



Douglas D. Karrow, Maurice DiGiuseppe, and Hilary Inwood

As environmental degradation continues unabated, the need for environmental and sustainability education (ESE) and the development of an environmentally literate public intensifies. Current environmental issues, such as biodiversity loss, water scarcity, and climate change, are pervasive and global. More than ever before, there is a need for all citizens to address environmental concerns through education and action.

The title of this book, *Environmental and Sustainability Education in Teacher Education: Canadian Perspectives*, deliberately references “teacher education” as including preservice teacher education (pre-certification), in-service teacher education (post-certification), and various nonformal teacher education approaches (beyond Kindergarten to Grade 12, K–12 school settings). Most of the chapters focus on preservice teacher education, and a few examine facets of in-service and/or nonformal teacher education as supportive of preservice teacher education. The title of our book reflects our intent to be inclusive of the various facets of “teacher education,” writ large.

Faculties of education, in particular, have a critical role to play in providing Environmental and Sustainability Education in Preservice Teacher Education (ESE-PTE). However, studies have shown that for the last 40 years, Canadian faculties of

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The authors recognize equal and joint authorship for this chapter.

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education have experienced many challenges in providing high-quality and effective ESE-PTE programs for their students (Lin 2002; Towler 1980). As a result, a *National Roundtable on Environmental & Sustainability Education in Pre-Service Teacher Education* (National Roundtable ESE-PTE) was convened in June 2016 at Trent University in Peterborough, Ontario. National Roundtable ESE-PTE was the first event of its kind in Canada and brought together key educational stakeholders who over a 2-day period engaged in a process of collaborative inquiry in which they discussed, debated, and analyzed key issues in ESE-PTE in the Canadian context, including past and current pedagogical practices in ESE-PTE; structural, programmatic, and economic challenges; theoretical and other explanatory frameworks; and critical areas of ESE-PTE in need of further research and analysis.

In general, National Roundtable ESE-PTE delegates agreed that embedding ESE in PTE remains a significant challenge for faculties of education across Canada, and that almost 40 years of scholarship and activism aimed at improving ESE PTE has resulted in relatively few significant gains. National Roundtable ESE-PTE was the most recent effort to change this untenable situation. The chapters in this volume were inspired by the rich discussions and debates that took place at National Roundtable ESE-PTE.

As National Roundtable ESE-PTE was concluding, the conference room was bristling with energy as delegates articulated their priorities for ESE-PTE, and multiple conversations were underway as they discussed and decided what was most important, moving forward (Fig. 1.1).

At this same time, delegates were moving enthusiastically to place their signatures on *The Otonabee Declaration*, a document describing key principles of ESE-PTE (Appendix 1.1), which delegates had collaboratively created only an hour earlier, and they warmly shook hands in celebration with colleagues who had been strangers just a few days previously. Many felt a strong sense of connection through their contribution to a new wave of activism regarding ESE-PTE, and rightfully so, since National Roundtable ESE-PTE was a remarkable event in Canadian teacher education history.

## 1.1 Historical-Developmental Considerations

Concerns about EE began to emerge in the early 1970s (Gough 2016), and recognition of the importance of ESE-PTE has been growing rapidly in the last decade. At the start of the *UN Decade of Education for Sustainable Development* (2005–2014), Hopkins and McKeown (2005) strongly recommended that teacher candidates (TCs) be provided with coursework in sustainability, and opportunities to develop skills to function as active citizens in sustainable communities. Hopkins and McKeown (2005) further recommended that TCs “understand the interrelatedness of the environment, society, and economy and have this interrelatedness be evident in their teaching and lives as community members” (p. 43). In 2010, the North American Association of Environmental Educators (NAAEE) established a set of



**Fig. 1.1** Delegates deliberating on the priorities for action at the final day of the National Roundtable

guidelines for the preparation of educators in ESE, and the following year, the United Nations Economic Commission for Europe (UNECE) published its own set of ESE competences, calling for all TCs to develop basic competences in ESE.

In Canada, the CMEC sponsored a study (Swayze et al. 2012) on Education for Sustainable Development (ESD) in PTE, recommending that dialogue, networking, and research be conducted in this critical area at national and international levels. Swayze et al. (2012) found that although faculties of education were making “modest but promising progress toward reorienting teacher education to address education for sustainable development” (p. 64), there was a divergence between individual and institutional responses, with individual faculty members often driving change in this area. Swayze et al. (2012) also recommended that “new avenues for communication on ESD research in Canada are warranted” (p. 65), as ESD in teacher education “is becoming an important area of inquiry” (p. 65).

A final recommendation from Swayze et al. (2012) confirmed the need for faculties of education and ministries of education to work together to strengthen ESE-PTE; however, National Roundtable ESE-PTE organizers found little evidence that this was actually happening, given that ESE lacked a prominent and/or consistent presence in most PTE programs. This seems to have occurred despite some Canadian provincial/territorial ministries of education having instituted formal policies, recommendations, and/or frameworks for environmental learning, requiring K–12 educators to develop students’ environmental literacy across the curricu-

lum (e.g., British Columbia Ministry of Education 2007; Manitoba Education and Training 2000; Ontario Ministry of Education 2009). In order to implement these provincial/territorial mandates fully, it was crucial for faculties of education to offer ESE-PTE programming.

## 1.2 Laying the Foundations for National Roundtable ESE-PTE

The foundations of National Roundtable ESE-PTE were laid by a small group of concerned educators working to build understanding in multiple traditions of environmental learning, including EE, ESD, Outdoor Education, as well as Nature-based, Place-based, and Ecojustice Education, to name a few. In this volume, we refer to these and related approaches to environmental learning by the expression “Environmental and Sustainability Education” (ESE). Creation of National Roundtable ESE-PTE was also inspired by studies on the state of ESE-PTE, including those of Towler (1980), Lin (2002), Swayze et al. (2012), and Sims and Falkenberg (2013), and by the proceedings of a Provincial Roundtable on ESE-PTE held in 2013 at the Ontario Institute for Studies in Education at the University of Toronto (OISE-UT). This Roundtable included over 60 environmental educators from across the province of Ontario who gathered to learn from one another’s work, share course content and pedagogical strategies, reflect on their common challenges, and decide how to better support ESE-PTE in Ontario. The Provincial Roundtable led to the establishment of a working group involving faculty members from Brock University (Dr. Douglas D. Karrow), OISE-UT (Dr. Hilary Inwood), Trent University (Dr. Paul Elliott), and the University of Ontario Institute of Technology (Dr. Maurice DiGiuseppe). This group quickly began working toward improvements in ESE-PTE in their own institutions and in producing publications such as the *DEEPER* guide (Inwood and Jagger 2014), *Canadian Perspectives on Initial Teacher Environmental Education Praxis* (Karrow et al. 2016b),<sup>1</sup> and *Initial Teacher Environmental Education Capacities* (Karrow et al. 2016a). It should be noted that the following authors’ contributions to the previous publications appear as republications in this volume. Chapter numbers in this book volume appear in brackets following the citations: Karrow (2016a) (Chap. 7); Ostertag et al. (2016) (Chap. 8); DiGiuseppe et al. (2016) (Chap. 9); Gwekwerere (2016) (Chap. 10); and Howard (2016) (Chap. 11). An early version of Block et al. (2016) has been resubmitted here with significant revisions by Beeman and Sims (Chap. 12). By 2018, we saw measurable results from our roundtables, publications, conference presentations, and lobbying: four PTE programs in Ontario had new ESE components that all TCs needed to take to graduate. In addition, many new electives and extracurricular activities in ESE were added to these and other faculties of education.

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<sup>1</sup> These publications were generously supported by the TD Friends of the Environment Foundation and Trent University’s Symons Trust Fund for Canadian Studies, respectively.

Roundtables, in particular, enabled educators to work collaboratively to improve the state of ESE-PTE, first in Ontario and then across Canada. The ESE-PTE team believed that events such as this could prove to be an effective way of addressing ESE-PTE issues in the challenging environment of the decentralized Canadian educational system and of building enduring professional relationships.

The group's main rationale for holding a National Roundtable was to bring together researchers, teacher educators, scholars, policy-makers, and community partners to disseminate research in ESE-PTE, share teaching approaches and strategies, and discuss the challenges of enhancing ESE-PTE. A combination of keynote speakers, research presentations, and working sessions would be offered, and through a collaborative inquiry process, delegates would be asked to analyze case studies; share programmatic challenges, pedagogical strategies, and expertise; identify new areas for research; and collectively create an action plan for moving forward. Information collected at the National Roundtable would be shared publicly via a digital communications hub. Overall, it was hoped that the National Roundtable would achieve four key outcomes: (a) development of a new network of ESE-PTE champions, (b) training and mentoring of TCs and graduate students, (c) stimulating new research, and (d) creation of a digital communications hub to support knowledge mobilization.

Following the development of a rationale and set of outcomes for the event, locating funding to support it was the next challenge. TD Bank Group's Friends of the Environment Foundation (TD FEF) was quick to offer support, providing much needed seed money to get the planning underway. While a SSHRC Connection grant application was not successful, other funders contributed to the project, including the Dearness Foundation and Trent University. Furthermore, Brock and OISE made in-kind contributions, which went a long way to ensuring the National Roundtable's success. This level of funding was enough to complete the planning process, launch a new website, and distribute promotional materials to faculties of education across the country.

### **1.3 Holding the National Roundtable**

The National Roundtable ESE-PTE took place on June 14–16, 2016, at Trent University in Peterborough, Ontario. A total of 73 delegates attended the 3-day event, including teacher educators, researchers, deans, graduate students, teachers, TCs, policy-makers, and Ontario Ministry of Education staff. Participants represented eight Canadian provinces (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Nova Scotia, and Newfoundland and Labrador), and a total of 27 postsecondary institutions, including 24 universities, two university colleges, and one community college. There were representatives from eight community education groups, nine school boards, and two policy-making organizations (the Ontario College of Teachers and the Ontario Ministry of Education) (Fig. 1.2).



**Fig. 1.2** Trent University on the Otonabee River in Peterborough, Ontario, Canada, was the site of the National Roundtable

The National Roundtable featured three keynotes, a variety of roundtable presentations on ESE-PTE, and three working sessions (Table 1.1).

The 10 roundtable presentations highlighted the theory, research, and pedagogical practices of 39 presenters in ESE-PTE (many of whom are featured in this volume). Four plenary working sessions and a number of voluntary off-site programs complemented the roundtables. Off-site excursions included a visit to Petroglyphs Provincial Park, yoga sessions, nature walks, a voyageur canoe experience on the Otonabee River (Fig. 1.3), and evening sessions at the Camp Kawartha Environment Centre, including a photo-share activity, Inuit games, an eco-puppet show, and entertainment around a campfire.

On the first day, Dr. Nicole Bell of Trent University provided the first keynote address, entitled “Anishinaabe Bimaadiziwin: Living Spiritually with Respect, Relationship, Reciprocity, and Responsibility” (see Chap. 5). Dr. Bell spoke about the deep connections between Indigenous education and environmental learning. On the second day, Dr. Lucie Sauvé from Université du Québec à Montréal (UQAM) presented “Transversality, Diversity, Criticality, and Activism: Enhancing E(S)E in Teacher Education” (see Chap. 4). This talk provided a glimpse into the work in ESE-PTE that she and colleagues at UQAM have been accomplishing in Quebec and beyond. On the final day, Professor Charles Hopkins, UNESCO Chair on Reorienting Teaching Education to Address Sustainability at York University,

**Table 1.1** Agenda of the National Roundtable—June 14–16, 2016

Time slots	June 14	June 15	June 16
Early morning warm-ups		7:00–8:45	7:00–8:45
		Breakfast	Breakfast
		Yoga or nature walk	Yoga or nature walk
Morning session	Optional pre-visits: Canoe Museum or Petroglyph Provincial Park	9:00–9:30	9:00–9:30
		Speaker: Lucie Sauvé	Speaker: Charles Hopkins
		9:30–10:30	9:30–10:30
Morning session 2	Optional pre-visits: Canoe Museum or Petroglyph Provincial Park	Working session 1: <i>Identifying Common Questions</i>	Working session 3: <i>Working Through Problems Towards Support and Solutions</i>
		11:00–12:30	11:00–12:00
		Roundtables research presentations 1	Working session 3 (cont'd): <i>Working Through Problems Towards Support and Solutions</i>
Lunch	n/a	12:30–1:30	12:00–1:00
Afternoon session 1	Optional pre-visits: Canoe Museum or Petroglyph Provincial Park	1:30–3:00	1:00–3:00
		Roundtables research presentations 2	Working session 4: <i>Creating a Collective Action Plan</i>
Afternoon session 2	Optional pre-visits: Canoe Museum or Petroglyph Provincial Park	3:30–5:00	3:00–3:30
		Working session 2: <i>Emerging Themes in ESE in Pre-service Teacher Ed</i>	Closing plenary (Paul Elliott, Elder Doug Williams)
Evening session	4:00–5:00	5:15–6:15	4:00 p.m. +
	Reception	Voyageur Canoe on the River	Travel home
	5:00 p.m.	7:00 p.m.	
	Welcome and opening keynote (Nicole Bell, Elder Doug Williams, Provost Jackie Muldoon)	Dinner	
	6:00 p.m.	8:00 p.m. +	
	Dinner	Social event, games, and activities at the camp Kawartha Environment Centre	
	7:30		
	<i>Successes &amp; Challenges of ESE</i> (photo-share)		
	Campfire and music at the camp Kawartha Environment Centre		





**Fig. 1.3** National Roundtable delegates canoeing on the Otonabee River in a voyageur canoe

presented an introduction to global developments in ESE-PTE, entitled “Teacher Education Around the World: ESD at the Heart of Education – Responsibilities and Opportunities Towards a Sustainable Future for All” (see Chap. 2). Each of these keynotes complemented Trent University’s natural surroundings, and introduced National Roundtable ESE-PTE participants to some of the critical issues in ESE-PTE in Canada and around the world.<sup>2</sup> Each of the keynotes was followed by a Working Session that focused on a different ESE-PTE theme, including identifying common questions, tracking emergent themes, working through problems to support and find solutions, and creating a collective action plan. These sessions provided multiple opportunities for discussion, debate, analysis, critique, and reflection; each time bringing together different groups of delegates to share ideas, stories, expertise, and perspectives (Fig. 1.4). For many, this was their favorite feature of National Roundtable ESE-PTE, in part for the rich insights that came from the collaborative inquiry process but also for the many new friendships that were established.

The main outcome of the Working Sessions was the creation of a National Action Plan, a set of priorities for moving ESE-PTE forward (Appendix 1.2). The first part of the Plan called for the establishment of a new national organization to improve the state of ESE-PTE in Canada. The second part of the Plan called for new research

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<sup>2</sup>The text of each keynote address, with updated references, is provided in this volume and also available in video format at [https://www.youtube.com/channel/UC1\\_YhGr5ehdL5ViK1nLNk\\_w](https://www.youtube.com/channel/UC1_YhGr5ehdL5ViK1nLNk_w)





**Fig. 1.4** National Roundtable delegates working outside at one of the Working Sessions

to assess the current state of ESE-PTE in Canada. The third part was to develop theoretical and pedagogical supports for ESE-PTE, as well as a digital communications hub to support communication and sharing. Finally, the fourth part of the Plan was a call to advocate for the crucial importance of enhancing ESE-PTE through individual and collective action.

An unexpected, but welcome, outcome of the last Working Session of National Roundtable ESE-PTE was the creation of *The Otonabee Declaration* ([Appendix 1.1](#)), which called on all faculties of education, ministries of education, boards of education, and bodies that regulate the teaching profession to make ESE a mandatory component of PTE in Canada. The Declaration was enthusiastically endorsed by all of the delegates in attendance on the last day of National Roundtable ESE-PTE, providing a fitting end to the event.

## **1.4 Outcomes of National Roundtable ESE PTE 2016**

In the months that followed National Roundtable ESE-PTE, the organizing team met to discuss, research, and establish a new organization dedicated to supporting PTE and practicing teachers in relation to ESE. After careful deliberation, the team decided to partner with the Canadian Network for Environmental Education and Communication (EECOM), the only national, bilingual network for environmental

learning in Canada. Now known as the ESE-TE<sup>3</sup> Standing Committee of EECOM, the original organizing team has grown to represent a national network of faculty, researchers, policy-makers, and community educators who share a commitment to embedding ESE in all levels of Canada's teacher education systems. The ESE-TE Standing Committee currently has 16 formal members<sup>4</sup> from across the country and more than 120 informal members who have subscribed to this growing network. This Standing Committee met for the first time in May 2017 as part of its first planning retreat, and it continues to meet monthly. The Standing Committee is supported by a part-time coordinator, who helps provide administrative, communications, and research support. The Standing Committee is guided by priorities that were set at National Roundtable ESE-PTE. For example, consistent with the second action item from the National Action Plan—for new research to assess the current state of ESE-PTE in Canada—a *Research Roundtable in ESE-PTE* was hosted, which took place in fall 2018, in conjunction with EECOM's annual conference held in Cranbrook, British Columbia.

The ESE-TE Standing Committee dedicates a significant amount of time promoting the enhancement of ESE-TE, including ESE-PTE, across Canada. Part of this occurs through conference presentations, including annual presentations at the Canadian Society for the Study of Education (CSSE) conference, American Educational Research Association (AERA) conference, and the World Environmental Education Congress (WEEC). These types of presentations are important as they provide opportunities to share research with educators, administrators, and education policy-makers on regional, national, and international levels.

In June 2017, members of the ESE-TE Standing Committee also presented a full-day workshop on infusing ESE into professional development courses for teachers. Sponsored by the Ontario College of Teachers (OCT), this workshop reached out to those who design and instruct Additional Qualification (AQ) courses for teachers in Ontario.

In October 2017, members of the ESE-TE Standing Committee were invited to present at the annual Association of Canadian Deans of Education (ACDE) conference, which took place in Montreal, Canada. At this event, several members of the ESE-TE Standing Committee made presentations and hosted a panel discussion for deans of education from across Canada. This resulted in the deans unanimously passing a motion to create an *Accord on Sustainability*, an important ACDE position statement that will encourage enhancement of ESE-TE across Canada. As a result, the ESE-TE Standing Committee was asked to provide an ACDE-sponsored session at the CSSE conference in May 2018 in Regina under the leadership of Dr. Maurice

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<sup>3</sup>ESE-TE stands for Environmental and Sustainability Education in Teacher Education, which includes preservice teacher education, in-service teacher education, and various nonformal approaches to teacher education. ESE-PTE, as the term implies, focuses only on Environmental and Sustainability Education in Preservice Teacher Education, the principal focus of National Roundtable ESE-PTE.

<sup>4</sup>The current list may be found at <http://eseinfacultiesofed.ca/about.html>

DiGiuseppe. This session acted as an important catalyst to further discussions about the future of ACDE Accords and the possibility of an *Accord on Sustainability*.

## 1.5 Recent Impacts of National Roundtable ESE-PTE

Several National Roundtable ESE-PTE organizers and delegates were interviewed recently to determine whether their view about the Roundtable event had shifted over time. Below are some of their responses.

Dr. Paul Elliott, a member of the original organizing team, stated:

I was pleased and proud that we had managed to attract like-minded people from across the country. The most rewarding part of the event was the final session where groups pooled their ideas about how we should move forward and, in particular, the emergence of *The Otonabee Declaration*. To see that there was so much common ground and determination to work together for a better future was inspiring and hopeful. Most of us who understand the value of ESE in Teacher Education work alone, or in small teams, and this can make the task of bringing about change seem daunting. By bringing together a diverse range of expertise, I felt less isolated and more confident that change could be achieved. (P. Elliott, personal communication, February 5, 2018)

Dr. Douglas D. Karrow, also a member of the original organizing team, shared his thoughts as follows:

Politically, the National Roundtable provided an opportunity for a variety of ESE stakeholders to identify and prioritise common issues through its National Action Plan and *The Otonabee Declaration*, which formally recognised Indigenous peoples' vital and important contribution to Canada, and a way of being that honours and models the tenets of ESE. Of several actions articulated within the Action Plan, a new political organisation [the Standing Committee] was created that provides opportunities to network, advocate, and educate at a national level. Epistemologically, the research on the development of new "disciplinary fields" repeatedly identifies the importance of establishing communities of practice as vital and important hubs to facilitate "identity creation." Our newly created Standing Committee will function as an important community of practice where like-minded stakeholders identify problems and investigate solutions that result in research. Establishing a credible and unified research community is essential to creating, defining, and supporting ESE further as a disciplinary field. Credible research supports teaching; teaching supports research: recognition and support of this dialectical relationship is essential for the field of ESE to move forward.

On a more personal, emotional level, the National Roundtable provided a sense of hope, inspiration, desire, admiration, and promise. In a field where daily pronouncements of environmental health and stress can be taxing on many levels, having a national network of ESE-TE educators provides important emotional support required to sustain any political activity with the challenges it faces; the emotional support communities of practice will benefit from in taking risks to pose questions and investigate solutions; and the emotional support one requires on a personal level to persevere with complex and controversial issues. (D. Karrow, personal communication, February 5, 2018)

Dr. Patrick Howard, a delegate and faculty member from Cape Breton University, affirmed:

The National Roundtable at Trent University was an opportunity for personal and professional reconnection and renewal. As a teacher educator I am a member of a small, committed team at an Atlantic Canadian university; we had recently championed a PTE programme with a core focus in Education for Sustainability and developed an M.Ed. programme with a Sustainability focus, trying to work within academic structures often openly hostile to ESE pedagogies and approaches. The Roundtable was a welcome time to network with like-minded teacher educators and others in the growing ESE community in Canada and proved to be instrumental in my understanding of the diversity of perspectives and approaches within the ESE community. There was an energy of those who often feel they exist as outliers in their organisations coming together with those who are committed to remaking education for the environmental and social realities we face. Academics, representatives from non-governmental organisations, government departments, and other interested educators came together with great hope to find common ground and chart a way forward for teacher education that spoke to the largest, most pressing issues for humankind and the myriad living beings with whom we share this planet. The tensions and outright conflicts that have characterised the oft competing factions within the ESE field could have derailed this event, and to be sure there were many difficult and complicated conversations. But at that time and in the time since, something transformative has happened; common themes, concerns, and language seemed to take precedence through shared, compassionate understanding, and the opening of a space to set down a vision to remake education.

To be sure, there is a lot of hard work left to do that will require tenacity, perseverance, and knowing what is relevant and appropriate for each community and organisation. It will require strategy, resources, planning, evidence, and dispassionate debate. But what brought people, including me, to Trent University on the banks of the Otonabee River surrounded by its magnificent boreal forests, was a sense of urgency, and perhaps most importantly, the capacity to feel awe and wonder for, to empathise with, and to mourn the loss of a larger living world that makes us truly human. (P. Howard, personal communication, February 5, 2018)

Erin Sperling, a National Roundtable ESE-PTE delegate and doctoral candidate from OISE-UT wrote:

Through the national network, which gave faces and voices to names in the field, I feel a stronger sense of solidarity around the massive goal we are undertaking, both as educators and citizens in the country. At times our work can feel isolating and moving at a glacial pace. To hear about the amazing work that is being done in many places across the country, and even some international initiatives, is heart-warming and spirit-lifting. I am proud to part of this growing network. (E. Sperling, personal communication, February 6, 2018)

These reflections align closely with anecdotal feedback received from many National Roundtable ESE-PTE organizers and delegates and, taken together, testify to the great value and importance that participants placed on the discussions, debates, and resolutions that arose at this remarkable event. The chapters in this volume stem from National Roundtable ESE-PTE proceedings, and are meant to complement and augment the current literature base on ESE-PTE, and also to provide greater insight into historical and current successes, failures, and challenges in the Canadian ESE-PTE landscape.

The chapters in this volume are organized into four thematic groups, or parts, with Part I including five chapters focused on the importance of ESE in Canadian TE programs, why ESE should be an integral part of ESE-PTE programming in Canadian faculties of education, and why and how existing ESE-PTE programs

may be broadened and enhanced. Part II includes nine chapters focused more specifically on elements of ESE programs in Canadian TE and how these program elements are (or are not) meeting the needs of preservice students. Part III includes three chapters aimed at sharing new and existing approaches to ESE-TE that may help support further development and enhancement of ESE in preservice, in-service, and nonformal teacher education settings. Finally, Part IV provides a concluding chapter summarizing some of the achievements of National Roundtable ESE-PTE; issues arising; and a discussion of what Canadian ESE-TE may contribute to international developments in this field.

In Chap. 2, Charles Hopkins and Katrin Kohl<sup>5</sup> provide a historical overview of the various international agreements addressing ESE/ESD and promoting the inclusion of ESE/ESD in teacher education programs, including PTE programs around the globe. Professor Hopkins and Ms. Kohl help set the stage for the rest of the volume by situating Canadian ESE-PTE developments in the context of international calls for enhancing ESE-PTE everywhere, including Canada.

In Chap. 3, Paul Elliott and Hilary Inwood continue and extend the discussion begun in Chap. 2 to a consideration of Canadian provincial and national policies and events that have shaped progress in Canadian ESE-PTE.

Chapters 4 and 5 contain transcripts of keynote speeches, given at National Roundtable ESE-PTE, by Lucie Sauvé and Nicole Bell, respectively. In Chap. 4, Dr. Sauvé provides an impassioned account of the need for ESE-PTE to embrace both personal and more broadly social dimensions, including promotion of the concepts of home, democracy, and ecocitizenship; the critical assessment of current social, political, and environmental realities; and the advancement of hope for the future. In Chap. 5, Nicole Bell deliberates on Anishinaabe culture, worldview, and teachings, and models environmental education from an Indigenous perspective. Chapters 4 and 5 delve deeply into various theoretical, conceptual, and intensely sociohistorical considerations of ESE, and environmental education more broadly, that may inform ESE-PTE programs, practice, and policy development.

In Chap. 6, Dianne Miller and Barbara Mills Wotherspoon extend the conceptual foci of Chaps. 4 and 5 by drawing our attention to philosophical and practical considerations for a place-based education (PBE) focus in ESE-PTE programming. In addition to potential benefits and challenges associated with PBE approaches, the authors discuss difficulties and challenges they experienced in their own PBE-based courses.

In Chap. 7, Douglas D. Karrow, Maurice DiGiuseppe, Paul Elliott, Xavier Fazio, and Hilary Inwood further extend the foregoing discussions on theoretical and practical considerations in ESE-PTE programming, to argue, through the lens of a generic capacities model, the need for preservice students (and their instructors) to develop key ESE-PTE capacities to support enhanced teaching and learning in this field.

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<sup>5</sup>Second author Katrin Kohl assisted with the rewriting of the original keynote address under the direction of Charles A. Hopkins.

Chapters 8, 9, 10, 11, 12, and 13 shift the focus from theoretical-practical considerations of ESE-PTE programming to narratives of lived experiences, in particular ESE-PTE programs in the Canadian provinces of British Columbia, Ontario, Nova Scotia, and Manitoba. In Chap. 8, Julia Ostertag, Susan Gerofsky, and Sandra Scott employ an autobiographical approach to informing about the marginalization of ESE in the context of a garden project at the University of British Columbia. In Chap. 9, Maurice DiGiuseppe, Paul Elliott, Sheliza Ibrahim Khan, Sheila Rhodes, Jeff Scott, and Astrid Steele discuss successes and challenges experienced in addressing ESE in the development of PTE programs in three Ontario faculties of education, and in Chap. 10, Yovita Gwekwerere reports on her survey-based research at Laurentian University in Sudbury, Ontario, aimed at evaluating the effectiveness of a recently developed course aimed at enhancing ESE-PTE in her faculty. In Chap. 11, Patrick Howard discusses how efforts to reorient PTE toward ESE in a faculty of education in the province of Nova Scotia have benefited from consideration of Nel Noddings's care theory, Max van Manen's interpretation of the pedagogic relation, and Catherine O'Brien's concept of sustainable happiness, and challenges experienced in the process. In Chap. 12, Chris Beeman and Laura Sims focus our attention on ESE-PTE developments in their respective faculties of education in the province of Manitoba, with emphasis on the need for developing relationships between humans and the more-than-human world, while in Chap. 13, Hilary Inwood discusses how at the Ontario Institute for Studies in Education (OISE), in Toronto, Ontario, ESE-PTE has been addressed, and enhanced, through course-infused teaching, cocurricular programming, advocacy, research, and community partnerships, benefiting PTE and the broader University of Toronto community.

Chapter 14 takes an unexpected turn, with Joanne Nazir discussing ESE-PTE developments within a Christian preservice teacher education program in Southern Ontario. In particular, Dr. Nazir chronicles her experiences in implementing a program called Creation Care for preparing preservice teachers to address ESE in Christian schools.

In Chap. 15, Erin Sperling, Darren Hoeg, and Douglas D. Karrow discuss the development and implementation of an ESE course in the PTE program at Brock University in St. Catharines, Ontario, providing insights into strategies employed in enhancing ESE programming, and recommendations for improvement, and in Chap. 16, Brittany Harding reports on the results of research examining proenvironmental behavior of a sample of Grade 6 students in the Greater Toronto Area, indicating significant positive results, providing valuable insights for ESE-PTE programs aimed at enhancing proenvironmental behavior in preservice teacher candidates.

In Chap. 17, Ying-Syuan Huang and Anila Asghar report on an ESE-PTE initiative exploring ways in which PTE programs may assist preservice teachers in their efforts to integrate ESE in K–12 classrooms, while in Chap. 18, Paul Elliott and Jacob Rodenburg discuss an ESE-PTE initiative based in Peterborough, Ontario, called *Pathway to Stewardship and Kinship*, providing a framework for guiding the development of environmentally engaged citizens and addressing the challenges preservice teachers may face when attempting to infuse ESE in their practicum experiences.

Finally, in Chap. 19, Douglas D. Karrow and Maurice DiGiuseppe examine recent developments in Canadian ESE-PTE in relation to international efforts in this field. In particular, they focus on gaps in programmatic approaches, rationales used for embedding ESE in PTE, theoretical frameworks underpinning programmatic approaches, and the pedagogical strategies and methods used to embed ESE in PTE.

## 1.6 Conclusion

Across Canada, faculties of education are slowly but surely acknowledging the need to enhance ESE-PTE programming in ways that better prepare future generations of teachers to address ESE in their K–12 classrooms. Future generations of teachers require the knowledge, skills, and dispositions necessary for providing the very best K–12 environmental and sustainability education for their students as they develop into active citizens who care for society’s and Earth’s health and well-being. Our hope in publishing this volume is that the proceedings of National Roundtable ESE-PTE have a ripple effect in raising awareness of the critical issues facing scholars, educators, and policy-makers in their efforts to enhance ESE-PTE in Canada and around the world.

## Appendices

### *Appendix 1.1 The Otonabee Declaration*

Acknowledging the centrality of land in Indigenous worldviews and teachings, we respect the inherent rights and sovereignty of Indigenous peoples as we sign this declaration.

Whereas human activity has caused environmental degradation, including climate change, species extinction, acidification of the oceans, and the melting of Arctic sea ice;

Whereas educators, children, youth, and all educational institutions can play a pivotal role in addressing environmental concerns by embracing systems thinking, environmental literacy, and holistic practice to develop sustainability practices that enhance personal, community and ecological well-being;

Whereas children, youth, and their educators should become full actors in their communities by working towards socio-ecological justice for all living beings;

Whereas there are demonstrated benefits for people of all ages being in and with nature;

And whereas UNESCO has called for a reorientation of teacher education to address sustainability;



**We urge leaders in Canadian faculties of education, ministries of education, boards of education, and bodies that regulate the teaching profession to make Environmental and Sustainability Education a mandatory component of initial teacher education.**

*Signed by those in attendance at the National Roundtable on Environmental & Sustainability Education in Pre-service Teacher Education*

*Dated June 16<sup>th</sup>, 2016 at Otonabee College, Trent University, Ontario, Canada*

## ***Appendix 1.2 National Action Plan of the National Roundtable on Environmental & Sustainability Education in Pre-service Teacher Education***

### **Introduction**

As part of the *National Roundtable on Environmental & Sustainability Education in Pre-Service Teacher Education*, hosted at Trent University in June 2016, delegates from across Canada met in person to discuss, analyze, share research on, and strategize ways to strengthen the presence of Environmental and Sustainability Education in pre-service teacher education (ESE-PTE). Representatives from faculties of education, NGOs, ministries of education, policy agencies, and school boards shared their expertise and experience to develop new initiatives, plan potential collaborations, and strengthen their networks. One of the key outcomes of this event was the creation of a National Action Plan and *The Otonabee Declaration*, developed and endorsed by those in attendance on the final day of the Roundtable.

### **National Action Plan**

#### **1. Establish a new national organization to support ESE-PTE in Canada**

At the present time, there is no group or organization whose central role is to improve the state of ESE-PTE in Canada. A non-profit organization needs to be established to support and coordinate efforts across the country. Establishing a clear mission, set of objectives and activities, and a governance structure will be part of this process. Locating funding to support this organization and its work will be an important step of this component.

#### **2. Assess the state of ESE-PTE in Canada**

We aim to collect data to ascertain the state of ESE-PTE in Canada. By collecting quantitative and qualitative data using a variety of research methods (meta-analysis, surveys, and document analysis), a clearer picture of the state of ESE in faculties of education can be created, and used as a benchmark to direct future action and advocacy, and monitor progress in this field.



### 3. Develop supports for ESE-PTE in Canada

Many educators and NGOs are developing supports to improve the state of ESE-PTE in Canada; however, there are few places to share tools and resources centrally. We propose developing a digital hub as a means to share theoretical and pedagogical supports, research, and resources to advance this work collaboratively.

### 4. Advocate for the crucial importance of ESE-PTE in Canada

Advocacy for the importance of ESE-PTE can begin immediately, capitalizing on the growing awareness of the need for action to deal with environmental degradation and climate change. Working to encourage a variety of individual advocacy actions (e.g., meeting with a Dean of Education) and collaborative advocacy actions (e.g., lobbying the CMEC) can begin to raise awareness amongst policy-makers and faculty leadership of the importance of this work. Part of this work involves sharing *The Otonabee Declaration*, already signed by the delegates of the National Roundtable.

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**Part I**  
**The Importance of Environmental and**  
**Sustainability Education in Teacher**  
**Education**

# Chapter 2

## Teacher Education Around the World: ESD at the Heart of Education— Responsibilities and Opportunities Towards a Sustainable Future for All



Charles A. Hopkins and Katrin Kohl

### 2.1 New Opportunities and Responsibilities for Teacher Education Institutions

Two years of negotiating and aligning more than 190 disparate national aspirations for sustainable development of the planet have culminated in several historic global accords that directly impact teacher education (TE) around the world, including *The Paris Agreement* (United Nations Framework Convention on Climate Change [UNFCCC] 2015); *Transforming Our World: The 2030 Agenda for Sustainable Development* (United Nations [UN] General Assembly 2015b) with the 17 Sustainable Development Goals (SDGs) at its core; and *Education 2030: Incheon Declaration and Framework for Action* (UNESCO 2015a) for the implementation of SDG 4 on “Education”. The vital role of education for the 2030 Agenda was highly recognised by all negotiating parties throughout the discussion process. Therefore, *Education 2030* had been agreed upon previously at the May 2015 World Education Forum in Incheon, Republic of Korea, by UNESCO members even before the 2030 Agenda with the SDGs was formally adopted by the UN General Assembly in September of the same year.

In November 2014, and in concert with the forthcoming *Education 2030* framework, the *Global Action Programme on Education for Sustainable Development* (commonly referred to as the GAP; UNESCO 2014b) had been launched, facilitating the continuing implementation of Education for Sustainable Development

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(ESD). To enable strategic focus and foster stakeholder commitment, the *GAP* identified the following “Priority Action Areas”: (a) advancing policy, (b) transforming learning and training environments, (c) building capacities of educators and trainers, (d) empowering and mobilising youth, and (e) accelerating sustainable solutions at the local level (UNESCO 2014b, p. 15).

While such multilateral agreements vary in their specific scope and framework, they are all consistent in counting on education systems as vital means of implementation and request them to meaningfully and effectively engage 69 million new teachers needed to achieve these education goals (UNESCO 2016a). TE institutions will play a crucial role in fulfilling these expectations.

The realisation that the current threats to future generations (e.g. climate change, biodiversity collapse, mass migration, and food and water shortages) will not be solved within the policy and power of any one nation acting in isolation has led countries to embark on this new journey together. The largest of the plans of action is the *2030 Agenda*—with its SDGs in a “five Ps” framework of people, planet, prosperity, peace, and partnership—that was adopted by 193 of the world’s nations.

Collectively, national leaders, with the endorsement of their governments, agreed in September 2015 to 17 ambitious goals (i.e. the SDGs) to be addressed between 2016 and 2030:

- Goal 1: End poverty in all its forms everywhere.
- Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
- Goal 3: Ensure healthy lives and promote well-being for all at all ages.
- Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- Goal 5: Achieve gender equality and empower all women and girls.
- Goal 6: Ensure availability and sustainable management of water and sanitation for all.
- Goal 7: Ensure access to affordable, reliable, sustainable, and modern energy for all.
- Goal 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.
- Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation.
- Goal 10: Reduce inequality within and among countries.
- Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable.
- Goal 12: Ensure sustainable consumption and production patterns.
- Goal 13: Take urgent action to combat climate change and its impacts.
- Goal 14: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.
- Goal 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss.

- Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels.
- Goal 17: Strengthen the means of implementation and revitalise the global partnership for sustainable development. (UN General Assembly 2015b, p. 14)

Unlike the previous *Millennium Development Goals*, the SDGs now address all member states equally, and call for fundamental changes to transform our world by 2030. This is historic momentum and a cause for optimism. The relative ease of acceptance of the SDGs as a global development framework of action is one indicator of the awakened understanding for collective action, both internationally and intranationally. The importance and relevance of these new, overarching SDGs were evidenced not only by the advance agreement on the *Education 2030 Framework for Action*, but also by the secured funding for the *2030 Agenda* before its adoption, given that many of the world's finance ministers had already met in Addis Ababa, Ethiopia, in July 2015 (UN General Assembly 2015a).

An overall *Global Indicator Framework* for the SDGs, and targets of the *2030 Agenda for Sustainable Development*, was adopted in July 2017 as the final piece of the architecture for implementation by the UN General Assembly (2017). To facilitate this, many countries have now developed national strategies or are in the process of such undertakings.

Canada is among the fast-moving countries in this regard and, in spring 2017, acknowledged the contribution of the *2030 Agenda* and the SDGs in its third whole-of-government strategy plan called *Federal Sustainable Development Strategy for Canada 2016–2019* (Environment and Climate Change Canada 2017). This strategy, carried out under the *Federal Sustainable Development Act* of 2008, sets priorities for government institutions and voluntary contributors, and establishes goals and targets with necessary actions. However, much remains to be done to implement the SDGs by 2030. The corporate world—notably the larger multinationals that trade between nations—is aligning, and such efforts are recognised in particular by SDG 17 focusing on stronger commitment to partnership and cooperation.

Yet, in order to achieve the transition, small- to-medium-sized enterprises (SMEs) are crucial for the success of the *2030 Agenda* to address sustainability. Today, SMEs are not yet fully involved. Initiatives by UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training on supporting leaders and practitioners in greening technical and vocational training institutions that prepare the next workforce generation already address this target group. TE institutions preparing technical and vocational education and training instructors are urged to engage and provide changes in their academic programmes. Many cities, states, provinces, and regions now embed sustainability into their policies and everyday practices, and most major higher education institutions around the world now incorporate sustainability in their overall strategies, ranging from research priorities and curriculum content, to human resources and general operations of campuses.

## 2.2 Engaging with Educators to Step Forward

This resurgent, collective realignment presents an opportunity for all aspects of education to be repurposed and rejuvenated. At the same time, a renewed respect for the centrality of education in any strategy to enhance the future of humanity and the entire planet is possible. The underlying principle of education being recognised as a fundamental human right and enabling right (UNESCO 2015b) stresses the noble mandate that TE institutions around the world are trusted with. However, directly in-servicing and preparing education systems and their teachers to competently reorient their programmes and practices to address their students' current and future sustainability issues, as called for in SDG 4 and *Education 2030*, is overwhelming. Yet, it is so necessary. For this to occur, education leaders and the world's teachers must step forward and become engaged, because SDG 4 will be critical in the achievement of the SDGs and the *2030 Agenda* as a whole.

In Canada, due to the exclusive responsibility for education being relegated to provinces and territories, very little is mentioned about education in the *Federal Sustainable Development Strategy*. It is hoped that the Council of Ministers of Education, Canada (CMEC), will develop good practices and recommendations/guidelines for TE institutions on how to integrate the *2030 Agenda* and its SDGs into the education and training systems in all provinces and territories, helping to maintain Canada's high education standards as compared to other systems worldwide. SDG 4 on Education states: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UN General Assembly 2015b, p. 17). SDG 4 encompasses seven targets and three specific means of implementation, including:

1. Completely free primary and secondary education for all.
2. Access to early childhood education and care.
3. Affordable quality technical, vocational, tertiary, and university education.
4. Skills for training, employment, and entrepreneurship.
5. The elimination of gender disparities ensuring equal access to all forms of education.
6. Ensuring all youth and "most" adults have numeracy and literacy skills.
7. The knowledge and skills for sustainable development. (UN General Assembly 2015b, p. 17)

To further monitor SDG 4 and *Education 2030*, the ministers at the 2015 UNESCO World Education Summit meeting in Incheon, Korea, entrusted UNESCO with the leadership and coordination of SDG 4 and the *Education 2030* framework and mandated UNESCO to provide independent tracking and reporting of their nations' progress in meeting the education targets (UNESCO 2016b). This system, called the *Global Education Monitoring Report* (GEM Report), was put into operation in 2016, and ESD is being monitored not only as a part of SDG 4 but also as an essential component within many other SDGs, as a crucial means of implementation. ESD is either directly or indirectly mentioned in both the intent and the indicators of the 10 targets in SDG 4.

The first report in 2016 stated that only 8% of 66 countries surveyed integrated sustainable development in TE, up from only 2% in 2005 (UNESCO 2016c). A recommendation regarding ESD was that stronger efforts are urgently needed to assess concepts inherent in ESD and global citizenship for teacher preparation and professional development.

As stated earlier, education in the SDGs is also explicitly linked with other goals within the *2030 Agenda* in one way or another. For example:

- SDG 3 Health and Well-Being (target 3.7): By 2030, ensure universal access to sexual and reproductive healthcare services, including for family planning, information, and education, and the integration of reproductive health into national strategies and programmes.
- SDG 5 Gender Equality (target 5.6): Number of countries with laws and regulations that guarantee women aged 15–49 years access to sexual and reproductive healthcare, information, and education.
- SDG 8 Decent Work and Economic Growth (target 8.6): By 2020, substantially reduce the proportion of youth not in employment, education, or training.
- SDG 12 Responsible Consumption & Production (target 12.8): By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
- SDG 13 Climate Change Mitigation (target 13.3): Improve education, awareness raising, and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning. (UN General Assembly 2015b, pp. 16–23)

Today, many of the world’s education ministers see their key role in achieving a more sustainable future by envisioning ESD as a purpose of the overall education system, not only building on environmental, antiracist, and economic education but, more importantly, reorienting all core disciplines, and revisiting the values and ethics of the “hidden” curriculum.

### **2.3 The Momentum of Change: ESD Recognised as a Purpose of Quality Education**

Fortunately, comprehending ESD as a purpose of education is a significant change from the very early attempts to address sustainability within formal education. Following the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, education systems did not heed the call that education is crucial to the implementation of sustainable development targets (UN Conference on Environment and Development [UNCED] 1992). Education became known as the “forgotten priority”. Post Rio, ESD engagement came largely from ministers of the environment and was often presented or perceived as a newer, yet similar, form of environmental education (EE).



The world's perspective on ESD and education systems only recently changed towards the better. At the close of the *United Nations Decade of Education for Sustainable Development 2005–2014* (UNESCO 2005)—a programme that had sought to mobilise the educational resources of the world to help create a more sustainable future (UN General Assembly 2004)—the largest gathering of education ministers and vice-ministers to date was held in Japan, in November 2014. As part of the decade's concluding *Aichi-Nagoya Declaration on Education for Sustainable Development* (UNESCO 2014a), member states reaffirmed that ESD was a vital means of implementation for sustainable development, and launched the *GAP* on ESD.

In the *Aichi-Nagoya Declaration*, UNESCO member states identified their education systems' roles in implementing sustainable development:

Reaffirming ESD as a vital means of implementation for sustainable development, as recognised in intergovernmental agreements on climate change (Article 6 of the UN Framework Convention on Climate Change and its Doha work programme), biodiversity (Article 13 of the Convention on Biological Diversity and its work programmes and related decisions), disaster risk reduction (Hyogo Framework for Action 2005–2015), sustainable consumption and production (Sustainable Lifestyles and Education Programme of the 10-Year Framework of Programmes on Sustainable Consumption and Production 2012–2021), and children's rights (Articles 24[2], 28 and 29 of the UN Convention on the Rights of the Child), among many others. (UNESCO 2014a, p. 1)

Additionally, it was recognised that ESD could be seen in various ways: as sustainability education, joining a host of other societal issues that needed addressing; as another discipline to be added to already overcrowded curricula; or as an overall purpose of education systems engaging all aspects of education, both formal and informal.

Fortunately, the conference parties largely accepted the latter, that the broader notion of engaging, reorienting, and re-purposing their entire education and training systems was needed to bring about the necessary and massive societal change in worldviews and lifestyles. Further, it was agreed to:

Invite governments of UNESCO Member States to make further efforts to.... [r]eview the purposes and values that underpin education, assess the extent to which education policy and curricula are achieving the goals of ESD; reinforce the integration of ESD into education, training, and sustainable development policies, with a special attention paid to system-wide and holistic approaches and multi-stakeholder cooperation and partnerships between actors of the education sector, private sector, civil society and those working in the various areas of sustainable development; and ensure the education, training and professional development of teachers and other educators to successfully integrate ESD into teaching and learning. (UNESCO 2014a, p. 2)

Finally, "Educating for a sustainable future" was accepted as an overarching purpose of education and training systems, calling on all disciplines and pedagogies to systemically embed ESD within their cultures.

## 2.4 The Original Core Elements of ESD Remain Today

ESD is a broad concept, and people often have trouble comprehending it other than as another discipline. Rather, ESD is simply a purpose of the world's education, public awareness, and training systems, drawing on reorienting existing disciplines, initiatives, and pedagogies. Khan's (2014) description of ESD is well formulated:

[ESD] entails a reorienting of education to guide and motivate people to become responsible citizens of the planet. It addresses the interrelationships among the environment, the economy, and society. It moves from teaching about sustainable development to education to achieve sustainable development. It therefore encourages linking ideas to action. It supports the acquisition of knowledge to understand our complex world; the development of interdisciplinary understanding, critical thinking and action skills to address these challenges with sustainable solutions; and the values and perspectives to participate in a democratic society, live sustainably, and to pursue sustainable livelihoods. Nothing could be more important to the future quality of life on this planet than ensuring, through education, the creation of a global culture of sustainability. (p. 11)

Still, the original combined foci of education, public awareness, and training—the three elements in Chapter 36 of Agenda 21 (UNCED 1992)—today remain the core of ESD. The first element, education, has been separated into two core aspects. The first aspect is to improve access to, and retention within, quality education as in *Education 2030*'s target 4.1. Without access to quality education for all humanity, there will be little or no development at all, condemning billions to abject poverty. Unfortunately, more than 260 million young people still have no access to schooling (UNESCO 2017), while several hundred million youth are limited to extremely poor-quality education settings. It must be recognised that, as the world evolves and changes at an ever-increasing rate, education needs to be seen as a lifelong process. Hence, the idea of lifelong access to, and retention within, quality education, as called for throughout SDG 4 and *Education 2030* is an essential component of this first aspect of ESD. However, access to and retention within quality education is a component that is too often overlooked by TE institutions. Yet, it is a crucial and essential way of engaging all faculty in the discussion, rather than one or two who are designated as the “ESD” or “EE” faculty member. This recognition of the true breadth of ESD—and therefore a concern for all TE institutions and their faculty—is a new responsibility and opportunity. With this recognition, our current so-called ESD/EE faculty would be the new engagers of administration and fellow colleagues.

The second aspect recognises that the traditional core curriculum of eight or 10 subjects is no longer adequate to prepare citizens for living in the twenty-first century in a manner that will also ensure the possibility of thriving civilisations in future centuries. As a result of this recognition, the most commonly practised part of ESD is the reorienting of existing education systems from goals focusing on human and national development to incorporating the new concept of sustainable human and national development. This competence is largely called for in SDG target 4.7 and, consequently, in *Education 2030*. The reorienting of the traditional core disciplines of language, mathematics, and natural and social sciences and the

addition of emerging curricular disciplines, such as EE, peace education, global citizenship education, consumer education, and antiracist education, are essential components in the systemic re-purposing processes in which the *Aichi-Nagoya Declaration* invites governments to engage. The remaining two elements of ESD, building public awareness of current and possible future sustainability issues, and the training of those in public and private sectors to address sustainability issues, remain as equal components of ESD.

## 2.5 Research on ESD and Engaging TE Institutions

In 2014/2015, ministers of education from around the world, calling for the *GAP* with the *Aichi-Nagoya Declaration* and with the *Education 2030: Incheon Declaration and Framework for Action*, endorsed ESD as a central purpose. To pursue this re-purposing, the ministers identified the need to ensure the education, training, and professional development of teachers and other educators to successfully integrate ESD into teaching and learning. TE institutions are now called upon for their contribution in achieving the education goals. This integration needs research.

TE institutions within the International Network of Teacher Education Institutions (INTEI) connected through the UNESCO Chair in Reorienting Education towards Sustainability at York University in Toronto, Canada, have been researching and addressing the complex issues of engaging TE institutions since 2000, and have added substantial findings and recommendations to this ongoing discussion. With both the original research carried out in 28 countries, and the ongoing network discussion at biennial conferences, the INTEI has been suggesting that ESD become an essential part of a larger conversation within and beyond faculties of education regarding quality of life and well-being for all life on Earth. In its research, which led to the publication of *Guidelines and Recommendations on Reorienting Teacher Education Institutions to Address Sustainability* for UNESCO (Hopkins et al. 2005), INTEI members found that the concept of ESD was unclear and unrecognised as an issue for most TE institutions. In particular, the INTEI reported a shortage of faculty members with an understanding of ESD who were able to take on a leadership role in the embedding process. It was hard to imagine reorienting education systems, and hence, many TE institutions had individual members conceiving ESD as another add-on called “sustainability education”, an optional course teaching *about* sustainable development issues instead of teaching *for* a sustainable future. This lack of awareness and conceptual clarity largely remains in many TE institutions.

For the guidelines and recommendations, the INTEI members reported initiatives in addressing and embedding ESD within a faculty framework. Working within their spheres of influence, members had implemented various forms of activities related to ESD at their own institutions. Some examples are listed below.

## 2.6 Initiatives in Addressing and Embedding ESE Within a Faculty Framework

### *Curricular/programme development*

- Developed graduate-level programmes at master's and PhD levels in ESD
- Established distance education courses in ESD.
- Reviewed and revised existing courses to address sustainability
- Infused ESD into core disciplines such as math, science, geography, history, and technology courses
- Initiated programmes within Women's Studies, Women in Society, Women in Agriculture, and Women's Literacy
- Devised an ESD project using literature and language arts at the secondary school level to address male youth violence and to deliver skills in conflict resolution
- Launched an Aboriginal Studies programme with a focus on ESD and traditional ecological knowledge

### *Institutional change*

- Formed institution-wide ESD committees and discussion groups
- Developed ESD internships for students from other countries
- Established an interfaculty research institute on innovation and sustainability

### *Faculty professional development*

- Developed interfaculty exchanges related to ESD among universities
- Established a national ESD professional development consortium
- Launched an international peer-reviewed journal on ESD

### *Networking*

- Established an ESD link with schools in another country
- Developed a regional strategy for ESD
- Established a language-based ESD network in Europe and the Americas in English, Portuguese, and Spanish

### *Partnerships/community service*

- Developed recognition programmes for schools and institutions that promote ESD (e.g. green school movement)
- Formed sustainable business partnerships to promote ESD
- Engaged geographic information systems and other information technology approaches to monitor community sustainability issues
- Developed community-based off-campus TE projects within the inner city to improve the delivery of schooling to underserved youth
- Developed link between the faculty of education and the school of business to co-develop professional development programmes on ESD for senior-level education administrators

- Produced manuals, texts, websites, and other sustainability teaching resources for elementary and secondary schools
- Translated key ESD materials, including the *Education for Sustainable Development Toolkit* website, into local languages

### ***Promotion of ESD***

- Raised the level of awareness of ESD through many activities by writing journal articles and popular press materials; giving media interviews, lectures, and presentations at conferences; contacting academics and educators in many disciplines; and speaking with higher education administrators around the world
- Participated in a national committee to rewrite TE certification requirements

To this end, teacher educators and researchers have a responsibility to become critical colleagues and advocates within faculties of education and beyond. They must examine the assumptions and propositions that circulate within the disciplines and that include the concepts and assumptions informing ESD. Being critical of the shortcomings of the concept of ESD is an essential part; ESD must not become indoctrination but instead be viewed as a stepping stone to yet better answers to the development dilemma that continues to exist in spite of current efforts. Acknowledging and answering the current criticisms of being too human-centred and vague about maintaining what, and for whom, are part of ESD. However, the *2030 Agenda* offers a philosophic and analytical framework for educative enquiries in which the “5 Ps” (people, planet, prosperity, peace, and partnership) are the important principles, and must be considered in relation to one another. Such enquiries provide opportunities for deliberating and addressing complex issues. Pedagogical processes that follow from these enquiries also require complex, multi-layered, and open-ended engagement with critical thinking. In essence, the pursuit of ESD can be inherent aspects within the ongoing pursuit of quality education without the hint or smear of sustainable development indoctrination.

Thus, part of the task for TE institutions is to develop networks across faculties and disciplines, thereby enabling discussions that will explore and theorise relationships and issues among social, economic, and environmental dimensions of sustainable development. These processes of inquiry, theory development, and critical dialogue are our central, ongoing, professional tasks, as opposed to imposing the concept of sustainable development on others.

## **2.7 Engaging Faculty**

In carrying out its work, INTEI members also found that the engagement of faculty beyond close colleagues is difficult. Faculty members are already engaged in their own pursuits and passions. Adding another stand-alone cause to faculties in general, and to faculty members in particular, is daunting. It must be seen as an overarching societal cause, such as inclusive education. INTEI members found that many

faculty members' perception of sustainability is largely about protecting the environment and, therefore, ESD is about EE—and because such individuals were not the “EE person” on faculty, this was not their particular issue to include or pursue. They did not see their academic strengths as relevant to ESD. Yet, broadly engaging administration and faculty members is crucial:

[TE institutions] fulfil vital roles in the global education community for it is they that often bring change within education systems. Teacher-education institutions serve as key change agents in transforming education and society. Hence it is these TEI that could shape the knowledge and skills of future generations. Over and over, education is described as the great hope for creating a more sustainable future yet when it comes to resourcing the mandate it has become a forgotten priority. Not only do teacher-education institutions educate new teachers, they update the knowledge and skills of in-service teachers, create teacher-education curriculum, provide professional development for practicing teachers, contribute to textbooks, consult with local schools, and often provide expert opinion to regional and national ministries of education. Institutions of teacher education also perform similar services for school principals who have significant impact on what occurs in schools. (Hopkins et al. 2005, p. 11)

Because of this broad influence in curriculum design and implementation, as well as policy setting within educational institutions, faculty members of TE institutions are perfectly poised to partner in *Education 2030* and other ESD initiatives. By working with the administrators and faculties of TE institutions, governments can bring about systematic and economically effective change. For these reasons, nations should include TE institutions in their national sustainable development plans, and most certainly in implementing *Education 2030*.

However, in preparing for this hoped-for engagement with local and national strategists, we must prepare ourselves within our own institutions. One important tool in engaging the entire faculty is to borrow from change management theory, and acknowledge that not only leadership and resources are necessary; each member must understand the rationale and the expected outcomes of the change. In addition, there must be expectations, targets, monitoring, and celebration. There should be assessment and recalibration of targets. This cannot be the responsibility of any one person or one department. We must recognise that we are speaking of examining the very purposes of education and reorienting each discipline to contribute to a coherent and effective outcome. We must understand that to accomplish this, no single teacher, discipline, or department can do it all or can “own” ESD. Rather, every teacher, discipline, or department can, and should, contribute to the effort. For example, special education teachers help ensure the first of the three elements of ESD in ensuring access to, and retention in, quality education. Teachers working in gender studies, and those trying to improve the education of Indigenous and vulnerable youth, are addressing SDG 4.5: equity. Furthermore, early childhood educators are working on SDG 4.2, and those preparing mathematics and language teachers are already working on SDG 4.1. However, beyond individual initiatives, *Education 2030* calls for an institutional approach. Some individuals or sectors must take lead roles in initiating the reorientation discussion, and maintaining the momentum. This is particularly crucial for all who have experienced initiatives rise and fall. The leadership for initiating and maintaining the discussion can come from any respected

individual or group. Lastly, administrators and leaders must step up and fulfil their role. Leadership, coordination, and resourcing the “strengths” identified by each faculty member are key elements of “whole institution” or systemic undertakings such as these. What emerges in our favour is that each UN/UNESCO member state eventually will report on their progress in achieving the education goals for the GEM Report and the *Global Indicator Framework*.

The overarching pursuit of enhancing national/provincial standings in standardised tests, such as the Programme for International Student Achievement (PISA), is essential to the faculty discussion regarding ESD as an emerging purpose and goal of education. Engaging in this discussion is necessary, and it is important that the purpose and goals of ESD and PISA are not at odds. Taken in its overall framework, PISA is an important tool for informing educators, but can be detrimental when reduced to a simple language or mathematics proficiency indicator. Although mastering such disciplines is important and essential to assist us in life, they are only tools in our lifelong pursuit of learning; they are not the purpose of education. In this simplistic analogy, PISA indicates the quality of our students’ tools. Comprehending the true underlying purposes of an education for all citizens, individually, and collectively, and assessing the success of our education systems achieving these purposes, is far more complex (Delors 1996). It is a discussion worth having by all TEIs and their faculty members.

The research paper entitled “Contributions of Education for Sustainable Development (ESD) to Quality Education: A Synthesis of Research” (Laurie et al. 2016) adds to the discussion on whether ESD is a contribution to or a distraction from standardised tests such as PISA. The findings are clearly in favour of implementing ESD into the whole school. Over a period of 2 years, 43 researchers collected answers from school systems that have profoundly embedded ESD into their respective schools’ culture. These schools spanned 18 countries, most of them from high-scoring PISA nations such as Japan, Finland, Canada, and Korea. The five research questions asked were, “How can ESD”:

1. Update and improve educational outcomes
2. Help to improve and enrich curriculum
3. Guide students to have the knowledge, skills, and values to care about and solve future sustainable development issues
4. Help strengthen the partnerships between schools and other stakeholders, including the community
5. Promote innovation in teaching-learning conceptual frameworks (p. 232)

Results showed that by embedding ESD throughout the school systematically, from policy to everyday practice, this ESD approach resulted in (a) increased academic skills, (b) stronger critical thinking skills, (c) deeper understanding of topics, (d) better research skills, (e) becoming more prepared for job market, (f) enhanced communication, (g) writing and mathematical skills, (h) increased problem-solving skills, (i) enhanced abilities in forming/defending opinions, and (j) enhanced post-secondary studies preparation. These are all attributes that build upon the overall aspects of quality education, and enhance the overall mission of PISA.



The call by the UN and UNESCO to revisit the purpose of education and reorient systems to address sustainability threatens neither current views of education quality nor even PISA rankings. There is a clear need, however, for education leaders to address both ESD and PISA influences. It would be helpful if they could be addressed in a synergetic way, as both programmes seek to enhance the quality of education.

## 2.8 Conclusions and Outlook

SDG 4 has now become a global priority, clearly identified and strongly anchored in the Sustainable Development Goals of the United Nations' *2030 Agenda for Sustainable Development* and in *Education 2030*. Along with the GEM Report, *Education 2030* will form an overarching imperative for the next several years. As such, education and educators are to be included as crucial elements of national sustainable development strategies. Around the world, many TE institutions have continued their part of the work that was initiated during the UN's Decade of Education for Sustainable Development by focusing on the new *GAP* on ESD since 2015. This is important to persistently provide research-based knowledge on emerging trends and developments in education.

In creating more knowledge through research, the UNESCO Chair's INTEI—with more than 300 members in 74 countries—serves as an action research platform and continues to lead research projects that provide policy advice from the practical work on how to bring the concept of ESD further forward. For instance, the latest research focuses on reorienting education and training systems to improve the quality of education of Indigenous youth, as called for in SDG targets 4.5 and 4.7, and is being carried out in 40 countries.

Despite the recognition of ESD in recent years, there continues to be a need to further question and enhance the importance that education leaders put on ESD until the concept is internalised. Too few ministry officials and faculty members feel competent to lead these efforts and discussions. On the other hand, experts need to continue a future-oriented yet critical dialogue to further develop the concept and the implementation of ESD for a sustainable future of the planet.

There are new opportunities today for educators from at least two perspectives (Swedish International Centre of Education for Sustainable Development 2016). The first is to get involved in the nation's and/or province's sustainable development strategies, establishing or enhancing the importance of education, public awareness, and training as a common public good, strengthening the effectiveness of a knowledgeable citizenry, and furthering the chance of a more sustainable future. In connecting within and across TE institutions nationwide, a stronger voice can be raised in order to influence these strategies and initiatives. Joint TE institutional research-based activities could provide more evidence on the potential effectiveness of ESD. TE institutions researching, implementing, and learning from each other can create significant benefits for communities, provinces, regions, and beyond.



The second opportunity for ESD and TE institutions alike is to use the international quest for a more sustainable future to revitalise the potential of education systems by using ESD as an integrative purpose of education. A whole-systems approach to ESD, bringing new relevance to curricula, adapted both in content and pedagogy through systemically addressing the elements of SDG 4, could lead to an overall enhancement of service to students and the community. This revitalisation and resulting re-visioning of the societal importance of education systems to the future well-being of all would be welcomed by both educators and society.

Visionary leaders, resources, and people of good will are needed to help TE institutions rise to these responsibilities and seize the opportunities that have emerged. Never before has it been so possible both to enhance the quality of education and to become a central element in the search for a sustainable future for the planet in a concerted global undertaking.

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# Chapter 3

## Contextualising ESE in Pre-service Teacher Education in Canada



Paul Elliott and Hilary Inwood

The development of environmental and sustainability education (ESE) in pre-service teacher education (PTE) in Canada has seen a slow but steady progress over the past 40 years. Certainly, the context for this work has been inextricably linked with its development internationally; its roots can be found in nature study, conservation education, and outdoor education, as well as in its connections to environmental science and environmental studies (Carter and Simmons 2010; Palmer 1998). Yet research studies, events, and organisations specific to the Canadian context have helped to broaden and deepen ESE in PTE in this country. As a detailed history or concise chronology of how individuals and groups have influenced the praxis of ESE in PTE in Canada does not yet exist, this chapter will identify some of these Canadian contributors in broad strokes. While not intended to be a complete or definitive history, the chapter recognises some of the contributions that have informed this work in recent decades and identifies where the field has been and the directions in which it is now headed in Canada.

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### 3.1 Tracing the History of ESE in PTE in Canada

As in many countries, the *Tbilisi Declaration* (UNESCO/UNEP 1977) marked a turning point in a Canadian history of ESE in PTE. The declaration built on the work of UNESCO's (1975) *Belgrade Charter* and was the first international accord to define the importance of Environmental Education (EE). It was established at an Intergovernmental conference on EE organised by UNESCO and the United Nations Environment Programme (UNEP) and accepted unanimously by delegates from 66 countries. As one of the signatories, Canada pledged to support the Charter's objectives of raising awareness, advancing knowledge, transforming attitudes, and increasing participation in EE and by using its 12 guiding principles to inform this work. However, this was easier said than done, especially in a country with a decentralised education system and few academics or NGOs to assist in the process.

It was not until 10 years later, in response to the United Nations' (UN) World Commission on Environment and Development's (1987) *Our Common Future* (more commonly known as the Brundtland Report), that the Canadian government took action by founding the National Round Table on the Environment and the Economy that included a task force dedicated to education. Over time, this task force identified a variety of ways in which postsecondary educators could contribute to environmental advocacy through curriculum design, research, involvement with NGOs, and consulting. Perhaps inspired in part by the task force, and in part by the *Talloires Declaration* (University Leaders for a Sustainable Future 1990), 16 Canadian universities signalled their support for sustainable development by signing the *Halifax Declaration and Action Plan* in 1991, which committed Canadian university leadership to addressing sustainable development in the context of higher education (Schroth et al. 2011). While this did not appear to have any immediate effect on faculties of education, it certainly provided support for those who were "planting the seeds of change" in higher education in Canada, inspiring many universities to consider physical and pedagogical changes to move towards sustainability through the 1990s.

In preparation for the UN's Earth Summit in Rio de Janeiro in 1992, Canadian Charles Hopkins helped to write chapter 36 on Education for Sustainable Development (ESD) in *Agenda 21* (United Nations Sustainable Development [UNSD] 1992), a non-binding action plan of the UN for addressing sustainable development. The chapter stipulated that "educational authorities... are recommended to assist or set up pre-service and in-service training programmes for all teachers, administrators and educational planners... addressing the nature and methods of environmental and developmental education" (UNSD 1992, pp. 321–322). At the time, Hopkins was a superintendent for the Toronto District School Board; after retiring in the early 1990s, he would become a leading force of ESE-PTE in Canada and at the UN over the next three decades. In 1999, Hopkins was named UNESCO Chair in Re-Orienting Teacher Education Towards Sustainability, based at York University. His significant contributions have helped to emphasise the importance of teacher education in discussions about ESD across Canada and on the world stage.

In the early 1990s, a number of Canadian NGOs were formed to help implement Hopkins's focus on ESD in teacher education, including Learning for a Sustainable Future in 1991, and the Canadian Network for Environmental Education and Communication (EECOM) in 1993. With support from a variety of governmental and corporate interests, these organisations began to advocate for and provide pre-service and in-service teacher education in EE and ESD. Still active after 25 years, both organisations have been instrumental in teacher education by creating resources and lesson plans and providing talks, workshops, leadership training, and conferences across the country. Along with the founding of the *Canadian Journal of Environmental Education* in 1996, this began to create a solid foundation for EE and ESD across the country, aligning with international developments and ensuring a presence for them in Canada. Two key teachers' federations added their support a few years later: the Ontario Teachers' Federation and the Canadian Teachers' Federation each adopted resolutions pertaining to education for sustainability in the late 1990s.

The growing importance of EE/ESD was signalled by the Council of Ministers of Education, Canada (CMEC), in 2000, with its publication of *Educating for Sustainability: The Status of Sustainable Development Education in Canada*. This report found evidence of a small and growing presence for Educating for Sustainability in K–12 provincial curricula (predominantly in Manitoba and New Brunswick) but a virtual absence of it in PTE. This view was supported by findings in Lin's (2002) study that tracked trends in EE in Canada up until 1996; perhaps not surprisingly, the study corroborated the CMEC's conclusions that little evidence of implementation of EE had been found in Canadian faculties of education. However, calls for more involvement in EE in Canadian teacher education were beginning to appear (Russell et al. 2000), and discussions were taking place on the national scene. In 2001, the Pan Canadian Network of Faculties of Education Supporting Sustainability and Stewardship was formed, leading to more in-depth discussions about ESE-PTE (though it is unclear how long this group lasted). A few years later, Regional Centres of Expertise on ESD began to be established as part of the UN's Education for Sustainable Development projects in 2005, helping to start conversations about ESD at all levels of education in targeted communities across the country. This was further supported by the launch of the UN Decade of Education for Sustainable Development the same year, which focused on ESD around the world and affirmed the integral role of education at all levels in bringing about positive environmental change. Hopkins continued to provide leadership in this area, publishing *Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability* (Hopkins and McKeown 2005); while not aimed specifically at Canadian faculties of education, the publication provided further support for PTE faculty advocating for a stronger presence of ESE in their programmes.

During the first decade of the new millennium, these developments began to have an influential effect on the ministries of education in some provinces, with evidence of EE and ESD beginning to appear in some educational policies and K–12 curriculum documents. In 2000, the Manitoba Education and Training ministry, under the leadership of Gerald Farthing, published *Education for a Sustainable Future: A Resource for Curriculum Developers, Teachers, and Administrators*, which positioned

Manitoba as a leader in ESD in Canada. British Columbia followed suit with a guide for teachers: *Environmental Learning and Experience: An Interdisciplinary Guide for Teachers* (British Columbia Ministry of Education 2007). Ontario continued this trend by publishing the first official policy framework in EE in Canada 2 years later, titled *Acting Today, Shaping Tomorrow* (Ontario Ministry of Education [OME] 2009). While these documents could not obligate faculties of education to implement ESE in their pre-service programmes, they were certainly influential in encouraging some faculties to begin this process. In Ontario, for example, a group of pre-service faculty began to meet annually in 2008 to discuss how to integrate ESE into their work in response to the new policy framework and used it as leverage in advocating for a stronger presence for ESE-PTE with their colleagues and deans.

During the second decade, major developments were beginning to take place that inspired more PTE faculty to undertake this important work. The CMEC (2012) published a major research study, *Education for Sustainable Development in Canadian Faculties of Education*, that found evidence of “modest but promising progress towards reorienting teacher education to address ESD” (p. 63); however, the study also noted a “divergence between individual responses and institutional responses” (p. 64) in this implementation, with individual faculty members showing considerably more progress than their programmes. This influential study made a number of recommendations for improving the presence of ESD in PTE nationally. Simultaneously, the Alberta Council for Environmental Education (2012) published *Advancing Pre-Service Environmental Education in Alberta: A Discussion Paper*, and Quebec’s Ministère de l’Éducation, du Loisir et du Sport (2013) followed with a *Plan d’Action de Développement Durable 2013–2015*. Guidelines for preparing environmental educators were also published by the US-based North American Association for Environmental Education (2007, 2010), helping to identify some of the components for EE in teacher education. In alignment with many political, cultural, and social shifts towards sustainability and sustainable development across North American society, EE and ESD were finally taking hold in PTE in Canada.

### 3.2 Research into ESE-PTE in Canada

While it is clear that there have been centres of praxis (i.e. interactions between theory and practice) in this work, we ask: What is the current general status of ESE-PTE across Canada? This is a surprisingly difficult question to answer because Canadian universities are semi-autonomous entities that prize their intellectual and academic freedom and independence, so a diversity of praxis in faculties and departments of education can be expected; this is a situation that has not changed significantly since Towler (1980) studied the issue. Teacher education programmes are influenced by an institution’s geographical location, faculty interests and expertise, and bureaucratic and historical precedence. Trying to capture a snapshot of practice is further complicated because of the decentralisation of Canadian education, governed at the provincial and territorial levels, rather than federally. Multiple players influence

the nature of teacher education—not only ministries of education, but also teacher education accreditation agencies and professional teaching bodies. Getting a clear nationwide picture is challenging, but useful attempts have been made.

Fawcett et al. (2002) reflected on the nature of desirable praxis in ESE and identified five guiding principles: grounding teaching and learning in students' lives; being biocentric; living bioregionally; respecting and encouraging diversity; and exploring and resisting linked oppressions. They believe the anthropocentric focus of education needs to be challenged and that progress will only be possible once we start taking a biocentric view of our world. Russell et al.'s (2000) article was an important attempt to identify a philosophical position from which to advance the cause of ESE, one that could be applied generally to teacher education. They reflected on what should be the primary goals of an education system in relation to ESE:

The ability to participate in decisions and actions that affect one's life, however, will not happen automatically and thus one of our goals as educators is to facilitate the development of knowledge, commitment, and skills necessary for democratic environmental citizenship. (p. 223)

Yet research has shown that adoption of Russell et al.'s (2000) philosophical stance in PTE programmes has been a slow process. In his study conducted almost 40 years ago, Towler (1980) found that few institutions in Canada were doing anything to prepare teacher candidates for a role as environmental educators, a position he strongly advised needed addressing. When Lin (2002) undertook a follow-up survey just over 20 years later, she found that little had changed and that few institutions had responded to international calls for enhanced teacher education provisions that may better prepare new teachers in sustainability education. Many institutions that responded to Lin's survey offered no EE courses and/or specialisations. Rather than being a component of all teacher candidates' preparation, environmental content was largely confined to specific curriculum and instruction courses such as biology and outdoor education; the socio-economic and political aspects of EE were not represented at all (Lin 2002). Lin summarised her findings as follows: "Environmental education remains at the fringe of most pre-service teacher training programs and the prospects of significant environmental education program implementation appears dim" (p. 212).

While there was significant policy development happening in the first decade of the millennium, little research took place in Canada in this time. Pickard (2007) did present a meta-study drawing on research in a range of related fields and suggested that future educators need to engage with the eco-philosophical roots of education, be critically aware of the dominant paradigm driving society, and understand education's potential as an agent of social change. However, more research began to appear in the second decade. Puk and Stibbards (2010) delved deeper into PTE by investigating the extent to which teacher candidates were pre-adapted to meet the expectation that all Ontario teachers in all grades should infuse EE into their teaching (OME 2009). Generally, they found teacher candidates to be ill-prepared and were concerned that "Faculties of Education in the province place little emphasis on



providing distinct courses in Ecological Literacy” (Puk and Stibbards 2010, p. 471). They called for all teacher education programmes to include compulsory, comprehensive, and in-depth courses in Ecological Literacy. Similarly, in a highly critical analysis of sustainability education in the school system, Greenwood (2010) identified central issues that act as barriers to the implementation of recommendations, such as those of Puk and Stibbards (2010):

With few exceptions, the field of teacher education has been nonresponsive to a wide array of globalised sustainability problems impacting local environments everywhere. This is so in part because teacher education, in practice, is less a field of cultural and ecological inquiry than it is a network of bureaucracies that operates under a largely unexamined cultural logic. (p. 139)

Greenwood went on to assert that “Environmental and sustainability education have never been central to the culture of teacher education, if they have been part of it at all” (p. 142) and noted that “colleges of education exist because they train teachers and administrators for service in public schools as they are, not as they should be” (p. 141). His perspective implied that what is needed is a wholesale re-imagining of the purpose of teacher education and the school system itself. This view was reiterated by Hart (2010) who believed that a new focus on EE had the potential to transform education if not for the inherent conservatism of teacher education programmes.

Tan and Pedretti (2010) surveyed Ontario teachers’ perceptions and views of EE and found that while they were supportive of it in principle, many felt that they lacked experience, confidence, and knowledge in the field. Many teachers were particularly concerned about the sociopolitical components and the inherent issue of “values”. The authors called for teacher candidates to receive better preparation in EE and continuing in-service opportunities once they are in teaching posts. Pedretti et al. (2012) followed up with another survey, completed by 377 teachers in Ontario, which questioned teachers about their perceptions of environmental and outdoor education. It showed that teachers felt these were neglected parts of the curriculum, leading the authors to suggest that faculties of education could supplement programmes to provide better preparation in these areas. Similarly, Falkenberg and Babiuk’s (2014) study found “no systematic and focused preparation of teachers for education for sustainability in any of the Manitoba teacher education programmes” (p. 418).

Furthermore, the CMEC’s (2012) Canada-wide *Education for Sustainable Development in Canadian Faculties of Education* survey found that the provision of sustainable development programming in pre-service programmes varied widely across the country, but did find evidence that its provision was steadily improving. The CMEC’s recommendations included two key suggestions: first, that there needs to be better channels of communication within faculties for faculty and students to share information about new initiatives, and second, that there should be better networking among Canadian faculties of education, possibly facilitated by the Association of Canadian Deans of Education (ACDE).



The need to reorient teacher education has also been echoed by Howard (2012) who emphasised that PTE should include the “value dimensions” of sustainability. Sims and Falkenberg (2013) also advocated for reorientation and considered the subject in terms of developing competencies. These scholars identified key components for preparing teacher candidates, including: experiential learning, the importance of place, community collaboration, Indigenous perspectives, real-life problem-solving, interdisciplinarity, and inclusive, participatory decision-making. Similarly, Karrow et al. (2016a) identified the potential benefits of prioritising EE-PTE because of the distinct capacities—competencies (knowledge, skills, and dispositions) and experiences (non-academic and academic)—that are essential for preparing the next generation of teachers.

Fortunately, the literature is also starting to document the work of those who are integrating ESE into PTE across the country. Puk and Stibbards’s (2011) study showed that, given an effective course, teacher candidates’ ecological literacy may be significantly enhanced as part of PTE. O’Brien’s (2012) account of an innovative elective course in this area also demonstrated that teacher candidates will respond to appropriate programming. Berger et al. (2015) noted their experiences teaching an elective course on climate change showed overwhelmingly positive responses from their teacher candidates, with many suggesting it should be mandatory. Dippo (2013) examined some of the persistent problems facing attempts to bring about change in teacher education and reflected on the nature of successful initiatives in introducing sustainable development in the PTE programme at York University. And a recent anthology by Karrow et al. (2016b) brought together a number of case studies and research reports analysing PTE in faculties of education across the country.

The barriers to bringing about effective change should not be underestimated. Ormond et al. (2014) reported on the experiences of teacher candidates and faculty involved in a pre-service programme with an emphasis on sustainability and environmental learning. They use the term “melancholy” to describe the feeling of participants as they found the hopes that the programme could reconceptualise hegemonic approaches to teacher development thwarted by a range of bureaucratic and philosophical norms. Ormond et al. provide a timely reminder of the challenges facing those wishing to bring about transformation within traditional school and university contexts.

Scholars around the world have undertaken a rich set of studies on all aspects of ESE-PTE, including policy research (Aikens et al. 2016), theoretical foundations (Summers et al. 2005; Zhou 2015), as well as case studies (Ashmann and Franzen 2015; Ferreira et al. 2007). (Authors Karrow and DiGiuseppe examine Canadian ESE-PTE in relation to international ESE-PTE in the final chapter in this publication.) However, there is no doubt that more research is needed to better understand our unique context within higher education in Canada. The Sustainability Education and Policy Network (SEPN) has been conducting research into aspects of sustainability in higher education in Canada since 2012 (SEPN 2019). Another group of faculty began to meet in Ontario 10 years ago to more deeply embed ESE-PTE across the province. Inspired by the OME’s (2009) policy framework and hosted at



**Fig. 3.1** One of the working groups in action

the Ontario Institute for Studies in Education (OISE) at the University of Toronto, this group joined 60 EE leaders from across Ontario at a Provincial Roundtable on ESE-PTE in 2013. This led to the establishment of a formal team (involving faculty from OISE, University of Ontario Institute of Technology, Brock University, and Trent University) that began working towards improvements in ESE, with a specific focus on PTE, and to a new resource, coined *DEEPER: Deeping Environmental Education in Pre-Service Education Resource* (Inwood and Jagger 2014). The team began to advocate for ESE-PTE at OME meetings and conferences and, in 2016, hosted the National Roundtable in ESE-PTE at Trent University, where more than 70 delegates from 27 faculties of education across Canada engaged with keynote presentations, research presentations, and working groups (see Fig. 3.1). This pivotal event resulted in the creation of a new national network of educators called the EECOM Standing Committee on Environmental and Sustainability Education in Teacher Education, which has created a digital communications hub, resources, including publications, and an action plan, all dedicated to strengthening ESE-PTE across Canada. This volume—*Environmental and Sustainability Education in Teacher Education: Canadian Perspectives*—is a collection of works evolving from the roundtables during that historic event.

### 3.3 Challenges and Opportunities in ESE-PTE in Canada

At National Roundtable 2016, the newly established network of faculty, administrators, policy-makers, teachers, and community educators identified some of the common challenges they face in ESE-PTE; not surprisingly, many of these are similar to

the challenges faced by educators in the K–12 school system. There are many competing priorities in PTE including (but not limited to) Indigenous education, equity and diversity, inclusion, differentiated instruction, global education, digital technologies, authentic assessment, and service learning. In general, teacher educators struggle to find time in their courses to introduce and fully explore such topics in an already-overcrowded curriculum, and traditional disciplinary approaches to PTE are not conducive to doing so, nor is the scheduling of instructors and courses. The traditional classroom environments found on many campuses are also problematic in supporting integrated, experiential, or collaborative learning. Faculty who lack knowledge of and expertise in ESE make its inclusion particularly challenging, “methods courses” is not pervasive will often complain that ESE doesn’t “fit” into what they teach. Professional development for faculty is often out of reach for many programme administrators faced with a lack of resources, research, and/or expertise on which to draw. In addition, administrators recognise the limits of a “top-down” approach to programme change, understanding that the individualistic nature of those in the academy makes widespread change problematic.

Still, ESE is finding its way into PTE in a variety of ways. Some PTE programmes are adding mandatory courses in ESE to their curricula. In Ontario, as many as four ESE-PTE programmes (Trent, OISE, Lakehead, and Queen’s) now have such courses, ranging from 12 to 36 hours of instruction, that all teacher candidates must complete in order to graduate. Some programmes across the country take this a step further by offering cohorts and/or practicums focused on ESE; these include OISE, Simon Fraser University, UBC, Queen’s, and Lakehead. Other institutions, that struggle to make significant programmatic changes, are bolstering their extracurricular offerings with workshops, conferences, and student clubs centred on ESE, often delivered in partnership with NGOs in the community. Some programmes (e.g. at UBC, Trent, and OISE) model garden-based pedagogies with the use educational gardens stocked with native plants. Such developments are set against a wider background, seen at many universities, such as investing in more efficient physical infrastructure, promoting sustainable approaches to transportation to and from campus, divesting faculty pension funds from fossil fuel investments, and even banning the sale of bottled water on campus.

Some scholars still argue that simply integrating ESE into existing PTE programmes misses a critical opportunity to bring widespread and far-reaching curricular change to the way such programmes are conceptualised at their very foundations (Arenas and Londoño 2013; Bowers 2012; Greenwood 2010). These scholars argue that maintaining traditional disciplinary approaches in PTE programmes merely replicates educational systems that have led to consumeristic, anthropocentric, inequitable communities in the first place. What is really needed is a complete reconceptualisation of PTE—alongside that of the K–12 education system—that would apply whole systems thinking to broad and deep systemic change in higher education, modelling holistic, interdisciplinary, and transformative approaches to teaching and learning for teacher candidates.

Whether ESE is integrated into existing programme structures, or at the core of a fundamental shift in PTE, it offers significant opportunities to position faculties of

education as leaders of positive social and environmental change. Implementing infrastructure improvements not only contributes to the economic sustainability of faculties but also supports faculty, staff, and students' health and well-being by increasing their understanding of energy conservation, waste minimisation, environmental literacy, and eco-justice. It provides innovative ways to support and manifest the tenets of Indigenous education, and to deepen all stakeholders' connections with the broader communities in which they function. These opportunities will be best realised if all levels of PTE are involved in planning and implementing ESE, from the grassroots efforts of faculty, staff, and students to the provision of resources, the establishment of curricula by deans and provosts, and the creation of policy by those in ministries of education and provincial accreditation agencies. This will require a whole systems approach to fully implementing ESE-PTE throughout Canada, one that is long overdue.

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# Chapter 4

## Transversality, Diversity, Criticality, and Activism: Enhancing E(S)E in Teacher Education



Lucie Sauvé

We know it is not easy to transform school and academic culture so as to ground education in the evolving dynamics of the socio-ecological realities of our world, and to experience education as a process of life itself. The current politics of formal education—from curriculum design, to teacher education, and classroom settings—maintain a huge gap between schooling and different contexts where rooted, strategic, and meaningful learning can occur. Too often, school stands offshore, as an island where pupils wait for “real life” to happen, learning things that “could be useful later”.

Important questions emerge here: How can schools invite and accompany children and youths to take part in the current ecosocial transformation movement that is shaping their world? How can they be considered full actors here and now in their community, and not only as future citizens or carriers of moral precepts? How can we value learners’ creative forces and respond to their quest for meaning and desire for action? To use Henry Giroux’s (2005) expression, how might we enhance the role of teachers as “cultural workers”? How can students contribute to defining and enacting the major cultural shift our society needs? These questions challenge teacher education programmes, as they are often the first locus of interpretation and appropriation of curricula, and of critical and constructive reflexion about education. In short, how can we encourage teachers “to assume a social and political leadership role” (Association of Canadian Deans of Education 2016, p. 3)?

Let us examine here what could be the contribution of the rich theoretical and pedagogical heritage of environmental education, as an ontological and political process, to respond to such questions. For this exercise, I will dwell on the educational culture of our interdisciplinary research centre (Centr’ERE<sup>1</sup>) which is

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<sup>1</sup>Centr’ERE in Université du Québec à Montréal: <https://centrere.uqam.ca/>

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grounded in an important partnership with diverse organisations of our educational society. Adopting a vision of research as a reflexive system, where investigation, teacher education, professional development, educational practice, and social action are closely related in retroactive processes, Centr'ERE's members are involved in projects and programmes related to environmental education, including preservice teacher education. We are deeply concerned about the persistent lack of institutional support for environmental education and have worked collectively towards the development of a policy strategy to promote environmental and ecocitizenship education in Québec.<sup>2</sup>

## 4.1 Environmental Education: A Transversal Dimension of a Holistic Education

Environmental education offers important tools in response to the quest for relevant learning in these troubled times, where loss of meaning and belonging, ecological problems, and social tensions—along with inequalities—are dramatically increasing. In French, we use the expression *éducation relative à l'environnement*, which Paul Hart (2003) referred to in English as environment-related education. This field encompasses the diverse types of education concerned with our human relation with the environment, more precisely with the web of relationships between persons, societies, and the environment: nature education, conservation education, place-based education, environmental health education, ecojustice education, and education for sustainability, among others. Each one of these fields is concerned with a particular aspect of our relation with the environment, defined as a complex web of socio-ecological realities.

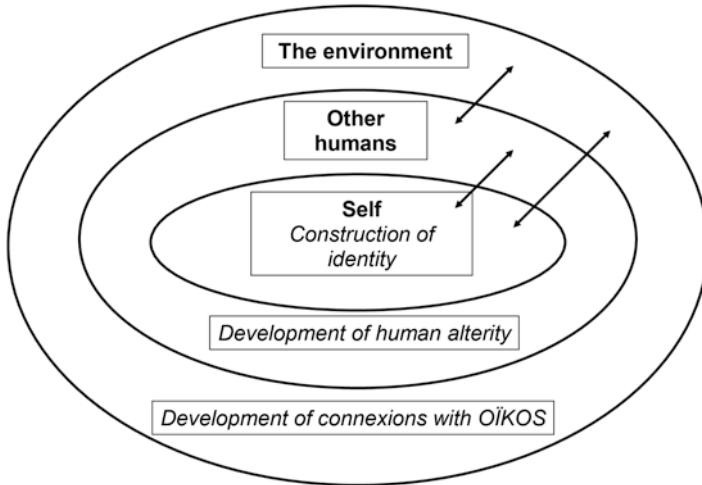
Whereas education and environment are two socially constructed fields of interaction that are culturally, ethically, and politically shaped, environmental education (or environment-related education) can be interpreted through many diverse theoretical frameworks and be enacted in an impressive diversity of pedagogical approaches and strategies (Sauvé 2005, 2017c). Globally, let us consider environmental education as an essential and transversal dimension of the holistic process of education, a dimension more specifically concerned with one of the three interaction spheres at the basis of personal and social development (Fig. 4.1).

The core sphere corresponds to relationships with our self: learning to be, learning to learn and to connect with the world, while constructing the multiple aspects of our identity. This first sphere relates closely to the second one, that of relationships with other humans: developing human alterity through democracy, interculturality, peace, justice, cooperation, and so forth. And the third sphere, deeply interconnected with the two others, is the one of our relationships with

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<sup>2</sup> See <https://centrere.uqam.ca/wp-content/uploads/sites/12/2017/01/%C3%891%C3%A9ments-dune-Strat%C3%A9gie-Version-de-travail.pdf>





**Fig. 4.1** Environmental education: an essential part of the global educational process

*oikos*—our common home, the living environment in which our humanity is embedded in a more-than-human world.

This third interaction sphere calls for ecological education. The aim here is to recognise that we are embodied beings and that our lives are situated, contextualised, and intertwined within a whole life web. We need to nurture connections with the natural world, to define our human ecological niche in relation to all the niches composing the local and global ecosystem to which we belong; we need to learn how to fulfil this “function” adequately, in a responsible way. The growing movements of outdoor schooling, of nature classes, and of place-based education all contribute to this educational goal (Louv 2016; Sobel 2006, 2016).

The interaction sphere with *oikos* also calls upon an economic education: the aim is to learn how to collectively use and share our common home and its resources, with care and solidarity. Conservation education and consumption education are key elements here (Agundez Rodriguez and Jutras 2013). One of the diverse reference frameworks for such education may be the politico-economic international programme of sustainable development, but it can also be the transition and degrowth movements, or ecodevelopment, or more ecocentric frameworks like the Indigenous *vivir bien* community-based economy, or other proposals aiming to interpret and build our economic relation with the environment (Sauvé and Orellana 2014).

In this third sphere, we also find eco-sophic education, as it serves to clarify one’s personal and cultural vision of the world (or cosmology), including our most immediate reality, and to build a coherent ethic. Ecosophy—as first defined by Naess (1989)—implies, among other things, rethinking the contextual significance of responsibility, care, justice, equity, solidarity, sustainability, and other values that can be adopted while facing different socio-ecological issues or situations.

Finally, in this sphere of interaction with *oikos*, ecosophy leads to ecocitizenship (Greenhalgh-Spencer 2014). Our *oikos*, our common home, is also our City, in the meaning of the ancient Greeks who used the word *polis* for city (*polis* being the root of the word politics). The City is a democratic place (which needs to be inclusive) where free and autonomous humans take decisions together about issues that affect them all. *Polis*, the City, is found in school, in the workplace or in the neighbourhood, in villages and towns, in the country, in international communities. Citizens have to learn to live together in their City. Now, ecocitizenship gives a specific meaning to the City, that of our living home shared between us humans, and also with all other life forms and systems. In the ecological City, our humanity is intertwined with the fundamental web of life itself. The City is not restricted to our human community; it includes the whole community of life (Sauvé 2017b).

## 4.2 Ecocitizenship: The Political Dimension of Environmental Education

Let us develop the idea of ecocitizenship. Schooling and academic life cannot be dissociated from the realities of our troubled and worrying times. In the context of the current governance, centred on political and economic alliances, and often backed by a complacent or incoherent legislative system, it is up to civil society to assume the difficult and very demanding role of becoming a critical vigil, of fighting *against* or *for* projects, programmes, or policies that affect lives, places, and territories. The ecological argument, which stresses the preservation of the integrity of ecosystems, as well as the concept of common goods (water, soil, health, security, auto-determination, etc.) seems to have very little importance for policy-makers, if only when they are upheld by popular discontent, requests, and claims.

Citizen mobilisation is more necessary than ever for whistleblowing, for raising debates, for contributing to problem solving, for protecting ecosystems and human health, and for reclaiming socio-ecological equity and environmental justice. It is also required in order to contribute to ecosocial innovation and transformation; for example, creative initiatives in the fields of food, health, transportation, energy, housing, and all others. These reactive or pro-active contributions to ecosocial transformation call for the involvement of all the different actors of our educational society, including schools, of course, that need to be well rooted in the community, in a constructive, collaborative dynamic.

So, in relation to the many complementary dimensions of environmental education, including its ontological dimension, aiming at the construction of an ecological identity, and its critical and ethical dimensions that give meaning and purpose to our *being-in-the-world*,<sup>3</sup> the political dimension of environmental education is more necessary than ever. Politics refer here to the democratic process of discussing

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<sup>3</sup>As in Heidegger (1962)

together our collective issues, of taking care of our “commons”<sup>4</sup> in school, in the neighbourhood, and in larger communities (Gutiérrez 2002; Heller 1999). Concretely, it means learning to manage information and communication, to question, to discuss, to debate, to deal with the diversity of arguments and uncertainty, to create, to propose solutions; it means learning to learn and to work together.

But if teachers, in relation to their important social role, should be equipped to consider these critical, ethical, and political dimensions of environmental education, what about children? Are they concerned with these aspects of environmental education? This opens up a huge discussion. Is criticality—in which critical thinking is associated with social critics (Burbules and Berk 1999)—an appropriate learning for children? What about activism? Is it not a risky pedagogy with youths? Let us point to some works on these issues.

First, in her inspiring book based on her doctoral thesis, Bronwyn Hayward (2012) says it is not a matter of teaching political science to children, but rather to offer them the possibility of becoming conscious of their place and role in the collective life, and to experiment with active democratic processes. Children need to recognise that ecological problems are closely linked to problems of violence, poverty, injustice, and inequity. Our role as educators is to invite them to talk about their daily living, to clarify their reality, and to experiment and understand how ordinary people (like their parents, their teachers, friends, neighbours, and themselves) can collaborate in collective projects and “act together in free collaboration to achieve extraordinary change” (p. 2), right here, in our living places. “We need to support young citizens as they discover the art, craft and passion of active ecological citizenship” (p. 16). Children and youth must be considered as full actors in our evolving society, without expecting them to carry changes hoped by adults, without imposing them to engage in “crusades” for projects conceived without them.

And also, in the impressive work they edited, Larry Bencze and Steve Alsop (2014) propose an *Activist Science and Technology Education*. The book gathers the contributions of 43 science education specialists to explore the legitimacy of activism in science and technology education, including environmental education, as a contribution to social transformations. The authors point out that inaction and immobility are the opposite of activism. Within this proposition, students are considered as subjects of change, as political subjects, learning through political action, and thus developing an individual and collective pro-active attitude. The teacher plays the role of a cultural animator who must clarify and justify constantly his/her own postures. Here, in relation to critical thinking, the search for meaning remains essential.

Fostering the development of critical and creative competencies, education therefore should focus on *empowerment*—the willingness and capacity to act—which goes well beyond adopting individual behaviours and embraces (e.g. beyond consumer habits) a diversity of relational modes to the environment. It is in the crucible of reflexive action that these competencies can be fully constructed and unfolded, and such experience calls for involvement.

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<sup>4</sup>The concept of commons is well discussed by Dardot and Laval (2015) and Lotz-Sisitka (2017).

Involvement, therefore, becomes a keyword in children and youth education. Inviting and accompanying them in diverse ways to be committed in dreaming and constructing their world allows for countering cynicism, and contributes to a pedagogy of hope. We must value inspiring school projects, and recognise the diverse forms of socio-ecological involvement of teachers and their students. This involvement goes far beyond the token gestures associated with consumption and recycling habits.

Of course, ecocivics must be learned, with its hundred “little” daily actions, its responsible behaviours that respond to an elementary social morality; even if these small gestures can be associated with shallow green codes, their adoption is often demanding in the course of everyday life. Ecological management practices must also be adopted in our personal lives and our institutions in a perspective of sustainability, for the preservation of our rarefying resources and the well-being of people. However, beyond ecocivics, ecocitizenship calls for the construction of a deeper value system (or ethics) focused on the challenge of *living here together*. Learning democracy is more essential than ever—a democracy not only centred on human rights but that also considers living beings’ rights, and the rights of life systems (Bourg and Whiteside 2010).

Ecocitizenship calls upon youths, and upon us all, to become involved in the collective and concerted care for socio-ecological realities: this implies learning in all domains, including politics, economics, and law (e.g. such as children’s rights—their right to access information and to have their voices heard). These questions should be addressed as early as possible, following the development of understanding and of the capability to act, through the teaching of geography, history, natural sciences, or philosophy (including morals and ethics), as well as in the teaching of language skills—as Célestin Freinet (1968) and Paulo Freire (1970/2000) observed, you can’t learn to read without learning to read the world. To be sure, the ideal context for integrating these learnings and transferring them would be an environmental education curricular-specific space.

Beyond ecocivics, ecocitizenship invites us indeed to involve ourselves in more structured projects characterised by the depth of their political significance and their contribution to the construction of a societal project, in accordance with a system of values we must clarify, confront, and enact. Hope for the future needs to be anchored in the confidence that all citizens are capable of contributing towards building their world, together, as soon as their age allows them to participate in the City, in the collective life.

### 4.3 Environmental Education: Rethinking Curriculum and Pedagogy

Exploring the scope of environmental education and its diverse dimensions—ontological, pragmatic, critical, political, and others—we can observe three main complementary perspectives that can and should be adopted while deploying this

essential sphere of a holistic education. And these perspectives correspond to three “good reasons” (or three components of a global argument) for integrating environmental education in curricula. Primarily, there is an environmental or socio-ecological perspective centred on the contribution of environmental education to protect and enhance the quality of the environment, in relation to human populations’ quality of living. Here, we find among other educational issues environmental health, risk management, ecological justice, socio-ecological equity, and so many others. Secondly, a psychosocial perspective is centred on the contribution of environmental education in order to fundamentally enhance the quality of being of persons and social groups in relation to their environment. We find here the construction of a vision of the world, of an ecological identity, one that includes a political identity<sup>5</sup> as well as ecocitizenship, and that responds to issues of belonging, meaning, and resilience, among others. Thirdly, a pedagogical perspective focuses on the quality of teaching processes, so as to stimulate learning towards the ecosocial transformation we need in our societies. These processes call for interdisciplinarity, knowledge dialogue and mobilisation, and transversality through disciplines and pedagogical projects. They also call for experiential and co-learning approaches, for critical pedagogy, and sound reflexive activism. Without attention given to this third perspective, the other two cannot be adequately considered. The rich pedagogical heritage of environmental education can help foster teaching and learning practices that enhance the relevance and the efficacy of contemporary education.

In this regard, there exist some curricular windows through which environmental education can be integrated in school. For example, as in many contemporary national curricula, the actual Québec education programme<sup>6</sup> already includes possibilities for transversality, for cross-curricular pedagogy, and for connecting school to real life. The programme is centred on the main explicit goal of accompanying children and youths in the process of constructing their own worldview, of constructing the significance of their being-in-the-world. Such a worldview should be constructed through the diverse subject areas and the development of cross-curricular competencies (methodological, intellectual, personal and social, and communication-related competencies). Also, the curriculum includes the important transversal component of five broad areas of learning,<sup>7</sup> including environmental awareness. Of course, we think it is regrettable to see that environmental education is reduced here to awareness and is mainly associated with the issue of consumption in the problematic perspective of sustainable development (Sauvé 2017a; Sauvé et al. 2007). Still, the programme would allow for the inclusion of more holistic

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<sup>5</sup>Following Mitchell Tomashow’s (1996) proposal

<sup>6</sup>Elementary programme: [http://www.education.gouv.qc.ca/fileadmin/site\\_web/documents/dpse/formation\\_jeunes/ecr\\_elementary.pdf](http://www.education.gouv.qc.ca/fileadmin/site_web/documents/dpse/formation_jeunes/ecr_elementary.pdf).

Secondary programme: [http://www.education.gouv.qc.ca/fileadmin/site\\_web/documents/dpse/formation\\_jeunes/ecr\\_secondary.pdf](http://www.education.gouv.qc.ca/fileadmin/site_web/documents/dpse/formation_jeunes/ecr_secondary.pdf)

<sup>7</sup>Health and well-being; personal and career planning; media literacy; citizenship and community life; environmental awareness; consumers’ rights and responsibilities: these areas have strong relations between them that can foster significant integration.

environmental education, as a growing number of teachers have already understood: they learned by themselves to re-read the curriculum and interpret it, opening spaces for pedagogical liberty and creativity.

However, in Québec, as elsewhere, there is a lack of teacher education not only in environmental education but more generally concerning transversality and the possible cross-curricular “niches” that would help develop a contemporary education rooted in real life, an education not only designed *for* the children and youths but also *with* them, as full actors of their community and of their learning journey. Teachers’ preservice education programmes include very few elements concerning, for example, project-oriented approaches, field- and place-based pedagogy, or other experiential strategies. Despite the importance of the current socio-ecological issues, very few preservice optional courses or activities are focused on environmental education<sup>8</sup>; its political dimension (ecocitizenship) may easily be forgotten because of its possibly controversial components. Environmental (or socio-ecological) contents have not penetrated mandatory teacher education courses either, such as those focusing on the fundamentals of education, sociology, or philosophy of education, or general and specialised didactics—except through certain windows of opportunity in the fields of science and technology and of moral education. Furthermore, teachers have little or no support in their school context to integrate environmental education contents and activities in their teaching. They rarely have access to in-service professional development activities or programmes in this regard. This situation contributes to the feeling of incompetence they frequently express when facing the integration of an environmental or socio-ecological dimension to their pedagogical practices.

Because of the usual school settings or format, the disciplinary structure of the education programmes, the current culture of evaluation practices, and the lack of appropriate teacher education concerning environmental pedagogy, most school activities integrating an environmental education dimension end up depending on the personal interests and motivation of teachers, and are more easily realised in an after-school context. Fortunately, pioneer school boards now offer some counselling service to accompany such pedagogical initiatives,<sup>9</sup> and, facing the lack of institutional support, teachers unions pursue their programmes to foster and support socio-ecological education in school.<sup>10</sup> But we can easily observe that up to now, environmental education has mostly been developed outside or at the margins of the formal context: a huge expertise has been developed in museums, parks, NGOs, and other non-formal structures that also offer their services to schools. As long as there are resources for such collaborations with different actors of our educational society, these partnerships will remain very important. But, in the current neoliberal context, these types of resources more than ever are becoming scarce.

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<sup>8</sup>For example, <https://etudier.uqam.ca/cours?sigle=DDD3513>

<sup>9</sup>For example, the Montréal school board initiative: <http://csdm.ca/csdm/environnement/ecoles-engagees/>

<sup>10</sup>For example, the Réseau des Écoles Vertes Brundtland de la Centrale des syndicats du Québec: <http://www.evb.lacsq.org/>

#### 4.4 Some Guidelines for Teacher Education<sup>11,12</sup>

Considering the major importance of current socio-ecological issues, the urgent need for a real transition process in our society, the important role of school in fostering a deep cultural change in this regard, and in light of the different specific reasons mentioned in the previous section, the development of teachers' competencies in the field of environmental education needs to be strongly supported. Of course, we must hope and work for the enrichment of school curricula and programmes, and the development of relevant didactic tools and pedagogical materials. However, to stimulate these advances and translate them into concrete practices, teachers must receive adequate education about fundamentals and contents, as well as about appropriate approaches and strategies for environmental education.

A specific professional competency would therefore need to be integrated in initial teacher education curricula: teachers should be able to relate pedagogical situations and students' learnings to the socio-ecological realities of life (in the community, neighbourhood, city, and region and on larger scales), so as to enhance the development of an ecological identity, to foster the construction of a critical vision of the actual and upcoming world, and to increase the capabilities of children and youths in regard to ecocitizen action.

Developing this key action competency in environmental education involves the acquisition and integration of the following learnings<sup>13</sup>: knowledge, know-how, attitudes, and values.

##### **Knowledge: The teacher should be able to ...**

- Acquire and update a general culture concerning the socio-ecological realities of our contemporary world, especially those related to one's own context of educational practice.
- Recognise the diversity of existing visions of the world or cosmologies, of ethical postures, and of cultures that shape our relationship with the environment, in order to develop a critical approach of these frameworks and favour sound and contextually appropriate pedagogical choices.
- Understand the political dimension of our relationship with the environment, in the sense that *political* refers to the act of collectively taking care of our commons (what concerns us all), while engaging in rigorous and democratic debates, and getting involved in our communities, our City.

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<sup>11</sup>This section is inspired from a collective work involving different members of our research centre. Hugue Asselin, Tom Berryman, Carole Marcoux, Jean Robitaille, and I mainly have contributed to reflect on teachers' competency in environmental and ecocitizenship education: [https://centrare.uqam.ca/wp-content/uploads/sites/12/2017/08/Note-conceptuelle-pour-une-Comp%C3%A9tence-%C3%A0-l'enseignement\\_03-05.pdf](https://centrare.uqam.ca/wp-content/uploads/sites/12/2017/08/Note-conceptuelle-pour-une-Comp%C3%A9tence-%C3%A0-l'enseignement_03-05.pdf)

<sup>12</sup>These guidelines afford a convergent view with the guidelines proposed by the ESE-TE group and as first clarified in the *DEEPER* document (Inwood and Jagger 2014).

<sup>13</sup>Of course, the lists presented here are incomplete. The idea is to underline some main avenues that could help design teacher education programmes.



- Characterise the different theoretical and practical currents that have been developed in the field of environmental education, each one translating a specific representation of the environment, of education, and of the relationship between them.
- Identify, in relation to these currents, the many specific or appropriate approaches and strategies for environmental education, so as to foster pedagogical diversity and contextual relevance of didactic choices.

**Know-how: The teacher should be able to ...**

- Identify and take advantage of the diverse possibilities for the integration of environmental education and ecocitizenship-related content and activities as offered by the existing disciplinary programmes.
- Break down the silos of school subjects so as to develop learning projects that have significance for children and youths.
- Experiment and use inter- and trans-disciplinary pedagogical approaches and strategies allowing for the deployment of the transversal dimension of the education programme.
- Promote the frequent and significant experience of nature by children and youths.
- Conceive pedagogical situations that allow for anchoring students' learnings in the realities of their own milieu (considering different complexity levels in accordance with their age); experiment project pedagogy, field- and place-based pedagogy, outdoor education, community work, and other approaches and strategies related to experiential and collaborative learning, to criticality and creativity, and to reflexive action.
- Promote dialogue and knowledge mobilisation, thus recognising and valuing the complementarity of diverse epistemologies.
- Enhance the development of critical thinking, including a critical approach to social realities and to pre-fab moulds for thinking; invite students to develop a rigorous analysis of situations and sound argumentation.
- Analyse and clarify different value systems (including one's own) that underline discourses and practices; accompany students in such a process; stimulate discussions concerning different "world visions", diverse cultures, and value systems that craft human relationships with the environment.
- Stimulate creativity, in relation to an artistic celebration of the living world and also in relation to the development of competencies for ecosocial innovation; foster imagination so as to conceive other ways of relating to our environment.
- Enhance collaborative and cooperative inquiry and learning for a better, critical understanding of socio-ecological realities; contribute to the construction of a collective intelligence—especially citizen intelligence—as applied to socio-ecological questions.
- Promote respectful debate and democratic dynamics in the classroom and in school.
- Encourage students to adopt coherent behaviour—in relation to their explicit values—and to conceive and implement sound action projects.
- Open school towards community, stimulate collaboration, and create partnership.



**Attitudes and values: The teacher should be able to ...**

- Clarify one's own ecological identity, including political identity.
- Clarify one's own posture facing democracy, ecojustice, and pedagogical and social activism.
- Value and sustain ecosocial and pedagogical innovation.
- Adopt a reflexive posture through one's own practice by "Reflecting on the assumptions, values, and ethics that underlie our approaches to environmental teaching and learning [as] an important way of ensuring that we are engaged in an ongoing examination of the foundations that support the work we do as educators" (Inwood and Jagger 2014, p. 55).
- Search for coherence between being, discourse, and action, in light of values of authenticity and integrity, while facing ecosocial realities and pedagogical issues.

In order to develop a global professional competency in environmental education, the following strategies will need to be adopted:

- Integrate in teacher education curricula at least one mandatory specialised course in environmental education, allowing for the exploration of diverse complementary theoretical and practical avenues in this field.
- Infuse an environmental dimension into existing mandatory courses, such as sociology of education, philosophy of education, general pedagogy, specialised didactics, etc.
- Promote internships (practica) in school contexts where interdisciplinary and transversal pedagogical experiences already exist and more specifically in relation to environmental education.
- Prepare future teachers to value and undertake a continuous professional development process (reflexive experience in school context, participation in workshops, online programmes, or other strategies)<sup>14</sup>; enhance their capabilities to work with other members of the school context and our educational society who have acquired or are developing specific competencies in environmental education (parks, museums, NGOs, teachers unions, parents, community members, media, etc.). Co-learning and practice-based communities should be recognised here as key strategies.

Finally, so as to promote teachers' professional development as a coherent continuation of preservice education, there is a need, as mentioned earlier, to offer specific formal environmental education programmes for in-service teachers and also for school pedagogical counsellors, for the different actors of the school system, and for the non-formal organisations who intervene with teachers and students in different aspects of life in school.<sup>15</sup> In such programmes, the experience

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<sup>14</sup> Sauv   et al. (2001) developed a guide for in-service professional development in environmental education for K–12 teachers, based on reflexive experience and co-learning.

<sup>15</sup> At Universit   du Qu  bec    Montr  al, a postgraduate programme is offered since 1996, aiming at professional development in the field of environmental education, for all types of educators, teachers, trainers, animators, communicators, and programme managers: <http://ere.uqam.ca/>

of participants should be critically examined and valued; inspiring initiatives should be celebrated and diffused.

Of course, teachers' environmental education initiatives cannot be dissociated from the process of reframing school curricula, in order to adapt its **fundamentals** and practices to our contemporary reality. This necessary shift calls for a greening of school culture, and for the involvement of its actors. It stands as a hopeful project for teachers, children, and youths, as well as the whole educational community. Environmental education—and its ecocitizenship dimension—can help stimulate pedagogical innovation and meaningful learning. It can counter teachers' isolation, open sharing spaces for educational tasks, and also create links between different actors of our educational society. It can increase the relevance and **effectiveness** of school education.

Such a deep change requires considerable political work with decision-making instances in the educational world. For this purpose, the ESE-TE initiative—Environmental and Sustainability Education in Teacher Education<sup>16</sup>—has brought together colleagues from across Canada. It is also in this perspective that a large coalition for the promotion of an Environmental and Ecocitizenship Education Strategy has been created in Quebec.<sup>17</sup> The ministry of education is called upon first, but also the ministries of environment, natural resources, health, agriculture, municipal affairs, and culture, among others. School is not an island, and education is not limited to formal contexts. It stands as part of a wider project for social education that mobilises our whole society.

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<sup>16</sup> See <http://eseinfacultiesofed.ca/>

<sup>17</sup> See <https://www.coalition-education-environnement-ecocitoyennete.org/>

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# Chapter 5

## Anishinaabe Bimaadiziwin: Living Spiritually with Respect, Relationship, Reciprocity and Responsibility



Nicole Bell

### 5.1 Situating Self

Boozhoo. Zongdekwe n'dizhnikaas. Kitigan Zibi n'doonjibaa. Makwa n'doodem. Greetings. My English name is Nicole Bell. I am Anishinaabe from Kitigan Zibi First Nation and I am from the bear clan. It is important for me to acknowledge my traditional teachers whom I have learned from. We learn from our teachers and then we transmit what we learn on to our students—that is how learning and education happens. So I acknowledge Elder Edna Manitowabi, Elder Vera Martin, Elder Shirley Williams and my father (Joe Bell). There was a time in my life when I said that I was not raised in my culture because although my dad was not taken to residential school, he was one of the Indigenous children taken by the Children's Aid Society and raised in non-Indigenous foster homes. As a result, I was not raised with aspects of my culture like ceremony, language, songs and story. I learned those from Elders and traditional people in my adult life. But my dad did teach me about the land. We were a hunting, gathering and fishing family, and so we were always on the land harvesting food.

I have many wonderful memories: fishing, snaring rabbit, partridge hunting and picking apples, berries, fiddleheads, chokecherries, puffballs, leeks and mushrooms. Picking mushrooms requires particular knowledge and skill because some mushrooms can be dangerous. After a day picking mushrooms, my dad would fry them with onions and serve it with venison/deer steaks or chops. Invariably at the dinner table, my brother, sister or I would ask him, "How do we know these aren't the poison ones?" to which he would answer, "Well, if you wake up in the morning, then I know they weren't poisonous". While his response provided a small degree

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of worry, my siblings and I would find it funny because we had trust in his knowledge. I acknowledge that my love of the land definitely comes from my father.

## 5.2 Sharing a Story

I am the founder of a JK to Grade 12 Anishinaabe culture-based school, the Anishinaabe Bimaadiziwin Cultural Healing and Learning Program, in Burleigh Falls northeast of Peterborough, Ontario. The school evolved from my personal responsibility I have as a parent in ensuring proper schooling for my children, and from the community need for a culture-based educational programme to meet the cultural and academic needs of other Indigenous children. The design of the programme reflects a pooling of the cultural teachings I have received from Elders and from epistemology and pedagogy synthesised from cultural teachings and educational theory and practice received during my teacher education and Master of Education degrees. The curriculum is organised on a medicine wheel framework through which cultural teachings and activities are addressed in the corresponding season on the medicine wheel. Anishinaabe spirituality, worldview and values inform the philosophical foundation of the programme. The Anishinaabe *Seven Original Teachings* are the guiding principles for the way in which individuals are to treat each other within the programme and reflect the values the programme wants to instil in the children:

- Love: capacity for caring and desire for harmony and well-being in interpersonal relationships.
- Honesty: to act with the utmost honesty and integrity in all relationships, recognising the inherent autonomy, dignity and freedom of oneself and others.
- Truth: recognising the interdependence and interrelationships of all life, to relate with one another with generosity, an ethic of sharing and a collective consciousness and cooperation.
- Respect: conscious of the need for kindness and respecting the integrity of oneself and others, to exercise strength of character and self-mastery in order to generate and maintain peace, harmony and well-being within oneself and in the total collective community.
- Bravery: the exercise of courage on the part of the individual so that the quality of life and inherent autonomy of oneself and others can be exercised in an atmosphere of security, peace, dignity and freedom.
- Wisdom: the respect for that quality of knowing and gift of vision in others (and striving for the same within oneself) that encompasses the holistic view, possesses spiritual quality and is expressed in the experiential breadth and depth of life.
- Humility: the recognition of ourselves as a sacred and equal part of Creation, and in the honouring of all of life that is endowed with the same inherent autonomy,

dignity, freedom and equality. This leads to a sensitivity toward others and a desire for good relations and balance with all of life (Bell 2010).

Eight principles of instruction are identified for the programme, which were adopted from Cajete (1999):

- Nurturing environment: learning occurs more readily in a safe, nonthreatening environment.
- Meaningful content: learning is enhanced by content that has personal meaning.
- Choices: given individual learning preferences, choices for approaching learning content enhance individual motivation to learn.
- Adequate time: learning is developmental and unfolds over time.
- Enriched environment: learning is more likely to occur in an environment that is rich in many forms of stimulation.
- Collaboration: human learning can be facilitated through group work and collaboration.
- Immediate feedback: learning is self-reinforcing through immediate feedback, which adjusts learning response until success is achieved.
- Mastery: the true evaluation of learning is the ability to use concepts and skills in real life.

Also adopted from Cajete (1999) are the contexts and methods through which teaching and learning occurs:

- Experiential learning: learning by doing and seeing.
- Storytelling: learning by listening and imagination.
- Ritual/ceremony: learning through participation and initiation.
- Dreaming: learning through the unconscious and imagery.
- Tutoring: learning through apprenticeship and one-on-one support.
- Artistic creation: learning through creative synthesis.
- Holistic learning: learning through spiritual, mental, physical and emotional aspects of being.

The programme also follows the 12 standards as outlined by Hampton (1995):

- Spirituality: respect for spiritual relationships.
- Service: to serve the community given its needs.
- Diversity: respect and honouring of difference.
- Culture: culturally responsive education processes.
- Tradition: a continuance and revitalisation of tradition.
- Respect: personal respect and respect for others.
- History: a well-developed and researched sense for history.
- Relentlessness: honing a sense of tenacity and patience.
- Vitality: instilling a vitality in both process and product.
- Conflict: being able to deal constructively with conflict.
- Place: a well-developed sense for place.
- Transformation: the transformation of Indigenous education.

The creation of the Anishinaabe Bimaadiziwin Cultural Healing and Learning Program involved taking the foundational philosophy of the design and implementing it into the practice of providing education and healing. In essence, it required that medicine wheel teachings and Anishinaabe spirituality, worldview and values be manifested into the reality of programme delivery. This story comes from my days teaching in the classroom at the Anishinaabe Bimaadiziwin Cultural Healing and Learning Program.

I was out on the schoolyard one day and saw two of my little kindergarten girls standing over in the yard by a big pile of topsoil delivered to our school for a medicine wheel garden we planned on planting. Our school was on the Canadian Shield, so we needed a little help getting enough earth for a garden. The girls were just standing by this pile of earth. I wandered around the yard checking in with other kids, and after a while I noticed that the two little girls were still standing by the pile of earth. My teaching instinct turned on, and I thought I better go over there and see what they were doing. So that is what I did. They had their backs to me, and I quietly wandered over to where they were. What I observed was these two little girls standing side by side, facing the pile of earth, with tobacco in their hands. These two little 4- or 5-year-olds had gone into the school, went to the medicine table in the school and had taken some tobacco. Tobacco is one of the four sacred medicines to the Anishinaabe people that is used to offer thanks/gratitude and communicate with the Creator and Creation. The girls had come back out to the pile of earth, with tobacco in hand, and I could hear them giving their thanks to the earth. They were sharing (some would say praying) about how they were wanting to grow a garden and were hoping that they would be able to grow a good garden and thanking the earth for being there so they could do that.

I share this story with you because I think it is our hope as teachers that the teachings we transmit to our students will be actualised into our students' everyday lives and that the learnings we teach extend beyond the classroom. That is my hope, and this story represents for me one of those moments when I saw that transmission happening and when I felt like I was making a difference. This is an example of teachings becoming internalised and then externalised out into our students' life and world.

### 5.3 Situating the Story

This story happened within the context of a culture-based school that was transmitting Anishinaabe worldview. The name of the school, Anishinaabe Bimaadiziwin Cultural Healing and Learning Program, translates as *living a good life*, according to the Anishinaabe people. In this school we believed we were raising up our next generation of Elders. The children would be given the traditional teachings to become the Elders who could do the cultural work needed for cultural, community and nation sustainability. We were teaching a very culturally specific curriculum and knowledge that is different than most other schools. A balanced education

facilitates the development of the whole person by having the student participate more fully toward the harmony in the interconnectedness and interdependence of all entities and to express that harmony in one's relations with them. Medicine wheels are mirrors that serve as systems of meaning, reflecting the essential interconnectedness, harmony and balance among all beings. A medicine wheel culture-based curriculum framework reflecting the four seasons consists of the following four direction teachings:

- Medicines: tobacco, sweetgrass, sage, cedar.
- Doorkeepers: eagle, deer, buffalo, bear.
- Life-givers: earth/food, sun/fire, water/moon, air/wind.
- Relatives: plant, four-legged, finned, winged.
- Aspects of being: spiritual, physical, emotional, mental.
- Relationships: self, family, community, nation (Bell 2010).

The medicine wheel curriculum framework reflecting the four seasons consists of the following seasonal cultural practices:

- Traditions: maple syrup, planting, birchbark, edibles, strawberries, spear fishing, lodge building, hand crafts, hunting, wild rice harvesting, apple picking, tanning, storytelling, outdoor survival, snowshoeing, ice fishing.
- Teachings/stories: creation story, seven ancestors, land of spirits, Nanaboozhoo stories.
- Ceremonies: fasting, feasting, sweat lodge, solstice, powwow, full moon, feast for the dead (Bell 2010).

The bigger picture of the story involving the kindergarten girls, and how it relates to initial teacher education, lies in transformation and self-actualisation.

## 5.4 Spirituality in Environmental Sustainability Education

Transformational and self-actualising education from an Indigenous perspective includes helping students to “find life and realize a completeness in their life” (Cajete 1994, p. 12). Transformation and self-actualisation occur through teaching holistically whereby educators engage all four aspects of who their students are as human beings. That means teaching to students' mental, physical, emotional and spiritual capacities. The two little girls in our story thought about their teachings (mental); they went inside of the school to get tobacco (physical); they felt like they needed to give thanks (emotional); and then from their spirit they offered up prayers of thanks (spiritual). All four aspects were actualised in that little act of what they did.

All education, including environmental sustainability education, must engage all four parts of our beings: our minds, our bodies, our hearts and our spirits. While it may seem easy to envision how we could engage the mind, the heart and the body, it is somewhat more difficult to envision how we could engage the spiritual or the



soul. Talking about spirituality in education can cause tension because some equate it with religion. From an Indigenous perspective, spirituality has nothing to do with religion. Spirituality is about knowing, feeling and acting like we are connected to the natural world. It is a spirit-to-spirit connection, and it is accessible to all people regardless of religion because we all share this same natural world, this one planet. It is not about religion; it is recognising that we only exist but for the life-givers that provide us with everything that we need. The life-givers are the air that we breathe, the water that we drink, the sun that provides light and heat and the earth that provides us with the food that we eat. We all need those things, and that is universal.

Spirituality is also about being humble enough to acknowledge that we are the most insignificant beings on this planet because we cannot live without the life-givers and what is provided for us—yet the life-givers can exist without us, and perhaps the planet might be all the better. The earth does not need us, but we need the earth. This degree of humility creates an understanding that we are the most insignificant of all the creatures on earth. In the Anishinaabe creation story, humans are created last because everything else needed to be on earth first. Even the plants and animals had to exist so that we would have something to eat. Coming last in the order of creation tells us how insignificant we really are in the whole scheme of creation, and this is a spiritual realisation that is manifested in many different ways by Indigenous people.

## **5.5 The 4Rs: Respect, Relationship, Reciprocity and Responsibility**

The spiritual connection can be actualised through the four Rs: respect, relationship, reciprocity, and responsibility. Respect, or re-spect, asks us to “look again”. By using our gift of vision, we can really see what is happening. It is no accident that Indigenous peoples have exceptional observational skills. They always had to know how everything in the natural world worked because their lives absolutely depended on it; their survival depended on that knowing. The gift of vision and being able to see creates awareness, including becoming aware of our surroundings and what is going on in our world. An identity in relation to the natural world is then created. We see ourselves in connection to creation, which in turn creates a value system that we walk through life with. In this identity and value system, there is a strong sense of belonging to a place and this results in the feeling of rootedness to a place. Indigenous people are deeply rooted to their places.

This value system can then be actualised through our relationships, with other human beings for example, but also in how we interact with the world around us that sustains us. Relating in this way realises the interconnections that exist among all things, including our kinship to the natural world. Anishinaabe people acknowledge their relatives by referring to the earth as mother, the sky as father, the sun as grandfather and the moon as grandmother. The plants and animals are acknowledged as

elder brothers and sisters. The family of creation is acknowledged, and Indigenous people see themselves in relation to creation, which is manifested in ceremony by stating “n’kaniganaa”—all my relations.

This relationship must also be balanced. Balance is a foundational principle in Indigenous worldview as it creates harmony. Balance is maintained by ensuring there is reciprocity by giving back, ensuring there is give and take. Part of giving back includes giving thanks and recognising that when we harm one thing in the natural world, we are harming ourselves. If we poison the water, we know that we are harming the health of the water and all that inhabit it, but we are also harming ourselves because we need to drink that water.

Responsibility then requires us to respond with our abilities—response ability. Anishinaabe teachings share that we are all born with certain gifts and we develop these gifts throughout our lifetime. We therefore have a responsibility to use these gifts for the goodness of all. Responsibility calls us to do, to behave and to act using our gifts. The hope is that this acting and doing and behaving become a way of life; that it is just part of who we are and how we are to live in the world. With responsibility comes an eye to the future. A strong sense of vision is extended into responsibility when we always look far ahead into the future. Anishinaabe teachings, and indeed many other Indigenous teachings, speak to a *seven-generation principle* which means when we want to act today, we look seven generations ahead and see what kind of an impact that is going to have. This practice brings insight into the decisions that we make now.

## 5.6 Returning to the Story

To live life in a spiritual way is to live respectfully in reciprocal relationships that result in taking responsibility. Reflecting back to the story of my two little kindergarten girls, they had respect for the natural world. They felt in relationship with it. They were being reciprocal by giving back and by giving thanks with the tobacco they were holding in their hands. They were responding and being responsible because they went into the school on their own accord and did this. My hope is that they will take what they have learned and walk with it throughout their lives.

## 5.7 Spirituality in Teacher Education

I now work with teacher candidates and try to employ the same pedagogy as I did when I taught small children. I offer a 12-day on-the-land experience at my home titled Learning From the Land and Indigenous People. The worldview of Indigenous people is a direct reflection of the natural world, and since there is a global/universal need for all students to learn about the state of the planet, I have provided a land-based learning experience since 2007 to serve the dual purpose of learning about

Indigenous people while instilling an ecological consciousness in teacher candidates and ultimately their future students. Teacher candidates spend 75 hours with me on the land and water in my community of Burleigh Falls and Lovesick Lake in the Kawartha Lakes in Ontario, and where the Canadian Shield begins. The placement assists teacher candidates to teach to and about Indigenous people while instilling an environmental consciousness in their future students. These objectives assist teacher candidates in implementing the *Ontario First Nation, Métis, and Inuit Education Policy Framework* (Ontario Ministry of Education [OME] 2007), and *Acting Today, Shaping Tomorrow: A Policy Framework for Environmental Education in Ontario Schools* (OME 2009).

Through experiential land-based and culture-based activities, teacher candidates identify connections that are made on multiple levels: with their sense of self, with the environment, within the learning group, with their teaching practice and with the Indigenous culture. Their experience is summed up by this student:

I came away with a better understanding of Anishinaabe culture as well as a new yet familiar approach to teaching and learning. This was a rich experience—a lot was accomplished in a short time. I feel full of possibility with respect to future teaching. I also feel connected with local Anishinaabe culture and the land. I now have new skills so that I can teach about Anishinaabe and First Nations peoples to my classes in a respectful and engaging way. I feel that I am also better prepared to teach Indigenous students.

In the Learning From the Land and Indigenous People alternative settings placement, teacher candidates have the opportunity to learn about Indigenous people through the land and to move through the 4Rs. I engage them spiritually with a hope that they will teach to their students' spirits, resulting in spiritual connections to creation. I encourage teacher education programmes across Canada to consider how they can instil and foster spiritual connections with the environment in teacher education through respect, relationship, reciprocity and responsibility.

N'kaniganaa.

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# Chapter 6

## Place Matters in Teacher Education



**Dianne M. Miller and Barbara Mills Wotherspoon**

We ask the reader to take a moment to think about a place that was important to you as a child. What was it like? Was it indoors or outdoors? What did you hear or smell? What colours did you see? What was your felt sense of that place? And how has your sense of that place changed over the course of your lifetime?

### 6.1 Hopes for a Pedagogy Based in Place

When preservice teachers in a recent offering of a compulsory core course titled “Pedagogies of Place” (PoP) were asked to draw a special place from their own childhood, they mostly drew pictures of places with specific memories of family, friends or teammates, frequently in the outdoors—a cabin by the lake, a path in the forest or an ice hockey arena. No one drew a school. While schools are the places that children and youths spend the majority of their time, they do not (if this post-secondary class is any indication) become the places that engage the senses, emotions, relational needs and aesthetic sensibilities to become enduring memories of connection with what one finds meaningful in life. As instructors of PoP in a preservice teacher education (PTE) programme, we work to broaden preservice teachers’ understanding of teaching and learning, the places where they happen and the “best place” to learn (Archibald 2002). We work to help preservice teachers see the places where they teach as pedagogical (Gruenewald 2003a) and to understand that most curricular outcomes can be achieved through engaging students in authentic tasks and civic issues in their communities (Smith 2002; Smith and Sobel 2010). At a

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deeper level, we hope for an ontological shift, for preservice teachers to have an embodied experience of their inseparability from the land and the ongoing processes of generation, disintegration and regeneration that characterise the earth's creative processes. We hope for them to undergo the kind of transformative learning described by O'Sullivan (2002):

Transformative learning involves experiencing a deep structural shift in the basic premises of our thoughts, feelings and action. It is a shift of consciousness that dramatically and permanently alters our way of being in the world. Such a shift involves an understanding of ourselves and our self-locations, our relations with other humans and with the natural world; an understanding of the relations of power in the interlocking structures of class, race and gender; our body awareness; our visions of alternative approaches to living and our sense of possibilities for social justice and peace and personal joy. (p. 11)

We work to build relations of respect for the land, to move understanding from the anthropocentric "I am, therefore place is" to "Land is; therefore, we are" (Bang et al. 2014, p. 45).

## 6.2 Authors' Standpoint

Dianne Miller: I began to teach PoP late in my career as a teacher educator. In fact, I had never heard of Place-based Education (PBE), the tradition on which PoP is based, until the PTE programme where I work began a curricular renewal process several years ago. I was quickly won over by the close alignment to the progressive pedagogies (Dewey 1938; Neill 1960) and the open classroom movement (Cuban 2017) that had excited me as a preservice teacher in the 1970s. As well, I view PBE as compatible with anti-oppressive education (Kumashiro 2000), and potentially with Indigenous ways of teaching and learning. As an educator with a White settler identity, I seek pedagogies that work to unsettle relations of dominance and the taken-for-granted assumptions of White superiority that I and other well-meaning educators are often complicit in perpetuating. I also want to challenge the Western worldview that elevates humans over other species and treats the earth's resources as if they were exclusively for human use and disposal.

Barbara Mills Wotherspoon: My experience of PBE began as a very personal journey when I pursued a doctorate that focused on theoretical and practical connections to place. My "place" was and is a tiny cabin set on the shores of a small lake situated in the middle of a beautiful Northern forest. Over a period of 5 years, I studied the connections that humans have to the land through four theoretical lenses: evolutionary science, quantum theory, Indigenous wisdom and contemplative practice (Mills Wotherspoon 2014). At the same time, I immersed myself in forging experiential holistic connections with the species that co-inhabited the place of my learning. My goal was to come to an understanding of the idea that humans must undergo a radical shift of consciousness in order to come to the realisation that the "universe is a communion of subjects, rather than a collection of objects" (Swimme and Berry 1992, p. 243). The result was a shift in consciousness, not in ways that I

had expected but in ways that convinced me that I must do everything in my capacity as an educator to encourage the students whom I teach to make their own connections to the land. For me, the opportunity to teach PoP provided a vehicle by which this process could begin.

### 6.3 PBE, Environmental Sustainability and Teacher Education

In this chapter we argue for a strong emphasis on PBE within PTE as a means to connect teachers and students to their communities, promote environmental sustainability and civic engagement, disrupt White settler identities, align with Indigenous ways of teaching and learning and develop capacities for lifelong learning. While such an ambitious project is beyond the scope of a class encompassing 39 contact hours, we turn to the theoretical underpinnings, conceptual foundations and practicalities of the core PoP course as offering a framework to build a PTE programme that would move public education and the nation towards environmental sustainability. Social and ecological justice are intricately connected, and efforts to avert the current environmental crisis must also address power relations that systematically advantage the few relative to the many and deny access to the resources needed to live well for large groups of people (e.g. Furman and Gruenewald 2004). As Foster (2013) points out, “The struggles for human equality and for the earth are becoming one. There is only one future: that of sustainable human development” (p. 50). We believe that working towards that future should be the number one priority of schools and PTE programmes; yet the earth’s continuance as a viable planet for humans is not high on the agenda of public education and PTE (Bieler and McKenzie 2016; Chopin et al. 2017).

While PBE has the ontological, epistemological and pedagogical elasticity to address issues of environmental sustainability, it has gained little purchase in PTE programmes to date. While PBE literature gives direction to what *should* happen in PTE programmes, very few sources document what *does* happen (Greenwood 2010). In fact, the very elasticity of PBE contributes to its obscurity, as PBE proponents have pointed out. Better-known pedagogies such as community education, service learning, outdoor education, adventure education, problem-based learning and other forms of experiential education may all incorporate elements of PBE without necessarily drawing on the specific tradition emanating from rural and environmental education (Furman and Gruenewald 2004; Gruenewald 2003a; Smith and Sobel 2010). Here we offer a condensed trajectory of PBE, and review selected critical conceptions of place from the literature, before describing the specific framework of PoP and its potential to promote environmental sustainability and combat environmental degradation in meaningful ways. We review the features of effective PTE programmes and comment on the challenges of a more general integration of PBE in PTE.

## 6.4 The General Trajectory of PBE

Theobald (1997) elaborated an understanding of the revitalisation of rural America as dependent on a shift in education from individual development to the realisation of interdependence and the promotion of shared values through place consciousness: “Intrdependence speaks of dependence within a place, dependence on the good will and wisdom of people with whom the land is shared” (p. 15). Theobald outlined the potential of schools to cultivate active citizenship through concerted attention to place in curriculum and pedagogy.

While rural revitalisation has waned as a focus of PBE literature, connecting students to their communities remains a strong theme. Smith (2002) brought the discourse of PBE from largely outdoor and environmental education arenas to a wider audience in education with his plain-language article in a mainstream education journal in which he outlined a broad multidisciplinary base for PBE: cultural studies, nature studies, real-world problem solving, internships and entrepreneurial opportunities and induction into community processes. He argued for a permeable relationship between the school and the community, and promoted a view of curriculum contextualised within the local community as opposed to schooling’s staple fare of decontextualised subject-matter knowledge. In a more recent text directed towards teachers, Smith and Sobel (2010) describe PBE as the liminal space where the local community “provides the context for learning, student work focuses on community needs and interests, and community members serve as resources and partners in every aspect of teaching and learning” (p. 23).

The articulation of PBE to environmental and sustainability education (ESE) initially focused on fostering an attachment among children to the natural world, and inquiry-based action projects to improve their communities. Sobel’s (1996) phrase “If we want children to flourish, to become truly empowered, then let us allow them to love the earth before we ask them to save it” (p. 39) is often repeated throughout the literature. The statement turns on the assumption that strong attachments to the land formed in childhood will instil a lifelong ethic of care and stewardship. This sentiment is often articulated alongside a concern that children are no longer spending much time outdoors forging that connection to the natural world (e.g. Louv 2008). Practitioner-focused magazines (e.g. *Green Teacher*, *Of Land and Living Skies*) and websites (e.g. Center for Place-Based Education 2019; Evergreen 2019; Getting Smart n.d.) are replete with examples of inquiry-based action projects to improve communities, and evaluations of PBE (e.g. Bishop 2004; Powers 2004; Skoutajan 2012; Smith and Sobel 2010; Sobel 2004) concur that such projects heighten student engagement and achievement and “improve environmental, social, and economic vitality” (Place-based Education Evaluation Collaborative [PEEC] 2010, para. 5).



### 6.4.1 *Critical Understandings of PBE*

The socioecological aspects of PBE and its global import continue to be theorised. Gruenewald's (2003b) synthesis of critical pedagogy with PBE to produce a "critical pedagogy of place" (p. 3) directly addresses the ecological crisis and calls for a transformation of education that aligns cultural practices with self-sustaining natural systems:

A critical pedagogy of place aims to (a) identify, recover, and create material spaces and places that teach us how to live well in our total environments (reinhabitation); and (b) identify and change ways of thinking that injure and exploit other people and places (decolonization). (p. 9)

Gruenewald's (2003b) articulation of the twin goals of reinhabitation and decolonisation has been influential in furthering an analysis of the pedagogical possibilities of place (Greenwood 2008; Gruenewald and Smith 2008; Scully 2012).

Indigenous analyses of education and recent theoretical turns in social science research have sharpened and extended understandings of teaching and research from place (McCoy et al. 2016). While PBE directs attention to the local as the starting place for inquiry, Calderon (2014) insists that it must begin with decolonising the local, particularly making visible the dynamics of settler colonialism which has, and continues, to justify land theft and genocide of Indigenous peoples (Tuck and McKenzie 2015), and perpetuate myths of Indigenous peoples as static, "ecological" (Friedel 2011, p. 534), unable to modernise and unfit to govern their lands (Razack 2015). PBE theorists are now grappling with the realisation that "alternative, long-held, comprehensive and theoretically sophisticated understandings of place exist outside, alongside, against, and within the domain of the Western philosophical tradition" (Tuck and McKenzie 2015, p. 11). Indigenous understandings of place, often framed in terms of relation with the land, arise from cosmologies, cosmogonies, epistemologies and ethical beliefs that Western-trained educators are only beginning to grasp. In her blunt assessment that Indigenous education must look and feel different from Eurocentric approaches, Kirkness's (1998) description of precolonial Indigenous education points to the pedagogical implications of these understandings:

It was an education in which the community and the natural environment were the classroom and the land was regarded as the mother of the people. Members of the community were the teachers, and each adult was responsible for ensuring that each child learned how to live a good life. Central to the teaching was the belief in the sacred, the Great Spirit. (p. 10)

As an alternative to Western ideas of PBE, Calderon (2014) elaborates a model of land-based education that presupposes that "all places were once Indigenous lands and continue to be" (p. 27). Working through what that means in practice is critically important to the development of PTE programmes that work to ensure an environmentally sustainable future. Fundamental to this work is consideration of how colonial practices shaped and continue to shape the land where we live, how it is used and ideas about who "owns" the land and who belongs on it: "Without such



exercises in decolonization, it is impossible to achieve goals of sustainability and the wedded notion of a community building that rejects anthropocentric and Eurocentric understandings of land and citizenship” (Calderon 2014, p. 28).

### 6.5 Framework for PoP Course

The specific course we teach is informed by two models of education conceptualised as concentric circles, in which the centre circle is designed to permeate educational endeavours throughout the entire circle. The first (Fig. 6.1) draws from, and adapts, a model developed within a professional development programme at the University of Saskatchewan that among other things sought to assist faculty to use “decolonizing pedagogies and the inclusion of Indigenous knowledge and ways of knowing in curricula and assessment” (Indigenous Voices n.d., para. 2).

“Shared ground” shown at the centre of Fig. 6.1 directs attention to the physical land on which humans live and relationships with plants, animals, rocks, water and air associated with the land. Also, the concept of shared ground makes indigeneity central and indicates the reciprocal responsibilities and practices through which Indigenous and non-Indigenous peoples can build respectful relationship. Moving

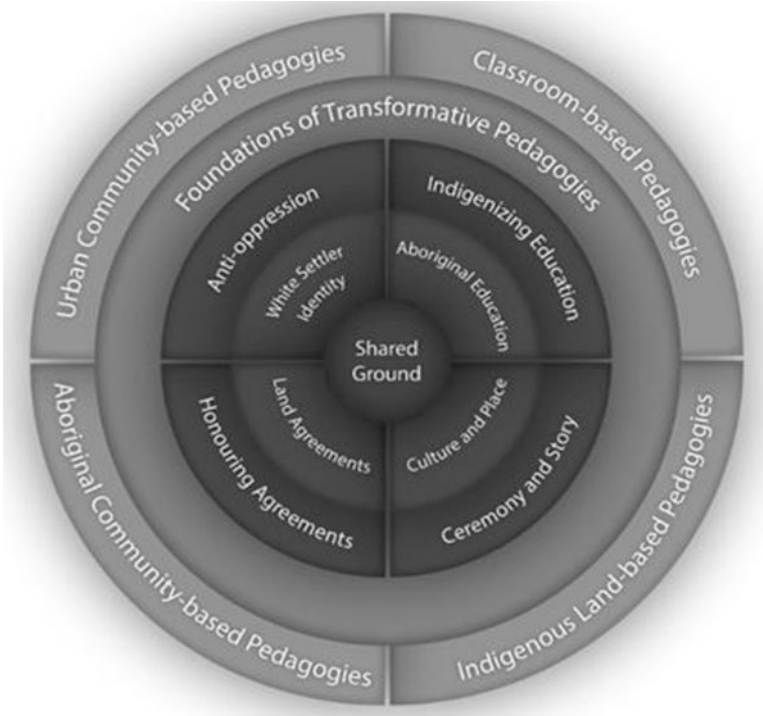


Fig. 6.1 Indigenous Voices, University of Saskatchewan

outwards in the ever-widening circles are the concepts and pedagogies necessary to “ground” one’s relationship to place and to fulfil ethical responsibilities in sharing the land. Of particular note is the work of anti-oppressive education in disrupting White settler identity, or what Calderon (2014) refers to as settler colonialism. According to St. Denis (2007), two streams of thought inform Indigenous Education. One is concerned with addressing White privilege and White supremacy through anti-oppressive education and the critique of ongoing colonial structures and practices; the other is concerned with affirmation of Indigenous knowledges, world-views, languages and cultures. Anti-oppressive education is critical for preservice teachers to make visible how they are positioned on land, and in relation to the Othered and the other-than-human, to reveal how relations of dominance are forged and maintained and to acquire appreciation of the violence it takes to maintain the status quo. Formal education may serve as an instrument of that violence or as a means of emancipation. From an Education for Environmental Sustainability (ESE) standpoint, some of the same mechanisms that hold dominant social relations in place—private property, meritocracy and notions of human superiority over other species (and some humans over others)—contribute to the destruction of the land.

The second model (Fig. 6.2) informing the course is a representation of the conceptual foundations of the provincial curriculum, in which the Broad Areas of

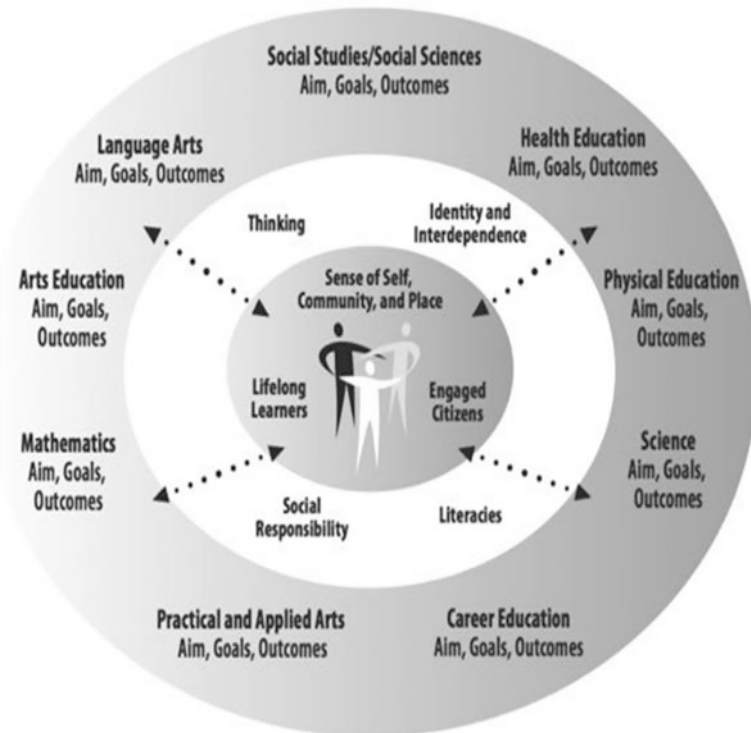


Fig. 6.2 Conceptual Foundations of Curriculum, Saskatchewan Ministry of Education

Learning at the centre permeate the cross-curricular competencies and the aims and goals of individual subject areas (Saskatchewan Ministry of Education 2010, p. 7).

From a curricular standpoint, preservice teachers need to comprehend what it means to explore one's sense of self in relation to community and place. Within this context, the concept of "self" is understood to mean an interdependent or intradependent part of a greater community in which each part is considered a subject that is essential to the whole (Berry 1999). Such an understanding challenges the individualistic perspective of the self as separate and disconnected from the ecosystem in which one lives, and it calls for connection to both human and other-than-human inhabitants of one's community. It also encourages preservice teachers to reflect critically on ways in which "place" has shaped and continues to shape their perspectives—in terms of ancestry, language, connection to the land, livelihoods, culture, mobilities, dominant ideologies and history. As Calderon (2014) insists, for students to understand themselves within the context of place "means not only understanding themselves in the present and future of place, but also the past and how all three shape who they are today and where they dwell" (p. 28). Moving outwards, this comprehension permeates the cross-curricular competencies and the goals of the individual subject areas, providing preservice teachers with the foundation to practise critical, contextual and creative thinking; to appreciate the difference between independence and interdependence; to consider the many forms literacies take, including the ecological (Orr 1992); and to explore the social political responsibility that the teaching profession requires.

The mandate of "engaged citizenship" requires preservice teachers to reflect on and develop their social, ecological and moral responsibilities as potential leaders inside and outside of the classroom. Preservice teachers cannot hope to inspire their students to develop connections to their communities and the broader world without experiencing such connections themselves. The seeds for continued engagement are planted when they are given experiential opportunities to participate in community initiatives, are able to meet face-to-face with teachers and community leaders who are active in social and ecological justice and begin to understand their capacity for making a positive difference in the community. When preservice teachers have the opportunity to plan collaboratively and facilitate such learning opportunities in their field and early career experiences, these seeds are more likely to germinate and grow.

The concept of "lifelong learning" recognises that learning is a process that continues long after one leaves school. It is relevant learning that requires the acknowledgement of many ways of knowing. It recognises community members as valid educators; it challenges product-oriented and standardised pedagogy; it encourages cross-curricular endeavours; and it fosters holistic education as exemplified by the First Nations, Métis, and Inuit (FNMI) holistic lifelong learning models (Canadian Council on Learning & Aboriginal Education Research Centre 2007a, b, c). As learners and as future educators, preservice teachers must have opportunities to explore participatory, process-oriented and relevant pedagogy in order that they might develop learning opportunities which facilitate many ways of knowing, learning and assessing.

As instructors, we acknowledge that a class of 39 contact hours is limited in terms of the opportunities it can provide towards inciting the ontological shift we have described. We realise that when preservice teachers enter teaching positions of their own, they likely will be faced with large classes, small budgets and administrative regulations that will restrict what they are able to do with their students. For that reason, we are continuously working to foster practical, low-cost, local experiences that engage preservice teachers and encourage them to develop their own agency in making positive change within the structures they find themselves. Drawing on approaches to ESE within PBE (connection/attachment, anti-oppressive education and inquiry-action projects), we offer some examples of the learning experiences that preservice teachers have found beneficial. We do not mean to suggest that these approaches are discrete; ideally they are dynamic and fluid, informing and supporting one another.

### ***6.5.1 Examples from PoP Practice***

To create connections and form attachment to the land, the One Square Metre (OSM) project is adapted from Roper's (2007), Plotkin's (2003) and Abram's (1996) connections to the land practices. This exercise requires preservice teachers to find a "place" on the land of the university grounds and spend a minimum of 15 minutes per week in their place over the course of an entire term. There is no expectation that they "do" anything or produce anything during this time; they are asked only to be silent and respectful. In a weekly reflective journal, students consistently refer to this time as one of the most meaningful in the class. Some have focused on changes, and compared the changes in their place with the changes in their lives. Some have focused on healing from grief at the loss of a parent, a child or a partner. Some have simply expressed gratitude at the opportunity to regain a sense of balance or perspective in their busy lives. Some get very little out of the exercise, but most feedback is positive. It is a meaningful learning opportunity that costs nothing, can be done in any schoolyard and is unique to each participant. In casual meetings with former students long after graduation, they often express that time in a special "place" on the land is one connection they continue to foster in their own lives and in the lives of their students.

The anti-oppressive education featured in the course also begins on the land and with consideration of one's relationship to place. This beginning might take the form of conversations in dyads about the history of members' names and the story of how their family came to live where they do. These conversations might extend into walks throughout the campus and the adjoining city, with attention directed to whose history is visible, how is it commemorated and who is included and excluded in such remembrances. Some groups of students might conduct research into the city's history and how Indigenous peoples were affected by colonial settlement historically and how that history reaches into the present. Some groups study the treaties pertinent to this area and may choose to participate in "treaty walks" as modelled

by teacher Sheena Koops (2012) who has blogged about her active inquiry into treaty for almost 7 years. Such meditative walks are aimed to encourage reflection on what the oft-cited statement “We are all treaty people” (Office of the Treaty Commissioner 2008) means in practice for non-Indigenous peoples in terms of divesting privilege and protecting the land. Some groups consider their current-day urban footprint and investigate how electricity is generated, water is provisioned and wastewater is treated locally as well as how these processes affect different groups of people and the environment. Some groups study the remnant natural grasslands and the effects of invasive species on the land. Some groups consider the ongoing colonial project (Razack 2015) and the violence it engenders in terms of the over-representation of Indigenous youth in gangs and the criminal courts. Some groups of preservice teachers, for example, have the opportunity to meet with and learn from former gang members, to hear what led them into gangs and to consider what contributes to their healing (see STR8 UP 2018). In all of these varied practices, preservice teachers are encouraged to consider how place shapes their identities and how their involvement in education can work to either reproduce the status quo or open possibilities to work towards social and ecological justice.

Preservice teachers have opportunities to visit local school programmes where diverse expressions of PBE and curricular integration are practised. They are required to design and facilitate a collaborative, cross-curricular, action-based inquiry project with a focus on PBE. One such initiative that was very popular with preservice teachers was a bat project that involved the whole class. It began with a nature walk led by a local biologist who spoke about various plants, insects and animals that are essential to the local ecosystem. He discussed the endangerment that several species of bats face from disease and pesticide use. Journal entries indicated that a large number of students were interested in bats, and in an ensuing discussion, the class decided that all of their inquiry projects would focus on bats. Preservice teachers took leadership in inviting bat experts and actual bats (Batrix and Elizabat) into the class, and they approached the university’s Office of Sustainability for a small grant. With the money, one student purchased and delivered the materials, and the entire class built and painted bat boxes, which they donated to several places throughout the city to provide safe habitat for bats (Canadian Wildlife Federation 2019). Each collaborative group then used the experience to create an inquiry-based action project that they could use in their own teaching practice. It became an experience in which preservice teachers developed agency in planning, organising and funding a project that fostered ecological justice and a connection to place.

## 6.6 Bringing PBE into Teacher Education

If one accepts that continually evolving PBE can create the conditions to foster teachers’ and students’ connections to their communities, promote environmental sustainability and civic engagement, disrupt White settler identities, align with

Indigenous ways of teaching and learning and develop capacities for lifelong learning, then the question becomes how should PTE programmes be structured? If ESE is to be prioritised along the lines suggested here—connection and attachment to the land, decolonising and anti-oppressive pedagogies and inquiry-action approaches—then what is required in the organisation and structure of PTE?

A review of the literature on PTE indicates that the most effective programmes demonstrate organisational coherence, a strong relationship between theory and practice and promotion of self-study (Webber and Miller 2016). When preservice teachers encounter consistent ideas across their courses and field experiences, they are more likely to internalise these ideas and develop teacher identities consistent with them. While this statement holds true for either progressive or technical-rational forms of thought and practice, the important point here is that PTE programmes are not neutral spaces. The development of teachers with a concern for and competence in teaching for environmental sustainability requires a consistent design and enactment across courses and field experiences. If we want teachers who can connect students to their communities, then PTE programmes must model partnerships with community organisations and integrate academic, practitioner and community-based knowledge. Without a strong relationship between theoretical knowledge and practical experiences in the field, theory tends to be abandoned as the preservice teacher is enculturated into the normative practices of the school, especially if these practices differ substantially from those advocated in their PTE programme (Webber and Miller 2016). The burgeoning literature on self-study in relation to teaching emphasises and gives direction to the processes of critical reflection into one's practice over time. Self-study is generally framed as a cycle of inquiry, reflection and action whereby the teacher constantly brings to mind and makes visible the assumptions that underpin his/her practice and its effects (Loughran et al. 2004; Pithouse et al. 2009).

### ***6.6.1 Challenges of Implementation***

The PoP course we teach was first developed in the context of PTE programme renewal. It was conceptualised by a cross-departmental team as a foundational curriculum course that would model interdisciplinary, integrated and inquiry-based approaches to meeting curricular outcomes in authentic projects connected to the community. It is designed to raise questions about how people are connected to and shaped by their contexts in natural and built worlds and deeper questions about identity, knowledge and relationships. Within the renewed programme, subject-matter methodology courses were to be delivered in integrated contexts (e.g. English Language Arts with Math), where preservice teachers would be directed to consider four curricular commonplaces: learners, teachers, subject matter and milieu (Schwab 1969/1978). Milieu is understood to extend beyond the classroom to include rural and urban land-based settings, community-based institutions and virtual technologies as initially modelled in the PoP course. Framed within critical understandings

of place that emphasise decolonisation, anti-oppressive education and respect for Indigenous ways of knowing and learning, the course would make manifest an approach to teaching and learning that was meant to spiral throughout the entire programme.

Before the renewed programme could be fully implemented, administrative changes and shifts in institutional priorities refocused the PTE programme on traditional subject-matter methodologies, outcomes and competency-based training in alignment with provincial certification requirements. We recognise that teacher educators are themselves educated in discipline-specific knowledge and subject-matter methodologies and may lack the competence and/or the confidence to attempt integrated and inquiry-based approaches to teaching and learning. While PoP is still a core course, its connection to the rest of the programme is tenuous and its necessity and value frequently called into question. We wonder if preservice teachers see the concepts, ideas and practices of the course as integral to their programmes, if they see them modelled in the field or in their other classes and if they see this learning as fundamental to, or as a distraction from, the “real work” of teaching. While some preservice teachers express the view that the course is transformative, others view it as a “bunch of field trips”, with little relevance for their practice. The lack to date of a broad-based evaluation of the current curricula that a systematic programme review would provide makes it difficult to assess the effectiveness of the current programme or the transformative outcomes intended in this particular course.

### ***6.6.2 To Lead or to Follow?***

The current climate of educational reform is problematic for the widespread implementation of PBE, despite its demonstrated success in other jurisdictions in achieving or exceeding state-mandated standards (e.g. Demarest 2015; PEEC 2010). Costigan (2014) points out that:

educational reform is the ocean in which all educators and education researchers now swim, and it is generally agreed that this is a neoliberal, depersonalised, corporate-type of thinking applied to education, with all the apparatus of measuring, preoccupation with a numbers-based audit culture, and maintaining accountability through sanctions. (p. 4)

While the foundational concepts of the Saskatchewan curriculum are very consistent with PBE as we have shown, the province’s corporate-style sector planning and austerity budgets hobble school divisions’ capacity to deliver services let alone innovate (Saskatchewan Teachers’ Federation 2014, 2017). PBE is not a current priority in provincial education.

Nevertheless, we are encouraged by the innovation of teachers and administrators who have initiated projects and programmes in K–12 schools that take up varied aspects of PBE, including ones that heed the call for a new paradigm in environmental education that follows a path of reconciliation with Indigenous peo-



ples (Korteweg and Russell 2012; McLean 2013). The Greater Saskatoon Catholic School Division's Grade 8 EcoJustice programme engages its students in a land-based ecojustice approach that analyses both the destruction caused by a Western consumer culture as well as how people can and do resist these colonising forces (EcoJustice 2011). Activities and programmes such as EcoJustice are for the most part driven by individual teachers' vision, passion, persistence, negotiation and collaboration within and beyond formal school structures. They offer teacher educators important considerations for a broader implementation of PBE (Miller and Twum 2017). The question remains as to whether TE programmes will take leadership in developing a broad momentum for PBE and its potential to address the most pressing issue of our time—environmental sustainability. As Teresa Cooley (2017), Executive Director of the Seattle-based Center for Courage & Renewal, reminds us: “There is no outrunning the power of nature. We can only respond. And that response is everything. It requires the deepest kind of courage we can summon” (para. 2).

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**Part II**  
**Environmental and Sustainability Teacher**  
**Education Programs**

# Chapter 7

## Preservice Teacher Environmental Education Capacities: What Is the Role of Ontario's Faculties of Education?



**Douglas D. Karrow, Maurice DiGiuseppe, Paul Elliott, Xavier Fazio, and Hilary Inwood**

During the United Nations Decade of Education for Sustainable Development 2005–2014, the United Nations Educational, Scientific and Cultural Organization (UNESCO 2010) called for a reorientation of teacher education to address sustainability (McKeown and Hopkins 2005). According to UNESCO (2012):

Sustainability is a paradigm for thinking about a future in which environmental, social and economic considerations are balanced in the pursuit of development and an improved quality of life. These three spheres—society, environment and economy—are intertwined. (p. 4)

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The Ontario Ministry of Education (the “Ministry”) responded to the Decade with an environmental education<sup>1</sup> (EE) policy framework, *Acting Today, Shaping Tomorrow* (Ministry 2009), that called for faculties of education to help prepare K–12 teachers for EE. The Ontario College of Teachers (the “College”) also recognised the role faculties of education play in preparing preservice teachers (PTs) to teach the Ontario curriculum, including EE. The theme of the Canadian Association for Teacher Education’s (CATE) 2015 working conference, *What Should Canada’s Teachers Know? Teacher Capacities: Knowledge, Beliefs, and Skills* (Hirschhorn and Mueller 2016), provided an opportunity for us to revisit issues related to these developments.

This chapter attempts to address three pertinent questions: (a) What PT-EE capacities should teacher education programmes instill in initial teachers? (b) How are these PT-EE capacities identified and cultivated within such programmes? (c) How do these capacities, developed by teachers during and after their teacher education programme, potentially impact such programmes? The chapter comprises four parts: (a) an argument for the necessity of PT-EE capacities; (b) a model for describing and understanding PT-EE capacities; (c) an examination of how PT-EE capacities are identified and cultivated, and how they potentially impact teacher education programmes; and (d) a discussion of next steps.

## 7.1 The Necessity of PT-EE Capacities

This section underscores the necessity for enhancing PT-EE capacities in Ontario faculties of education, thereby setting the stage for an examination of the three questions discussed in the introduction. We describe “PT-EE capacity” in general terms, arguing for its requirement in PT education by (a) re-emphasising the current predicament of Earth; (b) appealing to education as a social instrument to achieve sustainability reform; and (c) asserting the ethical responsibility of faculties of education to prepare PTs to provide effective EE within K–12 schools. In making this argument, we wish to clarify and assert the leadership role we play, as teacher educators, in enhancing PT-EE capacity within Ontario’s faculties of education.

Before presenting our argument, it is important to understand the relationship among faculties of education and other elements that influence Ontario’s K–12 school system. In Ontario, PTs are granted a bachelor of education degree and an Ontario Teacher Certificate upon successful completion of a university-based, College-accredited PT education programme. Thus, the College certifies PTs to teach in the province’s K–12 schools in two of three grade divisions, namely, primary–junior (K–Grade 6), junior–intermediate (Grades 7–10) or intermediate–

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<sup>1</sup>We use the term *environmental education* (and its acronym EE) in this chapter because it is most commonly used by the Ministry (2009). We understand, however, that a variety of terms and expressions may be used in other contexts (e.g. sustainability education, environmental and sustainability education, education for sustainable development and education for sustainability).

senior (IS; Grades 7–12). Furthermore, the Ministry creates curriculum for all K–12 subject areas, and the Ministry of Advanced Education and Skills Development (formerly the Ontario Ministry of Training, Colleges, and Universities) accredits all college and university programmes, including PT preparation programmes with the province’s faculties of education. The complex jurisdictional mixture makes it very difficult for groups and individuals to effect significant change in university PT education programmes and K–12 education.

## 7.2 Arguing for the Necessity of PT-EE Capacity

How lucky we are to live on a planet that continues to support life—bursting with a bewildering diversity of life forms that feed, clothe, cure, inspire and provide us with clean air and water, keep us company and maintain the stable ecosystems in which we can live. Yet, in a few brief centuries, we have normalised a way of living that poses a threat to all life on Earth. An education system devoid of EE not only is a product of this broken model of existence but also may help perpetuate it (McKeown and Hopkins 2005). Since 2009, the Ministry has legislated EE in Ontario’s K–12 schools, requiring, by law, that all of Ontario’s K–12 students be provided with basic EE. Recognising the precarious nature of Earth and civilization—especially on account of climate change, biodiversity loss, air and water pollution, resource depletion, overpopulation, discrimination, violence, conflict and war (United Nations 2015)—this legislation could not have come soon enough. These seemingly intractable challenges should be addressed not only in the context of K–12 EE and PT-EE but also in programmes focused on Indigenous education, place-based education, mindfulness education and social justice education. All of these programmes require the development of essential EE capacities eventually enabling Ontario’s K–12 teachers to effectively implement Ministry curriculum policy directives.

Education has the potential to be one of the most effective agents of change, especially if we can reform the education system in ways that prepare new generations with EE capacities needed to transform our relationship with Earth (Apple 1979; Giroux 1981; McKeown and Hopkins 2005; Orr 2004; O’Sullivan 1999). Recognising that many education systems tend to be conservative in nature, transformative change can be particularly challenging to achieve (Greenwood 2010; Orr 2004). However, if PTs are encouraged to adopt environmentalist perspectives, and implement new ideas and pedagogies in their future classrooms, then they can act as “seeds” who “sow” change in their classrooms. Nevertheless, challenges persist.

Among factors constraining work of faculty is a relative lack of support from those charged with overseeing PT education. If ministries of education have not developed clear EE requirements for the school system, or do not emphasise or prioritise them, it is not surprising that faculty find it difficult to provide space for EE in their programmes. The Ministry EE policy document (Ministry 2009) only commits to “encourage faculties of education to address environmental education in

their pre-service curricula” (p. 13) rather than requiring them to do so. The lack of EE in PT education programmes is exacerbated by College policy, which gives only cursory mention of EE and a few generic statements that may pass as informal efforts to include EE in PT education (College 2007). While Ontario (Ministry and College) has made some gains in requiring EE in K–12 schools, the same cannot be said of directives to support the development and education of the province’s PTs. Faculties of education must leverage their unique position in the preparation of Ontario’s PTs by advocating for the future of Ontario’s K–12 students. One way this can be accomplished is by clearly acknowledging PT-EE capacities, advocating for them and assuming leadership over their implementation within Ontario’s faculties of education.

Research demonstrates that properly and competently educated and trained teachers are critical to the education of children (Darling-Hammond 2012). We have an ethical responsibility, both on grounds of the future of the Earth and our mandate as PT educators, to prepare future teachers for the task of EE in K–12 schools. If we fail to assume responsibility or leadership for this, we breach the terrain of the “unethical”. Again, faculties of education are pivotal in preparing PTs with the EE capacities they require to educate a future generation of children, who in turn, need to know how to deal with complex and urgent problems developing now and in the future.

This section has underscored the necessity for enhancing PT-EE and has set the stage to examine the three questions discussed earlier. Before tackling these, it is important to understand EE’s current status within Ontario’s PT education programmes.

### **7.3 Status of EE in Ontario PT Education Programmes**

On the surface it may appear that EE is occurring within Ontario’s PT education programmes, whereas in the majority of Ontario’s faculties of education, it is not (Beckford 2008; Inwood and Jagger 2014; Lin 2002; Rioux 1973; Towler 1981). Currently, any EE happening in Ontario’s preservice programmes occurs because of the passionate and dedicated efforts of a few committed faculty members (Beckford 2008; Inwood and Jagger 2014; Lin 2002). This lack of PT-EE capacity presents us with a formidable challenge that needs to be addressed before any meaningful enhancement of K–12 EE programming. The next section examines a model for building PT-EE capacities. The model will help describe and understand PT-EE capacities.



## 7.4 A Model for Describing and Understanding PT-EE Capacities

### 7.4.1 A Model for PT-EE Capacities

This section introduces the reader to an adaptation of Grant's (2008) model for developing PT-EE capacities. It then addresses the first question: What PT-EE capacities should teacher education programmes instill?

Grant (2008) suggests successful teacher education programmes focus on developing PT capacities. PT *capacities* consist of two components: *experiences/natures* and *competencies* (knowledge, skills and attitudes). We have interpreted this model through an illustration shown in Fig. 7.1. Basically, experiences/natures refer to academic and non-academic experiences PTs may have experienced prior to PT education. For example, academic experiences might include those acquired while an undergraduate, such as experiences students might gain through a service-learning project. Non-academic experiences could be those acquired through family upbringing or extracurricular activities. Natures, academic or non-academic, may be defined as the personality traits PTs present with prior to PT education. Competencies, by contrast, refer to the knowledge, skills and dispositions acquired during PT education. There is, therefore, a temporal distinction between experiences/natures and competencies, with the former presenting prior to and the latter presenting after PT education.

### 7.4.2 Describing PT-EE Capacities: Experiences/Natures and Competencies

It is deeply distressing to see the underprioritisation of EE in Ministry and College policy and accreditation guides. Worse still, this phenomenon appears to be the case across Canada (Karrow et al. 2016). While specific PT education policy directives and accreditation requirements can be viewed as modest and unassertive, this lack of stringency may, by allowing a broader scope for interpretation, act as a catalyst for change.



Fig. 7.1 An EE capacities model consisting of experiences/natures and competencies

### 7.4.3 *PT-EE Experiences/Nature*

Current PT education programme admission and competency standards in Ontario address EE only indirectly—if at all. Generally, admission is based on a combination of academic and non-academic experience. An applicant's academic experience usually is assessed via the applicant's undergraduate GPA, while non-academic (personal/professional) experiences are assessed through a written experience profile and, in some cases, personal interviews. Table 7.1 summarises PT education programme admission protocols of four Ontario programmes.<sup>2</sup>

All four programmes shown in Table 7.1 assess applicant suitability through a combination of previous academic experiences (undergraduate transcript/GPA) and an assessment of personal/professional experiences through experience profiles involving written statements/reflections/essays, with no explicit criteria including anything related to EE.<sup>3</sup> In all cases, the minimum (cutoff) GPA was 2.7 (70–72%). None of the programmes required applicant interviews, and all gave special consideration to Indigenous applicants, visible minorities and applicants with disabilities. Interestingly, within the experience profile of Faculty D, there was a specific allowance involving gender, with males interested in primary teaching and females interested in nontraditional subject areas (e.g. physics) being accommodated further. In all cases, those assessing profiles were given specific training for the task (see Table 7.1 for academic vs. non-academic assignment of said task). Admission decisions were based on a proportional reckoning of overall undergraduate GPA and experience profile results.

None of the admission processes summarised in Table 7.1 refer specifically to EE in the assessment of undergraduate academic experiences (courses taken, degrees pursued, programmes) or the applicants' personal/professional experience profiles, although there is an emphasis in most protocols favouring applicants demonstrating experiences or commitments to equity and social justice. Also, some programmes instruct adjudicators to identify and favour applicants with significant academic or non-academic experiences in subject areas where there is a demonstrated shortage of teachers, such as elementary science and mathematics. Nevertheless, in all of the programmes, applicants have an opportunity to include environment-related experiences in their experience profiles, although without prompting or expressing preferential treatment.

The lack of any preferential consideration for PT education programme applicants with significant EE-related academic and non-academic experiences hinders admittance of applicants showing commitment and promise as developing EE leaders. While the current situation does not bode well for helping to build PT-EE capacities, it stresses the need for faculties of education to design and implement PT

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<sup>2</sup>At the time of this writing, a provincial study was completed examining admission criteria across Ontario faculties of education. See Holden (2016).

<sup>3</sup>As to whether experience profiles prompt applicants to include “anything related to EE”, to our knowledge, there are no explicit criteria to this effect.

**Table 7.1** Ontario PT education programme admission protocols

	Faculty			
	A	B	C	D
Experience profile	Yes Written essay discussing two teaching-related experiences of at least 100 h in duration	Yes List of experiences and a written essay discussing the role of education in society and reasons for wanting to become a teacher	Yes List of experiences and a reflection on challenges/ insights gained in teaching or life experiences The program favours commitment to social justice, inclusivity and ethical consciousness	Yes Essay discussing teaching-related experiences, insights, challenges, actions and learning and discussion of a life experience showing openness/ commitment/action towards equity in diverse classrooms, schools and underserved communities
Academic transcript (minimum GPA—percent)	Yes (2.7—70%–72%) (10 best credits)	Yes (2.7—70%–72%) (10 best credits)	Yes (2.7—70%–72%) (10 best credits)	Yes (3.3—77%–79%) (final year of undergrad)
Interview	No	No	No	No
Adjudicators	Non-academic admissions office staff Training is provided	For primary–junior applicants: sessional instructors For intermediate–senior applicants: non-academic office staff Training is provided	University faculty member or senior administrator and field reader (e.g. associate teacher, school principal or school board employee) Training is provided	Transcripts assessed by non-academic staff (training is provided) Experience profile assessed by faculty and sessional instructors possessing graduate degrees (training is provided)
Adjudication	GPA (50%) Experience profile (50%)	GPA (70%) Experience profile (30%)	GPA (50%) Experience profile (50%)	GPA (23%) Experience profile (55%) References (22%)
Special Consideration	Aboriginal Visible minorities Disability	Aboriginal Visible minorities Disability	Aboriginal Visible minorities Disability	Ethnic diversity Cultural diversity Social diversity Gender (i.e. males interested in primary teaching; females interested in nontraditional subject areas)

education programmes that help develop competencies leading to robust and enduring EE capacities.

One of the four faculties of education is currently reviewing its academic and non-academic admission criteria. As we have argued, PT-EE requires unique capacities in the form of experiences/natures and competencies. Opportunities exist for all institutions to advocate changes that would allow applicants to self-identify as possessing necessary academic and non-academic EE experiences/natures for which they could receive recognition or preferential treatment. On the academic side of adjudication, if EE was deemed a teachable subject by the Ministry and College, then applicants holding EE-related degrees would be motivated to apply. On the non-academic side of adjudication, EE-related experiences/natures gained through family or extracurricular life experiences working with children while demonstrating leadership, instructional or programming responsibilities could be targeted initiatives. Experience profiles that PT applicants are required to complete could provide opportunity for self-declaration, and adjudicators could review them preferentially. Given the dearth of EE teachers and leaders in Ontario K–12 schools (Fazio and Karrow 2012), the fact that EE is recommended by the Ministry (2009) and is part of the recognised Ontario curriculum (College 2007) indicates the targeted selection of future EE teachers is reasonable, necessary and long overdue.

## 7.5 PT-EE Competencies

Having explored how PT candidates' experiences/natures might contribute to the development of PT-EE capacities, we now consider the development of PT-EE competencies, which can be better understood through a framework provided in *Learning for the Future: Competences in Education for Sustainable Development* (UNECE 2012; Fig. 7.2). Introduced by Delors (1996) and summarised by UNESCO (2012), this framework is internationally recognised.

### 7.5.1 A Framework for PT-EE Competencies

UNECE (2012) identifies three essential characteristics of EE: *a holistic approach*, which seeks integrative thinking and practice; *envisioning change*, which explores alternative futures, learns from the past and inspires engagement in the present; and *achieving transformation*, which serves to change the way people learn and the systems that support learning (p. 13). Clustering competencies within the following framework (or pillars) can address these characteristics:

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

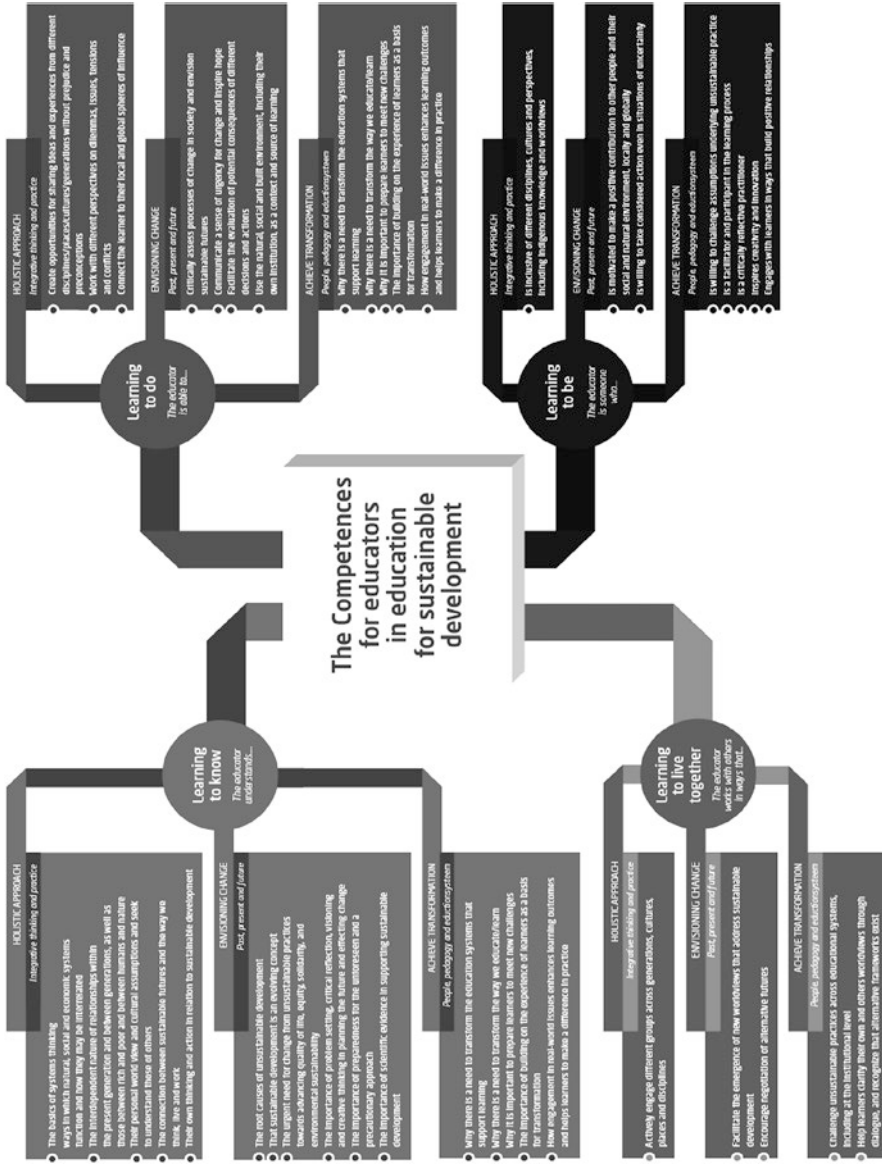


Fig. 7.2 A framework for PT-EE competencies: the competencies for educators in education for sustainable development. (Reprinted from *Learning for the Future: Competencies in Education for Sustainable Development* (UNECE 2012, pp. 14–15). Copyright 2012 by UNECE. Reprinted with permission)

- Learning to do: Developing practical skills and action competencies in relation to education for sustainable development, 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, judgement and personal responsibility in relation to sustainability.

A fifth pillar was suggested during the UN's Decade for Education for Sustainable Development (DESD): Learning to transform one self and society.<sup>4</sup>

To summarise, an EE-oriented adaptation of Grant's (2008) model for PT capacities was introduced. This model included two components: experiences/natures, and competencies. It was suggested that teacher education programme admission committees could adjudicate PT-EE experiences/natures in more inclusive ways that formally recognise, through the adjudication review, the types of academic and non-academic experiences/natures that students may possess. Typically, within our four institutions, PT education applicants are evaluated using academic transcripts and experience profiles.<sup>5</sup> Similar applicant evaluation methods are used elsewhere (Holden 2016; Kosnik et al. 2005). However, admission processes could be more discerning, for example, evaluating undergraduate and graduate degrees for knowledge, skills and attitudes foundational to EE. Referring to Fig. 7.2 and the clusters of competencies organised under the headings learning to know, learning to do, learning to live together and learning to be, prospective students could be selected, in general, on their respective demonstration of the following: understanding the challenges we face locally and globally, and the role that education can play; developing practical skills and action competencies in relation to education for sustainable development, including the ability to communicate a sense of urgency for change but also inspire hope; and 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 and personal attributes such as autonomy, judgement and personal responsibility in relation to sustainability. Refocusing admission selection practices, in this way, could enhance PT-EE capacity. Moreover, redesigning experience profiles for applicants to articulate explicitly how their experiences build a foundation of knowledge, skills and attitudes (see Fig. 7.2) unique to EE may further enhance PT-EE capacities and provide a foundation on which to further develop EE competencies (see Fig. 7.2).

We believe the time has come to re-imagine PT education as a form of education that develops the sorts of capacities that will enable PTs to be agents of change for a more sustainable future. In the next section, we return to the two remaining orient-

<sup>4</sup>See [https://menuntutilsjalfbaerni.weebly.com/uploads/6/2/6/2/6262718/unesco\\_5\\_pillars\\_for\\_esd.pdf](https://menuntutilsjalfbaerni.weebly.com/uploads/6/2/6/2/6262718/unesco_5_pillars_for_esd.pdf).

<sup>5</sup>There appear to be slightly different approaches to the relative weighting of application components, with some institutes protecting this information from the public. See Table 7.1.

ing questions noted in the introduction. To this point, our collective response (representing four Ontario faculties of education) has provided a description of PT-EE capacities. The next section examines how these capacities can be identified and cultivated in Ontario's PT education programmes and discusses the potential impact PT-EE capacities may have on these programmes.

## 7.6 PT-EE Capacities: Identification, Cultivation and Impact

A general conceptual framework (UNECE 2012) to delineate EE competencies was discussed in the previous section with PT-EE competencies clustered into four categories: learning to know, learning to do, learning to live together and learning to be. The combination of the two components of EE capacities—namely, EE experiences/natures and EE competencies—argues Grant (2008), optimises PT-EE capacities. In light of this, we now turn to addressing the two remaining questions posed in the introduction: How are these initial teacher EE capacities identified and cultivated within teacher education programmes? How do these capacities, developed by teachers during and following their teacher education programme, potentially impact teacher education programmes?

Our approach to answering these questions again focuses on PT-EE capacities, which, according to our framework, includes experiences/natures and competencies, so each question will be addressed in relation to each of these substituent components. In general, PT-EE experiences/natures are adjudicated at the admissions level (prior to PT-EE), while PT-EE competencies are addressed through curricular programming (after admission to PT-EE). In terms of programming, UNECE (2013) makes the following suggestion:

The Competences should be a basis for the review of curriculum documents. ... In order for educators to practice the Competences they should be supported by a curriculum which reflects such educational approaches. ... Materials may need to be developed to further support ESD. (p. 41)

In other words, a teacher education programme should have an EE curriculum providing opportunities for the development of competencies, resulting in the enhancement of capacities. For examples of such curricula, with specific course syllabi, see *DEEPER: Deepening Environmental Education in Preservice Education Resource* (Inwood and Jagger 2014). This is important because fine-tuning of competencies will also require fine-tuning of curricula—the two must occur in tandem.<sup>6</sup>

It is one thing to identify PT-EE capacities and examine how these capacities are characterised and cultivated during and after PT education programmes, and it is quite another to incorporate EE within teacher education programmes (Greenwood

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<sup>6</sup>See Greenwood (2010) for an excellent example of how an entire department of a teacher education programme reconceptualised PT's mission, goals and objectives to align values with programme curricula and student competencies.



2010). Institutional change, particularly in PT education, is a complex task. Greenwood (2010) sums it up as follows (offering a glimmer of hope):

Environmental and sustainability education are marginal to teacher education discourse if they are part of it at all. However, the professional autonomy available to faculty members does make it possible to create space at the grassroots within the otherwise regulated system to pursue educational aims that are neglected by convention and by design. Over time, grassroots work can begin to change local cultural practices and can coalesce into meaningful changes in policy. (p. 144)

Next, we will discuss how PT-EE capacities may be identified and cultivated within PTE programmes first by considering aspects associated with capacity identification and then with capacity cultivation.

### ***7.6.1 Identification of PT-EE Capacities Within PT Education Programmes***

As we will see, the identification of PT-EE capacities consists of examining experiences/natures and competencies. While PT-EE experiences/natures could be identified and adjudicated by faculties of education, competencies are already pre-identified by such third-party stakeholders such as UNECE (2012). The challenge ahead is to more tightly align UNECE's (2012) competencies with the Ministry's EE policy framework (specifically PT education) and those experiences/natures PTs could showcase within their applications to faculties of education.

#### **7.6.1.1 PT-EE Experiences/Natures**

As faculties of education enjoy significant discretion in selecting PT candidates through local admission criteria and adjudication processes (Holden 2016), the identification of experiences/natures is also an inherently local function.<sup>7</sup> Thus, faculties are in a position to characterise, for themselves, PT candidate's experiences/natures, according to their particular interests, values and perspectives. However, if PT-EE is—as denoted in the UNECE (2012) framework—a holistic, envisioning and transformative endeavour, then we ask: Do typical PT education admission requirements provide the necessary foundation for PT-EE competency development? Given the unique nature of EE as a discipline founded on holism, envisioning and transformation, screening PT candidates for knowledge, skills and attitudes reflective of these qualities seems desirable. This could involve examining academic records for credentials in fields such as environmental studies, in essence, any academic programme founded on holism, envisioning and transformative ways of teaching, learning and understanding (see Fig. 7.2). Additionally, applicants could

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<sup>7</sup>It should be acknowledged, given there is no centralised adjudication process in Ontario's faculties of education, that they may compete with one another "normativising" the process.



be required to profile certain experiences, including experiential, leadership and wilderness experiences, where complex holistic, envisioning and transformative activities involving programming for children/youths are specifically identified.

To encourage potential PT education students to pursue more EE-oriented undergraduate programmes, the College should recognise EE as a teachable subject in PT education programmes at intermediate and senior levels. Classifying EE as a teachable subject would elevate the profile of EE within a PT education programme and attract more candidates with the knowledge, skills and attitudes unique to EE. In terms of addressing the nature of applicants, faculties could emphasise EE-oriented attitudes such as resilience, determination, hopefulness, flexibility, creativity, caring, holism, fair-mindedness and mindfulness (see Fig. 7.2). Again, while some of these natures apply to all teachers, they are particularly useful in the field of EE in the sense that these attributes maximally orient the PT candidate for the development of PT-EE competencies once admitted to a PT education programme.

### 7.6.1.2 PT-EE Competencies

The internationally recognised standard for PT-EE competencies was derived from the Joint Ministerial Session on Education for Sustainable Development held at the Belgrade Environment for Europe Ministerial Conference in 2007. This standard recognised that one of the fundamental bottlenecks in achieving EE was the “competence of educators” (UNECE 2012, p. 7). Henceforth, the UNECE Steering Committee on ESD established an Expert Group on Competencies in ESD whose mandate included identifying:

a range of core competencies in ESD for educators, including defining these as feasible, to serve as a tool to facilitate the integration of ESD into all educational programs at all levels, as well as guidelines for the development of these competencies among educators. (UNECE 2012, p. 7)

These competencies transcend Ontario’s EE policy framework (Ministry 2009), which classifies competencies into traditional knowledge, skills and attitudes categories. While these types of outcomes do not apply directly to PTs, they are competencies all Ontario K–12 teachers are to develop in their students. Thus, we may infer that to nurture such competencies in students, teachers must first possess such competencies themselves—especially cognate competencies that derive directly from the UNECE (2012) competencies framework.

## 7.6.2 *Cultivating Initial Teacher EE Capacities*

In general, given the marginal status of EE in PT education (Beckford 2008; Inwood and Jagger 2014; Lin 2002), it makes it difficult to cultivate PT-EE capacities when their explicit identification remains happenstance. In Ontario, development and

implementation of EE policies and practices have largely been piecemeal, with a variety of informal grassroots initiatives such as the *DEEPER* guide (Inwood and Jagger 2014) leading the field. While these initiatives are important, they amount to only minor developments when compared to state-mandated PT education programmes preoccupied with “overdetermining course content” requirements for teacher certification (Greenwood 2010).

### 7.6.2.1 PT-EE Experiences/Natures

When, in the future, PT candidates’ applications and adjudication more explicitly accommodate PT-EE experiences/natures, the challenge changes to one of providing and maintaining the necessary programming to instill the PT-EE competencies described previously (see Fig. 7.1). This may be accomplished by, for example, establishing EE as a core aim of an entire PT education programme or department (Greenwood 2010), or, as will be described in more detail shortly, a variety of other programmatic adaptations tailored to this objective. At this level, a department could effectively communicate its aims and these would, in turn, further reinforce and nurture PT-EE experiences/natures.

### 7.6.2.2 PT-EE Competencies

Establishing EE as a key aim of an entire PT education programme would create a solid foundation for nurturing EE competencies and furthering EE curriculum development. Liaising with other academic units within one’s institution might bring the added advantage of scaffolding initiatives and nurturing the development of a political base. For example, at Brock University, an initiative within the Department of Teacher Education to liaise with one of the university’s transdisciplinary foci—the Environmental Sustainability Research Centre—may go some way in helping to nurture PT-EE competencies once they become embedded. If such avenues are intransigent, other more grassroots efforts can be effective. We now turn to examine our collective and organic efforts to cultivate PT-EE competencies within our respective faculties of education.

Without the formal support from faculties of education in developing PT-EE competencies and the establishment of EE as a teachable subject by the College, we wonder how significant change in PT-EE can happen. As a small group of faculty of education members from across Southern Ontario, we have, for over 4 years, been collaboratively exploring strategies to help develop and enhance PT-EE capacities. We have shared our struggles and our successes, and engaged in deep discussion about the tensions between our shared vision and what needs to be done to effect real change in PT-EE everywhere. We agree that creating an action plan to build capacity in PT-EE needs to include a variety of stakeholders, including teacher candidates, PT education instructors and administrators, and educational policy-makers at all levels of the education system in Ontario.

Most of us work very closely with PTs who have developed an understanding of the great importance of EE through their PT-EE experiences/natures despite the lack of explicit criteria for this aspect of capacity when they apply to our programmes. These PTs are full of ideas and suggestions for EE programme development. Thus, we may find strategies for developing and enhancing EE competencies by working closely with PTs at the grassroots level. This type of strategy has been documented by the Council of Ministers of Education, Canada (2012), Sims and Falkenberg (2013), and Inwood and Jagger (2014), all of whom have found evidence that EE programmes can be developed and enhanced.

### ***7.6.3 How Do PT-EE Capacities Potentially Impact Teacher Education Programmes?***

We have been arguing that the unique nature of EE requires a unique set of PT-EE capacities. A corollary to this is to acknowledge that if such a PT-EE programme were fully implemented, it could have a significant impact on the nature of PT education as we know it. What is it about PT-EE capacities that might fundamentally change the character of PT education? Since EE has been defined as holistic, envisioning and transformative, any PT education programme adopting EE would significantly be impacted by these features. Any faithful allegiance to EE-PT capacities would necessarily entail significant changes to many programme elements, including curriculum, timetabling, the nature of practicums and even student assessment and evaluation. Larger, more systemic programme changes could be imagined if faculties could better articulate aims, principles and values reflecting the field of EE (Greenwood 2010). For example, the interdisciplinary nature of EE and the distinctiveness of PT-EE capacities might require the restructuring of traditional course timetabling around multidisciplinary or interdisciplinary hubs (Karrow and Fazio 2015). In this way, other programmes vying for timetabling space—for example, Indigenous education, place-based education, mindfulness education and social justice education—could find curricular resonances with EE and the competencies being advocated. Moving from the traditional timetabling of discrete subjects with specific time allocations to interdisciplinary curricular fields with more diffuse time blocks certainly has the potential to impact teacher education. Other significant impacts may include shifts in teacher candidates' views of knowledge and changes in the manner in which field experience (i.e. practicums) might be conceptualised and implemented.

Beyond the hypothetical and hopeful, encouraging changes are happening across the province (Inwood and Jagger 2014). What can be learned from these developments? One important insight is that individual faculty members can start this work with small initiatives, employing few resources, building teacher candidates' competencies in EE by collaborating with community partners who may contribute support or expertise. Another insight is that these small-scale initiatives can share their

successes with faculties of education with similar interests in EE and sustainability, helping to build a larger community within a faculty or across faculties of education. Small projects can grow into significant enterprises without official sanction or support as PTs show their interest and commitment to learning about EE. But as Lakehead University's achievements attest, finding alignment with wider university priorities can better embed EE as an important part of mandatory PT education curriculum, and work towards developing the EE capacities of all teacher candidates, not just those who choose to participate in elective EE activities. Large-scale, systemic change in PT-EE in Ontario may be stimulated by the development of mandatory EE courses or EE coursework, along with the College identifying EE as a subject teachable and the Ministry supporting this through appropriate curriculum programming.

If change led by individual faculty can help develop PT-EE capacities (as discussed above), what else is needed to bring about large-scale systemic PT-EE reform? In general, as leaders of EE in our own faculties, we have been advocating for the need to enhance PT education by developing faculty and administrative capacities for EE. This is mirrored by several challenges, including selecting teacher candidates based on existing EE experiences/natures for admission, and faculty hiring along similar lines. In addition to changes in hiring practices, there is also a need for developing knowledge, experience and expertise among existing faculty. This does have some precedence in Ontario, with the work being done by the Centre for Place and Sustainability Studies at Lakehead University, and the former Sustainability Education Academy (SEdA) at York University. However, scaling this up would likely require support and alignment from the Ministry, the Ministry of Advanced Education and Skills Development, and the Ministry of the Environment and Climate Change—a lofty goal.

To date, our team has been working towards these types of changes in more modest ways. Starting with the DEEPER provincial roundtable in 2013, we began conversations regarding the need to develop teacher candidates' capacities in EE. This was furthered, by providing workshops, conference presentations and publications. We shared the grassroots activism that has been taking root in faculties across Ontario, some of which aimed to lead by example, so that other faculties can learn by doing similar work. We have also reached out to administrators and policy-makers to engage them in the conversation, knowing that they are key players in the further development of this work. By connecting with the Ministry, the Ontario Association of Deans of Education and the College, we have begun to increase this work by engaging these important stakeholders. Furthermore, broadening and enhancing relationships with community partners has also been an important development. Community partners have much valuable expertise to share, especially with teacher candidates who are just beginning to identify partners they can bring into their own classrooms in the future. In the next part, we will propose a course of action for future development.

## 7.7 Next Steps: Reform Principles and Actions

The *Report of the Working Group on Environmental Education* in Ontario specifically recommended that EE should become a requisite component of teacher education (Working Group on Environmental Education 2007). As already discussed, this is not an easy goal to achieve, since teacher education bureaucracy is tightly controlled and PT-EE is still not a fundamental educational goal for students or teacher candidates (Beckford 2008; Greenwood 2010; Jickling 1997). Nevertheless, the grassroots examples discussed above provide guidance on how effective PT-EE programming can be initiated in faculties of education. These grassroots initiatives must then be recognised at a systems level, including faculty admissions policies and faculty leadership orientations, and also rewarded in terms of time and support at a programme level. Furthermore, ideas drawn from school reform literature (e.g. Guhn 2009; Hargreaves et al. 2010) and EE implementation programmes in elementary and secondary schools (e.g. Fazio and Karrow 2012) provide additional insights for facilitating change in PT-EE. In particular, the EE reform literature describes two important reform principles: (a) faculty members overcoming resistance to change in existing practices, and (b) enhancing the capabilities of the EE adopters. Aligning these principles with recommendations from McKeown and Hopkins (2005), we suggest the following action steps for instigating change in faculties of education:

- Enhancing faculty awareness and professional development regarding EE
- Providing administrative recognition and reward for engaging in faculty-wide development and programme reform
- Institutionalising, through policies and guidelines, admissions processes and programmes that enhance EE capacities
- Leveraging teacher candidates and community partners/organisations to enhance and advocate for EE capacity and competency development

The previous action steps, together with the change from a two- to a four-semester model in teacher education programmes in Ontario since September 2015, provide a unique opportunity for faculties of education. Stakeholders could lobby for PT education reform that prioritises the development and enhancement of PT-EE.

An important next step in the process of enhancing PT-EE is to provide an opportunity for faculty of education representatives and community partners from across Canada to meet, share and discuss their views, perspectives and experiences in this area. In June 2016, our group hosted the first National Roundtable on Environmental and Sustainability Education in Pre-service Education. Representatives from faculties of education, NGOs, ministries of education, policy agencies and school boards shared their expertise and experiences to develop new initiatives, plan potential

collaborations and strengthen their networks. One of the key outcomes of this event was the creation of a National Action Plan and *The Otonabee Declaration*.<sup>8</sup>

## 7.8 Summary and Recommendations

This chapter began with a call to prioritise PT-EE in response to global environmental challenges. The argument being made is that EE is a distinct field with a well-defined history and foundation, requiring a unique skill set, and is predisposed to certain subject attitudes. As such, EE requires a distinct set of PT capacities. An education that prioritises EE can result in critically important, relevant, holistic, envisioning and transformative PT capacities—the sorts of capacities essential to preparing the next generation of classroom teachers with the knowledge, skills and attitudes needed to navigate their way in a world increasingly subject to the pressures of globalisation, unbridled capitalism and social and environmental degradation.

Through our adaptation of Grant's (2008) model, we delineated the components of PT-EE capacities, their interrelationship and the degree of discretion faculties of education have in the identification and cultivation of EE capacities. We also discussed the complex, yet substantive, role third-party stakeholders such as UNECE, the Ministry and the College play in describing and influencing the development of EE capacities in faculties of education.

Building on the adaptation of Grant's (2008) PT-EE capacities model and a detailed description of PT-EE capacities, we explored how such capacities are identified and cultivated, and how they potentially impact PT education programmes. PT-EE capacities derive from the adjudicated experiences/natures profiles that PT applicants provide in their applications, over which faculties of education have significant discretion. For instance, we identified that faculties of education could:

- Support politicisation of the argument (especially with the College) that since EE is a well-established disciplinary field, PT requires unique, yet distinct, PT-EE capacities and, accordingly, teachable subject status
- Hire PT-EE faculty with high levels of interest, knowledge and experience in EE-oriented pedagogy and programming
- Reform the PT education admissions process to (a) ensure that experience profiles provide opportunities for applicants to self-identify/highlight the whole range of experiential, leadership and wilderness experiences they may have; (b) provide descriptions of experiences that demonstrate applicant "natures" in terms of resilience, determination, hope, flexibility, creativity/ingenuity, appreciation, care, holism, fair-mindedness and mindfulness (Fig. 7.2); and (c) ensure that academic transcripts include evidence of greater diversity in undergraduate

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<sup>8</sup>As this work develops, outcomes of this initiative will be shared through the following Internet website: <http://eseinfacultiesofed.ca>.

programme completion, especially degree programmes with environmental content—since it may be assumed that such programmes inherently foster EE’s defining traits of holism, envisioning and transformation

Furthermore, our adaptation of Grant’s (2008) model emphasises that PT-EE capacities essentially derive from competencies. We indicated our preference for the competencies included in the well-established Initial Teacher Competencies for Sustainability model (UNECE 2012) which frames competencies under the rubrics of learning to know, learning to be, learning to live together and learning to do (see Fig. 7.2), with specific competencies premised further under the essential traits of EE: holism, envisioning and transformation. And, since it is evident that PT-EE capacities currently are being appropriated within faculties of education on a somewhat piecemeal and ad hoc basis, we must turn to the question of capacity cultivation. While small-scale, grassroots curricular and programming approaches are a step in the right direction (Dippo 2013; Inwood and Jagger 2014), Greenwood (2010) emphasises that these “small openings” can (and should) be further supported through an academic unit’s careful articulation of conceptual frameworks reflecting well-defined principles and values that will stimulate and guide the development and implementation of specific and robust EE programmes everywhere.

In our Next Steps section, we discussed future directions on two broad levels: (a) the grassroots or faculty of education level and (b) levels beyond faculties of education, such as the Ministry and the College. For those of us working in faculties of education, we may learn much from specific practices such as those currently at Brock, Lakehead, Nipissing, OISE-UT, Trent, York, and University of Ontario Institute of Technology. While these strategies capitalise on the relative autonomy of faculty-level planning and decision-making, the same cannot be said of change at levels beyond faculties of education—including government and other policy-making bodies—which operate in response to political and ideological exigencies of the day. Ideally, all levels should work together to support the growth and enhancement of PT-EE in Ontario.

In particular, we would like to re-emphasise the need for (a) the College to establish EE as a teachable subject within Ontario’s education system and (b) the Ministry to establish a strong EE curriculum emphasis within the province’s K–12 school system. These two changes alone would result in needed modifications to PT programme application components, criteria and adjudication standards in an effort to populate faculties of education and the K–12 school system with more highly qualified and effective EE educators. These changes would work to significantly enhance the description, identification and cultivation of PT-EE capacities.

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# Chapter 8

## Learning to Teach Environmental Education by Gardening the Margins of the Academy



Julia K. Ostertag, Susan G. Gerofsky, and Sandra A. Scott

As one of Canada's and North America's leaders in campus sustainability, the University of British Columbia (UBC) has positioned itself as an innovator for its green buildings, energy systems, campus operations, research, and teaching and as an employer (Baxter 2015; "UBC Receives" 2011). Faculty, staff, and students within the Faculty of Education at UBC have been actively involved in campus-wide sustainability initiatives, sustainability education, and environmental education (EE) within and beyond the Faculty. Consistent with this UBC-wide commitment to sustainability, the recently re-visioned teacher education programme emphasises ecological justice as a component of "diversity and social justice" (UBC 2012a, p. 10), which is a central thematic strand of the programme.<sup>1</sup>

These commitments have occurred alongside provincial attempts to integrate EE within the British Columbia (BC) K–12 school curriculum, which currently includes EE in the Science curriculum.<sup>2</sup> After the BC Ministry of Education's proposed (draft) Kindergarten–Grade 7 Science curriculum for 2015–2016 received extensive criticism for its lack of EE content, a team of experts developed EE content along

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<sup>1</sup>In draft stages of this re-visioning process, this strand was more explicitly entitled "Social & Ecological Justice and Diversity".

<sup>2</sup>For British Columbia Ministry of Education curriculum resources, see *Environmental Learning and Experience: A Interdisciplinary Guide for Teachers* (2007) and *The Environmental Learning & Experiences (ELE) Curriculum Maps: Environment & Sustainability Across BC's K–12 Curricula* (2009).

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with concepts of environmental stewardship and responsibility to be integrated at each grade level.<sup>3</sup>

Notwithstanding these shifts to apparently integrate EE at UBC and within the BC curriculum, in this chapter, we offer our perspectives as three teacher educators working in EE at UBC on the ways in which EE remains marginal—and, at times, marginalised—as teacher candidates learn to become teachers. The challenges and generative potential of “gardening the margins” become both a metaphor and an example of pedagogical places and practices in the landscape of teacher education as we move from a general description of EE within UBC’s teacher education programme to specific narratives from The UBC Orchard Garden,<sup>4</sup> a campus teaching and learning garden and outdoor classroom.

Julia Ostertag recently completed her Master and Ph.D. degrees in Curriculum Studies at UBC (focusing on environmental and garden-based education). She is co-founder of The UBC Orchard Garden Education projects. Julia has conducted research and led courses, workshops, seminars, and teacher candidate practicums in The Orchard Garden. Her doctoral thesis (Ostertag 2015) is based on her site-specific installation and arts-based research with student teachers in the garden. Susan Gerofsky is an Assistant Professor in the Department of Curriculum and Pedagogy at UBC, specialising in Mathematics Education and EE. She is co-founder and long-time Education Faculty Advisor to The UBC Orchard Garden and active in The Orchard Garden projects in teacher education. Sandra Scott is a Senior Instructor in the Teaching Professor stream in the Department of Curriculum and Pedagogy at UBC, specialising in Science Education, EE, and Teacher Education. She is the Education Academic Advisor to the Intergenerational Landed Learning Project at the UBC Farm<sup>5</sup> and has worked as an environmental educator, marine educator, and naturalist both within and outside the academy. Throughout this co-written chapter, at times we will be speaking individually from our distinct experiences and positions. These parts of the text will be flagged with our first names and will be formatted as indented paragraphs. At other times, we will be speaking together from shared experiences and interpretations, and these sections of the text will remain unmarked.

The chapter begins with an introduction to EE curriculum at UBC’s teacher education programme through Sandra’s autobiographical experiences teaching EE in the Faculty of Education. We then move to an example of an informal and marginal educational space: The UBC Orchard Garden. In this section, we draw on our extensive, hands-on experience developing The UBC Orchard Garden as a student-driven, outdoor classroom project. Through Julia’s tour of the Garden and other campus

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<sup>3</sup>The current draft of the BC Science curriculum (British Columbia Ministry of Education 2015) includes place-based learning, First Peoples’ principles of learning, key ecological concepts, and principles and themes of human-society-nature relationships.

<sup>4</sup>For more about The UBC Orchard Garden, visit the project’s blog at <http://theorchardgarden.blogspot.ca/>

<sup>5</sup>For more about the Intergenerational Landed Learning Project, visit <http://landedlearning.educ.ubc.ca/>

landscapes, and Susan’s ecopoetry walk with student teachers, we explore how ecological justice is positioned as a central strand to be infused throughout the teacher education programme, despite the fact that its presence nevertheless remains marginalised and fragmented.

## 8.1 EE in UBC’s Teacher Education Programme

While ecological justice is a strand within the UBC’s 2012 re-visioning of the teacher education programme and UBC promotes sustainability education pathways across the various disciplines of the university,<sup>6</sup> student teachers’ access to EE is often piecemeal. Currently, there are no environmental cohorts in the Bachelor of Education (B.Ed.) programme. In the past, the Living and Teaching Green cohort (2006–2010) was a very successful elementary cohort that featured themes of Social Responsibility and Environmental Sustainability. As with many cohorts in the UBC B.Ed. programme, Living and Teaching Green had a limited tenure to allow for the implementation of a new “themed” cohort.

Since the newly implemented B.Ed. programme, courses are framed by the following strands: Inquiry and Dialogical Understanding; Curriculum, Pedagogy, and Assessment; Diversity & Social Justice; Language, Literacies, and Cultures; and Field Experience: School and Community. Many instructors infuse EE into existing courses, particularly in science education (Scott and Adler 2014) and interweave bioregional and land-based experiences through field trips to the UBC Farm, The UBC Orchard Garden, local beaches, and forest walks. Teacher candidates at UBC can also access EE through electives offered to secondary teacher candidates during the summer (Outdoor Environmental Education: Curriculum and Pedagogy; Advanced Methodology in Outdoor Environmental Education; Environmental Education), through inquiry classes, and during a 3-week Community Field Experience (CFE) practicum where students learn to teach in a broad range of educational settings in addition to their regular 10-week school-based practicum. Teacher candidates can choose outdoor EE projects for their CFE such as The UBC Orchard Garden and the Intergenerational Landed Learning Project at the UBC Farm.

Many environmentally conscious UBC Education faculty, staff, and students have laid the groundwork for EE in the UBC Faculty of Education. The EE Caucus, co-chaired by a faculty member and a graduate student, was formed in 2005 and has been key to developing EE courses and programmes and implementing “green” initiatives within the Faculty of Education. Although the activity level of the EE Caucus fluctuates, depending on need and student/faculty engagement, it has remained an important grassroots force in advancing work in EE in the Faculty. Due

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<sup>6</sup>For more on UBC Sustainability’s (n.d.) *Teaching & Learning* sustainability pathways across all teaching programmes, see <https://sustain.ubc.ca/campus-initiatives/teaching-learning>

to these efforts, the UBC teacher education programme has begun to acknowledge and incorporate EE initiatives.

## 8.2 Autobiographical Inquiry into EE at UBC: Sandra's Story

Sandra has taught in the UBC teacher education programme for more than 20 years. From her earliest experiences in this programme, her work has consistently promoted EE as a foundational, integral approach to be woven into every course and programme. She has witnessed what has changed and what has remained the same in the teacher education programme at UBC since the early 1990s and writes about her personal journey navigating change and constancy. Through autobiographical introspection, Sandra highlights a combination of encouraging EE initiatives and a frustrating lack of uptake on some of these initiatives. As well, she documents new teachers' struggles stepping into professional responsibilities.

**Sandra:** During a recent conversation with education colleagues, we discussed the presence, or really the lack of presence, of EE in the UBC teacher education programme. We came from a variety of educational backgrounds that included teaching in elementary, middle, secondary, and postsecondary classrooms as well as in parks, museums, and science centres. To explain the dearth of EE at UBC, a colleague offered this observation: "I will tell you what the problem is. EE tends to take over, to the exclusion of everything else". During the prevailing silence, I thought, "Isn't that a good thing?" I was reminded of David Orr's words, "All education is Environmental Education" (Orr 1994, p. 12). I also thought of a conversation with my colleague and friend, Mathabo Tsepa, a Mosotho of the Bafokeng (Hare) clan of the Basotho people, from Lesotho in southern Africa. She explained that in her Sesotho language, there was no word for EE. Environment, the Land, was "simply part of the story", a story about rootedness, connection, and deep care for the land (M. Tsepa, personal communication). Why then could we as environmentally conscious educators not understand and teach about the land, and by *Land* I mean all worlds of the earth, skies, and waters, in a similarly integrated way?

This idea of EE "taking over" has not been my experience during 20 years working with teacher candidates and practising teachers at UBC. When I first taught in the teacher education programme as a graduate student in 1994, there was no EE component in the required coursework for the Bachelor of Education degree. The secondary B.Ed. students were offered an EE elective in the summer, but the elementary B.Ed. programme did not have a similar course. And so, as a newly appointed instructor of a 13-week elementary science methods course, it was my idea, and therefore up to me, to interweave EE into my curriculum. To start, I drew upon my lived experiences and my lifelong knowing of and being in the more-than-human world (Abram 1996). My vision was informed by my experiences as a marine educator, park naturalist, and elementary and secondary classroom teacher. Ignited by my caring, connection, and concern for the Earth, I infused those 13 weeks with a sense of wonder inspired by the writings of Rachel Carson (1965) and Eleanor Duckworth (2006, 2008). This reimagining and re-enlivening of the students' inborn sense of wonder was framed within an inquiry approach to teaching and learning as conceived by Schwab (1962) and furthered by the work of White and Gunstone (1992).

One area I emphasise in my curriculum is the importance of infusing what Canadian environmental researcher and educator Lucie Sauvé (2005) refers to as a bioregional focus. When we honour where we live and who we are, then we come to know, connect, care, and ultimately strive to ensure the health and well-being of ourselves, our families, our culture, and all the Earth's living and non-living communities. This focus also reflects my own research and what I call "environmental knowing" (Scott 2007) conceived through my doctoral work on children's EE experiences. I continue to draw upon and add to this understanding of knowing and being in all of my pedagogical and research pursuits.

The current elementary science methods course that I teach is a work in progress as I attempt to instil a sense of wonder, love, commitment, and an ethic of care for the land within the confines of a 5- to 6-week course. This brief time frame does not provide a favourable context for Payne and Wattoch's (2009) "slow pedagogy". I have also been disheartened to note in my research that student teachers did not explore and articulate their environmental knowing as fully in their final assignments (a unit plan) as they did when engaging in class discussions, conversations, course experiences, and writing and drawing in their course notebook. These results suggest that, just as with many practising beginning teachers, teacher candidates tend to teach the way they were taught when confronted with a challenge (Adler 2012; Blanton 2003; Lortie 1975; Nashon 2006). Pushing the boundaries beyond the seemingly "easy" and "comfortable" textbook-derived activities of a conventional unit is not yet part of many a beginning teacher's pedagogy.

In working with my graduate students who decide to further their studies in EE after their B.Ed., I can see, as Tsepa (2008) suggests, that the environment becomes part of their story. Within initial teacher EE, however, we are far from the situation that my colleagues described as EE taking over the entire curriculum. However, ever so slowly, changes are taking place. Today in my academic home, the Department of Curriculum and Pedagogy, as well as across the UBC Faculty of Education, there is a growing community of educators who care deeply about the Land, who live an ethic of care not only in their teaching and learning but in all that they do. I truly believe that it is not the programme and curricula that make EE *live*; rather, it is those individuals who live within it as the land becomes their story. As Carson (1965) writes, these individuals are the companions who share and relive the "excitement and the mystery of the world" and "keep alive" (p. 45) our inborn sense of wonder.

### 8.3 The UBC Orchard Garden and Its Role in the UBC Teacher Education Programme

The UBC Orchard Garden is a place and a project designed to further the efforts of UBC teacher educators, graduate students, and teacher candidates to learn how to teach across the curriculum through a garden as an outdoor classroom. The Orchard Garden has afforded many opportunities for teachers and learners to infuse EE, ecological awareness, integration of the arts, a sense of wonder, and the importance of complicated, unsettling conversations and actions in the process of learning to teach in and with a living place like a school garden. We will introduce The Orchard Garden and its projects here and then explore some of the implications of *gardening the margins* through Julia Ostertag's autobiographical narrative of her experiences leading teacher education classes based in the garden.



Initiated as a partnership project between the Faculty of Land and Food Systems and the Faculty of Education, with the participation of the School of Architecture and Landscape Architecture, The UBC Orchard Garden is a project of UBC, grounded in a physical garden on central campus. The garden is a collaborative, student-directed research and university teaching project that creates an outdoor teaching and learning space where students and educators (who are often other students) come together as a community to teach, learn, and grow organic produce for the UBC community. The garden is also a point of contact for community engagement, both within the UBC community and externally, notably with the Vancouver School Board, the Chinese-Canadian Historical Society, local artists (e.g. Sharon Kallis and the Urban Weaver Project; see Kallis 2014), local food systems projects (Fresh Roots, the Vancouver Food Policy Council, the Vancouver School Food Network), and the Musqueam community via the First Nations House of Learning at UBC. Finally, The UBC Orchard Garden is recognised as fulfilling the goals of UBC's (2012b) strategic planning document, *Place and Promise* (Fig. 8.1).

Graduate and undergraduate students are central to all aspects of the garden's operation. Mentored by faculty from Education and Land and Food Systems, students write grants to fund the garden; design the garden; maintain the garden; sell garden produce through direct sales to the student-run Agora Café and a Community-Supported Agriculture garden share model; promote the garden as an outdoor classroom for teacher education; host classes; lead and teach student teacher practicums; host celebrations, conferences, and workshops in the garden; conduct research; design curriculum resources; collaborate with community partners and international garden-based educators; and maintain an active blog of garden-based initiatives. Students from the Faculty of Land and Food Systems largely focus on urban, organic



**Fig. 8.1** The original UBC Orchard Garden, prior to relocation in 2014. (Photo credit: Julia Ostertag)

gardening practices, frequently sharing their knowledge and skills with students from the Faculty of Education. Student leaders from the Faculty of Education explore the garden as a co-teacher and outdoor classroom. Since 2010, more than 1500 teacher candidates have engaged with the garden as learners, educators, researchers, and volunteers. Courses that have held classes in the garden span the B.Ed. programme, including Aboriginal Education, Math and Science, Philosophy, Art Education, and Language and Literacy Education. The UBC Orchard Garden offers an intensive, eight-part, student-led Saturday workshop series and a 3-week CFE placement for student teachers interested in garden-based EE.

We will explore gardening the margins through co-author Julia Ostertag's autobiographical contribution, a creative non-fiction description about guest-teaching a class in the UBC teacher education programme, written in an ironic, third-person voice. She brings us into the story of The UBC Orchard Garden as a fraught and contested place in the academy.

**Julia:** Imagine that you are a UBC teacher candidate sitting in a mandatory teacher education class on Aboriginal Education in Canada (EDUC 440), and your instructor has invited Julia, an educator at The UBC Orchard Garden, to bring your class to the garden. You are not entirely sure what a garden has to do with teacher education or Indigenous Education but you are looking forward to getting outside. However, just as you leave the front door of the teacher education building, Julia has already stopped the group. You gather around and notice that Julia is standing beside a young apple tree that you have never noticed growing out of the concrete planter box on the front sidewalk.

"This little apple tree was planted by our campus landscapers", Julia starts saying. "It is a cutting from the original apple orchard that used to grow from behind this building to the agriculture building where the garden used to be that gave us our name, The UBC Orchard Garden".

An orchard, here? And what does she mean when she says "where the garden used to be"? But the group moves on, down the steps, and out onto the expansive Main Mall Boulevard. Immediately, however, Julia stops again in the middle of the kilometre-long stretch of green lawn that reaches north-south on Main Mall, from the Canadian flag at the Rose Garden to the flag of the Province of British Columbia by the Forest Sciences Building on the opposite end of the lawn (Fig. 8.2).

"I want you to start looking at this campus landscape as a garden, or particular kinds of gardens, and consider how these gardens narrate stories about human relations and human-land relations", she says. Your eyes are drawn down the long line of immense red oak trees that grow parallel to the grassy boulevard and recently completed stone walkways. "In which ways might this be a colonial campus design? Why are there oak trees 'native' to eastern Canada and the US northeast growing here when the forests around us are coastal temperate rainforests? What does this suggest about whose knowledge and ways of organising space are most important? What is being erased?" The flood of questions and Julia's passion are unsettling and unnerving, since the large green boulevard is a central attraction at the heart of the campus.

"When we first started looking for an outdoor classroom garden space on campus", Julia continues, "we naively asked the campus planners if we could garden here on Main Mall, right in front of our building, since, after all, it was zoned 'green academic'. We were told,





**Fig. 8.2** Main Mall Boulevard, UBC. (Photo credit: Julia Ostertag)

in no uncertain terms, by the planners that, ‘This is a sacred green lawn, stretching from one flagpole to the other’. Sacred? What do they mean by sacred?’ Julia leaves the question hanging, but you sense that she still struggles with what seems like a colonial appropriation of the notion of sacred land for grass monocultures on linear campus boulevards.

The group continues walking down the boulevard toward the BC flag, where you turn right and head down a small slope. Immediately, the noise of yet another construction site on campus assaults your ears and eyes (Fig. 8.3). Cranes stretch into the sky, looming above the grey skeletons of concrete high-rises. Shouting above the din, Julia’s hand sweeps over the construction site where, with a wry laugh, she says, “Welcome to The UBC Orchard Garden!”

Puzzled, you frown. This is the garden? “This is where, in 2005, students in Land and Food Systems started The UBC Orchard Garden, after a series of old portables were demolished behind the agriculture building”, Julia explains. “In 2010, after our failed attempt over several years to find garden space close to teacher education classes, an expanded garden was cultivated as a collaborative initiative with the Faculties of Education and Land and Food Systems, and the School of Architecture and Landscape Architecture. In 2014, however, we were relocated to a new site. The University cut down the remaining original apple trees and began construction of the Orchard Commons to house Vantage College’s international student programme that will charge \$45,000 for 1 year of tuition and housing at UBC”.



**Fig. 8.3** Destruction/construction site of the original UBC Orchard Garden/new Orchard Commons. (Photo credit: Sandra Scott)

Since the noise of the construction site makes it too loud to keep talking, the class continues walking down the sidewalk, turning left and heading toward Totem Park residences, the undergraduate student residences adjacent to Totem Field, where the new garden is located. Pausing in front of the residence buildings, Julia notes that in the past, they have visited this location with Sarah Ling from UBC's Aboriginal Initiatives, and Sarah has shared with students the story of how two of the Totem Park residences, *həm'ləsəm'* and *q'ələyən* Houses, received their *hən'q'əmin'əm'* names drawn from Musqueam First Nations history, oral traditions, and significant places.<sup>7</sup>

When you finally enter the large rectangular plot allocated to The UBC Orchard Garden, you notice how the clean lines of the Totem Field agricultural experiments quickly give way to a barely contained profusion of plant life that threatens to spill beyond its borders. "Here we are", Julia announces. "Whenever we host visiting classes or events in the garden, we acknowledge that we are gardening, teaching, and learning on the traditional, ancestral, and unceded territory of the Musqueam First Nations. This history and these ongoing relations are particularly important for land-based projects such as this one and require that we constantly work toward repairing and renewing our relations, examining colonial and oppressive assumptions in our historical and contemporary gardening and teaching practices, and experimenting with ways to engage ethically with this land and the First Nations peoples that have lived here since time immemorial. Layered onto these stories are also the ever-changing dynamics of the land, of glaciation, of isostatic rebound, of deforestation and urbanisation, and now, of climate change". Julia pauses, looks around the garden, and gazes up into the sky.

You ponder Julia's words and the webs they have spun on this walk to the garden, struggling to juxtapose these unsettling stories with the beauty, abundance, and possibilities presented to you today as you gather together in the garden.

<sup>7</sup>For more information about the house names, visit [https://wiki.ubc.ca/Totem\\_Park\\_Residence](https://wiki.ubc.ca/Totem_Park_Residence)

Although it takes longer to tell these pedagogical place stories of The UBC Orchard Garden than to simply walk briskly from the classroom straight to the garden itself (or to describe the garden briefly in a few cursory sentences in this chapter), sharing these narratives is central to what it means to be an environmental educator and to understand, challenge, and reinvent our relationships within human and more-than-human communities. As the story of the garden suggests, garden-based education is itself a complex and complicated pedagogical practice. Add to this complexity the challenging financial, spatial, temporal, and discursive marginalisation of garden-based educational initiatives and initial teacher EE more generally, it becomes apparent that even at a university that foregrounds sustainability throughout its operations, teaching, and research, integrating EE programmes and projects (such as the garden) within UBC's teacher education programme and the campus landscape exposes layer upon layer of obstacles.

## 8.4 Poems from the Invisible Gardens Ecopoetry Walk

Engaging with these obstacles through arts-based practices has been one approach that we have used extensively at The UBC Orchard Garden in our research and teaching. As such, we turn now to the poetic voices of student teachers and their responses to some of these barriers during a poetry walk as part of The UBC Orchard Garden's student teacher workshop series. Susan Gerofsky's autobiographical narrative about the experience of leading these ecopoetry workshops frames and contextualises the students' poetry. All student poems have been included with the consent of their authors.

**Susan:** From the unofficial margins of the teacher education programme, The UBC Orchard Garden offers all student teachers the opportunity to voluntarily attend a workshop series on garden-based learning. The workshops are designed and led by students on The UBC Orchard Garden team and, occasionally, even by student teachers on their CFE practicum. In addition to their busy academic schedules and practica, these remarkably dedicated student teachers spend six Saturday mornings in the garden, and, at the end of the workshop series, they receive an informal certificate for their teaching portfolios.

Although students lead the majority of the workshops, most sessions also include invited guests from the community (e.g. high school students from an exemplary school gardening project, local artists, soil scientists, or landscape architects). On a cold, damp day in January 2015, I facilitated a Garden Poetry session as part of the workshop series. My own history as an English language and literature teacher and poet, as well as a teacher of mathematics, physics, music, drama, film, and modern languages, has meant that I have some facility in moving among and across disciplines and sometimes finding unexpected resonances betwixt and between them.

These sketch poems, written by workshop participants at 5-minute intervals during an ecopoetry walk around campus, express thoughts and impressions, real, remembered, and imaginary about the invisible and visible gardens of this place. These poetry walks draw on

the practices of ecopoetry (Bryson 2002),<sup>8</sup> grounded in acknowledging and valuing the ecological interdependence of human and more-than-human entities, a decentring of the human, and an attitude of humility, respect, and listening.

*Ode to the Lawn, Sara Peerless.*

A mono-culture.  
 Green is the colour.  
 Order is the agenda.  
 At all costs.  
 Mow, spray, deter all pests.  
 A mono-culture.  
 Primp, preen, green is best.  
 Look on, don't touch.  
 Nature's perfect green.  
 Or mankind's perfect mess.

*Sacred, Elisha Gill.*

Sacred they say,  
 But what is so sacred when you are stepped on,  
 Easily maintained,  
 Green as ever you stay,  
 Your silence keeps the garden away,  
 What is messy needs to be tucked away,  
 Us humans always want our neat and tidy ways,  
 Plucked, picked, pruned,  
 Always groomed...  
 That is not the natural way.

*Stolen, Elisha Gill.*

They take away the land that brought people together,  
 They take away trees,  
 They take away apples,  
 They take away community,  
 They take away the feasts,  
 They take away a place of refuge,  
 They take away the food on my plate,  
 I ask you to take away your greed.

*Poem about the original Orchard Garden, Suke Padam.*

No more garden, it's rebar.  
 No more garden, it's cranes.  
 No more garden, it's hammers.  
 No more garden, it's cement.  
 No more garden, it's steel.  
 No more garden, it's workers cussing.  
 No more garden, it's mass development.  
 No more garden.  
 I am sad now.

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<sup>8</sup> See also the online journal *ecopoetics*: <https://ecopoetics.wordpress.com/>

## 8.5 Challenges of Implementing Initial Teacher EE at UBC

Institutions of teacher education fulfil vital roles in the global education community; they have the potential to bring changes within educational systems that will shape the knowledge and skills of future generations. Often, education is described as the great hope for creating a more sustainable future; teacher-education institutions can serve as key change agents in transforming education and society, so such a future is possible. (Hopkins and McKeown 2005, p. 11).

As expressed in Hopkins and McKeown's (2005) *Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability* report, a great deal of hope and possibility lies in the role of teacher education for transforming education and society more generally. However, a central challenge that makes it difficult to bring about EE programming within initial teacher education is that teacher education programmes—like schools themselves—are remarkably resistant to change. Furthermore, after years of observing other teachers teach, it is difficult, as Sandra illustrated above, to unsettle the identity of the teacher that student teachers have formed over years of their own schooling (Britzman 2003) and stereotypical representations of teachers and classrooms in the media. Teacher education, Hargreaves and Jacka (1995) write, is all too often “a stressful but ineffective interlude in the shift from being a moderately successful and generally conformist student, to being an institutionally compliant and pedagogically conservative teacher” (p. 42). Hargreaves and Jacka go on to suggest that even when students are seduced by new teaching ideas during their short induction period, they then encounter the relatively unchanging realities of schooling when they begin their first appointments. If EE and unique pedagogical places such as The UBC Orchard Garden are to become integral to initial teacher education, it will require that these pedagogical practices and places are not simply seductive new teaching ideas. Instead, it is important to prepare and support student teachers to engage with these ideas, practices, and places within the context of the relatively unchanging reality of schools (and schools of education). For instance, through our work with The UBC Orchard Garden, gardening the margins has not been about seducing students with new pedagogical innovations. Rather, the collaborative, student-led initiative has allowed for unique pedagogical relations to emerge wherein students and the garden “become teachers together” (Ostertag 2015, p. ii), a notion we discuss in greater detail below that may offer an alternative response to both seductive utopias and the isolation and individualism that contribute to the challenges for changing teaching practices within, beyond, and “beside” (Sedgwick 2003) the physical and metaphoric walls of the traditional, anthropocentric school classroom.

Despite the fact that UBC's teacher education programme offers courses in outdoor EE, and ecological justice is included as a central thematic strand within the programme, efforts to integrate EE throughout the curriculum and develop EE specialisations within the teacher education programme as well as graduate programmes have consistently failed to gain support and traction. For instance, congruent with Lin's (2002) findings is the lack of specific individual faculty members employed as EE specialists who can oversee the development of courses,

programmes, and special projects such as The UBC Orchard Garden. Rather, science educators (such as Sandra Scott) and mathematics educators (such as Susan Gerofsky) have played an active role in teaching EE and developing EE programming from the side of their already overflowing desks. In addition, untenured adjunct and sessional instructors continue to offer many of the summer outdoor EE courses, and, while these instructors may be specialists with extensive experience and qualifications in EE, they are marginalised within the neoliberal academy from many of the institutional decision-making processes required to implement and sustain EE programming within the Faculty of Education. This has all contributed to a fragmented approach to EE within teacher education that has undermined numerous passionate attempts to develop programmes, certificates, diplomas, courses, and special projects (e.g. The UBC Orchard Garden) over the last decade. Without institutional support, EE has remained poorly infused within the teacher education programme.

Notwithstanding this fragmentation, initiatives such as The UBC Orchard Garden reflect yet another common factor in the implementation of initial teacher EE, namely, the central role of motivated and engaged individuals. As Van Petergem et al. (2005) report, “Education professionals—teachers, department heads, as well as non-teaching staff—and students are the key players in EE” (p. 162). As we suggest below, students have driven numerous EE initiatives in teacher education; nevertheless, in order for these programmes to be well integrated within teacher education, the programmes require financing, space, and faculty support embedded in teacher education programmes instead of being treated as occasional novelties. The integration of such inherently interdisciplinary programmes, however, necessitates a collaborative school culture, strong institutional leadership, and faculty professional development and support (Van Petergem et al. 2005). This collaborative culture is difficult to achieve. According to Van Petergem et al. (2005), “the most difficult constraint seemed to be the motivation of all the teachers as a team. Most of them did not feel committed to action since they were trained to work autonomously” (p. 168). The ability for faculty, staff, and students to collaborate as human and more-than-human collectives within the highly individualistic, anthropocentric, and increasingly neoliberal culture of the academy is clearly a barrier to implementing initial teacher EE. Unfortunately, this also replicates the isolation experienced by many educators within the school system.

A further barrier to faculty collaboration is the continued emphasis of disciplinary silos, a particular challenge for EE as a highly interdisciplinary field. As Van Petergem et al.’s (2005) research suggests, many “teachers regarded EE as a supplement in addition to the overabundance of topics in the syllabus. In particular, the non-science teachers, with little EE experience, did not feel responsible as EE was understood to be a task of science teachers” (p. 168). While many EE proponents recognise the inherently interdisciplinary nature of the field, EE programming is still often housed within the disciplinary silo of science education, which continues to be perceived as its most “natural home”. For instance, McDonald and Dominguez (2010) suggest that:



although the basic premise of EE calls for an interdisciplinary approach, the reality of resource availability for preservice preparation may mandate a single subject approach. Therefore, the most reasonable alternative would be the use of science methods courses for EE preparation delivery. (p. 26).

While the two formal EE courses in UBC's Faculty of Education programme are housed within science education in the Department of Curriculum and Pedagogy, the creation of inquiry courses and the CFE practicum offer the potential to overcome these boundaries and create spaces for the collaborative and transdisciplinary infusion of EE.

The UBC Orchard Garden is one such space that resists disciplinary enclosure and follows an emergent, arts-based, responsive curriculum dependent on complex factors. These factors emerge from the interests of the student team at the garden, the season, the weather, the visiting classes' curricular or pedagogical foci, contributions from community partners (guest speakers, artists, agriculturalists, etc.), scholarly readings, and unplanned conversations and activities that emerge at the garden.

## 8.6 Becoming Teachers Together

Through practices of becoming teachers together, perhaps EE initiatives such as The UBC Orchard Garden can contribute to fundamentally changing the culture and context of teacher education and education (particularly schooling) more generally. As Hargreaves and Jacka (1995) note, the experience of beginning teaching continues to be shaped by "physical isolation, teacher cultures of non-interference and individualism, absence of administrative or collegial support, and school staffs who are unreceptive to the new methods that beginning teachers can bring" (p. 60). What we have explored and encountered through The UBC Orchard Garden is that entanglements of land, student teachers, and ever-changing constellations of highly interdisciplinary undergraduate and graduate student gardeners/student educators with faculty mentorship can create unique intergenerational and inter-species conditions for "becoming teachers together" (Ostertag 2015) that are unlike those found in most teacher education programmes or schools (Brennan and Clarke 2011).

As gardeners on the margins of the campus landscape and educators on the margins of the teacher education programme, becoming teachers together has allowed students to teach students in close relation with the land. The student educators working with the garden have included doctoral and master's students in Education, graduate students in Landscape Architecture, undergraduate students in Land and Food Systems, and other student teachers through the CFE. While these students are mentored through close collaboration with Faculty Advisors associated with the garden, they have a great deal of freedom to develop, experiment with, and respond to unique curricular and pedagogical encounters. Strengths of this approach include creating conditions for teacher education that are highly collaborative, creative, relevant to students' interest, supportive, inter- and transdisciplinary, inspiring, flexible,



responsive, and locally relevant and allow for risk-taking and experimentation. As such, becoming teachers together in close relation with the land- or garden-as-teacher can create a community of human and more-than-human teachers and offer an alternative to the isolation and fragmentation of the four-walled classroom that materially and discursively creates barriers to implementing initial teacher EE.

As with any ongoing, student-driven project at schools and universities, The UBC Orchard Garden has also had to cope with the fact that students are at the university for a limited time and that even faculty members may move on to other jobs, life stages, and projects. Despite the difficulties around having key members of the team graduate and move away, it has been very heartening to find that, as one incredible, dynamic, and irreplaceable student must leave, several more have shown up wanting to do research, teaching, and volunteer work because of a deep love for gardens as living places of teaching, learning, and sustenance. In the 10 years of Orchard Garden projects, there has been constant support and engagement with the project from Land and Food Systems undergraduates, teacher candidates, and Master's and Ph.D. students, along with faculty and staff. Alumni of the Garden have continued to work in EE and frequently support the Garden through collaborations from their new positions as teachers, researchers, or gardeners in the Vancouver area, or from their new homes around the world (Louw and Gerofsky 2013a, b, c, d).

For better or worse, becoming teachers together in these rich margins of the university is also relatively inexpensive. While the fluidity and transience of student leaders at The UBC Orchard Garden has been a surmountable challenge for the project, the lack of permanent funding for the project remains a continuous challenge. The UBC Orchard Garden continues to survive, month-to-month and year-to-year, on a series of small- and medium-sized short-term grants from a variety of sources, including internal university funding for innovative teaching and learning projects, sustainability grants, student society and work-study grants, and small grants from local NGOs and government youth employment projects.

Deans and department heads, while offering moral support and featuring The UBC Orchard Garden as a "poster child" for sustainability initiatives in promotional publications for the Faculty (UBC 2012a), have been able to offer little in the way of legitimization or core funding, through, for example, the status as a centre or institute, and hiring instructors. This past decade has been a time of deep and repeated budget cuts to all academic units at UBC, while at the same time, university faculties have been given the responsibility of raising millions of dollars to fund the university's massive building projects, and fundraising for these high-rises has taken anxious precedence over all other initiatives, large and small. Increasingly, huge concrete and glass towers take priority on the neoliberal campus, whether or not they actually end up being fully inhabited or making money for the university. In these days, when academics and students do their work from home, a café, beach, or out-of-town conference with Wi-Fi on portable devices, more and more university offices and laboratories sit eerily empty much of the time, especially during the summer months, while construction of ever more offices and labs continues all over campus.

Gardens, on the other hand, are treated as temporary, movable, and disposable frills, particularly when viewed by the development arm of the university. To those in charge of building a greater number of money-spinning office towers, residences, condos, shopping malls, golf courses, and even resorts on university campuses, teaching and learning gardens are not taken seriously as academic classrooms and research sites. In this (conventionally gendered) view, big high-rise towers made of hard materials are powerful and valuable, while small, fertile gardens of living, tender, seasonal plants and trees are seen as weak, marginal, merely decorative, and appropriate only to the fringes of a high-powered, moneyed, world-class research institution (see Fig. 8.3). These discourses are highly gendered, since gardening and teaching are marginalised in the “pink ghetto” of women’s activities, which, as Gough (2013) recognises, frequently echoes the gendered nature of EE discourses:

The foundational discourses of EE are “man-made” discourses at least two levels—because of the absence of women in their formulation and because of the modernist science that separates “man” and “nature” and associates “woman” with “nature”. The genderedness of the discourses also permeates their epistemology—not only are non-male perspectives not valued, but the epistemology, being consistent with modernist science, views knowledge as universal, consistent, and coherent and the subject of knowledge as culturally and historically disembodied or invisible and homogeneous and unitary. (p. 16)

As a team of mostly female students and faculty advisors at The UBC Orchard Garden, we have responded to this often-times imposed marginalisation as a challenge and a source of activist energy that continues to drive our collaborative work as teachers, gardeners, and researchers.

Constantly confronting unstable funding and space, however, has been a powerful pedagogical experience for the students, community members, and faculty who teach, learn, and grow together at The UBC Orchard Garden. In fact, it has become one of the central EE stories we tell with the garden and one of the ways in which the failures of the garden are pedagogical, unruly, and potentially transformative. As Halberstam (2011) writes,

*The Queer Art of Failure* dismantles the logic of success and failure with which we currently live. Under certain circumstances, failing, losing, forgetting, unmaking, undoing, unbecoming, not knowing may in fact offer more creative, more cooperative, more surprising ways of being in the world. (pp. 2–3)

At The UBC Orchard Garden, failures to secure funding and space—or, in the words of Sandra’s colleague, to “take over” education—have created surprisingly creative and collaborative ways of being and teaching together in the world.

## 8.7 Conclusions: Gardening the Margins of the Academy

In UBC's previous strategic plan,<sup>9</sup> the tagline *Place and Promise* was used to encapsulate the mission and vision of the university and is highly visible on all of the university's branding, advertisement, and signage. In a discussion document describing the meaning of the tagline, the UBC explains how "the University is informed by the physical majesty of this place. It is easier here to feel a *profound connection to the land* [emphasis added]. It is also understandable to feel a particular responsibility to protect this place, and this planet" (UBC 2012b, para. 1). While the sentiment in this statement might suggest a "green light" for place-based EE programmes and initiatives, our experiences in teacher education and with The UBC Orchard Garden suggest that the realities of life "on the ground" are incongruent with UBC's branding. Perhaps we need to continue reading what else is contained within the university's notion of *Place and Promise* to help us understand where some of these disconnections may originate:

Open vistas and boundless skies evoke a *frontier* spirit, metaphors for the opportunities UBC presents to learn, to explore, to question, to grow. The University *explodes its limits* whenever students, staff, faculty, and alumni set their *collective gaze on a common horizon*, and we are doing that now. (UBC 2012b, para. 2; all emphases added)

It is here that the universalising, gendered, colonial, and neoliberal underpinnings of *Place and Promise* become more apparent, since the settler fascination with frontiers and capitalist ideologies of endless, explosive, limitless growth are central to the university's connections between land and learning. As Tuck et al. (2014) maintain, the university's interest in feeling a "profound connection to the land" is an example of "the seduction of claiming Indigenous land as 'our' [settlers'] 'special places' where feeling connected to the natural world is possible" (p. 14). Tuck et al. (2014) also question who are the educators (including the environmental educators) and researchers at UBC who set their "collective gaze on a common horizon" by reminding us to critically consider ways in which "gifted/enlightened non-Indigenous environmental or outdoor educators are the chosen ones to learn and pass on Indigenous knowledge and traditions" (Korteweg and Russell 2012, as cited in Tuck et al. 2014, p. 14). Land education offers a necessary turn for environmental educators engaging with initial teacher education, since it recognises the importance of decolonisation "in environmental education toward reconstituting a shared future, or perhaps parallel futures, for settlers and Indigenous peoples" (Tuck et al. 2014, p. 14). Through our work with The UBC Orchard Garden, we have just started to become engaged with colonial, patriarchal, and neoliberal discourses and material realities that continue to shape our campus landscape, gardening practices, pedagogies, and curricula.

What we have learned throughout our experiences of gardening and learning to teach together on the margins of the academy, however, has been to engage with

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<sup>9</sup>UBC released its new strategic plan in 2018 entitled *Shaping UBC's Next Century*, but this new plan is not discussed here as the previous plan was in force when this chapter was written.

these messy and uncomfortable realities rather than escape them into a utopic garden paradise or refuge. We have learned to constantly ask questions, since scientific management and rationality work with, and sometimes clash with, more spiritual and holistic traditions and the unsettling possibilities of land education: What is a weed? What is a garden? Why plant in straight rows? Do you really mean to say the plants talk to you? Can we learn from gardens? Do we need to make the plots tidy before the winter? What can we learn by engaging ethically with “invasive species” or “native” plants? Is a garden a “natural” place? What are the stories that give support to certain practices? Are there other stories we should be attentive to, and do they support very different practices? By attending to these and a multitude of other questions, by attending to students and gardeners as teachers, by collaborating across and beyond the university, by becoming teachers together, and by gardening the margins of the academy, we are challenging and contesting Orr’s (1994) probing question: “What is education for?”

We are also, in a slow and erratic way, challenging and contesting the structures that reinforce an anthropocentric individualism that is at the heart of the increasingly neoliberal academy, teaching practices, and identities. As Berg et al. (2014) write, this fragmentation of relations is a central part of the increasingly neoliberal climate of the academy:

Universities in the space now known as Canada are situated on land stolen from indigenous peoples. ... These universities are the embodiment in both practices and actual bricks and mortar of the materialities of gendered social relations as they interlock with, for example, colonialism, racism, ableism and neoliberal capitalism. (p. 68)

Becoming teachers together in the marginal spaces of The UBC Orchard Garden has created conditions for human and more-than-human collaboration that unsettle—more than “take over”—the bricks and mortar of the academy. Sustaining the garden, therefore, as an integral (and, hence, no longer marginal) space and programme at UBC that contributes to broader efforts for initial teacher EE will continue to offer exciting challenges as the seedy weeds of our teaching and gardening together proliferate in unruly and unpredictable places and pedagogies.

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# Chapter 9

## Rising to the Challenge: Promoting Environmental Education in Three Ontario Faculties of Education



Maurice DiGiuseppe, Paul Elliott, Sheliza Ibrahim Khan, Sheila Rhodes, Jeff Scott, and Astrid Steele

### 9.1 The State of the Planet and the Well-Being of Its Children

In the wake of relentless environmental degradation, society must overcome its inertia and act quickly to address the anthropogenic threats to Earth's biosphere. Climate change, habitat destruction, and biodiversity reduction are among the factors seriously harming Earth's ecosystems on which all life depends. Some of this harm is irreversible. For example, recent data from the *International Union for Conservation of Nature (IUCN)* indicate that current extinction rates exceed the normal background rate by 100–1000 times (IUCN 2004; see also Pimm et al. 2014). While the impact of such threats can seem to be far off, their effects are being felt now. Furthermore, many Canadian children entering Kindergarten this year can expect to still be alive in 2100, when average global temperatures are likely to be at least 2 °C warmer (Intergovernmental Panel on Climate Change 2014). Given the implications of these and other pressing environmental concerns, one might expect them to be at the top of political and educational agendas. Instead, we often witness

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individuals and institutions adopting a “business as usual” approach to managing the planet. Education systems, in particular, struggle to prioritise Environmental Education (EE) when political and strategic decisions focus on preparing young people for roles in an unsustainable economy.

In our view, the education system has a critical role to play in steering society towards sustainable ways of life. While formal education cannot be expected to provide all of the leadership, it is in the unique position of being able to inform, reform, and transform successive generations of youth. This is especially important given the changes in childhood that have been experienced in much of the world, including Canada, in recent decades. While there is growing appreciation that spending time outdoors benefits children physically and psychologically (Faber Taylor and Kuo 2009; Wells and Evans 2003), many of today’s children lead more sedentary lives than their parents or grandparents. Authors such as Louv (2005, 2012) have made a powerful case for the benefits that flow from helping young people reconnect with nature in their local environment, and Chawla (2009) has shown that when children receive frequent access to natural areas and the mentorship of well-informed adults, they are more likely to develop into adults who have a deeper interest in, and empathy for, nature. The task for education is surely to help us move towards the day when the term “environmentalist” is redundant because ecologically responsible behaviour, at individual, governmental, and corporate levels, is the norm. In terms of Preservice Teacher Education (PTE), there is an urgent need to nurture future generations of teachers equal to this challenge.

## 9.2 PTE as a Driver of Change

Faculties of education have always been in the powerful position of fostering change in the education system, given their dual role of educating new teachers and conducting education research. In particular, they can introduce preservice teachers (PTs) to novel, evidence-based approaches and sow expectations that challenge and disrupt traditional practices. From this perspective, PTs can be seen as potential “Trojan horses”, smuggling new ideas and alternative frameworks into established school systems. All of this is good news when it comes to promoting innovative EE through the supply chain of newly qualified teachers.

### 9.2.1 *Theoretical Frameworks*

EE, as education *in, about, and for* the environment, inherently entails cognitive, affective, and empirical/practical dimensions (Hines et al. 1987). The cognitive element essentially involves development of knowledge and understanding of environmental processes and issues, and strategies for addressing environmental problems. The affective domain primarily concerns values and ethics education and the

development of sensitivity, forethought, appreciation, and responsibility. The empirical and practical dimensions of EE involve the development of awareness of environmental issues through direct engagement with the environment and planning for and taking appropriate action to prevent and mitigate environmental harm and degradation. In a pedagogical and curricular sense, the cognitive, affective, and empirical/practical dimensions of EE may be understood through the perspectives of inquiry-based learning (Chiarotto 2011; Moyer et al. 2007) and experiential and place-based education frameworks (Gruenewald 2003; Kolb and Fry 1975; Sobel 2004).

## 9.2.2 *Pedagogical Perspectives*

### 9.2.2.1 Inquiry-Based Learning

Inquiry-based learning is a student-centred, constructivist approach founded on the premise that “all people normally try to make sense of their world” through direct observation and analysis (Moyer et al. 2007, p. 12.). Essentially, inquiry-based learning involves iterative cycles of observing, questioning, inferring, collecting evidence, testing, analysing, justifying, and communicating. Ideally, the process is collaborative, with groups of students “engaged in critical discourse about the world” and teachers facilitating learning by “creating a context for questioning and helping [students] along their journey of discovering of ‘big ideas’” (Chiarotto 2011, p. 1).

### 9.2.2.2 Experiential and Place-Based Education

Experiential education involves teaching and learning that is empirical in nature, grounded in concrete experience, and reflective (Kolb and Fry 1975). In a related way, place-based learning is learning that takes place in students’ local environment or community, taking advantage of the unique social, economic, political, cultural, and historical resources of the “places” in which students live (Gruenewald 2003; Lim et al. 2013; Smith 2002). Sobel (2004) describes place-based education as:

The process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science, and other subjects across the curriculum. Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students’ appreciation of the natural world, and creates a heightened commitment to serving as active, contributing citizens. (p. 7).

Historically, EE has been addressed in courses such as Science, Geography, and Environmental Science. However, EE is distinct from these particular subject areas because it focuses on the relationship between people and nature and on issues arising from that relationship. Thus, EE involves study of the basic principles of science, geography, and environmental science, as well as relevant aspects of economics, law, political science, sociology, psychology, philosophy, literature, and

the arts. EE is therefore inherently multidisciplinary and cross-curricular in nature (UNESCO 1977). As such, school systems often have difficulty determining if EE should be integrated across the curriculum or offered as a stand-alone course. Adding or integrating an additional course to an already overcrowded programme can be challenging. Presently, only a few Ontario faculties of education have instituted discrete elective or compulsory EE courses, while most have endeavoured to integrate EE across the curriculum—with varying degrees of success (Inwood and Jagger 2014). The integration of EE into other courses may be analysed through models of imposition, insertion, infusion, and framing (Heimlich 1992; Monroe and Cappaert 1994).

### **9.2.3 Curricular Perspectives**

#### **9.2.3.1 Integrated Curriculum Models**

##### **9.2.3.2 Imposition**

Imposition involves the incorporation of discrete EE exercises into a curriculum not exclusively focused on the environment. Such exercises often focus on a specific topic, such as pollution, global warming, alternative energy, or water quality, and may be implemented in response to government, community, or institutional initiatives, such as Earth Week or Energy Watch. Imposed activities may provide excellent opportunities for students to engage in EE; however, the depth and breadth of learning is limited, and the concepts and issues are often addressed without due regard for the complex, highly interconnected, and interdisciplinary nature of the subject.

##### **9.2.3.3 Insertion**

Insertion is similar to imposition in that it involves the addition of a discrete environment-based unit of study into an already existing (non-EE-based) programme (Monroe and Cappaert 1994). However, in this case, the unit is more extensive in breadth and depth of coverage and would typically involve the insertion of an extensive unit of study, a compulsory or elective EE course, and/or extracurricular programme. When an EE unit, course, or programme is inserted into an already existing programme, a variety of conflicts may arise that need to be reconciled, including timetable and space conflicts.

#### 9.2.3.4 Infusion

In the context of EE, infusion involves the unified incorporation of extensive environmental content into non-EE courses, such as science, geography, mathematics, social studies, literature, and the arts (Heimlich 1992). In this approach to EE curricular development, educators look for opportunities to connect EE concepts and issues with a mainstream course's curricular content. Various organisations, including school districts and ministries of education, have developed resources to assist in this process (Ontario Ministry of Education [OME] 2011a, b). According to Disinger and Howe (1992), if not applied skilfully, infusion may result in compromised outcomes because it "may adversely affect the rigor of the host subject, and ... [the] intellectual investment needed for thorough understanding of specific detail ... not directly pertinent to the discipline at hand" (p. 6). Moreover, Karrow and Fazio (2015) claim that infusion is a "reductionist" strategy of curricular integration that results in only superficial treatment of EE within established subjects such as science, geography, and mathematics, and that "superficiality ... creates the impression ... that EE is occurring within schools, when in fact only a very rudimentary and superficial curricular form of EE is being practiced, if at all" (p. 98).

#### 9.2.3.5 Framing

Framing is a pedagogical approach in which the arbitrary boundaries of traditional subject areas are eliminated, and a highly integrated and interdisciplinary framework for teaching and learning is implemented (Heimlich 1992). Framing is more commonly practised in elementary grades, where a particular teacher is typically responsible for a number of different subjects, and is less common in middle and secondary schools where subject discipline divisions tend to be less flexible.

### 9.2.4 EE in Ontario PTE

After years of neglect, the status of EE in the Ontario school system received a boost in 2007 with the publication of *Shaping Our Schools, Shaping Our Future* (SOSSOF), a report produced by the Ontario Curriculum Council's Working Group on Environmental Education (WGEE), chaired by Dr. Roberta Bondar (Ontario Curriculum Council 2007). The OME accepted the 32 recommendations in the SOSSOF report and used them to help create *Acting Today, Shaping Tomorrow: A Policy Framework for Environmental Education in Ontario Schools* (ATST) (OME 2009). This policy framework requires that EE be embedded in all subjects and grades of the Ontario curriculum. However, PTE programmes were already quite intensive and focused on a number of mandated curriculum emphases, including numeracy and literacy, which steered attention away from EE. Nevertheless, studies by Tan and Pedretti (2010), Marcum-Dietrich et al. (2011), and Blatt and Patrick

(2014), among others, made the case for enhancing EE in PTE in Ontario. However, finding space in busy timetables, recruiting capable faculty, and convincing sceptical and poorly informed colleagues of the importance of EE in PTE have been significant challenges.

Discovering that there are individuals and organisations that support efforts to enhance EE in PTE provides the inspiration new teachers need to persevere in the face of resistance. Faculties of education that introduce PTs to local environmental heroes, especially those who have succeeded within the constraints of the school system, go a long way in inspiring PTs to make a difference. Furthermore, by showing PTs and children that concern for and interest in the environment extends beyond the school walls, we demonstrate the advantages of integrated thinking and the power of making real-world connections. The time is ripe to examine how faculties of education can empower new teachers to become effective and hopeful environmental educators who take on leadership roles in environmental protection and sustainability. Many faculties of education, including the three discussed here, are meeting the challenge by providing effective EE in the face of formidable practical, political, and perspectival tensions.

### **9.3 Three Field Narratives**

In the three field narratives presented below, we discuss programmes and activities that have been implemented in our respective faculties of education to address EE in our PTE programmes in light of the pedagogical and curricular theoretical frameworks discussed above.

#### ***9.3.1 Field Narrative 1: Eco-Mentors at Trent University***

Launched in 2003, the consecutive Bachelor of Education (B.Ed.) programme at Trent was initially lacking in EE content. There was some infusion of EE in some courses, but the extent depended on individual instructors. There was no elective in EE or outdoor education. To address the perceived shortfall, and encouraged by the publication of ATST (OME 2009), a working group was struck in 2009 to identify opportunities for the development of ecological literacy and sympathetic pedagogies. Various ad hoc contributions to EE in the B.Ed. programme were elicited from community members during the 2010–2011 academic year. As these workshops occurred near the end of the programme, however, it was too late for PTs to make use of the content and techniques during their school-based practicums. The main contributor of workshops was Camp Kawartha, a nearby outdoor education centre. In subsequent discussions with the camp director, it was suggested the workshops could be offered earlier in the year, so that PTs would be able to apply their learning during their placements. From this arrangement, Trent's Eco-Mentorship Certificate

Program emerged and was subsequently launched in fall 2011. Trent University PTs are invited to sign up for an Eco-Mentorship programme. Collaboration with various community members is central to the programme's philosophy; it shows PTs that there are people and organisations locally that can support them in their quest to become an Eco-Mentor to students. Partnership gives access to expertise that can enrich and support curriculum delivery and provide professional advice and encouragement.

The Eco-Mentorship programme consists of four half-day workshops, which are themed Nearby Nature, Overcoming Barriers, Inspiring Hope, and Cross-Curricular Connections. Workshops are extracurricular and bear no formal credit, and attendance is voluntary. These features give the programme an unusual degree of freedom compared to standard university offerings, and they enabled the programme to be established efficiently and with limited bureaucracy. Workshops are held in Camp Kawartha's Environment Centre (a satellite building to the main camp), and timetabling conflicts are avoided by holding workshops on Saturdays (Monroe and Cappaert 1994). The Environment Centre was built by faculty and students from Sir Sandford Fleming College's Sustainable Building Design and Construction programme on the edge of the Trent University Wildlife Sanctuary, and it provides a highly conducive learning environment. PTs who participate in the full programme are invited to submit a report demonstrating how they incorporated ideas and philosophies from the workshops into their teaching. Each year, 30–50 PTs have signed up for the programme, representing 15–25% of Trent's PTs. Candidates who submit a report are awarded an informal certificate in recognition of their commitment.

The Eco-Mentorship workshops are jointly coordinated on a volunteer basis by a small group of faculty and the director of Camp Kawartha, but importantly, each workshop also reaches out to involve additional faculty and other community members. The community contributors are experts not only in fields of teaching but also in journalism, photography, nature conservation, community gardening, and Indigenous studies. These experts share their expertise in various subjects and also serve as role models for a range of pedagogical approaches. Many of the contributors incorporate outdoor experiential activities in their sessions to reinforce, explicitly and implicitly, the underlying message that the outdoors provides a stimulating place-based learning environment (Lim et al. 2013; Sobel 2004).

Among the experts are local teachers who have championed EE in their schools and have inspiring stories to tell. These have included a recently retired teacher who worked with children, parents, and colleagues for over 25 years to transform the grounds of his elementary school from a barren monoculture of grass and hard surfaces into a child- and wildlife-friendly series of habitats. Another local teacher works with at-risk youths with whom he has developed a vegetable garden whose produce they use to make salsa, which is then sold (along with items they make from recycled materials). Other presenters have come from organisations that can support teachers by providing classroom speakers and venues for school outings. These include a regional conservation authority that runs a water stewardship programme in schools and the Peterborough Ecology Garden that promotes sustainable,

wildlife-friendly gardening techniques. Furthermore, members of the Camp Kawartha teaching staff provide PTs with information about facilities available to school groups at outdoor education centres. PTs are also made aware of employment opportunities through exposure to the work of a range of educators, many of whom do not work in traditional classroom settings. Some of our students have gone on to secure internships with our community partners for the final phase of their B.Ed. programme—in an Alternative Placement setting—by working at the Peterborough Ecology Garden, for instance, helping to plan and run sessions for visiting school groups.

The Eco-Mentorship sessions challenge preconceptions and provide curriculum support ideas and enrichment opportunities. Outdoor activities are incorporated in every workshop—whatever the weather—and provide PTs with first-hand experiences of how curriculum expectations may be met outside the four walls of a classroom, which demonstrates the value of experiential and place-based learning in EE (Gruenewald 2003; Smith 2002). This aspect of the programme helps to raise awareness of growing calls to reconnect children with the outdoors and with nature (Kozak and Elliott 2014; Louv 2005; Sobel 2004). The pleasure and stimulation that PTs display in response to outdoor activities makes it easy to convince them that they should be planning to incorporate such opportunities with their own teaching (Figs. 9.1 and 9.2). Moreover, many of the activities can help fulfill the expectation that children in elementary schools in Ontario experience daily physical activity (OME 2005; Fig. 9.3).

The Ontario curriculum recommends an inquiry-based approach to learning (e.g. OME 2009, 2013), and some of the workshop activities demonstrate how this can be achieved in outdoor settings by, for example, developing children's inquiry skills, including observing, questioning, and seeking answers (Chiarotto 2011). By providing concrete examples of inquiry learning and other activities, we believe that



**Fig. 9.1** Meet a tree



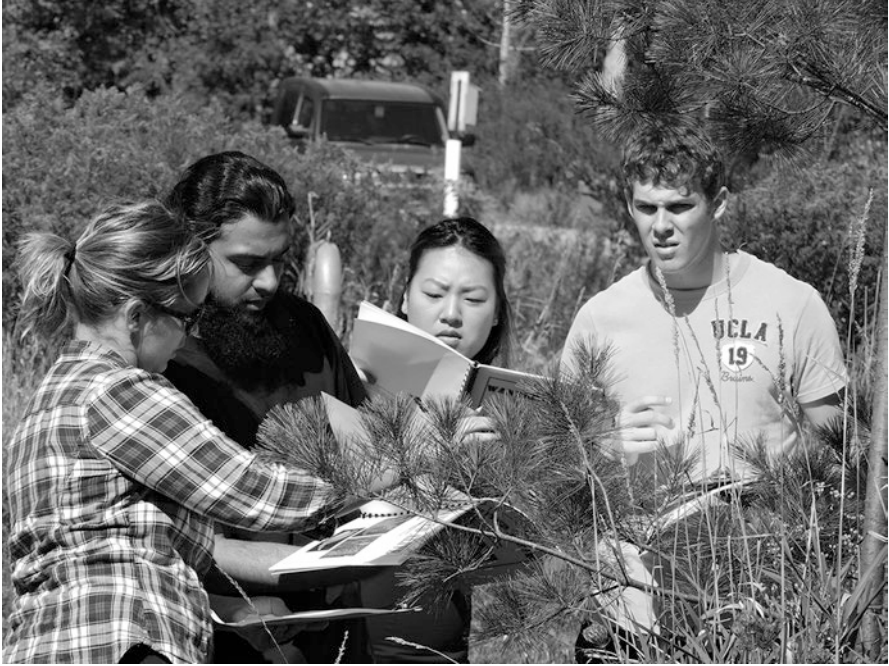


Fig. 9.2 Tree identification activity



Fig. 9.3 Geese skein activity

PTs are more likely to have the confidence to try these strategies for themselves. A workshop on cross-curricular links specifically examines how environmental and Indigenous education can be integrated and used to support each other—an example of curricular infusion (Heimlich 1992). This particular workshop has included traditional teaching by an elder, which was a new experience for most participants that they often find profoundly motivating and thought-provoking. One Eco-Mentor PT commented: “I loved having the elder come in. I could have listened all day”. Showing our PTs how Indigenous education can be infused with environmental subject matter in inspiring and mutually beneficial ways is an important aspect of the programme.

By exposing participants to the ideas of a range of educators from a variety of backgrounds, we hope that they will be encouraged to try new things and gain confidence. Some participants reported finding themselves completing placements in schools where no other teacher is interested in EE and where there is no tradition or expectation that students should experience outdoor learning opportunities. One PT reported: “My Associate Teacher was not always on-board with going outside. She did not want to take responsibility for children outside. The focus was on math and language”. In such environments, PTs can feel isolated, and so we encourage our Eco-Mentors to reach out to people and organisations for support and collaboration. In questionnaire surveys and focus groups conducted after the programme, PTs often reported that the highlight of the programme is working with like-minded people and discovering others who want to prioritise EE in their teaching. As one PT said: “My passion for being outside became something I really wanted to share because of the excitement of the programme and seeing how many other people felt the same way”. By working with like-minded others, it is possible to build a team spirit that nurtures and sustains us when faced with negativity and institutional/developmental barriers.

### **9.3.2 Teachers as Eco-Mentors**

We are inspired by the outcomes of the Eco-Mentorship programme. After completing the workshops, PTs are challenged to implement an environmental focus to any subject area or curricular theme during their practicums. PTs then report on what they did, how they connected with students and community members, and how they tackled the challenges they encountered. The reports provide insights into how informative and useful the PTs found the workshops. In general, the outcomes reveal how PTs (a) acquaint themselves with the school community and connect a sense of place to environmental inquiry (Chiarotto 2011; Lim et al. 2013; Sobel 2004); (b) support and inspire environmentally focused activities; and (c) foster and manage the development of environmental leadership in themselves. The following sections expand on these three outcomes.

### 9.3.2.1 Sense of Place

According to Lim et al. (2013), place is a “conceptual framework that helps us to understand the importance of relationships between the individual and the society and also the local and the global” (p. 192). In practice, we propose ways in which awareness for one’s place can foster environmental connections, locally and globally. We recognise our role in society as educators, sharing knowledge about sustainability and environmental stewardship. Yet, the challenge is how to take what one has learned about place during the Eco-Mentorship programme and move theory into practice. For many PTs, placements are in unfamiliar communities where they have to discern and adapt to school dynamics and connect with student interests.

A place-based educational framework is witnessed in several PT reports. Some emerging themes include facilitating excursions, getting students outside of their classrooms, and piggy-backing on initiatives in the local community. For example, one PT shared information about an excursion to a logging company where students learned about the company’s ethics on sustainable forestry practices. In another example, a PT harnessed the power of getting youths outside to perform a play on the open field in their schoolyard. Another PT had students perform math tasks outside, searching for angles among the natural and built environments (Fig. 9.4). Lastly, a PT collaborated with the local Rotary club on their Annual Spring Clean Up. Getting to know the community in terms of clubs, centres, and local organisations



**Fig. 9.4** Finding angles

proved to be worthwhile for new teachers wanting to get their students to participate in meaningful outreach and partnerships. Each of these experiences cultivates a sense of place in PTs.

### 9.3.2.2 Support and Inspire

Several PTs reported learning opportunities that encouraged students to think critically about privilege. One PT described how students' exploration of clean, fresh drinking water provoked their thinking: "We discussed how fortunate we are in Canada to have access to fresh drinking water. We compared our situation to other countries that are not as lucky to have the water that we do". Another used the Jay-Z documentary *Water for Life* to raise awareness on what we can do to help those who do not have clean water. Creating a reflective space to inquire and discuss water usage inspired the students to create their own "Charter of Water Rights" (Fig. 9.5). Subsequent activities engaged students in better practices to conserve water and to research and advocate for water conservation in their school, homes, and communities.

Another example activity promoted a recycling initiative with students. In this case, a PT reported how "many parents shared that their children had gone home and spoken at length about the initiatives undertaken in the classroom" and how the children's misconceptions were rebuked: "The fact that plastic never really goes away blew their minds!" Here the PT was able to answer critical questions through the knowledge they shared about waste and plastics; it resonated with the students who spoke about it at home and then demonstrated their growing concern by completing a classroom recycling project.

In both of the cases above, students were inspired to act. We believe some of the most encouraging projects reported are those that make a call to action among students. Scholarship that appeals to student agency (e.g. Hodson 2010) strengthens how motivation and engagement in learning is supported when students understand their social responsibility and take action on issues of local and global concern. For example, litterless lunches helped nurture behaviour and cultivate habits that a PT reported as lasting: "Students will continue the Recycling Rangers programme that was put in place and will also continue to empower the students to make a difference". Importantly, in terms of EE, PTs explored how their action has a ripple effect on the world, as exemplified in posters they made (Fig. 9.6).

### 9.3.2.3 Fostering Leadership

One critical triumph of the Eco-Mentorship programme is the fostering of leadership through the development of mentors or leaders who can confidently infuse EE into their practice as well as encourage their colleagues to do so. The reports produced by PTs after completing the workshops and venturing into their placements offered insights here as well: "I was able to bring with me and teach others (teachers

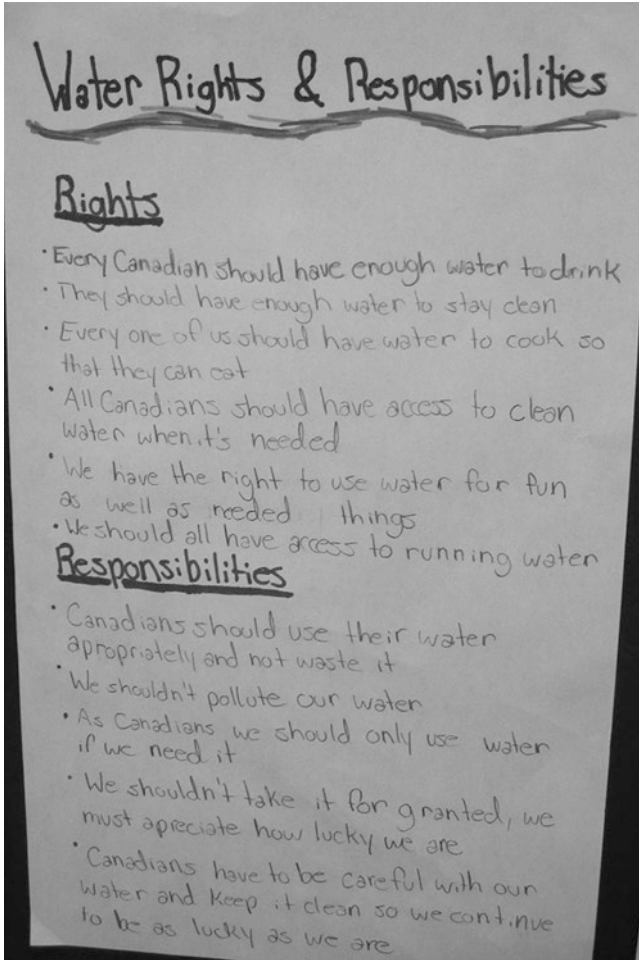


Fig. 9.5 Charter of water rights

and students) what I know about environmental conservation”. Assurances like this are inspiring and hopeful. While it is difficult to measure, a number of PTs also made claims that can be interpreted as a personal victory as they take on the role of an Eco-Mentor. One participant said, “When I recognised the science and environmental infusion that was possible, and when I was able to see it work and how excited the students got, I knew it was worth the effort!”; another commented, “I made it my mission, throughout my placements, to incorporate the natural world into as much of the curriculum as possible and make environmental education a ‘normal’ part of everyday school life”; while another reflected that, “I felt a sense of satisfaction with this lesson that I didn’t feel with many other lessons. The students were engaged and participating, and in the end, isn’t that what we strive for as teachers?”





Fig. 9.6 Recycling posters

### 9.3.3 *The Future*

The Eco-Mentorship programme will continue to evolve, most notably as we move from a 1- to 2-year Bachelor of Education degree programme. In the B.Ed. programme, we will run a new core course in EE, and the Eco-Mentorship programme will now offer experiences to complement this addition. Fuelled by the positive reception our PTs have given to the Eco-Mentorship workshops, and by the successes our PTs have experienced in schools as they served as Eco-Mentors, we will continue to forge opportunities for EE to be highly valued in our faculty as a prerequisite for preparing PTs and their future students to live sustainably and ecologically.

## 9.4 Field Narrative 2: E4E at Nipissing University

### 9.4.1 *Beginnings*

Prior to 2005, Nipissing University's School of Education did not offer any EE course. At that time, practices involved infusing snippets of EE into other courses such as Science and Technology, depending on the interests of the instructor and time available. Consequently, a group of determined faculty members developed a 36-h course titled "Outdoor and Experiential Education" (OEE) which ran from 2005 to 2012. In its heyday, the OEE course was heavily subscribed by many PTs who had an interest in developing and implementing outdoor education programmes and who desired to work in non-traditional venues, such as outdoor education centres. Participants were required to pay approximately \$700 for tuition and an additional \$250 to cover the costs of four off-campus weekend experiences. By 2012, to the disappointment of founding faculty members, declining enrolment and rising costs led to the cancellation of the OEE course.

Unable to resurrect the OEE course or introduce a new EE course into an already packed PTE programme, we, like many other faculties of education, were at a loss (Monroe and Cappaert 1994). How could we infuse or insert EE into the programme? Fortunately, in the spring of 2012, we learned of the Eco-Mentorship programme at Trent University, and the proverbial light bulb began to blink! Of course, what works at one institution doesn't necessarily translate well to another, but the concept of weekend workshops for PTs struck us as entirely possible. And so was born the idea for the "E4E" (Educating for Environment) workshops. In essence, we wanted to offer our PTs an opportunity to explore and participate in training for infusing/inserting environmental and sustainability issues throughout classroom curricula. This was different from the OEE elective course, which focused on outdoor and experiential learning and the development of outdoor education skills and programmes.

### 9.4.2 *The E4E Workshops*

In all, we (the authors) currently offer four E4E workshops at Nipissing University: two in the fall and two in the winter, each addressing different topics. The two faculty members advertise the workshops through posters and the school of education electronic newsletter. Generally, about 24 PTs register for these workshops, with the understanding that, in order to qualify for an informal certificate of completion, they must attend all four workshops and provide evidence of integrating EE during an instructional period. The workshops take place on a Friday evening and the following Saturday (all day). Participants pay a nominal fee of \$25, which covers honora-ria for guest speakers, supplies, and snacks. The workshops are each designed to provide PTs with ideas for both indoor and outdoor activities that focus on some



aspect of learning *in, for, and about* the environment, while deliberately identifying potential opportunities to infuse EE throughout the mandated curriculum. Furthermore, opportunity for discussions about various concerns that PTs might have, including details about taking groups of students outside their classrooms and schoolyards, is provided throughout all four sessions. Guests, including teachers, graduate students, and faculty members from other programmes, provide a diverse and rich opportunity for students to engage in discussion.

The surrounding landscape of Nipissing University is beautiful and varied. The campus sits atop an escarpment, beside a large pond, bordered to the west by rugged, mature hardwood forests. An extensive trail network exists for hiking, biking, and snowshoeing. In other words, we do not have to travel far from our door to be immersed in a natural world that offers many EE-related learning experiences. We encourage our E4E participants to be prepared to go outside in all types of weather, keeping in mind the maxim of one of our guest speakers (who is a teacher in the primary panel): “There is no such thing as bad weather, only poor clothing choices” (Fig. 9.7).

Typically, fall workshops have included a theoretical introduction to EE in Ontario; delivery of EE lessons through the eyes of a classroom teacher; a night hike that provides inspiration for poetry writing; and a social studies activity called “Global Morning”, taken from the *Green Teacher* series (Grant and Littlejohn 2009), in which participants track on a hand-drawn world map the worldwide sources of everything we might encounter in the first hour of our morning, including



**Fig. 9.7** Nipissing University participants

our alarm clocks, running shoes, and breakfast choices. This leads to a robust discussion around socio-environmental concerns. In addition, PTs are introduced to a series of environmentally focused physically active games, such as “Quick Frozen Critters” and “Oh Deer!” (Canadian Wildlife Federation 1992), and the use of a digital microscope outdoors to enable participants to see the world of the “tiny”. Winter workshop activities have included a history of materials and the design of snowshoes; an outdoor adventure on snowshoes, including races and games; and the creation of snow art as an expression of visual arts. In the style of an environmental science class, PTs complete a snow study, identifying snow layers and varying temperatures in the snow profile and discovering the amazing world of the pukak.<sup>1</sup> Over lunches, we encourage conversations that challenge the personal views and actions of our participants (e.g. discussions about climate change, food security, consumerism, and environmental toxins).

After attending all four workshops, participants are encouraged to apply their newfound understandings and resources during practicum placements to design and implement a minimum of one lesson that integrates EE. Upon submitting evidence of their lesson (a lesson plan or detailed description), the participants are issued an informal certificate verifying completion of the E4E workshops. The lessons submitted by the participants address a large range of subject areas and grades, such as Grade 1, Art with Natural Materials Gathered Outdoors; Grade 6, Consumerism/Wants and Needs; and Grade 8, Five Senses Snowshoeing. Response to the E4E workshops has been tremendous over the last 3 years, with workshops oversubscribed (of course, we accommodate all who register) and with more women represented than men. Using social media, participants share resources and ideas that extend beyond the workshop topics and times.

### 9.4.3 *The E4E School Project(s)*

As an extension of the E4E workshops, we have partnered with the local public school board (Near North District School Board) to connect interested PTs with local classrooms. For the last 3 years (2013–2015), we received generous Schulich School of Education funding to hire five or six newly graduated PTs as facilitators. These facilitators—most of whom had participated in the E4E workshops—collaboratively designed (with the classroom teachers) and then implemented a number of EE learning experiences for local elementary students in formal and non-formal settings. The facilitators met and planned with the classroom teachers to create learning experiences that embedded EE in the curriculum being covered in

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<sup>1</sup>Pukak is an Inuit word for the space between ground cover (grasses and herbs) and the snow layer where temperatures hover around 0 °C; in the winter, various animals like shrews and voles are active foragers in this layer (Nelson 2003).

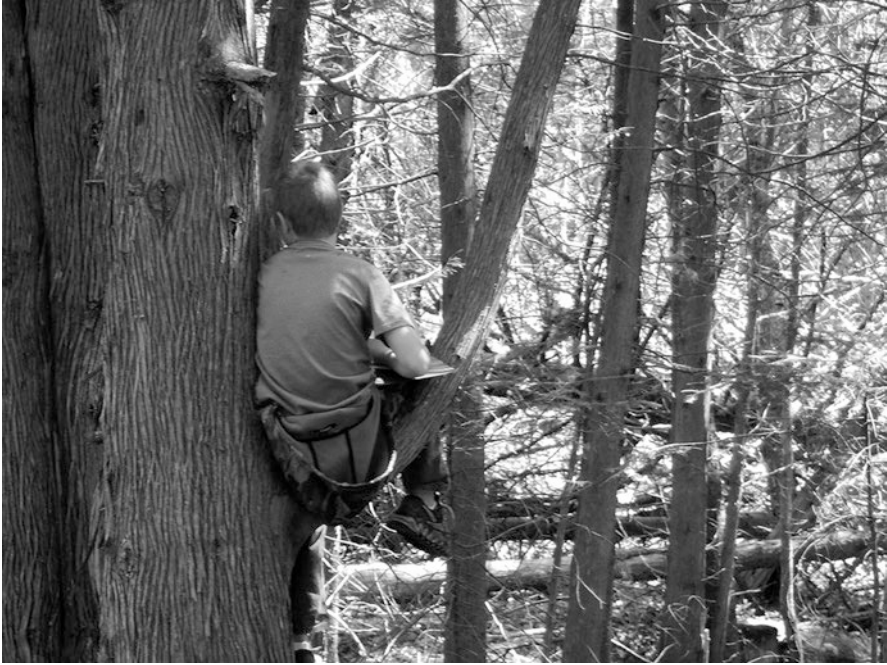


**Fig. 9.8** Writing about heroes

the classes at the time rather than a special topic suitable only for field trips to informal centres. For example, in the 2015 E4E School Project, Grade 3–6 themes included spatial reasoning (a numeracy initiative) and persuasive writing (a literacy initiative). The themes were addressed through learning opportunities including writing about “Environmental Heroes” and constructing outdoor shelters using found materials (Fig. 9.8).

#### **9.4.4** *Looking to the Future*

In fall 2015, our school of education launched a 2-year Bachelor of Education programme, as required by provincial legislation. We see the extra year of teacher preparation as an opportunity to provide additional EE for our PTs. In particular, the following three EE-based electives will be offered: Environmental Education across the Curriculum; Environmental Science; and Teaching, Learning, and Being in the Outdoors (Fig. 9.9).



**Fig. 9.9** Being outdoors

### **9.5 Field Narrative 3: Environmental Education in the University of Ontario Institute of Technology's PTE Programme**

EE in the University of Ontario Institute of Technology's Bachelor of Education programme developed by fits and starts until 2012–2013, when more organised EE programming began to take root. Previously, environmental topics were mainly addressed in the context of the environmental science/ecology components of Intermediate-Senior (I-S) Science and Geography methods courses and the science and geography components of Primary-Junior (P-J) methods courses. In September 2012, a group of University of Ontario Institute of Technology PTs and instructors, motivated by the OME's (2007, 2009) recommendations for enhancing EE in PTE programmes and by their own personal concern for the environment, formed the faculty's first "Environmental Education Committee" (EEC) to (a) examine the degree to which EE was being addressed in the faculty's B.Ed. teaching methods courses; (b) raise the community's awareness of local and global environmental issues through community-based environment action projects; and (c) connect with other University of Ontario Institute of Technology faculties and departments, local school boards, other Ontario faculties of education, and relevant community organisations to explore common interests and concerns.



### **9.5.1 *B.Ed. Course Reviews (2012–2013)***

The B.Ed. course reviews carried out in 2012–2013 involved examining syllabi for evidence of EE content, especially EE-based learning activities. Results of these reviews indicated that most courses included no EE learning activities at all, while others, such as Intermediate-Senior (I-S) English and Primary-Junior (P-J) Language Arts, had some optional project-based EE activities; only P-J and I-S Science and Geography courses included compulsory, highly infused (Monroe and Cappaert 1994) curriculum-driven EE exercises. In the review process, the reviewers included some suggestions that instructors might consider for infusing EE in their courses, many of these suggestions drawn from the OME's (2011a, b) Grade 1–8 and 9–12 “Environmental Education Scope and Sequence of Expectations” resources. Further to the course review activity, a Grade 9 Geography “Web-Quest Activity Kit” was developed by a geography instructor and his PTs that focused on the topic of “Human-Environment Interactions”, with specific connections to Grade 9 History and Grade 9 English curriculum outcomes—a good example of EE cross-curricular infusion (Monroe and Cappaert 1994).

### **9.5.2 *Community-Based Environmental Action Projects (2012–2013)***

The PTs and faculty who started the EEC were also concerned by the apparent lack of personal and institutional interest in local and global environmental issues. Consequently, the committee joined forces with other University of Ontario Institute of Technology faculties to conduct an electronic device recycling drive and also planned to enhance the Faculty of Education's dull interior and exterior spaces with plants and nature-themed wall murals. The recycling drive was well-received and highly successful, but plans for greening the campus and painting murals were fraught with administrative and financial difficulties, resulting in extended delays for the mural project and outright cancellation of the campus greening project. Eventually, with some faculty of education support (including financial support), the first phase of mural painting began in fall 2015.

Early in its mandate, the EEC made a commitment to forge stronger relationships with members of University of Ontario Institute of Technology's faculty of education; other University of Ontario Institute of Technology faculties, including the Faculty of Science and the Faculty of Engineering; University of Ontario Institute of Technology's Baagwating Indigenous Student Centre; the Environmental and Sustainability Education (ESE) programme at the Ontario Institute for Studies in Education of the University of Toronto (OISE-UT); and the Durham District School Board's Science and Technology programme facilitator and Waste & Energy officer. The primary goal of these efforts was to explore common interests, share useful resources, and consider collaborations that could enhance EE in our respective organisations.

### 9.5.3 *Subsequent Developments (2013–2015)*

The EE programme in University of Ontario Institute of Technology’s Faculty of Education continued to evolve through the 2013–2014 and 2014–2015 academic years, including the development of University of Ontario Institute of Technology’s (a) “Enviro-Mentor” programme, (b) first Environmental Education Conference, (c) first Environmental Education course, and (d) School Garden research programme.

#### 9.5.3.1 **University of Ontario Institute of Technology’s Enviro-Mentor Programme (2013–2015)**

Inspired by Trent University’s Eco-Mentorship programme, University of Ontario Institute of Technology’s “Enviro-Mentor” programme (Fig. 9.10) was created to provide PTs with opportunities to learn about EE in local, regional, national, and global contexts; engage in local environmental action projects; and learn about ways in which preservice students may infuse EE in their practicum placements and beyond. The Enviro-Mentor programme is a voluntary programme in which participating PTs attend three half-day workshops and one full-day workshop throughout

**Fig. 9.10** Stream survey



the academic year, facilitated by a team of cross-curricular instructors and invited experts, including Aboriginal elders. Each session, which takes place on Saturdays, engages Enviro-Mentor PTs in a large variety of place-based, experiential, and classroom-based EE activities, including ecological stream and field studies, citizen science projects, exploration of “best practices” in environmental sustainability, strategies for integrating Indigenous Traditional Ecological Knowledge and Wisdom (TEKW) into elementary and secondary classrooms, and the integration of Information Communication Technology (ICT) and other technologies in EE activities.

In their weekend workshops, Enviro-Mentors are encouraged to develop lesson activities that they may implement during their practicum placements, and their strategies and successes are shared over noon-hour informal get-togethers. In addition to participating in the weekend workshops, Enviro-Mentors regularly contribute to the growing EE mural and to the Faculty of Education’s annual EE conference. The mural project, in particular, was developed to be an ongoing activity in which each new cohort of Enviro-Mentors will be expected to contribute to the mural’s evolution (Fig. 9.11).

In order to highlight the importance of integrating EE in all curriculum areas, Internet matrix barcodes (QR codes) linked to environmental organisations and websites containing EE lesson ideas will be added to the mural on a regular basis. In addition to contributing to the ongoing wall mural project, Enviro-Mentors are also expected to contribute to planning, organising, and hosting University of Ontario Institute of Technology’s annual EE conference.

**Fig. 9.11** Mural





### **9.5.3.2 Environmental Education Conference (2014–2015)**

Following on the early plans by the EEC to host an EE conference at University of Ontario Institute of Technology, and after securing a TD Friends of the Environment Grant, the faculty's Enviro-Mentor facilitators and a group of Enviro-Mentors took on the task of planning and organising University of Ontario Institute of Technology's first EE conference in March 2015. Participants included students, faculty, local teachers and school board representatives, and displays by a number of EE resource providers and environmental non-profit organisations. The 2015 conference comprised 23 presentations and workshops with titles such as *Climate Change: Teaching the Reality and Addressing the Deniers*; *Citizen Science and Education: Opportunities and Challenges*; *Using Eco-art Education as Environmental Activism*; *Where Is the Learning?*; and *Designing a Learning Garden and Eco-Justice Education Across the Curriculum*. Several Enviro-Mentor PTs presented sessions at the conference that provided a unique learning opportunity for them. Although the EE conference is planned to be an annual event either at University of Ontario Institute of Technology or elsewhere, the procurement of adequate funding, suitable space, and other resources will be a perennial challenge.

### **9.5.3.3 Environmental Education Course (2014–2015)**

Since its formation, the EEC discussed the need for enhanced EE programming at University of Ontario Institute of Technology and, in particular, the possibility of offering a compulsory or elective EE course within University of Ontario Institute of Technology's B.Ed. programme. After lengthy discussions with university administrators, and in light of the OME's introduction of a 2-year PTE programme, the committee received approval for developing an elective EE course, first offered in the 2014–2015 academic year. In this EE course, PTs were provided with opportunities to develop critical skills for implementing EE in the Ontario context. The course employed a project-based approach, enabling PTs to develop resources for infusing EE in their academic, professional, and everyday lives.

Activities in the course were centred on digital technology-based learning (e.g. blogs, discussion boards), field studies (i.e. experiential, place-based learning activities), and traditional Indigenous environmental knowledge. Each week, current environmental topics were discussed and debated, which provided real-world contexts that PTs could use in developing stronger connections to the issues. For example, in the first year of the course, PTs selected the topic "GMOs will save the planet" for a whole class debate and conducted extensive research to support their arguments. For many of the PTs, this was their first experience with classroom debating. The major assignment in the EE course involved the creation of a problem-based learning module on a local environmental issue. Topics included *Chemical Valley: Harmful Emissions and Pollution*, *Bee Decline and Crop Pollination*, *Environmental Stewardship*, and *Reconnecting with Nature*. Student groups

researched their topics and presented their findings through interactive town hall sessions, case studies, and web-based strategies.

## 9.6 School Garden Research Programme (2013–2014)

In the 2013–2014 academic year, University of Ontario Institute of Technology faculty began case study research projects on the development and implementation of learning gardens at three elementary and middle schools. In addition to examining the benefits, drawbacks, and challenges of developing and implementing school-based learning garden programmes, these studies explored the types of gardens students and teachers have constructed at their schools; how garden-based learning activities connect with the Ontario curriculum; how garden-based learning fosters development of creativity, communication, collaboration, and critical thinking skills; and the extent to which school garden programmes promote the development of environmental sustainability, stewardship, and well-being. In 2014–2015, the School Garden research programme was expanded to include a fourth case study involving a Southern Ontario high school where an extensive herb-vegetable garden had been developed. At this school, the produce is regularly donated to the culinary section of the school's Specialist High Skills Major programme in Hospitality or processed and sold for proceeds, which have been used to make international micro-loans through the Kiva organisation (see [kiva.org](http://kiva.org)). This particular research project endeavours to explore the relationships among garden-based learning, nutrition, food supply, healthy living, and social justice (Fig. 9.12).



**Fig. 9.12** Creating a school garden

### **9.6.1 *Future Developments***

University of Ontario Institute of Technology's Faculty of Education EE programming continues to grow and evolve. The elective EE course will continue to be offered, with plans to recommend that it become compulsory for all B.Ed. students. The resounding success of the faculty's EE conference has led to calls for the conference to become an annual event, possibly hosted by different faculties of education on a rotating basis. The Enviro-Mentor programme will continue to be offered, and the School Garden research programme will continue its investigations into the foreseeable future. Though great strides in enhancing EE have been made in a relatively short period of time, there is still much to be accomplished. Together with the wisdom gained from past experience and dogged determination, University of Ontario Institute of Technology's EE visionaries will continue their mission of moving EE from the periphery of the B.Ed. programme to the mainstream.

## **9.7 Analysis and Discussion**

The commitment to enhancing EE in these faculties of education is inspiring and hopeful. Each of the EE learning opportunities offered was designed and implemented to meet specific and unique local needs. However, analysis of the cases also reveals that the three institutions had some common experiences and similar challenges. Each case study describes responses to a perceived lack of EE pedagogy and curricula in PTE programming fed by frustrations that the requirements of the government's EE framework were not being given appropriate weighting and the view that many environmentally conscious PTs were being poorly served. In each case, passionate faculty members and enthusiastic community partners created opportunities to meet previously underserved goals, often through efforts well beyond the call of duty.

PTs in each of the programmes committed to attend weekend workshops. This helped alleviate the practical constraints of timetabling, staffing, and room allocation. Additionally, extracurricular workshops benefited the programmes by avoiding the more unnecessary requirements of standard university courses, including formal enrolment and assessment procedures. An unanticipated advantage of the model was the degree to which participants developed a sense of community and common purpose. Though there may have been no monetary or non-monetary reward for running or participating in weekend workshops, these activities constituted some of the most rewarding that students and faculty have done (and continue to do). One of the most interesting features of the programmes described is the involvement of community partners. Working collaboratively with local organisations and individuals with expertise and enthusiasm, each faculty was able to draw on a rich source of ideas. PTs not only benefited directly from such resources but also were additionally alerted to people who might support them in their future teaching careers, via advice, classroom visits, visit venues, and teaching resources.

Also noteworthy were the offshoots of the workshops at each faculty. In each case, EE learning and teaching did not end with the final workshop session. In all three faculties, workshop participants brought EE into their practicums, creating EE learning experiences within formal curricula for their students. The workshops also became stepping-stones for other action projects, unique and meaningful to each faculty of education and beyond—rich evidence of the rippling outward effect of EE awareness, knowledge, and commitment among participants and partners. The workshops and other EE-based activities in the cases also provide evidence for the continuing need to impose, insert, infuse, or frame (Heimlich 1992; Monroe and Cappaert 1994) EE within each of our PTE programmes (and, by extension, all PTE programmes) since EE is recognised as an essential element of education in Ontario (OME 2007, 2009), and many PTs wish to engage in effective EE learning in their preservice programmes.

## 9.8 Issues Inherent in EE Programming

We began this chapter with the question: How can a faculty of education effectively prepare teachers to embed studies *in, about, and for* the environment in their teaching practice? The answers provided by the field narratives discussed in this chapter demonstrate that PTE programmes have found ways to offer EE opportunities both within and in addition to the formal programme and schedule at each institution. There is an implied sense that the implementation of an elective or compulsory EE course within a formal PTE programme is a victory, but this notion is troubling for some scholars, including Disinger and Howe (1992) and Gruenewald and Manteaw (2007).

### 9.8.1 *Infused or Siloed? Core or Elective?*

The question of whether EE should be offered through stand-alone courses or be embedded/infused within existing courses continues as Ontario moves from 1-year to 2-year B.Ed. programmes, with each faculty of education finding its own way forward. Despite shared commitments to EE, teacher educators bring different perspectives to the conversation. For example, one might argue that if EE is truly to be afforded the same curricular status as mathematics, language arts, or science education, then it should also have its very own course, and, indeed, all of the faculties highlighted in this chapter have since created an EE-based course or two in their respective programmes. On the other hand, by infusing EE learning into existing courses, we might promote its importance in the same way as infused language literacy informs teaching and learning across curricula. Gruenewald and Manteaw (2007) point out that an EE stand-alone course can become a form of fragmentation that works against the holistic or systems-thinking approach considered to be at the heart of EE. Furthermore, Disinger and Howe (1992) indicate that EE courses “place

a premium on the divergent thinking needed to encourage the development of generalizations based on data from multiple sources and disciplines ... [and] creative teachers who are able and willing to go beyond their own disciplines” (p. 6).

The apparent contradiction can confound our thinking and frustrate our efforts to offer EE in a suitable format in our PTE programmes. Perhaps the answer lies not in whether EE should be infused into existing courses or “siloed” in a compulsory or elective course in a PTE programme, but rather, and far more importantly, whether it will provide participants with opportunities for critical inquiry (Disinger and Howe 1992). Maybe our questions should become: What is the most effective format or venue for presenting PTs with the knowledge and skills associated with EE to support their inquiries into how EE can be used as a tool to critique education and the structures within which it functions (i.e. unlimited economic growth and consumerism)? How can we support our PTs in effecting positive change? And, how can we inspire confident and committed preservice teachers to pursue such difficult and long-term goals?

## 9.9 Conclusions

To avoid ending this chapter with questions—despite our commitment to inquiry learning—we leave you with these closing thoughts. Although the narratives presented are unique to three different faculties of education in Ontario, the individuals who were inspired and committed to address EE in each of them did not work in isolation. We are friends and colleagues who continually search for creative ways to address EE in our preservice programmes, and the actions of one become inspiration for the others. Pedagogies and theoretical frameworks aside, we recognise that the foundation of environmental education is relational—we are all connected, and that is our most important asset.

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## Chapter 10

# Environmental Literacy for All: Innovating Environmental Education for Teacher Education Majors and Non-education Majors



Yovita N. Gwekwerere

In order to combat the environmental crisis confronting our world today, there is need to ensure that all citizens are environmentally literate and that younger generations, in particular, receive an education that supports a more sustainable future. Schools play a critical role in this regard, and Preservice Teacher Education (PTE) programmes can play an even greater role by preparing teachers who are environmentally literate and who can successfully implement sound Environmental Education (EE) programmes in schools. The North American Association for Environmental Education (NAAEE) defines an environmentally literate person as “someone who, both individually and together with others, makes informed decisions concerning the environment; is willing to act on these decisions to improve the well-being of other individuals, societies, and the global environment; and participates in civic life” (as cited in Hollweg et al. 2011, pp. 2–3). The ultimate goal of educating others about the environment is to bring about an awareness of how important it is to live in harmony with nature and to change the unsustainable ways that have led to the current environmental crisis. When we think about change, we normally target education because that is the easiest way to impact future generations. The current environmental crisis cannot wait for future generations to solve the mistakes made by those before them. It is critical that current generations are educated about the environmental crisis in order to bring about the needed changes, such as climate change mitigation and adaptation. Alongside the preparation of environmentally literate teachers, we also should think about ways to prepare environmental educators for non-formal education settings, what I would call “environmental educators for the masses”.

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How can teacher educators play the dual role of preparing environmentally literate teachers and being environmental educators for the masses? This chapter provides an answer to this question by discussing an undergraduate EE course that was designed to meet the needs of undergraduate Concurrent Education majors and non-education majors at Laurentian University in Sudbury, Ontario. It reports on a post-course survey that was conducted for the purposes of evaluating the effectiveness of the course and for course improvement. The chapter begins with an introduction that discusses the need for environmental literacy among preservice teachers (PTs) and how the neoliberal climate of our time has imposed challenges on implementing EE both in the formal education system and in the non-formal sector. This is followed by a description of the EE course for Concurrent Education majors and non-education majors. Finally, I discuss the findings within the context of the course content and provide suggestions for course improvement to better meet the needs of a diverse student audience. The conclusion offers some insights into how the PTE programme at Laurentian University can use this course to ensure that all Concurrent Education students are well prepared to effectively integrate EE across the school curriculum.

As a science educator with a background in biology, I have always had a passion for teaching about the environment. I have emphasised the integration of the environment into my Science and Technology courses for Primary-Junior and Junior-Intermediate teacher candidates in order to address the Ontario Ministry of Education (2009) policy on EE; this policy document highlights goals, strategies, and actions for teaching and learning, student engagement and community connections, as well as environmental leadership. The policy framework advocates for integration of EE across the curriculum; however, it does not give a universal model for implementation, mainly due to the eclectic and complex nature of EE. With such broad and non-specific goals and no specific direction in which EE should be addressed, teachers need to be knowledgeable about what constitutes EE and how it can best be integrated within different subjects.

The Ontario Ministry of Education has made progress in outlining specific expectations describing what students need to know and be able to do in the area of EE within the different subjects, but no specific directions or financial aid has been provided to support teacher preparation in this area. The contradictions between the policy mandate and implementation of EE in PTE have made it difficult for faculty who have been advocating for the inclusion of EE courses in their programmes. However, some progress has been made and a number of PTE programmes in Ontario are offering EE courses. Inwood and Jagger (2014) highlight examples of the PTE programmes in Ontario that offer EE courses either as elective or required courses.

The PTE programme at Laurentian University did not offer an EE course for students in the Concurrent Education programme until 2014, when I was given the opportunity to develop an EE course for the Environmental Studies programme in the university's new School of the Environment. The idea was to develop an undergraduate elective EE course that not only would meet the needs of Environmental Studies and Environmental Science majors, but that also would be suitable for

Concurrent Education majors as well as other students across campus who would be interested in learning how to teach others about the environment. Some of these students could eventually pursue careers in non-formal educational settings such as conservation areas, parks, science centres, and museums. Some may question why we should care about developing environmental literacy among PTs. The following section provides a review of literature that shows the relationship between environmental literacy and PT effectiveness in developing environmentally literate students.

## 10.1 Environmental Literacy Among Preservice Teachers

The need to prepare teachers who are environmentally literate, who can impart environmental knowledge, and who can influence students' values, beliefs, and behaviours is more critical now than ever before. The goal of EE in school is to shape young people's perceptions and values about human impacts on the environment and to ensure the development of a sustainable future. Teachers play a significant role in the development of environmental literacy among students (McKeown and Hopkins 2002; World Commission on Environmental Development 1987). In addition, teachers are influential in environmental leadership development among children and teenagers (Esa 2010). Therefore, teachers who are knowledgeable, have positive attitudes, and show concern for the environment are more likely to produce students who are more environmentally literate (Tuncer et al. 2009). Teachers who lack proficiency in environmental knowledge, skills, and commitment are less likely to effectively lead environmental change in schools (National Environmental Education Advocacy Council 2005; Yavetz et al. 2014). Inadequate incorporation of EE within ITE programmes is one of the obstacles to successful implementation of EE in schools (Cutter and Smith 2001; McKeown and Hopkins 2002; UNESCO 1997; Yavetz et al. 2014).

A lack of the desired environmental knowledge and understanding among PTs has been well documented, including misconceptions regarding issues such as the greenhouse effect, ozone layer depletion, and acid rain (Boyes et al. 1995; Dove 1996; Groves and Pugh 1999; Khalid 2003). Spiropoulou et al. (2007) reported on how limited knowledge about the environment among Greek primary PTs resulted in low rates of implementation of environmental programmes in schools. Similarly, Esa (2010) reported that the lack of environmental knowledge among students and teachers contributed to a lack of pro-environmental behaviours.

Yet other studies have revealed positive environmental attitudes, limited environmental knowledge, and low levels of environmental behaviour among PTs (Boubonari et al. 2013; Michail et al. 2007; Pe'er et al. 2007; Stir 2006; Tuncer et al. 2009). Boubonari et al. (2013) and Stir (2006) reported that PTs in Greece and Australia, respectively, were very concerned about environmental issues and scored high on attitudinal factors. Although they possessed minimal knowledge regarding environmental issues, they expressed a lack of confidence in making wise decisions

and in taking appropriate action. Similarly, PTs in Turkey showed a high degree of concern about environmental problems and expressed positive attitudes towards the environment despite their low levels of knowledge on current environmental issues (Tuncer et al. 2009). A study of Israeli PTs revealed their positive attitudes towards the environment despite limited knowledge (Pe'er et al. 2007). This can be viewed as a reflection of PTs' awareness and desire to identify with what they intuitively accept as correct values regardless of their limited knowledge. Chapman and Sharma (2002) attributed the lack of environmental awareness among PTs to the theoretical way in which EE is taught.

The literature above implies that teachers are more likely to produce students who are more environmentally literate if the teachers are more knowledgeable, have positive attitudes towards the environment, and show concern for environmental problems. If teachers lack proficiency in environmental knowledge, skills, and commitment, it is unlikely they will be able to effectively lead environmental change in schools. Inadequate incorporation of EE within PTE programmes has been identified as one of the obstacles to successful implementation of EE in schools. Given the contradictions that exist between the EE policy mandate and the lack of support for implementation of EE, PTE programmes need to find creative ways to ensure that teacher candidates are provided with the necessary knowledge and skills required to effectively lead EE programmes in schools.

## 10.2 Environmental Education and Its Challenges in a Neoliberal Climate

A look at the history and development of EE shows that it is not a new concept. Internationally, it is claimed that the term “environmental education” was first used in Paris in the 1960s at the International Union for Conservation of Nature and Natural Resources meeting (Disinger 1984); and in Britain, the first recorded use of the term can be traced to a conference held in 1965 at Keele University, Staffordshire (Palmer 1998). The roots of studies of nature and what was commonly known as “nature study” in schools can be traced further back to the ideas of progressive educators of the eighteenth and nineteenth centuries (Hammerman et al. 2001; Woodhouse and Knapp 2000). Dewey (1938), for example, advocated an experiential approach to student learning in the local environment, and Jean-Jacques Rousseau (1712–1788) advocated for using the child's natural interests and curiosities to the fullest, maintaining that education should include a focus on the environment (Hammerman et al. 2001). This was followed by nature study movements of the early 1900s, which paved the way to conservation education programmes of the 1930s (Inwood and Jagger 2014). The current EE movement was fueled by the public awakening to chemical pollution and general environmental awareness prompted by such publications as Rachel Carson's (1962) *Silent Spring*. This was followed by international EE forums, meetings, and pronouncements, including the 1972

Stockholm Declaration, 1975 Belgrade Charter, 1977 Tbilisi Intergovernmental Conference on Environmental Education, and the 1992 Rio Summit (Palmer 1998). These events brought together government officials from different nations and the support of key international institutions to raise the profile of EE during the 1970s, leading to a great deal of common understanding of the aims, objectives, and approaches to the subject (Palmer 1998). The reports and declarations from these meetings provided guidelines for EE and Education for Sustainable Development (ESD). Article 6 of the *United Nations Framework Convention on Climate Change* (United Nations 1992), for example, stipulates the promotion of education, training, and public awareness on climate change.

Global attempts to promote inclusion of ESD in the education system were initiated by the United Nations' declaration of 2005–2014 as the *Decade of Education for Sustainable Development* (DESD) (UNESCO 2002). The DESD has been replaced by several ESD agendas, such as the *Aichi-Nagoya Declaration on Education for Sustainable Development* (UNESCO 2014a), the *Roadmap for Implementing the Global Action Programme on Education for Sustainable Development* (UNESCO 2014b), and the *2030 Agenda for Sustainable Development* (United Nations General Assembly 2015). The goal is to ensure the development of education that would allow every human being to acquire the knowledge, skills, and values necessary to shape a sustainable future. Such education would include key sustainable development issues such as climate change, disaster risk education, biodiversity, poverty reduction, and sustainable consumption. It is education that would require teaching and learning methods to motivate and empower learners in changing their behaviours and taking action for sustainable development. Ten years later, the education system worldwide still struggles to integrate environmental and sustainability education into curricula at all levels. Such challenges may be due to what Huckle and Wals (2015) identify as failure by the UN to acknowledge or challenge neoliberalism as a hegemonic force blocking transitions towards genuine sustainability.

Neoliberalism in this discussion refers to a modern politico-economic theory favouring free trade, privatisation, minimal government intervention in business, and reduced public expenditure on social services. Neoliberals expect governments to replace a social democratic notion of public good with a version in which competitive markets provide for the public good (Judt 2010). Hursh et al. (2015) view neoliberal ideals that promote economic growth and use of markets to solve environmental and economic problems as constraints on how we conceptualise and implement EE. They go on to show how our lifestyles have become a part of these neoliberal ideals to the point that we cannot think of how else our societies could function. According to Hursh et al. (2015):

Neoliberal ways of thinking about and acting in the world have become so prevalent, naturalized, and internalized that we are often unaware of how neoliberalism constrains our thinking and practice, such that it is difficult in both thought and deed to imagine a society proceeding on different principles. (p. 300)

In Canada, for example, a neoliberal regulation favours an economy of resource extraction where economic and environmental policies and tax codes benefit the concentration of corporate wealth from oil, gas, and mineral development (Hursh et al. 2015). This has negatively affected any environmental initiatives that are viewed as countering economic growth. In *What Every Environmentalist Needs to Know About Capitalism*, Magdoff and Foster (2010) speak up against capitalism. They assert that capitalism is so much a part of our lives that it is as invisible as the air we breathe, and they oppose any suggestion that capitalism offers the solution to the environmental problem.

Most institutions face challenges in their efforts to implement EE amidst ideological contradictions between the rhetoric of public policy, actual programme structure, and practices administered in an economy that primarily serves to reinforce a capitalist mode of production marked by high environmental impact (Stahelin et al. 2015). Such challenges are mostly encountered by institutions or organisations when they come up with environmental information that may question the activities of corporations. Such information is viewed as anti-economic development. For example, the Conservative Government of Canada's pursuit of economic growth without regard for environmental consequences led to muzzling of scientists and cuts in funding for environmental research for about a decade, from 2006 to 2015 (Mancini 2013). It may not be surprising that even though an EE policy has existed in Ontario since 2009, there has been no promotion of EE initiatives. This reveals the general, profound contradictions that exist when neoliberal environmental governance meets public environmental initiatives (Stahelin et al. 2015). Such situations create a challenge for teacher educators who are concerned about the development of environmental literacy among PTs.

Hursh et al. (2015) argue that educators and researchers need to analyse how neoliberalism undermines education in general and EE in particular. Huckle and Wals (2015) suggested combining the emerging theory and practice of sustainability with *ecopedagogy* and citizenship education. *Ecopedagogy* is a combination of the critical pedagogy of Paulo Freire with future-oriented ecological politics and involves teachers and students carrying out environmental projects in the classroom and community (Huckle and Wals 2015). Freire (1998) advocated for dialogue between the student and the teacher, and that the dialogical action has to have both action and reflection in order for transformation to take place. *Ecopedagogy*, therefore, opens up spaces for dialogue that allows critical analysis of the discourses surrounding sustainability and enables students to become active participants. These suggestions are critical for educators as they provide a way to question the "business as usual" attitudes in order to bring about change.

### 10.3 Developing an EE Course for Concurrent Education Majors and Non-majors

In order to ensure that the EE course designed for Concurrent Education majors and non-education majors contained a balance of content and teaching strategies suitable for a diverse group of students, consultations with other educators and an Internet search were conducted to see if similar EE courses were being offered elsewhere. The search revealed a few EE courses at universities in the United States that were designed to meet the needs of both education-track and non-education majors and a few more EE courses that were designed specifically for non-education majors. Consultations with colleagues in PTE programmes in Ontario revealed diverse perspectives in terms of the content and focus of the EE courses offered. Themes that could be identified across the courses included activities that involve learning about the environment through ecological studies and the connectedness among living and non-living entities in the environment; experiential learning in the environment through inquiry, nature walks, and field trips; and learning for the environment through action projects and eco-mentoring activities. Some specific examples of EE courses offered by Ontario PTE programmes included the EE/Outdoor Education course at Brock University; the Education for a Sustainable Future course at York University; Exploring Environmental and Sustainability Education at OISE, University of Toronto; and the Climate Change Pedagogy and Outdoor Ecological and Experiential Education courses at Lakehead University.

Common themes such as education *about, in, and for* the environment could be identified across the EE courses gleaned in the search process, and these themes provided a framework for designing the new EE course for education majors and non-majors at our university. The first part of the course focused on learning about EE in terms of its history and how it evolved over the past six decades, discussion of local and global environmental issues confronting our world today, and a look at the Ontario EE policy. The second part of the course focused on strategies of teaching about the environment in the environment, and this included programme and lesson planning, and teaching strategies focused on developing a sense of place, including experiential learning, inquiry activities, hands-on investigations, field trips, and project-based learning. During this part of the course, students are given the opportunity to go on a nature hike to explore the woods around the campus. As part of this activity, students worked in pairs to observe and identify plant and animal species found in the local environment. The idea was to help students develop a sense of place by becoming more aware and conscious about other organisms with which they share their environment. The second experiential activity involved students going on a field trip to the Lake Laurentian Conservation Area during one of the classes. To date, activities at the conservation area have been led by the environmental educator at the centre who demonstrated the hands-on activities they do with school children. This activity was multifaceted in that it served as an experiential form of learning about the environment in the environment, while also demonstrating what non-formal EE looks like and what the job of an EE educator entails.



Students were also introduced to experiential projects they were to complete as assignments for the course, which focused on designing an eco-mentoring activity and an action project.

The final part of the course focuses on teaching for the environment, and this includes topics such as Education for a Sustainable Future, Indigenous Knowledge and Ways of Living in Harmony with Nature, Radical Environmentalism, and Ecological Justice. The new EE course, ENVI 2556, was offered for the first time during fall semester 2014, and a total of 28 students were enrolled. Given the elective nature of the course, students from different disciplines were enrolled, including 13 Concurrent Education majors, eight Environmental Studies/Science majors, one Biology major, one Geology major, three Law and Justice majors, one Nursing major, and one Outdoor Education major. It is important to note that this is not a required course for Concurrent Education students, but it is highly recommended. The next section outlines a self-study that was conducted to evaluate the effectiveness of the EE course.

### ***10.3.1 Methodology***

A self-study research design was used to evaluate the effectiveness of the undergraduate EE course designed for Concurrent Education majors and non-education majors. Participants for this study included all of the 28 students enrolled in the ENVI 2556 course during the fall term of 2014. The participants majored in different undergraduate degree programmes, and an anonymous survey was administered at the end of the course in order to provide the instructor with feedback about the effectiveness of the course and for improvement purposes. The survey included four items exploring (a) factors that motivated students to enrol in the course, (b) perceptions about their EE knowledge before and after taking the course, (c) aspects of the course that may have impacted their thinking and views about environmental issues, and (d) suggestions for how the course could be improved. To ensure that the rights of the participants were protected, the researcher sought approval from the research ethics board before data collection. The ethics board approved the use of an anonymous survey on the condition that the data were only going to be analysed after the course ended and after students' marks were published. An anonymous survey was used in order to protect students' identity and to ensure that they would be free to provide more honest responses without fear of their views jeopardising performance in the course. The following section provides a description and discussion of the findings.

## 10.3.2 Findings and Discussion

### 10.3.2.1 Students' Expectations About the Course

The survey results indicate that students had different expectations in terms of what the course was about or the focus that the content would lean towards. Students' expectations were almost equally divided: one-third said they thought the course was about teaching *about* the environment to young children in non-formal settings; approximately one-third thought the course was about teaching in a school setting; and one-third thought they were going to learn more about environmental content and environmental issues. The syllabus for this course indicates that the course presents methods of teaching about the environment both in the formal and non-formal education settings. However, the findings seem to indicate that this description had different meanings for students depending on their prior knowledge and motivations for taking the course, as shown in the following quotation from a student: "This course was essentially how I thought it would be, while I thought it would be more heavily influenced by education in the classroom". Another student wrote: "I thought this course would give me different tools on how to address a group of students about different environmental issues". On the other hand, one-third of the students indicated that they had expected the course to focus more on environmental issues and providing facts on how to help people change their attitudes and behaviours. In this regard, one of the students wrote: "I thought this class was just a good class about environmental issues; I have looked into many of the topics talked about in this class before but it was nice to learn about educating others about the issues". Another student reported: "I thought this class was gonna be more on how to change the conventional way of thinking. Also, I thought it was going to present an issue and give ideas on how to help".

These responses were not surprising given the diversity of students' academic interests. More importantly, the findings provide a glimpse into different students' motivations for taking the course regardless of what the official course description says. The Concurrent Education majors were more likely to be drawn into the course by its promise to teach them how to teach children in school, while the Environmental Studies/Science majors may have been drawn to the course because of its promise of teaching them how to teach in non-formal settings. Most of the Environmental Studies/Science students were in their upper years and had taken a lot of environmental courses; therefore, they were likely to have been drawn to the course by its promise to help them disseminate environmental knowledge. On the other hand, non-education students who had no environmental background were more likely to have taken the course to be educated about environmental content.

Given the diversity of interests and expectations among students coming into this course, one might ask: How diverse can an EE course be for a diverse student body? I think the answer to this question lies in the eclectic nature of EE itself which has been described by Palmer (1998) using the metaphor "a stream with many tributaries" (p. 22). This course managed to meet the diverse needs of students by including

a diverse range of themes, experiential and hands-on teaching methods, and a variety of positive learning experiences.

### **10.3.2.2 How the Course Impacted Students' Thinking and Views about Environmental Issues**

#### Environmental Education as Developing a Sense of Place

In order to emphasise the need to connect with nature and to demonstrate that this course was more experiential in nature, the first class was held outside the classroom in an area where students could sit on rocks. The experiential nature of the course was emphasised again during the second class by taking students on a nature walk along the campus trails. The major goals of these experiential activities were to demonstrate how to teach *about* the environment *in* the environment and to help students develop a sense of place through reflective practice. This is in agreement with Lewis and Williams (1994) who assert that experiential education first immerses learners in an experience and then encourages reflection about the experience to develop new skills, attitudes, or ways of thinking. Being in Northern Ontario, our university is surrounded by woods, and students found this exercise to be eye-opening as they had never really thought about looking closely at the nature surrounding them. In their reflections, students mentioned how, after the nature walk, they walked the trails more often and noticed the diversity of plant and animal life they had never thought about before. As one student wrote:

After the first exploration around campus, I began to appreciate what was around me and notice all diverse species living together in the same area to create a beautiful environment. Now after having gone on this nature walk I am more reminded of the beauty and diverse nature around me.

The experiential learning theme was extended by taking students on a field trip to a community EE centre about 15 minutes from campus. The major goals of this activity were to demonstrate strategies for teaching children *about* the environment *in* the environment, to provide an example of what the job of a non-formal environmental educator entails, and to show how teachers can use a non-formal EE centre as a resource to teach *about* the environment *in* the environment. The class was led by an environmental educator who engaged students in hands-on learning activities that they do with school children who visit the centre. This field trip was appreciated by all students, and they found the learning experience to be valuable and something that they could use in the future. According to one of the students, "Going on the field trip was awesome and gave us a new perspective to look at. It's important to have hands-on activities as students of all ages respond well to it". Another student wrote: "I did not realise [the course] would teach us the importance of learning about the environment and how to incorporate the environment into everyday education". Yet other students just loved the idea of connecting with nature in addition to the lessons learned; as one of them stated: "Overall the trip had a very positive

effect on me. It has not only given me insight to the importance of exposing students to nature and learning hands-on, but has also allowed me to gain further appreciation of nature". It was clear from students' experiential reflections that this activity was all-encompassing; students were able to see the possibilities of using the games and hands-on activities they experienced at the centre and what the position of an environmental educator in non-formal settings could involve. This is in agreement with Reid and Nickel (2008) who showed how cognitive and situated teaching strategies place participation at the centre of learning. The feeling of being outside and learning how to teach about the environment as well as experiencing the environment is something that cannot be captured in a lecture.

### Environmental Education as Taking Action through Projects

Students completed two group projects for this course. One of the projects was an eco-mentoring activity, and the second project involved planning and taking action on an environmental issue around campus or in the community. The two projects aimed to show students how they could teach about the environment in everyday life to peers, family, friends, and children and to show how they could lead or teach through civic engagement to address environmental issues both in formal and non-formal settings. Students found these projects to be empowering, and the projects helped them realise that they did not have to be education majors to teach others about the environment; as one student indicated:

I was surprised a bit about the Environmental Action project and teaching strategies because I thought that only Con Ed students would be able to do well at teaching, but it is easy for anyone to get involved, makes me want to teach more people and not be afraid of their reactions.

In the same vein, another student wrote: "I understand more that individual people can work towards improving the environment. Simple actions, even on social media, can be a useful tool to raise awareness about issues you feel are important".

This mentoring component of the course was equally important for education majors and non-majors alike as their interests involved teaching youth at different stages and in different settings. On this issue, one student stated: "The thing I found most helpful about this course was the emphasis placed on voicing your opinion on, and telling others about, environmental issues". The students realised that youth participation is a component of civic engagement that enables youths to voice their opinions about issues that are important to them while making a difference in the development of a more sustainable future. Students got to practise components of civic engagement and service learning through the action project. One student described his experiences as follows: "I understand how to carry out a campaign or action for an environmental issue on campus or in the city". From the class presentations, students were able to see the different action projects that their peers performed, and they realised that the possibilities were endless. The action project opened up space for dialogue as students presented their projects, and it gave

students an opportunity to critically analyse environmental issues on campus and in their neighbourhoods (Huckle and Wals 2015). Working on the action projects in groups demonstrated that participation should not be seen only as something students do as an extension of their classroom learning; rather, it is more effective when it is integrated in the learning process by engaging teaching perspectives that view learning as occurring within a community (Lave and Wenger 1991).

### Learning *for* the Environment: Questioning Our Campus Sustainability

Questioning the sustainability of our own lives is one way to make more meaningful, sustainable lifestyle changes. With this goal in mind, students participated in a trash audit to see how much recycling was happening on our campus and the type of garbage the campus sends to the landfill. The whole class was shocked by the results of this audit, which showed that our campus lagged so much in terms of recycling. Students in the class noted how they had not paid much attention to recycling and would try to recycle more. On this topic, one student wrote:

I now try to recycle as much as I can. If I can take these things I have learned about in this course and apply to my everyday life which I have been trying to do I can be more involved and continue to helping the environment.

Students were also happy to realise that the university was taking some action to make the campus greener, as noted by one student in the survey: “This course helped me to learn about some of the environmentally friendly impacts and actions the school is taking and I was happy to be able to look at the more positive environmental acts”. In general, students were happy to learn about the campus sustainability strategies that were shared by the university’s sustainability manager, and they showed a willingness to be involved in making the campus more sustainable. One feature distinguishing an EE course from an environmental information course is that the former promotes the development of critical thinking and encourages students to come up with solutions. Students felt motivated to do more in order to make their lives on campus more sustainable. Youniss and Levine (2009) noted the importance of translating theory into practice and how this is critical in terms of empowering young people to fully participate in their communities. This course was successful in the sense that students were able to identify the environmental issues on their campus, and they were able to come up with solutions that they shared with the campus sustainability manager.

### Radically Rethinking Environmental Sustainability in the Twenty-First Century

By beginning the course with an analysis of environmental issues on a global scale and concluding with a critical stance on the challenges confronting our planet, students were able to critically analyse their own lifestyles and determine what needed to change. In the course, students also realised that what we do in our part of the

world impacts other parts as well and that there is a need for everyone to live responsibly. The following two reflections articulate students' understanding of the intricate nature of the current environmental crisis. One student commented: "This course impacted my thinking and views by opening up my eyes to the bigger picture. There are so many contributing factors associated with the environment that I previously was not aware of". Another said:

It made me realise there are really more issues out there than I thought and it shocked me how so many are not doing anything about it. This allowed me to be more critical when thinking about alternatives to what we do in our daily lives or how to keep doing what we are doing and making it more environmentally friendly.

Considering the challenges confronting our world, EE for the twenty-first century means that we need to prepare young people to be critical thinkers who can radically rethink how to change the lifestyles that have led to the current environmental crisis. In the course, students also practised civic engagement through a classroom debate based on issues surrounding the "Ring of Fire", a chromite mining project in Northern Ontario. Students' reflections about the debate showed that they appreciated the opportunity to openly express their opinions. According to one student:

This debate gave everyone a chance to make their voice heard and address any concerns they may have had on the issue. In conclusion, this debate was informative, and gave the class a chance to be very open and express their opinions freely.

Through the debate, students became more aware of the intricate nature of the environmental issues involved in a high-profile project that promises to bring billions of dollars to the province. Students became knowledgeable about the environmental impact of the chromite mining and development project as well as the social justice issues confronted by First Nations communities in the area.

Overall, students benefited from taking this course in terms of having gained an overall understanding of a variety of global and local environmental issues, and, as a result, they felt more prepared to teach others about the environment. One student clearly summarised her overall experience as follows: "For a second-year environmental studies course, I think this course works well with its existing content. It was refreshing to work in hands-on settings, as well as having guest speakers, but balanced out well with the lecture material". Another student wrote: "I believe this course was perfectly operated as we had in-class lectures and plenty of hands-on experience, which got us involved to write about our experience". In general, there is a need for EE to be taught in a way that promotes the translation of theory into practice and that promotes embracing the sustainability action process (Cutter-Mackenzie 2010). This course managed to provide a balanced model where the theory presented through lectures was translated into action through experiential activities and action projects.

### 10.3.3 *Suggestions for Course Improvements*

Approximately one-third of the students in the course suggested that the course could be improved by engaging students more in experiential, practical experiences. Throughout this course, students were engaged in several experiential activities as described previously, and they were given the opportunity to write reflections of their experiences and feelings. This suggestion might reaffirm the fact that students did enjoy the activities and found them to be great learning experiences, which is why they felt the need for more such activities. This is reaffirmed in the following quotation from another student: “More outside education such as the conservation area field trip and more active engaging projects like the eco-mentoring project”.

Teaching *about* the environment *in* the environment is an effective teaching strategy that brings students to experience the natural environment as opposed to hearing about it in a lecture. Experiential learning is the major focus in non-formal environmental settings, and schools also need to include more experiential learning activities in their EE programmes. Perhaps, in the future, we will consider adding another field trip to a non-formal environmental learning centre such as Science North to provide students with yet another experience of teaching about the environment in non-formal settings.

Five of the survey respondents suggested that the course could be improved by focusing more on teaching skills and practising skills such as communicating ideas about the environment. One student made a suggestion that: “Environmental education is a huge topic to cover everything and there isn’t enough time for it, I think focusing on teaching skills and improved communication about environmental issues would be a better focus”. This is a great suggestion, given the fact that this is the only EE class that most non-education majors would be taking in university. Certainly, they would appreciate more time to practise in order to feel more confident in their communication skills.

In the course, students learned about programme planning and planning lessons and lesson activities, but no practical peer-teaching session was included. However, the eco-mentoring project enabled students to plan a lesson that they taught either to their peers or school-age students. In the future, it would be important to consider including a micro-teaching activity in order to give students the opportunity to teach a lesson or lead an activity with their peers. Literature shows that practicum experiences are critical to improving student teachers’ self-efficacy and teaching skills (Hascher et al. 2004). In this course, it may not be possible to include practicum placements due to class schedule conflicts. An alternative would be a weekend camp for school-age students, where university students would plan the programmes, lessons, and activities that they would engage students in for one or more weekends. This would be evaluated as a major course project and replace the final examination. One student suggested: “This course could be improved by more outdoor classes or field trips and maybe not an exam but rather a bigger action project that would go further in-depth to making a difference”. Weekend camps could be used as such an ongoing project where students can practise their communication skills and where



they can be evaluated for their abilities to plan an activity and engage students in hands-on environmental inquiry.

Three students suggested that the course could focus more on environmental issues and not just education. According to one of these students: “I would suggest having a more structured schedule that would allow to present various issues, explain why it’s happening and how to help. I think factual information is great and would help overall understanding of current environmental issues”. Although we discussed environmental issues on the local and global scale at the beginning of the course, students who had not taken any environmental courses prior to this course felt that they needed to learn more about environmental content. I happen to teach an Introduction to Environmental Studies course that most of the students who were enrolled in the EE course had taken before. This introductory course focused on providing environmental information both at the local and global scale. In the future, it would really work well if the introductory course were to be made a prerequisite to the EE course. This would ensure that students have a deeper understanding of environmental issues before taking the EE course.

## 10.4 Conclusion and Future Directions

The environmental education course described in this chapter was designed for the School of the Environment at Laurentian University to meet the needs of a diverse group of students, including Concurrent Education majors, Environmental Studies/ Science majors, and students from various majors across campus. The course focuses on developing critical thinking skills among students with regard to local and global environmental issues, and it is designed to enhance their problem-solving and decision-making skills through participation in hands-on and action projects. It also provides a balanced outlook on EE, both in formal education and non-formal education. The end of course survey results showed that students found the course to be well balanced in terms of lectures, hands-on, action-oriented activities, invited guests, and opportunities to voice their opinions. Students reported that the course changed, or enhanced, their positive environmental behaviours and that it provided them with more ideas of how they can help others change their lifestyles. The students felt empowered and more confident to teach others about environmental issues and ways to protect the environment.

These findings indicated that the course was successful in developing environmental literacy among environmental educators both for formal education and non-formal environmental education settings. In order to have a greater impact, this course should be made available to more undergraduate students. More importantly, there is a need to make this course accessible to all education majors. Considering that almost 50% of the students enrolled in the course were education majors, it is clear that this course can make significant contributions to preparing preservice teachers to teach about the environment. Teachers who are more knowledgeable and show concern for the environment are more likely to develop students who are more

environmentally literate (Tuncer et al. 2009). Currently, this course is not mandatory, but highly recommended, for Concurrent Education majors. However, making it a required course will greatly help to ensure that student teachers from the programme will be prepared to integrate EE in the school curriculum as mandated by the Ontario Ministry of Education. Since the course is offered in the second year, Concurrent Education majors can take it as an elective in their undergraduate programme where it does not compete with the compulsory, Professional Year, teacher certification courses.

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# Chapter 11

## Re-Visioning Teacher Education for Sustainability in Atlantic Canada



Patrick Howard

**Résumé** Ce chapitre donne un aperçu historique des initiatives en éducation au développement durable en Nouvelle Écosse. Il se fonde essentiellement sur le principe que, pour promouvoir les valeurs du développement durable, il ne suffit pas d'enseigner des notions liées à l'écologie et à la viabilité, il faut aussi se concentrer sur un apprentissage et un enseignement qui sont *relationnels* en soi. Les institutions responsables de la formation des enseignants sont au cœur des efforts visant à promouvoir l'éducation au développement durable. Ce chapitre décrit les défis qu'a présentés, pour une institution de la Nouvelle-Écosse, la volonté de réorienter la formation des maîtres vers l'enseignement au développement durable. Il va de soi que, pour modifier l'orientation d'un programme de formation, il faut donner au corps professoral et au personnel enseignant le temps nécessaire pour explorer et analyser les dimensions sociales, économiques et environnementales impliquées par ce virage. Grâce au dialogue et à la réflexion, il a été établi que les efforts qui favorisent l'acquisition des compétences, des connaissances, des attitudes et des croyances nécessaires pour former les futurs enseignants aux valeurs du développement durable passent nécessairement par des critères relationnels. L'éthique de la sollicitude de Nel Noddings, l'interprétation de la relation pédagogique de Max van Manen, ainsi que le concept de bonheur durable de Catherine O'Brien, fournissent aux didacticiens et aux institutions de formation des maîtres de meilleures pistes pour structurer les occasions d'apprentissage et réorienter les curriculums de façon à favoriser, chez les futurs enseignants, les valeurs liées au développement durable.

Atlantic Canada has been shaped by a tenuous relationship with the living landscape. From the destruction of the largest living biomass on the planet—the northern cod off Newfoundland and Labrador—to the social upheaval resulting from generations of unsustainable, exploitative, extractive industrial practices in Nova

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Scotia and New Brunswick, the region struggles to find a sustainable way forward in the twenty-first century. This chapter provides a brief historical overview of initiatives to educate for sustainability in the province of Nova Scotia. The central premise of this chapter, however, is that teaching for the values of sustainability cannot simply be teaching “about” sustainability; it must be about teaching and learning that is, at its heart, *relational*. Teacher education—specifically, institutions responsible for teacher education—is central to any effort to educate for a sustainable future. While there have been efforts to reorient teacher education for the values of sustainability (Hopkins and McKeown 2005), such efforts will only be successful if there is a clear understanding of how people best learn such values. The chapter will describe the efforts and challenges resulting from one Nova Scotia teacher education institution’s commitment to reorient teacher education for sustainability. It explores the ways in which Noddings’s (1984, 2002) care theory, van Manen’s (1991, 2002) interpretation of the pedagogic relation, and O’Brien’s (2012, 2013) concept of sustainable happiness offer teacher educators a deeper understanding of how to structure learning opportunities to foster the values of sustainability in preservice teacher education.

Canada has played a significant role in education for sustainable development before the publication of Gro Harlem Brundtland’s watershed report in 1987 (Hart 1990; Hopkins 2013a). For example, Canada was present in the planning meetings that would lead to the Earth Summit in 1992, and, a few months after the Rio Summit, Canada hosted the first international Education for Sustainable Development (ESD) conference in the world (Hopkins 2013a). In the early 1990s, as governments were becoming involved in sustainable development, non-governmental organisations (NGOs) were also organising. In Canada, the group Learning for a Sustainable Future (LSF) was launched nationally. LSF was designed as a joint initiative to bring together the private sector and federal and provincial governments with supporters of ESD.

In 2002, the United Nations (UN) declared 2005–2014 as the UN Decade of Education for Sustainable Development (DESD). In 2005, at a meeting of high-ranking education and environment ministers, held in Vilnius, Lithuania, Canada gave its support for the DESD (Council of Ministers of Education, Canada [CMEC] 2010, p. 6). The goal of the Vilnius meeting was to set out strategies that included objectives to (a) equip educators with the competencies to include ESD in their teaching, (b) ensure that adequate tools and resources for ESD were accessible, and (c) strengthen cooperation on ESD at all levels. In 2009, the CMEC attended the UNESCO World Conference on ESD and signed the resulting *Bonn Declaration*, which specifically focused on teacher education by committing to:

Reorient curriculum and teacher education programmes to integrate ESD into both pre-service and in-service programmes. Support teacher education institutions, teachers and professors to network, develop, and research sound pedagogical practice. Specifically support teachers to develop ESD strategies that can work with large class sizes, and to evaluate ESD learning processes. (UNESCO 2009, p. 4)

Post-DESD planning has occurred to ensure ESD commitments continued after the Millennium Development Goals expired in 2015 (UNESCO 2014a, b, 2015a, b, 2016a, b; United Nations General Assembly 2015).

## 11.1 Education for Sustainable Development in Nova Scotia

Hopkins (2013a) outlines the particular challenges specific to the Canadian context in adhering to and implementing international ESD commitments. In the early 1990s, federal leadership for ESD was given to Environment Canada, which, according to Hopkins (2013a), “unfortunately perpetrated the notion of ESD as the same as EE” (p. 28). The second major challenge for a national ESD strategy is the structure of the education system in Canada, which lacks a national ministry of education. The exclusive responsibility for matters pertaining to education rests with the 13 provincial and territorial governments. Implementing ESD policy and strategy across a huge country with disparate provincial ministries has severely curtailed meaningful, widespread ESD adoption across Canada (Hopkins 2013a, p. 24).

Nova Scotia has been involved in sustainability education initiatives since the early 1990s. In 1991, the presidents of 33 universities from 10 countries on five continents met in Halifax to examine the role of universities regarding the environment and development. They were joined by a number of senior representatives from business, the banking community, governments, and NGOs. The *Halifax Declaration* (1991) was released at the conclusion of this conference. It stated, among other things, that “The voice of the university be clear and uncompromising in its ongoing commitment to the principle and practice of sustainable development within the university, and at the local, national and global levels” (para. 3).<sup>1</sup> However, the response to adopting ESD as a core element of the public school system reflects the challenges described by Hopkins (2013b), in that Nova Scotia’s Ministry of Education made early and modest steps to integrate ESD into the provincial curriculum. In progress reports and responses to UNESCO questionnaires (CMEC 2014), many provinces, including Nova Scotia, reported activities that are described by Hopkins (2013b) as being in the beginning stages of an ESD adoption trajectory.

Nova Scotia government internal strategic planning documents lay out commitments characteristic of early adopters at the beginning of a trajectory leading to full implementation. For example, the Nova Scotia Department of Education’s (2009) *Annual Accountability Report, Fiscal Year 2009–2010* states:

The department has evaluated and listed a number of ESD tools and resources in the Authorized Learning Resources list. ESD outcomes are addressed in various curricula at all grade levels. Plans for a Nova Scotia ESD website are in development. The department provided *Green Technology for Exploring Technology 10* summer institute in 2009. The

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<sup>1</sup> See transcript of the declaration at [http://www.iau-hesd.net/sites/default/files/documents/rfi\\_727\\_halifax\\_2001.pdf](http://www.iau-hesd.net/sites/default/files/documents/rfi_727_halifax_2001.pdf)



department has planned summer institutes and other workshops to be provided in 2010–11. (p. 17)

These initiatives are in line with a teaching “about” sustainability approach, which is also characteristic of early adopters. In 2016, while the plan for the development of an ESD website has not been realised, ESD according to the Department of Education “permeates several subject areas. Science, Social Studies, English Language Arts, Health Education, and Technology Education tend to have more outcomes related to ESD. Other subjects have ESD embedded in their outcomes” (S. Taylor-Foley, personal communication, July 6, 2015). The Government of Nova Scotia is committed to LEED (Leadership in Energy and Environmental Design) gold certification in the building of new schools. However, altogether, the province has not moved beyond modest steps to integrate ESD learning outcomes and has not pursued systemic, province-wide ESD adoption such as that pursued by the province of Manitoba (Buckler and MacDiarmid 2013).

ESD in the Nova Scotia public school system depends, as it does in many other jurisdictions, on the commitment and passion of teachers, parents, and communities dedicated to education for sustainability. Some rural schools are becoming community centres, supporting the viability of small towns, while school gardens and entrepreneurial ventures are appearing and producing local, healthy food as the result of authentic, project-based learning. Despite these developments, the systemic support that comes with province-wide policy is not yet in place. The lack of a provincial vision for ESD means, for example, that schools are unable to get the fresh food they grow to the cafeteria because of restrictive contracts signed by corporations managing food services.

In 2015, Nova Scotia undertook an extensive review of its public education system. As a result of the review, New Essential Graduation Competencies now provide a future vision for K–12 education in the province. The competencies include Creativity and Innovation, Citizenship, Personal and Career Development, Critical Thinking, Communication, and Technological Fluency. The language of the six competencies in many ways reflects the principles of ESD. For example, for the competency of Citizenship:

Learners are expected to contribute to the quality and sustainability of their environment, communities, and society. They analyze cultural, economic, environmental, and social issues, make decisions, make judgments, solve problems, and act as stewards in a local, national, and global context. (Council of Atlantic Ministers of Education and Training 2015, para. 9)

While the language is hopeful, decisions by the Department of Education in reforming the Kindergarten to Grade 3 curriculum do not seem to bode well for real commitment to ESD in the province. Addressing the concern for raising test scores and increasing accountability, the Minister of Education is committed to “fundamental changes to improve and *modernize* [emphasis added] the education system for the first time in a generation” (Nova Scotia Department of Education and Early Childhood Development 2015, p. 5). The modernisation referred to by the Minister means that the K–3 curriculum will focus on Math and Literacy, which are deemed

to be core subjects. One may argue this approach constricts the breadth of the curriculum and reflects typical neoliberal education approaches primarily concerned with accountability, standardisation, and achievement scores (Van Heertum and Torres 2011). While the plan to integrate the teaching of other subjects into Math and Literacy aligns with integrative, interdisciplinary approaches of ESD, the K–12 curriculum will be severely constricted in the coming years without an accompanying vision and a theoretical framework to support professional development designed to effectively prepare teachers to implement integrative, project-based learning in the classroom.

In Nova Scotia, the promotion and implementation of ESD has primarily been taken up by an organisation called Sustainability Education in Nova Scotia for Everyone (SENSE). This group represents a network of governmental, non-governmental, community, and industry groups. SENSE's current status and level of activity is difficult to ascertain as it currently does not have a web presence and its contact information is difficult to find. Efficiency Nova Scotia, an independent non-profit organisation funded by the province's electrical utility, provides financial support for Green Schools Nova Scotia:

Efficiency Nova Scotia, Green Schools teaches students about energy efficiency and helps schools reduce their environmental footprint. We work with the whole school—students, staff, parents, and community members—to strengthen positive efforts already underway and help establish new leadership in schools that are ready to go green. (Andrea P. 2014, para. 2)

The focus of Green Schools Nova Scotia is on largely environmental issues and energy conservation, and, significantly, it does not explicitly reference ESD. Environmental education that makes direct links to the health, well-being, and economic prosperity of communities in Nova Scotia instead has fallen to long-standing donor-funded NGOs, such as the Ecology Action Centre, based in Halifax, and the Atlantic Coastal Action Program (ACAP) in Cape Breton.

## 11.2 Teacher Education and ESD

In 1998, realising that teachers were crucial to the success of any effort to use education to promote sustainability, efforts were initiated by UNESCO to reorient teacher education. A UNESCO Chair on Reorienting Teacher Education to Address Sustainability was established at York University in Toronto, and an international network of 30 teacher education institutions in 28 countries began planning to move the initiative forward. It is not surprising that faculties of education and teacher educators are identified as “key change agents in reorienting education to address sustainability” (Hopkins and McKeown 2005, p. 12). Teachers, and the education and preparation teachers receive, are critical to any effort to use education, specifically schooling, to foster more sustainable societies.

The unique challenges faced by Atlantic Canada regarding teacher education and ESD are related to shifting demographics and a reliance on strained non-renewables (including mining, fishing, and oil and gas). For decades there have been calls for bold, creative responses to these challenges. A recent call came in the aptly named report, *Now or Never: An Urgent Call to Action for Nova Scotians* (Ivany et al. 2014). The report unabashedly insists that “there is a crisis, and it does threaten the basic economic and demographic viability of our province, most dramatically our rural regions” (Ivany et al. 2014, p. vii). The report calls on Nova Scotians to have the “courage”, “imagination”, and “determination” needed to reshape the province’s future. While it is an economic document that recommends solutions largely driven by business and investment, the report does recognise a role for education, primarily entrepreneurial education. Although the *Now or Never* report does not reference ESD, its authors speak directly to the need for an educated citizenry able to meet the existing challenges. The values, skills, knowledge, and beliefs required to transform the province means that people need to be fully invested in the places they live—they need to understand their rich history and culture, as well as respect and use with restraint the living ecosystems on which everything else depends.

While the *Now or Never* report is one start of the conversation, the province needs to take further steps. Sustainability will require people who can problem-solve, are creative and innovative, and are community-minded and motivated through direct inquiry-based learning that is authentic, is meaningful, and has a benefit for the community. Nova Scotia needs learning that values participatory, collaborative approaches that break down the barriers that block interdisciplinary connections and that encourages systems-thinking and local solutions to local problems. In other words, the principles of education for sustainability must be fully integrated at all levels of the public education system.

In Nova Scotia, top-down, policy-supported leadership on ESD is largely absent. NGOs wax and wane on the availability of funding. Industry-funded initiatives, such as Green Schools Nova Scotia (2015), are primarily environmental programmes aimed at energy conservation, and they lack the full vision and mandate required to reshape education. Despite this, there are local, school-based, teacher- and community-led initiatives that reflect the principles of ESD. They are flexible, are creative, and foster a sense of personal responsibility for place and planet. There are projects all over the province that encourage respecting and preserving our histories, valuing culture and community, caring for others and the environment, and taking real action for viable, sustainable communities in which people can live well. Teacher education institutions have an important role in supporting this work by reorienting teacher education for the values of sustainability.

### 11.3 Reorienting Preservice Teacher Education: Cape Breton University

In 2012, the CMEC, in partnership with LSF and the International Institute for Sustainable Development (IISD), surveyed Canadian teacher education institutions (TEIs) to “gain a better understanding of how they are incorporating ESD into their pre-service programmes, research, and other activities” (CMEC 2012, p. 1). Of the five TEIs in Nova Scotia, four were invited to respond to the survey. Of the four invited, two responded. While a full discussion of the research is beyond the scope of this chapter, it was reported that across Canada, “There is modest but promising progress toward reorienting teacher education to address education for sustainable development” (CMEC 2012, p. 2). At the time of the CMEC survey in 2012, Cape Breton University (CBU) was preparing to make education for sustainability a core focus in its preservice teacher education programme. The CBU reorientation was based largely on theoretical and conceptual frameworks related to the values-driven and normative undertaking that is ESD. In other words, faculty and staff were engaged in the necessary hard work of “decid[ing] which themes to emphasize within their curricula, programmes, practices, and policies to ensure that teacher-education programmes fit the environmental, social, and economic conditions and goals of their communities, regions, and nations” (Hopkins and McKeown 2005, p. 15).

In the early phase of the reorientation to ESD, faculty and staff engaged in discussions that questioned how teacher education might be reoriented for the values of sustainability. It was believed such a reorientation could only be undertaken with a clear understanding of what constitutes these values and how people best “learn” these values. In outlining the specific values of sustainable development, the *ESD Toolkit* (McKeown 2002) refers to the *Earth Charter* as a reference point, recognising that values taught in school need to reflect:

The larger values of the society that surrounds the school ... a full range of values influenced by local traditions, aboriginal groups, ethnic populations, immigrants, religions, media and pop culture will be revealed, inventoried and considered for relation to and inclusion in ESD. (p. 23)

Being located in Unama’ki, the ancestral homeland of the Mi’kmaq people, aboriginal values, teachings, and education should be central to the reorientation process in Nova Scotia. Additionally, the *Earth Charter* sets out four basic values, or commitments, and 16 key principles that flow out of the basic values. The four broad commitments are (a) respect and care for the community of life; (b) ecological integrity; (c) social and economic justice; and (d) democracy, nonviolence, and peace (Earth Charter International 2016).

The document *Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability* (Hopkins and McKeown 2005) provided further guidance for the CBU reorientation. The document offers recommendations on change within institutions of higher education and within faculties of education, including recommendations on funding, research, partnerships, and communication.

These are worthwhile suggestions, but when designing transformational teaching practices to influence *values*, the “recommendations on change related to engaging pre-service and in-service teachers” (Hopkins and McKeown 2005, p. 43) were especially significant. It is recommended that teacher educators request preservice teachers to:

Analyze the mandated curriculum they will be teaching to identify themes related to sustainability and provide student teachers with opportunities to explore their own values and attitudes towards local sustainability problems while encouraging critical thinking and decision making that influence personal lifestyle and economic choices. (p. 44)

If preservice teachers in turn are to teach for the values of sustainability, they must be encouraged to question whether education, in its current form, may be an obstacle to realising sustainable communities. These communities can only be fostered within an educational framework that is “visionary and transformative and must clearly go beyond the conventional educational outlooks we have cultivated over the past several centuries” (O’Sullivan 1999, p. 4). For example, instead of simply analysing the mandated curriculum for themes that support the values of sustainability, preservice teachers must also be encouraged to inquire into how curriculum guides, textbooks, classroom practices, and teacher beliefs, as the main conveyors of curriculum in the classroom, may become tools in the perpetuation of values in conflict with values of sustainability. Textbooks (including novels), digital resources, current classroom practices, and teacher beliefs in public schools and in TEIs require critical reflection to determine embedded cultural assumptions that may or may not support educating for the values of sustainability.

While these key recommendations allow teacher educators and preservice teachers the opportunity to be critical as they access the personal and the experiential, they do not go far enough. The attainment of the values of sustainability is not commensurate with the knowledge we possess. Critical pedagogy (Kahn 2010) addresses the underlying structures responsible for the current crises, which students should be engaged in deconstructing and unpacking. Education in socio-political analysis is clearly important, yet the ability to critique must include building not only a knowledge base around these issues but also a deeper sensibility for the losses we have experienced from being separated from each other and from nature because of cultural ideologies predicated on competition, individualism, aggression, and consumerism (Howard 2011, 2012). Although this critique is necessary, we must, as Doerr (2004) argues, be moved from “I know to I care” (pp. 30–31).

## 11.4 Care, Pedagogy, and Sustainable Happiness

Reorienting a teacher education programme requires time for faculty and staff to explore and theorise the relationships and issues among social, economic, and environmental dimensions of sustainable development. These processes of inquiry and critical dialogue are crucial. Imposing the concept of sustainable development on

others contravenes the basic ESD tenet of collaborative knowledge building and supportive ways to identify and build on shared values. For such a critical discourse to take place, it was important to make sustainable development an open question for examination in the socio-political and socio-ecological contexts within which we work. Through dialogue and reflection, it was determined that efforts to foster in preservice teachers the requisite skills, knowledge, attitudes, and beliefs to teach for the values of sustainable development must be firmly grounded in the relational. The work of Noddings (1984, 2002) in care theory helped us to better understand how the values of sustainability may best be attained by preservice teachers and to identify the types of learning tasks best suited to accomplishing this goal. We drew on van Manen's (1991, 2002) phenomenological interpretation of pedagogy as it offered a deeper sense of how to structure learning opportunities in faculties of education. As well, O'Brien's (2012, 2013) concept of sustainable happiness provided a framework by which the faculty and staff could challenge long-held and often unexamined assumptions and behaviours. We could then use this awareness to lead initial teachers in understanding the interrelatedness of the environment, society, and economy and have this interrelatedness be evident in their teaching and their lives as community members. An appreciation of how interrelatedness plays out on the campus and in daily life is a first step.

Noddings's (2002) work on care theory posits that values cannot be taught directly but are "defined situationally and relationally" (p. 2). Central to Noddings's work are her components of values education: modeling, dialogue, practice, and confirmation (pp. 15–20). Noddings believes that, as carers, we attend because we want to, that "we love the ones who address us or have sufficient positive regard for them or the request is so consonant with ordinary life that no inner conflict occurs" (p. 13). In describing this encounter as one of "natural caring", the *I must* is an expression of desire, not a recognition of duty. Noddings's first component, *modeling* the values of sustainability as a way of being in the world, allows teacher educators and institutions to communicate the values, as they are *lived*, in the classroom. Teacher educators who are committed to interdisciplinary course work, who support participatory learning, who seek ways to incorporate shared decision-making, and who provide opportunities for initial teachers to reflect on their own values and explore issues around local sustainability create powerful opportunities to foster the values of sustainability. Van Manen (1991) calls this the living out of a relational commitment to students and "the possibility of a new pedagogy" (p. 3); this new pedagogy requires us to "stand in a relationship of thoughtfulness and openness to young people rather than being governed by traditional beliefs, discarded values, old rules and fixed impositions" (p. 3).

Noddings's (2002) second component of care theory is *dialogue*, which is described as open ended, involving careful listening and attending, and as "the most fundamental component of the care model" (p. 16). Dialogue is also at the heart of van Manen's (1991) interpretation of the "pedagogical relation" (p. 83). Attending to the other—to thoughts, feelings, memories, and experiences as they come out of conversation or out of response to reading and viewing—may serve as a space to deepen student teachers' understandings of their place in the world. Dialogue will

inevitably involve questions that require knowledge, reasoning, and even debate. It is important, however, that we not close off further questioning with “answers”. The efforts to reorient education for the values of sustainability will require *un*learning and *re*learning. It calls for developing awareness that how we relate to the world is socially constructed and that education is a major purveyor of hegemonic practices and beliefs.

## 11.5 Concluding Thoughts

In many ways, CBU is just beginning to reorient preservice teacher education, and it has taken important first steps. All preservice teachers at CBU must take a course in Sustainability Education, EDUC 4114: Teaching and Learning for a Sustainable Future (see Root 2014). This course is designed to allow students to acquire knowledge of theory related to Education for Sustainability (EfS) and to consider the complexities of its pedagogical implementation. The terms Education for Sustainability (EfS) and Education for Sustainable Development (ESD) are used interchangeably in Canada (McKeown and Nolet 2013). The term preferred by CBU faculty and staff was EfS, as it avoids the contention sometimes associated with the word “development”. In the core course, EDUC 4114, students are introduced to societal perspectives related to systems thinking, globalisation, and how historical events have influenced the development of the scholarship and practice of EfS. The course focuses on the competencies for educators in EfS and provides preservice teachers with opportunities to build practical strategies to implement a holistic approach to learning. Students learn from the experiences of teachers, schools, students, and community organisations that have implemented EfS to organise the learning environment. In addition to theory and the scholarship of sustainability, students are engaged in experiential learning activities ranging from creating art in the natural environment to participating in urban neighbourhood adventures designed to introduce strategies for place-based learning (Root 2014).

Preservice teachers also have the opportunity to take a popular elective course, EDUC 4104 Sustainable Happiness (see O’Brien 2010). Through lectures, group work, readings, and assignments, students investigate the applications of positive psychology in their lives, in society, and in the environment. Through the practice of “happiness skills” to increase happiness literacy, students examine the social messages related to happiness and well-being that influence values, beliefs, behaviour, and life choices (O’Brien 2010). In addition to these courses, ESD principles and practices are integrated throughout each course in the B.Ed. programme. As well, students can complete an Aboriginal Education Option that focuses on language preservation and Mi’kmaq education models, teachings, and cultural practices. Work continues on professional development for sessional instructors and on the creation of a graduate programme in Sustainability, Creativity, and Innovation. Faculty research agendas are growing to include questions related to sustainability



education. As sustainability is an evolving process, so too is the journey to reorient a teacher education programme.

The future prosperity and well-being of Atlantic Canadian communities requires a critical consciousness of our challenges. It also calls for the creativity and investment of those who are committed to living here and living well. A different definition of wealth and prosperity is needed. Halting the mass exodus of young people out of rural communities requires a progressive definition of community. In many ways, it means revitalising values that have fallen by the wayside in the rush to modernity—values that have allowed people to survive and thrive here for hundreds of years. Communities are dynamic, and they create a context for interdependence. They teach the skills of leadership and the power of local action. Communities are about knowing a place and about seeing the connections and networks that exist between the local and the global. Schools are central to the community ecosystem. ESD allows us to think about how our schools enable or inhibit the natural development of community.

Teachers are community leaders and understanding how to reshape our communities and live well in our places is essentially an educational challenge. However, for the foreseeable future in this region, reshaping our communities for different values will remain largely a grassroots endeavour. We are in need of teachers who believe that a revised form of education can play a transformational role in cultivating a cultural shift towards a more sustainable way of living, thereby providing us with a clearer sense of a way forward. As the eco-theologian Thomas Berry put it, we are in need of a new story—a story that places education at the heart, where the focus is on the practicalities of community renewal and regeneration and on the creation of start-ups to meet real needs. Teachers with the right preparation can be at the centre of this shift and see it as a time of creative innovation and opportunity.

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# Chapter 12

## From Relationship to Something More: Environmental and Sustainability Education and a New Ontological Position



Chris Beeman and Laura Sims

In an earlier paper with Lee Anne Block on Education for Sustainability in Manitoba (Block et al. 2016), we described some of the thinking behind our teaching practices, from the perspective of each author. In collaboration, we then considered the similarities and differences in both theoretical perspective and professional circumstance. We then gave a presentation based on this work at Trent University in May 2016 at the National Roundtable on Enhancing Environmental and Sustainability Education in Canadian Faculties of Education. In this chapter, our hope is to move these ideas further and to explore some of the underlying principles in our teaching, some of which were noted in *Canadian Perspectives on Initial Teacher Education Environmental Education Praxis* (Karrow et al. 2016). In Sect. 12.1, we begin with some of the ideas that support our teaching practice. Laura Sims gives a perspective based on her teaching at the Université de Saint-Boniface (USB) in Winnipeg, Manitoba. Chris Beeman speaks of the ideas underlying his teaching practice at Brandon University in Brandon, Manitoba. In Sect. 12.2, we look at what these practices presuppose about human/place interactions, and we suggest ways to move forward teaching in the area of Environmental and Sustainability Education (ESE). We posit what would be necessary for a full expression of ESE to occur, based on a different enactment of human/place being. This, in turn, is based upon some of the recent theorising in new materialisms.

Relationships, and the building thereof, are key to our teaching in ESE. But the building and sustaining of relationships is a central concept undergirding learning in all Indigenous contexts as well. In fact, the significance of the relationship between

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people and land is now recognised as a precondition for understanding Indigenous experience (Armstrong 2017). Thus, there is a necessary connection between Indigenous and environmentally based learning (Basso 1996). In First Nations, Métis, Inuit (FNMI) communities, learning almost always comes from some place and occurs in the context of an existing relationship. This relationship is often with another person such as an elder. But it is also frequently with what Abram (1997) has called the “more-than-human world”. Thus, the more-than-human world (i.e. “nature”) can be considered an active other, a co-teacher in learning (Blenkinsop and Beeman 2010). And, in practice, both of us teach in faculties of education, and both teach some courses in Indigenous education. Laura Sims explores the idea of relationships primarily in the context of building relationships with and between her students and with the local community—human and ecological—around USB. Chris Beeman explores the idea of building relationships through place, primarily the relationships that may emerge from human–place interactions, both in his research and in his teaching at Brandon University. In this chapter, considering our teaching practices leads us to theorise further, to engaging with some of the ideas in the new materialisms. Referring to the stories of Teme Augama Anishinaabe elders of Chris’s acquaintance, we posit that unless the underlying cosmology of the global West is challenged, teacher education in the area of ESE is bound to be unsuccessful, because the relationship with the more-than-human world—that critically important bond that creates co-relational knowing—will not be strong enough for people to know, through their moment-to-moment actions in the world, their actual interdependent being with the more-than-human.

## 12.1 Practices of Relationship

### 12.1.1 *Laura Sims on the Building of Relationships in Teaching and Learning*

Transformative learning (as described by Mezirow 2008) is central to education for sustainability (Diduck et al. 2012; Sims 2017). More than ever, I believe that we must learn to live differently in the world, and with each other, in ways that are much more gentle, respectful, equitable, and life-giving. Teachers play an important role in this process. In Block et al. (2016), we describe how, through our roles as teacher-educators, we engage in work involving some kind of transformation, or the shifting of position by preservice teachers, rather than simply the transmission of information, yet that our teaching positions at times provoke, or at times sidestep, this transformative stance. We explore how we try to enable this shift in position primarily through enabling meaningful experiences that involve living and learning actively in the environment and the community. We then work with students to make sense of these experiences. For preservice teachers, these experiences, and the

relationships that result from them, have the potential to trigger transformative learning and can also nourish and sustain their learning process.

Relationships play an essential yet underexplored (Taylor and Cranton 2013) role in the transformative learning process (Sims 2017). When reflecting upon education for sustainability (Chiariotto 2011; Kovak and Elliot 2011; United Nations Economic Commission for Europe 2012) and my experiences over the past 15 years as educator and researcher, I no longer see building relationships with community (human and the more-than-human world) as primarily a learning goal; I see it much more as an essential process, or conduit, that enables a genuine transformational change in perspective, in being, and finally in action. *Being in relationship* is a source of learning; it also sustains and allows us to make sense of experience.

Insights from research focusing on learning for sustainability through nonformal educational contexts, like those found through public participation in environmental governance processes, show the importance of building and maintaining positive relationships with community and with the natural environment in the transformative learning process (Diduck et al. 2012; Sims 2012, 2017; Sims and Sinclair 2008). Through this research, the importance of relationships in facilitating learning is revealed, particularly the significance of emotions, such as a sense of well-being, courage, and accompaniment, and their relationship to the critical reflection process (Sims 2017). Diduck et al. (2012) assert that the better the relationships, the broader and deeper the learning outcomes. Changing one's intellectual stance is a first step involving some risk, but genuinely acting and being committed to living in a more sustainable way requires genuinely caring for others and the environment. For example, results from Central American case studies of small-scale farmers transitioning towards less pesticide-reliant agriculture (Sims 2017) show how, as a result of healthy relationships with farm families, university collaborators developed empathy for farm families' challenges, as well as an appreciation for their values, and they were inspired to continue implementing project activities in spite of significant challenges. Significantly, considering the complex nature of the problem and the risks to livelihood security, farm families identified the importance of feeling a sense of accompaniment and trust when having the courage to change their ways towards alternative, less pesticide-reliant farming practices.

In the context of my professional teaching practice with teacher candidates at USB, a primary focus has been, and continues to be, on building relationships between my students and the human communities that are the focus of my courses<sup>1</sup> (Block et al. 2016; Sims 2015). Thus, my teaching is focused on the social aspect of sustainability education. This is done through course activities, guest speakers, visits to communities, and with community representatives. Authentic voices sharing stories and wisdom and hands-on experiences in different communities are essential to make the learning real and personal. I believe that for students to learn to respect others' wisdom and contributions, there is a need to provide role models and also to

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<sup>1</sup>At an undergraduate level, I teach courses on Cultural Diversity in Education, Aboriginal Perspectives in Education, and Social Studies and Curriculum and Instruction (secondary). At a graduate level, I teach a course in Values in Education and another in Education for Sustainability.

facilitate positive interactions leading to relationship-building. Currently, and on an ongoing basis, this involves encouraging students to learn to engage with different communities that previously they might not have had contact with, like the Indigenous community, independently. This process involves courage, as, potentially, preservice teachers are asked to reach beyond their comfort zone, given that Indigenous and non-Indigenous communities are quite isolated from one another in Winnipeg (Comack et al. 2013; Macdonald 2015; Sims 2015; Sinclair 2016). As Sinclair (2016) so aptly noted,

Understanding the truth of Canada's past is important but it is only a step. Changing the past and becoming more than what you inherit is another. This doesn't come from merely understanding how Indigenous peoples and Canadians exist in systemic cycles, but via the courageous steps needed to break these cycles. Another word for this is: reconciliation. ... The TRC [Truth and Reconciliation Commission] defines reconciliation as "an ongoing process of establishing and maintaining respectful relationships." (p. 2)

Dr. Niigaan Sinclair, when sharing teachings around the treaty relationship with my students in the context of my course, often stresses the importance of seeing ourselves as part of a larger family and having to learn to care for, and respect, one another and the land.

I truly started to understand the vital importance of relationship-building as a goal and as a learning process when teaching an Aboriginal Perspectives in Education course. Reflecting on my own learning, it is only *through and being in relationship with* Indigenous people that I have learned to appreciate the deep resilience, generosity, courage, and wisdom that continues to thrive in spite of a devastating colonisation process (Sims 2015). It is through being in relationship with Indigenous friends and mentors, participating in cultural activities and ceremonies, that I have had the courage to face my own prejudices and privileges, and the lies and the partial truths I have been told, and told myself, about Indigenous peoples, our history, and Canada. It is by being in relationship that I have been intellectually and emotionally challenged and supported when learning what it means to truly be a part of this beautiful yet complex place, learning what it means in terms of my responsibilities in the reconciliation process. It is also being in relationship with Indigenous people that I have come to appreciate how my education-for-sustainability pedagogical approach shares many commonalities with an Indigenous approach to learning and teaching.

Through my work with teacher candidates, I try to put into action these lessons that I have learned. As I have been accompanied in the learning process, so too I want my students to learn and grow. I want to help them build relationships, and then I want to inspire them to continue to maintain these relationships long past the end of our time together. There are many things I do to build meaningful relationships with students and between students and community allies. In my courses, for instance, I try to create a welcoming, honest, and safe learning environment, where important, heartfelt, and oftentimes difficult and sensitive issues can be discussed. I try to begin discussions where the students are and build from there. To create a democratic and equitable learning environment, I engage students in the decision-making process around course content and activities and to tailor the course to meet



their needs. To build relationship with the environment and community, my pedagogy is community-based and community-focused, and the local community and environment are used as learning contexts; I want students to learn in/about/from community. I use an inquiry approach and try to facilitate critical reflection in order to push students to be curious, to critically reflect, to problem pose and problem solve, and to hopefully disrupt their potential complacency, enabling them to critique the dominant culture. I encourage my students to take risks and to be courageous. This is done through activities that ask them intellectually to be critically reflective and creative and to explore tough questions. Emotionally, they are asked to have the courage to open themselves to engaging with communities who previously might have existed as separate, marginalised, or perhaps invisible (for further details, see Block et al. 2016; Sims 2015).

There are enablers and structural constraints on our teaching practices, often occurring at a cultural and institutional level. USB, as an institution, prioritises education for the vitality and viability of the francophone community in Manitoba (Block et al. 2016). Over the years, this has involved responding to the needs of an evolving francophone demographic, as evidenced by staff and students coming from all over the French-speaking world. For example, in the past decades, USB has evolved from a primarily Catholic institution to one that accommodates and celebrates different spiritual beliefs. The original chapel has been transformed to an interreligious space, where Muslims and Christians can pray together. At a student governance level, USB has seen the formation of a Métis student group and the equivalent of a gay–straight alliance. Responding to a larger provincial mandate, USB recently signed the Manitoba Indigenous Education Collaborative Blueprint Initiative. For me, these are all positive developments when thinking of building understanding between communities.

Interestingly, recent renovations have made me acutely aware of how physical spaces enable, or constrain, how we relate with one another. From what I observe, in one particular classroom, recent renovations were designed around, and privileged, the use of technology, with plugs for electronic devices at each seat. Facing the front, tables are arranged in rows and electrical cords connect the tables to each other and to the wall, making them hard to rearrange. Circulating among the tables is difficult. I have noticed through teaching in this physical space that it reinforces a hierarchal structure where the teacher is the focus of the learning; group work is challenging, as is documenting student ideas on the white boards (located on the side walls) during discussions. Sitting in a circle is next to impossible. For me, this configuration highlights how one physical setup in an educational context can essentially make it impossible to teach in other ways, such as setups that integrate education for sustainability pedagogies.

Thankfully, USB's location provides excellent access to many kinds of cultural and natural spaces, which I use extensively in my teaching. However, access to wild spaces is limited. Unfortunately, the human–community focus of the courses I teach, and the challenging access to wild spaces, reinforces a more human-centred pedagogy, even within the context of an approach meant to enable ESE more broadly. I

do not do enough actual learning *from* nature with students. The implications of this are potentially devastating (Louv 2005).

### 12.1.2 *Chris Beeman on Relationships and an Autochthonous Teaching Practice*

My premises for learning and teaching in ESE are that wilder places/the more-than-human world/“the land” may speak and that we may listen to and understand what it says; that this understanding may occur in ways that are not language-based; that to understand the land, one must live and act in the world in certain ways; that these ways of living and acting are linked with the state of being of attentive receptivity/indigeneity/autochthony<sup>2</sup>; that while the capacity for this way of being is broadly distributed among people, special efforts and learning must occur that resist the inclination of the global West, which tends to suppress this way of being; that a related being with the more-than-human, which transcends a dualism made necessary in forms of presentation such as this one, is possible; that learning and teaching practices of ESE ought to include possibilities for bringing forth a love of the more-than-human world, a listening to the land such that boundaries between “self” and “world” may merge; and that these practices ought to be at the heart of educative action in and with the world (Barad 2007; Beeman and Blenkinsop 2008; Roszack 1992; Wilson 1984).

In educative practices in the field of ESE, I am sometimes able to teach in ways that enable the above to be understood and enacted, and I hope that a kind of learning, which is comprised in part of enacting different ontological positions, may occur. Yet, I also recognise that these principles may be linked to “competencies”—knowledge, values, and skills that students may learn. The relationship between competencies and state of being might be described as a mutually interdependent one that relies upon a relationship with the world such that the interdependent well-being of the more-than-human and human is, moment-by-moment, both known and reenacted. I call this state of being “attentive receptivity”. It is an ontological state that is roughly equivalent to Autochthony or Indigeneity, where Indigeneity functions as an ontological rather than an ethnic description.

The principles noted above, in the first paragraph of this section, only occur when there is a changed ontological relationship with place. Otherwise, the land is only “talked about speaking”, “imagined to speak”, or “recounted to speak”. But the land does speak. I know this on the authority of elders/knowledge keepers with

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<sup>2</sup>Attentive receptivity is an ontological condition, a state of being in which the human participant enacts, at each moment, an understanding of the lived interdependence between person and place. See Beeman (2006). The term *Indigeneity* is at present undergoing rapid change in its academic and cultural usage since earlier work (e.g. Beeman 2014); in the sense here, it is used roughly synonymously with attentive receptivity. Hitherto, the term *Aboriginal* was used to refer broadly to FNMI peoples. In this chapter, I use *Indigenous people* to refer to these cultural groups.

whom I work and from my own experience (Beeman 2006; Beeman and Blenkinsop 2008). It falls to us humans to be in a position in which we can hear what it has to say. Those of us from the modern, global West usually fail to be in that position.

Many Indigenous people (Autochthonous people<sup>3</sup>) of my acquaintance understand this. They also live it. I am thinking in particular of certain Teme Augama Anishinaabe knowledge keepers. In the sense in which I use the terms here, I mean the preceding to be a kind of tautology—that the state of being of Indigeneity or Autochthony incorporates an understanding of human/world interdependence because a life is lived this way. Ontology thus precedes intellectual apprehension. This understanding tends to shape further acting with, by, on, and in the world. But the most significant aspect for humans who live in an Indigenous way is to be of the world. This is a praxis of being. It is the being that I think is at the heart of ecological/environmental learning. But, for such a praxis to occur, it must reflect intent and underlying premise and theory. For the most part, sustainable/environmental/ecological education may be said to fall short in praxis, because it is at a “knowledge about” level, not a “being” level.

In my faculty’s undergraduate programme, I teach three sections of an Aboriginal perspectives course and one section of an Environmental Science course. Many of the principles described above find their way into these courses, but none are fully realised. In addition to the kind of teaching practice that Laura has mentioned above, which is predicated on the building of relationships among students and with local First Nations and Métis communities, I focus also on building relationships with the more-than-human world, on seeing school as something that can occur outside of a building designed with a particular model of learning in mind, and on understanding locale as a significant factor in learning. I focus on an inquiry approach to learning, on community engagement and involvement, on land-based orientation, and on learning through experiences—in short, on many aspects that are in common with Indigenous modes of learning. Because these courses occur in a faculty of education, teaching in this way challenges conventional, school-based, and teacher-centred approaches to education.

The Environmental Science course is taught as an experiential, inquiry, and place-based course. It is normally held outdoors for about one class out of two each week. Because it is taught between January and March, I have begun to call it “Winter”. Like Laura I offer students some choices about course content. Early in the term, I ask students what kinds of things they would like to do outside during the term. We come up with a list. In the past 3 years, this list has included building a quinzhee, skating on an open-air rink, cross-country skiing, tobogganing, and tracking animals through the prints and signs they make in snow. Then, combining our interests with learning, we choose from our list and make a schedule. Then we begin to ask science-based questions about these things. In building a quinzhee, for example, we ask questions about snow structure, physical forces at play, and changes in crystal structure; in skating, we ask questions about friction, speed, acceleration,

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<sup>3</sup>The relationships between attentive receptivity, Indigeneity, and Autochthony are addressed in multiple past papers, but especially in Beeman (2014).

and direction. After I facilitate some of the initial sessions, I encourage students to take responsibility for teaching the sessions involving activities in which they have most interest. We use an environmental inquiry learning model throughout (Chiarotto 2011).

The greatest challenge in teaching this course is to enable preservice teachers, who are often seen as responsible and goal-oriented and for whom professional demands may require that they think in terms of *covering* curricula from a position of expertise, to consider the possibility that the conditions for learning success may also include asking progressively better questions, to which even the teacher does not know the answer. After all, some of the best questions have no answers. For preservice teachers, this may involve relinquishing strongly guarded ideas of what it is to be a teacher. Early in this course, when I am asked for easy answers, I make a point of saying “I don’t know the answer to that; I wonder how you could find out?”—many times, enough that it becomes a standing joke. This is followed by “What other questions does that lead you to ask?” In other words, I model the way I hope my students will teach, which may be very different from the way in which they were taught. As the course progresses, I cease to be the authority in the subject area and start to be a person with skills in inquiry, able to support student learning, as indeed I hope they will be with their own students. I do not refuse to give any answers; I merely refrain when it is possible to do so. But, there is no doubt that this practice changes teacher as well as student. I find myself a co-learner, conceiving of my role as, for the time being, one with better-informed questions. My sense of wonder grows. As the term progresses, and students develop expertise in terms of wanting to understand more in a certain area, I expect my questioning skills to be eclipsed, as indeed they often are.

Inquiry-based learning naturally works well outdoors. Opportunities for learning by observing are frequent. Such a varied context for learning seems to suggest, in its wider palette, more possible explanations. Almost any non-human-controlled event may spark a question. Approximately half of the classes of the Aboriginal Perspectives course are held outside. The pedagogical justification for this, in addition to that which is provided by research regarding the benefits of outdoor learning (Louv 2005), is that spending time in what was the original home for all beings—the natural world—is an excellent context for understanding historical, cultural, economic, and political perspectives of Indigenous peoples. The learning we do outdoors includes building a relationship with the natural world, fostering our own community in that context, and engaging in experiences with metaphorical relevance for ideas around FNMI education. The natural world is a rich environment in which to situate experiences, because it provides nuanced contexts that are not reproducible in human-created environments. It allows for holding discussions that are open, less constrained, and peaceful, all of which are beneficial in addressing some of the deep divisions that so often emerge around learning to teach in Indigenous contexts.

When I inherited this course, I had heard that because of the nature and context of the course, which entails, among other things, the addressing of structural racism, and because the course had become mandatory for preservice teachers, there was a

possibility of conflict, anger, racism, and antipathy emerging in my classes. From my perspective though, Indigenous modes of learning, Indigenous contexts for learning, and FNMI subjects of learning are all a source of joy and interest. That these can take place outside of a standard school setting, and thus, that a primary source of historical conflict between FNMI and non-FNMI people—the institution of the school—can be viewed from the outside, is another virtue in learning in wilder settings. I follow Jickling (2014) in this, believing that the wilding aspect of *wild pedagogies* occurs, not simply through a changed relationship but in the challenging of often unintentionally held expectations around what constitutes learning.

Still, while learning suited to exploring Indigeneity may be effectively taught in the more-than-human world, an orientation (in fact, a relationship) to the world that would characterise such a position of attentive receptivity is for the most part lacking. The closest we may come to experiencing ourselves differently within an ecosystem (i.e. when the ideals of this teaching philosophy are attained) come in only a few precious moments of teaching each term. The simple *nature sit*, the returning to a place one comes to know over a period of weeks, months, or years (Young et al. 2010), can be what some have called a *gently powerful, unexpectedly transformative*, and an *immensely rich* event.

In the nature sit, the intent is precisely not to *be* in the way in which being normally occurs in the modern, global West. One listens, but with all the senses. One does not think in the past and future way in which thinking normally occurs. One pays attention to what the world is “saying”, not with the goal of understanding a language (though that too may play a part)—in fact, not with a goal of acquisition at all—but with an intent to fully listen, with all one’s senses and without the expectation of an answer. To presuppose an act of communication would be to limit the event, but observation may entail understanding in more ways than through language and rational thought. These thoughts relate to a subsequent section in this chapter in which the divisibility of human identity from that of world is challenged. But for the time being, let us assume, as a starting point, the separated mode of being that is inherent in the modern, global West.

The sweat lodge is another experience related to attentive receptivity that is offered as a possibility for learning in this course. The Dakota ceremony practised in our area is linked to the world through the grandfathers: the heated stones of the earth, within a rooted pole structure, sitting on the earth. Fire, water, earth, and air elements are all recognised and part of the ceremonies. This is a spiritual practice shared by many North American first peoples. In this practice, participants are led through the four *doors*, or phases, which correspond to the four directions, stages of life, and aspects of identity, all of which comprise part of a conceptual organisational structure for First Nations’ beliefs and teachings. An elder conducts the ceremony. After students participate, they present their experiences to those in the class and prepare a paper based on what they learned. The discussions may be wide-ranging and very engaging.

While I greatly value the teachings accompanying the sweat lodge, I also understand the sweat lodge as a more human-directed process than the gentle nature sit.

The sweat lodge is a more distinct kind of intervention in human thought and being than is the simple encountering of the more-than-human in a nature sit. On the other hand, it is one of many ceremonies that, in Indigenous traditions, serves as a continual reminder of human interdependence with the more-than-human world. We will touch again on the significance of ceremonies such as these later in this chapter.

The initial structural limitations on my practice derive from a worldview—that of the modern, global West—that, beyond encompassing all ways of thought and being, as if that were not enough, also imposes curricular structures. In this worldview, quality of learning tends to be sacrificed for quantity of information received and processed. These kinds of limitations derive not from ill-intent but rather from lack of consciousness that there could be another way of being in the world. I want my students to be aware of these limitations and to critically appraise them. My practice in these classes is justifiably limited by my responsibility to ensure that students are introduced to modes of learning that are outside the usual modes understood in the modern, global West. I also seek to enable my students to identify ways of teaching that *they* consider necessary and desirable in their teaching practice.

## 12.2 Moving Beyond a Simple “Relationship”

In this section, we attempt to move theoretically beyond a conception of world in which the players, even if they were not ordered in ladder-like hierarchy but rather in webs of interaction, might not be separable. We then go on to suggest how, if at all possible, this might play out in a class.

In the preceding section, we focused on the significance for both authors of the building of relationships, both within an academic course made up of students, with people and communities in the broader culture, and with the natural world. But, it is clear that these relationships, even if with the natural world, are predicated on a theoretical framework that presupposes that there is an inherent separation of people from world, as hinted at earlier. By this, we mean, not simply that there has existed, at least since the advent of the modern, global West, a cultural attitude of human being as more valuable than other forms of being. We mean this in the most literal sense: that in the usual way we speak of humans, we speak of them as being somehow outside of the rest of nature. While this distinction is perhaps reinforced most by the attitudes of parents, it is likewise strongly emphasised in schools, not simply by explicit curricula but also by the undergirding attitudes and beliefs of a culture—and by the necessities of continued rapacious “use” of the natural world inherent in neoliberalism (Derby et al. 2015). If we are to judge by our ways of taking up space in the world, there is a tendency for us humans to think of ourselves as somehow existing outside of nature, of being superior and un beholden to nature, but most of all to be *different from* nature.

There is, therefore, something missing in our cosmology, if we aspire to sustain a true relationship with the more-than-human. And, this lacuna is not simply based

on value-laden regard; it is also based on the ontological separation we feel, and objectify in, language and syntax (in most surviving languages in the world created by the modern, global West and in the world's dominant (neoliberal) culture). We become the only subject in a world full of objects. Even this is not the extent of the problem; the problem is that our conceptualising of the world *needs there to be* groupings of objects, which are sometimes joined by verbal structure (and ideation).

Thus, if we need, for the sake of planetary health, to move beyond this world-view, then even the relatively progressive “systems approach” to ESE is lacking. In a systems approach, the relationships of systems of interaction in an ecosystem are emphasised. Thus, rather than a tree sitting in a field, we can surmise a systemic process of the eating of light and transpiring of moisture, while carbon is being sequestered from the atmosphere, as systems of water evaporation and transpiration, and energy transfer to mass are enacted. It is true that this process-based system reduces an earlier focus on individuals or species, which were often emphasised as possessing certain qualities independent from the ecosystem containing it. In this view, the emphasis was on the “stars”—the individual species—and the ecosystem as a whole was understood as involving interdependent beings that occasionally interacted. But, abstracting from the above description, we are still left with the subjects of *ecosystem*, *water*, and *nutrient cycle* and *laws of thermodynamics*. We are even left with *systems approach*, which, all else being equal, is a kind of megastar, governing (with the confidence of a meta-theory) all that plays out in the abovementioned ecosystem.

No simple fix is available. What is actually needed is an utterly different conception of cosmos and its enactment in the world that finds its early roots in Spinoza, which is now expressed in the writings of the new materialisms as they apply to ESE. But the oneness of all being is an understanding, an approach to the world, and enacted *ontos*<sup>4</sup> that links to both spiritual traditions of the East and to times prior to contact on Turtle Island. This conception must be predicated upon an enactment of this way of being. The parameters of this chapter preclude an exploration of the former but do permit some reflection on the latter, through the first author's work with Teme Augama Anishinaabe people, over the past 15 years. A few relevant ideas will be addressed later in this chapter.

This section, therefore, continues with an exploration of what has come to be called, in the writings of Clarke and McPhie (2014), *immanent materialism*. We show the close correlation between these ideas and those of some First Nations applied cosmologies, especially as expressed in the words of elders with whom Chris has worked in Teme Augama Anishinaabe territory. We will conclude this

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<sup>4</sup>The limitations of this chapter prevent a full explanation for why this term is preferred over the usual “ontology”. Suffice it to say that when *ontos* is always linked to *logos*, as it is in English, with “ontology”, even when it is not the study of being but being itself that is intended, then the logotistic tendencies inherent in the modern, global West tend to predominate. For fuller theorizing about this, please see Beeman (2017).



section with a discussion (a pessimistic one) about the possibility of such a worldview entering an average classroom on Turtle Island today.

### ***12.2.1 Immanent Materialism and Its Roots: Spinoza and Ontos from Turtle Island***

The limitations of space in this chapter prevent a full accounting of new movements in this area; we are only able to make mention of the work of a few of those writing in this field. This said, finding their recent origins in Barad (2007), the new materialisms in environmental education focus attention on the vibrancy and agency of the more-than-human world. In doing so, they move discussions from the linguistic, post-structural, and postmodern “turns” of the past half-century to an understanding of the world that is not so attendant to or predicated upon human interpretation. This is a world that acts on its own and that cocreates meaning and being with humans (Rautio 2013). While human interpretation still figures—because it is we humans who do the thinking and writing in papers like this one—human interpretation is understood to occur in conjunction with the agency of the more-than-human.

We note in particular the work of Clarke and Mcphie (2014) whose paper titled “Becoming Animate in Education: Immanent Materiality and Outdoor Learning for Sustainability” hints at what a cosmology that is not predicated on “objects” and their “interactions” might look like. Central to this worldview is the indivisibility of matter, the interpretive and material aspects of which are indivisible. Their work derives in part from the work of Deleuze (1970/1988), who is arguably one of the most astute interpreters of Spinoza, so it is no coincidence that the world of new materialisms begins to sound a great deal like the intertwined *thinking* and *extending* aspects of being. In a Spinozan worldview, Nature is equivalent to God, in the “All that is” sense, and the *naturans* aspect of Nature: the “nature naturing” is, as it were, the inherently active force in the “all-that-is” that is Nature (Morgan 2002). Wienpahl’s (1979) interpretive work on Spinoza, which investigates the verbal aspect of both Hebrew and the language (Ladino) spoken at the time by Jewish people in seventeenth-century Amsterdam suggests a syntactic link between this worldview and the language that describes it. English cannot do this, or perhaps, it would be more apropos to write that “acting-doing this is not possible while ‘Englishing’”. In other words, another language might do a better job of trying to convey these ideas. Nonetheless, Clarke and Mcphie (2014) succeed, to a creditable degree, in suggesting what a world like this might be like.

In this world, there is no division between objects set in space or, for that matter, between space and objects; rather, this world is, in Clarke and Mcphie’s (2014) words, “*whole, alive and forever becoming*” (p. 199). As such, its nascent homogeneity pervades. Thus, in contrast to the earlier sections of this chapter, in which we described our focus on teaching practice as relational, this cosmology interrupts even that binary division between human agents and what it is they are observing.

The world in this cosmology is both the “is-ness” of world and of (human) observer. And, except in using language like this to try to discuss what can only be conceived of through the use of words in the cosmology we inhabit, there is no division between anything. Thus, it is clear why Clarke and Mcphie eschew a systems approach; such an approach presupposes the very possibility of division (and with it, organisation) which this cosmology precludes.

Once again, this description owes something to others, for example, the cosmology developed by Freya Mathews (1991) in her interpretation of Spinoza: a variegated tapestry of space-time, composed of nodules of energy, all made of the same stuff, with nuances of difference, responding to interaction between what might superficially appear to be different “things” with the tapestry, but ultimately one being—as is Spinoza’s conception of Nature (Morgan 2002). While this may sound far-fetched, if taken from a macroscopic perspective, this view might well turn out to be more meaningful than would be a standard human-centred one, which is very much influenced by the personalities, proclivities, and preoccupations of those humans who happen to be featured in the given interpretation.

A similar worldview is shared by several elders of Chris’s acquaintance. Mary Carol Mathias (deceased, 2002), who was married to Alex Mathias, said in 2002:

there’s a totality<sup>5</sup>  
 many living things  
 including mother earth  
 but let’s say we recognized the forest  
 and all the species  
 that live in it  
 and then mother earth  
 herself...  
 then we can live harmoniously. (Beeman 2006, p. 52)

Alex and Mary-Carol Mathias worked together for many years. Alex agrees with, and also expresses, this interpretation. The significance of these words for the present discussion is the relationship that is accorded to humans—“then we can live harmoniously”—when other significant beings are recognised (Beeman 2006, p. 52). This process of recognition culminates with “mother earth” (*juju dakim*<sup>6</sup>). In interpreting these words, it would appear that it is the lack of capacity to recognise as existing the beingness of other beings that is at the heart of the state of being characteristic of the modern, global West. And it is the capacity to recognise “self-in-other-being-ness” that is at the heart of both aspects of Indigeneity and of an interconnectedness that surpasses related being. Perhaps, one might go so far as to suggest that, while the term “relational” is used to describe the phenomenon, according to Clarke and Mcphie’s (2014) cosmology, such a differentiation would not exist. This was certainly the case in discussions with Alex over his consideration of

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<sup>5</sup>In working with elders during the course of his doctoral dissertation, Chris searched for a way to honour the rhythms and patterns of speech of the elders. To this end, slight pauses were marked by a line break. Sentence structure was often unconventional, so standard punctuation is not used.

<sup>6</sup>Alex Mathias speaks a local version of Anishnabemowin. The italicized transliteration of Alex’s words may be an expression which is particular to the Teme Augama region.

position within the wider whole. Thus, Mary Carol's words might be thought of as incorporating the conceptual division needed to describe, in this language and ontos, what may be in enactment an incommensurable one.

### 12.3 What Might This Look Like in Teacher Education?

We began this chapter with investigations into the process of building relationships in our respective teaching practices in ESE. The question that titles this section is more a send-off for future work. In practice, as noted in earlier descriptions of our work, and its theoretical context, there is an interest in deepening the possibility of relationship with the more-than-human, even if this "relationship" is more of *aspects* of an interconnected whole than between separate entities.

Yet, within faculties of education, it can hardly be said that such a cosmology is either in practice or in play. The notably job-focused aspects of a teaching life, both for professors and for prospective teachers, predominate. We therefore doubt that educating according to this cosmology is feasible in the foreseeable future. Even if it were, it is not enough to simply wish another ontological position into being; it has to be lived (Beeman 2006). However, there might emerge pedagogical moments in which consciously entered experiences do more than they say. In other words, moments may emerge in which students (and teachers) might be, as it were, caught off guard in moments of experiential learning, perhaps outside of usual course timetables, perhaps in travels in wild places for sufficient periods of time, and perhaps with the involvement of knowledgeable elders. But this wider project would have to occur within a cultural context in which the tendency of the quality of thought to occur, of the kind used in writing such as this, is subverted. Even if only momentarily, if the "language about" kind of thought is disrupted and replaced by a lived practice of interdependent being, then divisions between self and world—and between humanness and the more-than-human—may be momentarily forgotten, or perhaps may come to be superseded entirely.

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# Chapter 13

## Growing Innovative Approaches to Environmental and Sustainability Education in Teacher Education Programmes



Hilary Inwood

It all started with lunch. Knowing that a stronger presence was needed for environmental and sustainability education (ESE) in our preservice teacher education (PTE) programme, a few faculty members gathered for an informal lunch in 2008 to discuss how best to proceed. At the Ontario Institute for Studies in Education (OISE) at the University of Toronto, we were well aware of how important environmental learning is for the next generation of teachers as they help to address the looming crisis of climate change. With food fueling our discussion, we articulated our beliefs, values, and expectations and arrived at a decision: despite significant challenges, few resources, and a lack of institutional approval, we would forge ahead with a plan to grow ESE to support the creation of a culture of sustainability across OISE. Working with Orr's (2007) words in mind, "Hope is a verb with its sleeves rolled up" (p. 1392), we left lunch feeling inspired, rolled up our sleeves, and got to work.

Since that fateful lunch 9 years ago, we have taken a multibranch approach to developing and delivering ESE in OISE's teacher education programmes. As one of Canada's largest faculties of education, we have had ample opportunity to grow ESE for a large and receptive student body, resulting in the establishment of an active and influential *ESE Initiative*. This has established new courses, offered extensive co-curricular programming, undertaken advocacy and research, and nurtured rich community partnerships. As a case study on this work, this chapter tracks the ongoing development, implementation, and refinement of the *ESE Initiative*, demonstrating how we have made ESE an integral part of OISE's teacher education programmes, and the institution as a whole. Each year, the *ESE Initiative* reaches hundreds of preservice teachers (PTs) and has helped to move us closer, in unexpected ways, to our goal of creating an organisational culture of sustainability. It not

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only has helped us to reduce our ecological footprints in terms of behavioural change and physical infrastructure improvements but has also extended our environmental handprint (Centre for Environmental Education [n.d.](#)), a term that signifies our positive impacts that now reach into the wider university and educational communities in which we work. Our challenges in this work, as well as its impacts, are identified and analysed as part of this case study, as are the next steps for continuing to grow this work in the future.

### 13.1 Preparing the Ground

As we began work on seeding the *ESE Initiative*, a few of us had already been integrating environmental learning into Curriculum and Instruction courses in our main PTE programme in small ways; Jane Forbes had been ensuring a place for it in her science education courses, and I had been doing the same in my visual arts education courses. While there may have been other faculty doing similar work, one challenge was finding others who shared our desire to develop a more cohesive approach to ESE within our large faculty of education. When we approached Associate Dean Mark Evans and Program Director Kathy Broad with our ideas, we were delighted to find them supportive and felt buoyed to move forward. We quickly put a small series of extracurricular events in place, including talks and short workshops on ESE, and were impressed with the high level of student interest right from the start. While we learned early on that our students understood the importance of ESE, we still had to assess our colleagues' level of interest.

Our timing proved to be fortuitous in finding like-minded faculty members. A year earlier, the Ontario Ministry of Education (OME) had commissioned a report from the Working Group on Environmental Education (2007), which was accepted by (then) the Minister of Education Kathleen Wynne, and used as the basis for a new policy framework *Acting Today, Shaping Tomorrow* (OME 2009). As a way to introduce this policy, the OME established the theme of its annual forum for PTE faculty as environmental education. This forum helped us to locate other faculty interested in supporting ESE in our own institution, and Jane and I were able to form OISE's faculty-based ESE Working Group with David Montemurro, Erminia Pedretti, Terezia Zoric, and others. This committee demonstrated that there was interest in ESE on the part of faculty at OISE and that their expertise could help ensure that the OME's new policy framework would be infused into our PTE programme. This aligned well with our Chief Administrative Officer's support of sustainability; he had just formed OISE's Sustainability Advisory Committee to investigate possible infrastructure improvements in our 50-year-old building, looking to reduce OISE's ecological footprint (with a corresponding reduction in operating expenses).

We were surprised with how quickly the *ESE Initiative* took root. The number of ESE extracurricular events grew quickly, from four in the first year to 15 by the fourth year. This was supported by Toronto's wealth of nonprofit organisations focused on environmental education, from established groups like Evergreen,



Learning for a Sustainable Future, and Ontario EcoSchools to newer additions like FoodShare and the Natural Curiosity Project. We invited educators from these groups to speak, lead workshops, or act as guest speakers in courses. We also invited these same community partners to an annual *EcoFair* to meet our students and share their resources; this had the added benefit of bringing internship positions into our PTE programme, sometimes leading to job offers for our graduates. Professional development in ESE was then added to our offerings, which entailed members of the ESE Working Group leading workshops in faculty meetings, supporting individual faculty members who wanted to infuse ESE into their PTE courses, and providing in-class workshops as requested.

As part of this rapid growth, we drew inspiration and expertise from those who had been doing research and writing in the area of ESE and teacher education before us. While OISE had had an active programme in Global Education in the 1990s, led by Graham Pike and David Selby, it was no longer active by the time we started the *ESE Initiative* in 2008. We had a general sense of the history of environmental education from Palmer (1998) and Russell et al. (2000), as well as its development by UNESCO through the Tbilisi Report (UNESCO 1977), the Brundtland Report (United Nations 1987), and Agenda 21 (United Nations Sustainable Development 1992). But we also knew from Canadian research (Lin 2002; Puk and Behm 2003; Towler 1981) that Canadian faculties of education did not have a strong record of supporting ESE in PTE, though there was much to learn from Canadian scholars who had written in this area (Hart 2003; Hopkins and McKeown 2005; Sauvé 2005). What we didn't know was that at the same time as we were starting the *ESE Initiative* at OISE in 2008, the Council of Ministers of Education, Canada (CMEC), was establishing a new committee, the Education for Sustainable Development Working Group. Interest was growing, but there were few practical examples for us to follow in ESE in PTE in Canada.

## 13.2 Growing Support

As the *ESE Initiative* grew in scope in these early years, so did the workload, making it challenging for faculty to administer on their own. But thanks to our PTE leadership team, key elements of support helped to facilitate the continued growth of the *ESE Initiative*, including course release to balance off administrative time commitments, and work-study students, Teaching Assistant and Graduate Assistant student positions to help develop student leadership and capacity. The latter enabled us to extend the infusion of ESE into existing Curriculum and Instruction courses, including the core Teaching Fundamentals courses, meaning that all of our PTs received an introduction to ESE as part of their PTE programme. This proved critical to continuing to grow the initiative, as students became aware of the importance of ESE in schools. Furthermore, more students chose to attend our extracurricular programming to develop their knowledge and skills in this area and to better understand its connections to experiential learning, outdoor education, and place-based

education. We also continued to draw connections to social justice and equity education via ecojustice education, as these fields of study were already deeply embedded in OISE's programmes and scholarship. Teacher candidates began asking for practica and internship placements with a strong ESE focus, leading us to connect with the Toronto District School Board's (TDSB's) EcoSchools programme, which was also experiencing rapid growth. The TDSB was supportive of connecting our PTs with their EcoSchools teachers as a way of supporting their programme; we didn't know it at the time, but this was to be the start of an innovative long-term partnership.

As the *ESE Initiative* grew, so did the requests from our PTs for an elective course in ESE, and after a few years of lobbying, we added this to our PTE course offerings in 2010. This provided an opportunity for 30 PTs each year to deepen their understanding of the praxis of ESE in class, in their practica, and across the institution. By examining the theoretical roots and history of ESE, its many traditions, its connections to Indigenous education, and the multitude of ways in which it is manifested in formal and informal settings, the course resulted in a core group of PTs who championed ESE as they moved through their other courses in the PTE programme.

In the third year of the course, we began what would become an annual tradition of creating an environmental art installation at OISE, an idea that came from my research programme into eco-art education. We began collaboratively planning art installations that would offer an opportunity for those with little art-making experience to get involved in the creative process in a supportive environment, develop self-efficacy in art-making, and simultaneously learn about an environmental "big idea". In the first year, the focus was on the *Fatal Light Awareness Project (FLAP)* that raises awareness of the plight of migratory birds; we created over 300 handmade prints of Ontario birds (Fig. 13.1) that were distributed to those with outside-facing windows.

This aimed to remind OISE staff and faculty to turn off their lights at night to reduce the possibility of birds mistaking office windows as fly-throughs, which results in the deaths of millions of birds each year in urban centres. We also created

**Fig. 13.1** Handmade print for the FLAP project



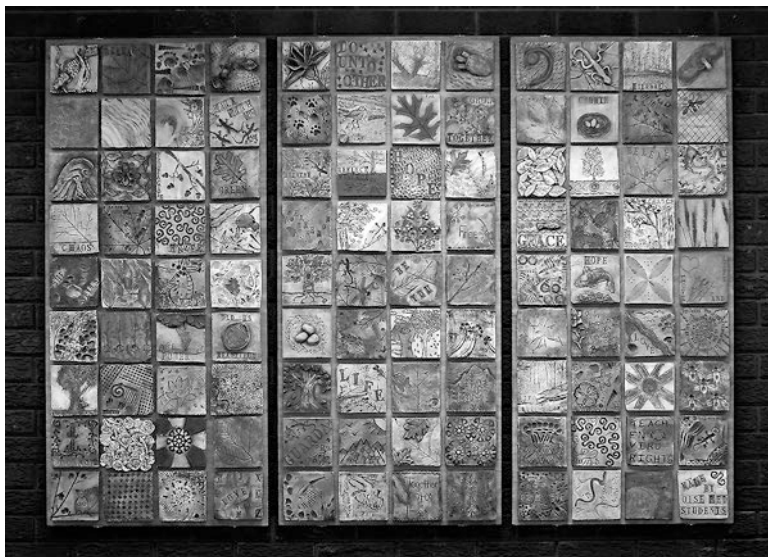


Fig. 13.2 Clay tile mural on nature-based learning

a large clay mural that highlighted the power of nature-based learning; with over 100 individually made clay tiles, its installation near OISE's subway entrance ensured its viewing by an ever-changing audience (Fig. 13.2).

Through this period, faculty involved in the *ESE Initiative* looked for ways to continue their own professional learning. The Ministry's annual *Faculty Forum*, originally useful in finding others at OISE interested in ESE, became a source of locating colleagues at other Ontario universities working in this area: Trent, Brock, Nipissing, Ottawa, and Queen's were some of the PTE programmes with faculty engaged in ESE. The Forum became a way for us to network and compare the developments in our faculties of education each year; for example, Paul Elliott of Trent University shared the start of his extracurricular Eco-Mentor programme in 2012, a series of extracurricular workshops they offered in outdoor education (Bell et al. 2013). Many of us were inspired that their PTs would commit four Saturday mornings to undertaking this learning, and resolved to try something similar of our own. As we already had a series of ESE workshops underway, we decided to offer an Environmental Leadership Certificate to recognise the learning that our PTs did in this area but felt that a more substantial commitment was required. By the next fall, our PTs were undertaking a combination of formal learning, co-curricular learning, and service learning to earn this certificate, the equivalent to an extra 36-hour course of learning (in addition to an already heavy PTE course load).

We were thrilled to have 33 PTs complete the requirements for the certificate in the first year, signalling to our institution that from our PTs' perspective, ESE was a critical component in their development as emerging educators. This was evidenced in the words of one PT: "thank you very much for running this amazing

program at OISE ... the program was well run and was able to provide me with a deep understanding of the importance of ESE and how and when to incorporate it in the different subject areas I teach” (K. Kunaratnam, personal communication, April 2014). Another wrote: “I truly enjoyed being a part of this group. It was a really valuable part of my B.Ed. Sometimes just being with people who are passionate about issues you are, helps to keep you motivated in fighting this grueling battle we are all a part of. Thanks for making it a part of OISE” (S. Regli, personal communication, June 2014).

### 13.3 Branching Out

As word spread through OISE of the high level of student interest in ESE in our main PTE programme (a consecutive B.Ed. programme), other programmes came on board, including our Master of Teaching programme. The latter made space in its schedule for a 1-day conference in ESE starting in 2012, featuring a keynote and 10 workshops that were attended by over 200 first-year PTs. This was an important development as it brought OISE’s graduate students into the *ESE Initiative*, inspiring some to focus their Master’s research in this area. It also brought a greater range of experience and expertise into the OISE student club, the Environmental Leadership Circle, which continued to grow from its inception in 2010. This club took on a number of sustainability campaigns across the institution, including clothing swaps, battery and cell phone recycling, reducing the use of disposable water bottles and paper, and working towards energy conservation. These had tangible results, evidenced by the number of batteries and cell phones redirected from landfill, a widespread shift to double-sided copying of course materials (and then to paperless courses), and the contribution made to a campus-wide ban on the sale of bottled water. Some PTs were clear about the impact that their involvement in the Circle had on them: “Being a part of the EL Circle has been a great experience. It pushed me towards finding ways to incorporate the environment into every aspect of my teaching, and developed my ability to view teaching from the lens of the environment” (A. Cirinna, personal communication, April 2014). Another PT appreciated the activist stance of this work:

ELC provides a supportive place where ESE initiatives not only get talked about, but get done. This is so key. So many people attend classes or workshops and think that’s enough. The ELC was dynamic in that we were always hearing and sharing about things that were actually happening—which is so inspiring. (R. Ly, personal communication, May 2014)

Perhaps, the most eye-catching result was the founding of the OISE Community Learning Garden in 2013 (Fig. 13.3). Developed by a team of students and faculty over the course of a year, the garden was planned with multiple goals in mind: to become both a symbolic and physical manifestation of the *ESE Initiative*; to model the power of educational gardens; and to showcase OISE’s pedagogical and curricular approaches to the local community and the public who frequent the building.

**Fig. 13.3** The OISE  
Community Learning  
Garden



The Learning Garden was planted in a high-profile location at the front of OISE and was organised thematically to showcase some of the foci of our programmes: indigenous education, equity and inclusive education, holistic education, creativity in education, and environmental and sustainability education. More than 30 plants native to Ontario were selected to demonstrate these themes in six different gardens, growing and changing with the seasons (just as they do theoretically in the academy). Thanks to funding from TD Friends of the Environment Foundation (TDFEF), OISE classes now use the garden as a learning resource, as does OISE's daycare and K–6 Lab School, and we offer programming to support garden-based learning each year through workshops and lectures.

Around this time, members of our ESE Working Group recognised the need for a broader conversation around ESE in PTE and organised a Provincial Roundtable on this topic in 2013. Sixty faculty, policy-makers, and community educators from across Ontario attended, helping to share their expertise and experiences in how to develop PTs' core competencies in ESE in terms of their knowledge, attitudes, and actions. What resulted was a first-of-its-kind publication, the *DEEPER* guide (Inwood and Jagger 2014), which acted as a summary of the roundtable discussions by sharing proven strategies and existing practices for developing ESE in PTE. Funding from TD's Friends of the Environment Foundation proved crucial for both the event and publication of the guide, which has now been distributed internationally in English and French. Writing the guide also helped to form a core working group by improving the flow of communication about ESE between facul-

ties of education across the province. It also set the stage for collaborative conference presentations at CSSE, NAAEE, AERA, and WEEC, as well as further publications (Karrow et al. 2016a, b).

### 13.4 Deepening Roots

As we gained momentum in growing the *ESE Initiative* at OISE, we found it easier to identify new places for growth across the institution. We located internal university funding sources to support small research projects, including one on co-learning between PTs and their associate teachers in practicums (Inwood et al. 2014) and another on the Learning Garden (Jagger et al. 2016). While there were ample research possibilities in the work we were doing, running extensive ESE programming took many hours of planning and delivery time and limited our ability to conduct research. But success in this work was demonstrating itself in other ways; one example came from our annual EcoFair, as our students were connecting with, learning from, and supporting EcoSchool teachers and community partners across the Greater Toronto Area. Some even got hired by our community partners and by the TDSB's EcoSchools programme, a huge win in the tight Ontario job market.

Other students cycled back into OISE's graduate programme, both at the Master's and Doctoral levels, choosing to continue their learning and research in ESE in multiple ways and offering strategies to strengthen and share our work in ESE across the institution and more broadly (Inwood and Hoeg 2015; Inwood and Sharpe 2018). We added a seed "lending" service to the OISE library, providing us with a reason to collect and disseminate seeds from the Learning Garden to share with OISE students and teachers; we also added two vermicomposters that were available to borrow for PTs' practicums. Our annual environmental art installations, totalling 13<sup>1</sup> in number at this time, grew into a walking art gallery. This encouraged the OISE community to walk the stairs, rather than take the elevators, contributing to energy conservation and improved fitness. We were also able to bring in well-known speakers for talks and workshops, including Mitchell Thomashow in 2014 and David Sobel in 2015. In addition, we were recognised for our work by the wider university community, winning University of Toronto *Green Ribbon* awards in 2011, 2015, and 2016. At this stage, we had far exceeded our plans made at the initial lunch in 2008, were feeling exhilarated (and somewhat exhausted) with what we had achieved across the institution (see Table 13.1 for a summary), and believed that the work of the *ESE Initiative* had fully taken root at OISE.

However, as with any cycle of change, there are years of prolific growth and those of decline. We knew that 2015 would offer either, as major changes were coming to PTE in the shift from a 10-month model of PTE to a new 20-month programme across Ontario, aligned with a 50% decrease in PT enrolment. We began considering the opportunities and the challenges this might present for the *ESE Initiative* and actively searched for ways to maintain its growth. As part of



**Table 13.1** Chronology of the growth of OISE's ESE initiative

2008	Initial discussions at a faculty lunch Small roster of ESE events offered
2009	Ministry of Education establishes EE policy framework Faculty Forum on Environmental Education ESE Working Group formed Sustainability Advisory Committee formed Work-study and TA positions in ESE offered for the first time Infusion of ESE into teaching methods courses began ESE website started (ongoing)
2010	First offering of the ESE elective course First year of the Environmental Leadership Circle (student club) in ESE (ongoing) Establishment of the annual EcoFair (ongoing) New institutional goal of social and ecological responsibility established
2011	Professional Development for ITE faculty offered Development of OISE's Community Learning Garden begun Research study on TC/associate teacher co-learning in ESE started Sustainability campaigns started (ongoing) U of T <i>Green Ribbon Award</i> for the <i>ESE Initiative</i>
2012	ESE Certificate programme offered for the first time (ongoing) Annual environmental art installation begun (ongoing) First year of the annual Master of Teaching programme ESE conference Graduate assistantship in ESE added to support the initiative (ongoing)
2013	First season of the OISE Community Learning Garden (ongoing) Research study in ESE begun Provincial Roundtable on ESE in ITE at OISE Annual "Amazing Stairs Race" begun (ongoing)
2014	First year of AQ Course in Environmental Education (part 1) offered (ongoing) Summer Speaker Series: Mitchell Thomashow <i>DEEPER Resource Guide</i> published
2015	New "Science & Environmental Education" course offered for first time (ongoing) First year of AQ Course in Environmental Education (part 2) offered (ongoing) Summer Speaker Series: David Sobel U of T <i>Green Ribbon Faculty Award</i> (Hilary Inwood)
2016	First year of AQ Course in Environmental Education (part 3) offered (ongoing) U of T <i>Green Ribbon Faculty Award</i> (Jane Forbes) National Roundtable in ESE in preservice teacher education
2017	Start of formal collaboration between OISE and the TDSB's EcoSchools programme (ongoing) OISE/TDSB ESE collaborative conference in ESE begun (ongoing) OISE's revised Academic Plans now include references to ESE

OISE's decision to end its long-standing B.Ed. programme and expand its two Master's-level teacher education programmes, we advocated for a new, core, cross-curricular course in ESE to be added to the Master of Teaching programme. This was partially successful in the creation of a new course called "Science and Environmental Education", becoming one of only four faculties of education in Ontario to add in new core courses with mandatory ESE components (a huge win overall as no faculties had these ESE courses prior to 2015). Yet, due to administra-



tive shifts, the *ESE Initiative* found itself, for the first time since its inception, with no departmental supports due to the closing of the B.Ed. programme, which had backed it for 7 years. This was a huge challenge, given the scope of its work; without a supportive lead in the Dean's office, it appeared as if this successful initiative might come to an end.

### 13.5 New Growth

Sometimes seeds planted lie dormant for months or years before germinating and then spring into life with just the right conditions. We had been slowly cultivating a partnership with the TDSB's EcoSchools team over a number of years, but it had not been a core aspect of the work of the *ESE Initiative*. I had co-led a series of Summer Institutes for TDSB's EcoSchools' teachers over 6 years and also offered after-school workshops for them. We had collaborated on a small research study (Inwood et al. 2014), which resulted, as part of its knowledge mobilisation plan, in an annual celebration to highlight the successes of EcoSchools teachers; this was hosted at OISE and involved our PTs as attendees. This proved to be an enriching part of PTs' learning:

Throughout the year I have learned an immense amount about the possibilities that Toronto and the TDSB offer in terms of environmental awareness and learning possibilities. The meetings were wonderful because we got the opportunity to speak with our classmates and the teachers and see what experiences were working for them. (N. Otten, personal communication, May 2013)

Most importantly, as we added in Additional Qualification (AQ) courses in Environmental Education for teachers in 2014, the TDSB's Sustainability Office decided to subsidise their teachers to attend, ensuring a steady flow of in-service teachers into our AQ programmes. By 2016, all three parts of this AQ course were up and running, engaging over a hundred teachers in intensive learning in ESE over 3 years. As the TDSB team was busy with the certification of EcoSchools, they had limited capacity to mentor and support their teachers' professional learning in ESE to the extent needed. In a landmark meeting in December 2015, we were asked to take on responsibility for all of their teachers' professional development in ESE, running it in conjunction with our PTs' preservice learning through the *ESE Initiative*. This was a turning point; integrating professional learning in ESE for teachers and PTs at this scale was a remarkable opportunity. We began by piloting one aspect of this with the first OISE/TDSB conference in ESE in 2016; entitled *Climate of Change: Environmental Education in Action*, we successfully hosted over 230 people, 2 keynotes, and 20 workshops.

On a side note, most school boards would not have access to this type of in-service funding for ESE, but the TDSB's Sustainability Office had a unique source, its *Environmental Legacy Fund*. By installing solar panels on school roofs (and getting the roofs fixed simultaneously), their team was able to sell energy back into the power

grid as part of Ontario's Feed-in Tariff system and also sell carbon credits on the carbon emissions trading market, resulting in revenue that was dedicated to supporting sustainability measures, such as teachers' in-service training, across the school board. The TDSB's main challenge was not having enough staff available to deliver it.

While we had no way of knowing this at the outset of our work with the TDSB, this proved to be just the right conditions for a new collaboration to flower between the *ESE Initiative* and the TDSB's EcoSchools team focused on professional learning in ESE. With this substantial collaboration in ESE in the offing, and supports for PTs in ESE at risk, it was a logical step for the largest department at OISE (Curriculum, Teaching & Learning) to become the new home for this work. Chair Clare Brett proved to be a supportive administrator, fully understanding the importance of doing this work as a part of OISE's Master of Teaching programme. While it took over 18 months to negotiate, this collaboration formally began in fall 2017, signalling the beginning of an innovative programme of integrated preservice and in-service professional learning in ESE. Aligning the learning of these two groups provides enhanced opportunities for OISE students to learn from and collaborate with EcoSchools' teachers, resulting in deeper learning in ESE for OISE students, training and work opportunities, and a greater number of practicum placements and networking opportunities in certified EcoSchools. In turn, the TDSB benefits by being able to access year-round programming in ESE to enhance the professional learning of EcoSchools' teachers, gain PT volunteers to support the work of their EcoSchools programs, better prepare new teachers before they are hired, and increase opportunities for their teachers to deepen their mentoring and leadership skills. A programme evaluation component and research study will track the successes and challenges of this collaboration and allow the collaboration to be improved as it unfolds. As far as we have been able to ascertain, no similar programme on this scale exists in North America, offering both partners a unique opportunity to contribute to creating a new vision for professional learning in ESE.

A second flowering of ESE activity happened simultaneous to this one. The core team of Ontario PTE faculty, formed at the Provincial Roundtable in 2013, began organising a National Roundtable in ESE in preservice teacher education in 2016. Once again, TD Friends of the Environment Foundation provided generous funding to support this 3-day conference, which brought 75 faculty, policy-makers, teachers, and community educators together from across the country to Trent University to more fully investigate this field. Three keynote speakers, 10 roundtable presentations (highlighting the work of 40 presenters), and 4 working sessions drew on the research and practice presented in these sessions to inform the creation of a National Action Plan (described elsewhere in this volume). A national committee has now been formed to implement the plan: this includes the establishment of a national network of educators and stakeholders, a new digital communications hub,<sup>1</sup> and new resources, videos, and webinars, all to strengthen ESE in preservice teacher education across Canada.

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<sup>1</sup> See: [www.eseinfacultiesofed.ca](http://www.eseinfacultiesofed.ca)

## 13.6 Principles for Growth

The OISE faculty involved in the *ESE Initiative* had no way of anticipating where this work would lead us when we first started to meet in 2008. In retrospect, this initiative has grown more broadly and deeply than we could have ever imagined, taking its own organic route to connect with the programmes and activities of those doing related work in ESE across the city, province, and country. Given what we have learned from the organic growth of this initiative, is there a way that aspects of it could be replicated in other faculties of education? Based on self-study, analysis, and reflection, we believe that it is replicable, and what follows is our advice for others wanting to develop a pathway into ESE in their own faculty of education. This is framed loosely around the principles of permaculture, a design process based on Whole Systems Thinking (Holmgren 2002) that can just as easily be applied to gardening as it can to any movement of social change.<sup>2</sup>

### 13.6.1 *Use Small Solutions*

We began with the classic EE saying in mind, “start small and do it well”, which applies nicely to growing ESE in PTE. By showing that we were able to run a few events effectively and efficiently, our administration gave us more latitude and resources to grow the *ESE Initiative* over time. While we started with an expansive vision of what we wanted to accomplish, we started with small steps, being patient with what was possible in the first few years. It takes time to build trust between those who are funding the work and those who are willing to roll up their sleeves—with a nod to Orr (2007).

### 13.6.2 *Integrate Rather Than Segregate*

As things developed, we looked for opportunities to connect with and support existing initiatives, programmes, and projects across the institution. At times, seeing the connections between the work we thought was important and what others valued was difficult, but over time it became easier to see how “all education is environmental education” (Orr 1991, p. 54). Connecting with others’ initiatives helped us to build allies as others began to see how their work supported ours and vice versa.

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<sup>2</sup>For a list of all of the principles of permaculture, see: <https://permacultureprinciples.com/principles/>

### ***13.6.3 Use the Edges, Value the Marginal***

We discovered early on that there were many ways to make the work of the *ESE Initiative* visible and that making use of the edges or cracks of the spaces in which we worked was where ESE could easily take root. There were no complaints when we offered to place environmental art installations in the main stairwell as no one saw value in this marginal space. Similarly, taking over the empty garden spaces at the front of the building, which had been left untended for years, turned out to be one of the most high-profile locations at OISE. Sometimes working at the margins provides unexpected ways to enhance traditional means of knowledge dissemination and mobilisation.

### ***13.6.4 Produce No Waste***

From the outset, members of the *ESE Initiative* modelled the sustainable behaviours we wanted others to adopt, from minimising waste and energy use at events to offering vegetarian meals on reusable plates and cups and ensuring that food waste was composted. This often entailed extra work beyond our academic duties (like washing the dishes or watering the garden), but people quickly understood that we walked the talk and sometimes joined in to lend a hand; this helped to build community around the initiative.

### ***13.6.5 Value Renewable Resources***

While it may seem obvious, ensure that educational work in ESE is sustainable over the long term. This can mean making sure that institutional supports are in place; having the brief institutional goal of *social and ecological responsibility* allowed us to reference it repeatedly in garnering support for our work with allies and partners; this could mean finding a way to support the facility manager's goal in connection to sustainability, as well as getting the departmental Chair or Dean on board. Not surprisingly, bringing in funding to support ESE helps to grab everyone's attention, for example, start with finding funding for a community garden (which is relatively easy to do), and often other money can be found to support research that aligns with this.

### ***13.6.6 Creatively Use and Respond to Change***

With every change of university leadership, the *ESE Initiative* came to expect unanticipated ripple effects on its work; sometimes this played in our favour, but often it did not. Recognising that change is an ongoing part of the development process and

learning to be creative in responding to changes in policy, leadership, funding, and partners has become a regular occurrence. Some parts of an initiative may stay the same, and others may have to be changed as partners come and go; sometimes as one component fades, something new and unexpected grows in its place.

## 13.7 Conclusion

The *ESE Initiative* has had an excellent record of growth at OISE; we are proud of what we have accomplished so far. By working with thousands of PTs, hundreds of community members, dozens of fellow faculty members, and now a national network of colleagues, we have seeded and grown ESE in a multitude of innovative ways. We know that we are not alone in this work; others have been growing research and programming in this area at the same time, documented by research by the CMEC (2012), Sims and Falkenberg (2013), and Karrow et al. (2016b). Our next challenge will be maintaining the pace and quality of this work as we integrate the learning of our PTs in ESE with that of the TDSB's EcoSchools' teachers and align it with a research programme to better analyse the effects of this learning on their praxis. We are happy to continue to roll up our sleeves in this and prepare for organic, verdant, and unimagined growth as this work develops.

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# Chapter 14

## Creation Care as a Basis for Environmental Education in Preservice Teacher Education



Joanne Nazir

Some time ago, I accepted a post as an Assistant Professor of Education in a small Christian University in Southern Ontario that offers undergraduate qualifications in the liberal arts and sciences that are unabashedly Christ-centred and prepares students to live out a Christian worldview in any vocation and place they may be called in their future lives. What this means in a practical sense is that programmes and courses privilege established Christian ideologies and theories related to the various fields of study offered at the institution. One of the programmes offered is a Bachelor of Education programme intended to prepare teachers for teaching in Christian and secular schools at the elementary level (K–10). At the time of my arrival, no course in environmental education (EE) was being offered in the programme. Since EE had been receiving a growing amount of attention in Ontario, with calls for its inclusion into all provincial education systems (e.g. Ontario Ministry of Education 2009) and more recently explicit calls for its inclusion in teacher education programmes (Inwood and Jagger 2014), I decided to develop a suitable course that could be offered as an elective within the programme. A major consideration for developing the course was that it would introduce teacher candidates to the main theories, issues, and pedagogies for teaching EE while fitting in with the institutional mission of privileging a Christian worldview. My overall purpose was to interest teacher candidates in teaching EE in whatever educational roles they might find themselves in the future. This chapter describes my work in developing and enacting the course. Within this narrative, I describe the salient features of Creation Care—a Christian perspective on environmentalism that can serve as an entry point for educators to draw Christians more fully into EE.

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Two questions may have already formed in some readers minds: Are Christian perspectives still significant in the postmodern world in which we find ourselves today? Is a Christian response to EE relevant to the broader field? My answers to both these questions are affirmative. Despite a growing trend towards secularism, religion, especially Christianity, remains an influential worldview within the global population. According to the Pew Forum on Religion and Public Life (2011), approximately one-third of the global population still 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. In other words, Christians still form a significant portion of many societies and communities today. When combined with another feature of our postmodern, global world—the growing multiculturalism and diversity of our communities—it is reasonable to conclude that educators need to be prepared to meet the needs of a variety of students from different religious and cultural backgrounds in their classrooms. Moreover, preservice teachers need to be aware of a variety of perspectives on environmentalism if they are to create meaningful, engaging EE learning experiences for all their students, including, in many situations, a significant population of Christian students.

## 14.1 Christians, Environmentalism, and EE

One of the first steps I took in developing a suitable EE course was to conduct a search to find existing courses that I could draw on and adapt to my context. This initial search yielded very few exemplars suitable for a Christian education programme. I was not surprised, since in many jurisdictions EE courses for preservice teacher education programmes were at the time being developed. I expanded my search to look at Christian responses to environmentalism in the hope that those would offer some direction. Searching in this direction proved to be more fruitful in its results, but surprising in its implications. In surveying the search results, it was apparent that two opposite strands of thought existed: one describing a negative relationship between Christianity and environmentalism and another totally supportive of the relationship between the two.

In the negative camp, there were those who were arguing that, at its best, a Christian worldview simply does not support an interest in environmentalism (e.g. Beisner 1993; White 1969; Zaleha and Szasz 2015). According to these authors, Christianity and environmentalism are derived from different underpinning worldviews so that Christianity, with an emphasis on God and spirituality, has very little to say about the physical and nonhuman world. As such, concern for the non-human world is simply not a part of Christian life (Hitzhusen 2007). Other writers in this camp were more strenuous in claiming that more than being oblivious, Christianity is anti-environmentalist; Zaleha and Szasz (2015), for example, explain

that for Christians, the nonhuman world is nothing more than a backdrop for the enactment of the drama between God and humans. Furthermore, too much concern for the nonhuman, physical world aligns too closely with non-Christian forms of worship. Supporters of these ideas seemed particularly wary of forms of popular environmentalism which describe the Earth as mother and suggest a familial relationship between animals and humans (e.g. Lovelock 1979; Wilson 1984). Finally, there were those in this camp who directly charged Christianity as being the source of the world's environmental problems. This viewpoint was perhaps most clearly described in a paper by Lyn White. According to White (1969), the rise of Christianity was synonymous with the destruction of the natural world. He refers to that famous passage from Genesis 1:26–30 where God established a unique position for humans as the only beings that are images of God, gifts the creation to Adam, and charges him with the responsibility to *rule over* and *subdue* it:

Then God said, "Let us make mankind in our image, in our likeness, so that they may *rule over* the fish in the sea and the birds in the sky, over the livestock and all the wild animals, and over all the creatures that move along the ground." So *God created mankind in his own image*, in the image of God he created them; male and female he created them. God blessed them and said to them, "Be fruitful and increase in number; *fill the earth and subdue it*. Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground." Then God said, "I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food. And to all the beasts of the earth and all the birds in the sky and all the creatures that move along the ground—everything that has the breath of life in it—I give every green plant for food." And it was so. (Genesis 1:26–30 New International Version; emphasis added)

White (1969) goes on to trace how over the centuries these ideas have been used by dominant Christian cultures as a licence to manipulate and pollute the earth and exploit all of nonhuman life forms:

[Christianity] not only established a dualism of man and nature but also insisted that it is God's will that man exploit nature for his proper ends. ... Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects. (p. 1205)

White's charges are serious, and while there are some Christians who have sought to refute them (e.g. Bouma-Prediger 2010; Kearns 1996), there are other Christian authors who prove White's point by remaining adamant that the nonhuman world was made exclusively for human use (Beisner 1990, 1993) by citing verses about the biblical description of end times when the Earth will end and only some righteous humans will be saved; for example, "But the day of the Lord will come like a thief. The heavens will disappear with a roar; the elements will be destroyed by fire, and the earth and everything done in it will be laid bare" (2 Peter 3:10).

In direct opposition to those who viewed the relationship between Christianity and environmentalism negatively, I found that there were those who portrayed Christianity as deeply supportive of environmentalism. As with the first camp, the arguments in support of a positive relationship between Christianity and environmentalism were diverse and sometimes offered counterarguments to those of their opponents. Toly and Block (2010), for example, squarely placed the responsibility for all our serious environmental problems on humans, but rather than blaming

Christianity as being the root cause for this, their claim was that environmental degradation is a consequence of the broken relationship between humans and God. According to Toly and Block, only restoration of a spiritual balance through the practice of true Christianity, which includes participation in active environmental work, can remedy the situation.

Expanding on this line of thought, some Christian authors (e.g. Berry 1981; DeWitt 2011; Van Dyke et al. 1996; Wilkenson 1986; York and Alexis-Baker 2014) equated healthy, sustainable living with biblically described simple lifestyles that emphasised land stewardship, a wonder-filled view of all of creation, using minimal technology, and fostering strong community relationships. They reinterpreted Genesis 1:26–30 to negate the human–nature dualism, emphasising instead that God as Creator is concerned about all of Creation, not only humans. They also emphasised the notion of the human responsibility to care for the world as part of loving, dutiful worship of God. Wirzba (2006) terms this type of lifestyle “sabbath living” and described it as an intrinsic aspect of a redemptive Christian lifestyle. Authors in this camp also provided alternative eschatological views. According to them, the end of the world will not be marked by a destruction of the nonhuman physical world but a renewal of the Creation to what it was meant to be when God first created it (Moo 2010). They also provided many biblical quotations to support a more equitable relational positioning of humans to nature, for example, Leviticus 25:3–5:

For six years sow your fields, and for six years prune your vineyards and gather their crops. But in the seventh year the land is to have a year of sabbath rest, a sabbath to the LORD. Do not sow your fields or prune your vineyards. Do not reap what grows of itself or harvest the grapes of your untended vines. The land is to have a year of rest.

## 14.2 Course Development

The literature summarised above directly informed the course I developed. It was clear that the relationships between Christianity, environmentalism, and, as a consequence, EE were complex. An EE course supportive of a Christian worldview should privilege supportive ideas about the relationship between environmentalism and Christianity but at the same time provide opportunities for students to interrogate painful viewpoints regarding Christianity’s complicity in causing environmental problems. I was also mindful of the fact that the Bachelor of Education programme for which I was developing the course is hosted by a Christian institution that prepares teachers to serve in Christian and secular schools. Consequently, the course was designed to emphasise Creation Care and at the same time introduce teacher candidates to a wide range of perspectives and curricular approaches for integrating EE into elementary school settings. The course objectives are for teacher candidates to be able to:

1. Discuss a diversity of perspectives regarding the nature and purposes of EE.
2. Justify the need for comprehensive programmes of EE in elementary schools.
3. Critically evaluate concepts inherent to environmental literacy from Christian and non-Christian perspectives.
4. Describe different curricular approaches to EE, especially emphasising how these intersect with or diverge from a Christian worldview.
5. Articulate current Ontario Ministry of Education policy positions with regard to theory and practice of EE.
6. Plan, design, and prepare suitable curriculum experiences to meet environmental literacy goals for a diverse range of students.
7. Demonstrate a mindful awareness that EE is a developing field fraught with tensions, opportunities, and challenges that need to be addressed with humility and open-mindedness.

One of the most difficult parts of the course development process was deciding on the details of an appropriate Christian response to include. As noted in the previous section, Christian supporters of environmentalism hold different views of why and how Christianity and environmentalism are related. This is because there are many interpretations of Christianity and therefore many denominations or sub-groups, each with their own creeds and positional statements about life issues. However, one response that I found repeatedly emerging in the literature despite denominational differences was a need for humans to show “care” (e.g. Francis 2015; Presbyterians for Earth Care 2018), as specified in phrases like Creation Care, Earth Care, and Care for Creation. Of these, Creation Care was a term that was being used directly by significant authors in the field of Christian environmentalism (e.g. Berry 2000; Bouma-Prediger 2010; Dewitt 2011; Kostamo 2013). I decided that it could act as a non-denominational umbrella for Christian ideas supportive of environmentalism, as well as an entry point for teacher candidates into Christian EE.

Another crucial task during course development was to form a working definition for Creation Care and flesh out key aspects to include in the course. I defined Creation Care as a set of ideas derived from a Judeo-Christian worldview that explains environmental degradation in terms of spiritual disconnects and prescribes solutions for it in terms of restoring relationships between God, humans, and the rest of the living and nonliving world. Creation, in this context, is understood as consisting of the living and nonliving world, including humans. Based on this definition, and working within the fundamental Christian belief of an overarching narrative (creation, fall, redemption, and end time yet to come) that encompasses all existence (Wolters 2005), Christian ideas of faith, the acknowledgement of biblical doctrines, and the writings of significant Christian environmentalists, the following aspects of Creation Care emerged which I thought the majority of Christians could subscribe to.

### ***14.2.1 God Is the Master of Creation***

For Christians, God is the all-powerful creator, redeemer, and sustainer of all Creation. He created the world for His own purposes and continues to actively sustain it at every moment. Christians view the love of God, marked by obedience to His will, as an essential duty (Mark 12:30). Advocates of Creation Care acknowledge the natural world as “our Father’s world” (Brown 2005) and posit environmental work as a part of Christian love and obedience to God.

### ***14.2.2 All of God’s Creation Is Good***

Throughout the biblical account of Creation, the goodness of every part of the physical world is emphasised (Genesis 1). Supporters of Creation Care have cited this latter point as proof that God values not only humans but all of His Creation (Dewitt 2011). Bouma-Prediger (2010) has gone further by suggesting that nonhuman parts of Creation, far from being exclusively for human use, have their own intrinsic purposes, lending to environmental work a broader non-anthropocentric motive.

### ***14.2.3 Environmental Problems Are a Part of the Brokenness of Creation***

According to the Christian narrative, Creation was originally designed to flourish but was later broken, resulting in the world we live in today. The narrative is also very clear that the cause of this brokenness was due to human disobedience of God’s laws (Genesis 3). Supporters of Creation Care explicitly link perverted human action to most of the environmental problems we face today (Toly and Block 2010). They explain that at their root, environmental problems are spiritual in nature and require spiritual solutions and infer that humans need to work with God in caring and restorative ways to address environmental issues.

### ***14.2.4 Creation Care Advocates for Certain Dispositions and Practices***

According to the Christian narrative, humans were originally created with many special capacities and given a particular place in Creation as caretakers of God’s world. Supporters of Creation Care point out that rather than being violent conquerors, humans were originally charged with the responsibility to act as stewards, exemplified by the metaphors of the “good shepherd who lays down his life for the

sheep” (John 10:11) and the gentle gardener who works towards the flourishing of all Creation (Luke 13:6–9), which can be lived out through certain dispositions and practices.

Three dispositions supporters often name as important to Creation Care are wonder, gratitude, and hope. Bouma-Prediger (2010) strongly suggests that rather than fear of disastrous future consequences, wonder-filled gratitude for God’s beautiful work is the proper Christian response to all Creation; out of such wonder and gratitude would spring loving care. In chronicling her work as a Christian environmentalist, Kostamo (2013) describes how depressing dealing with a broken reality can be, but she also clearly names hope as one of the essential dispositions of Creation Care. For her, this hope is derived from her faith that the heart of being Christian is total dependence on God. Her responsibility to care for Creation, while great, is always bearable since she is working with God by her side and the promise of a positive resolution in the end.

So, what does Creation Care look like in practice? Supporters of Creation Care advocate for many of the same actions as non-Christian environmentalists, including preservation of the natural world; reducing consumption of resources through recycling, and reusing; and restorative conservation practices. Brown (2005) also suggests some practices that are more specifically derived from the Christian worldview, for example, developing spiritual lives that find rest in God rather than material things, spending time in nature with a focus on getting to know the Creator through His Creation, and asking always for God’s guidance through prayer. There are also some who advocate for Christian ecojustice (e.g. Berry 2000). These latter extend the long-established Christian tradition of supporting the poor and marginalised (Wolterstorff 2004) to include not only humans but all of Creation.

### 14.3 Course Delivery

The course is conducted face to face and utilises a variety of strategies including lectures, multimedia presentations, discussion of assigned readings, inquiry activities, outdoor activities, guest speakers, and student-led seminars. In practice, it is divided into three parts. Each part focuses on several of the objectives stated in the previous section. Part 1 introduces preservice teachers to the nature and purposes of EE and the urgent need for comprehensive programmes of EE in elementary schools. Preservice teachers read and discuss scholarly papers linking education to environmentalism. They also review the scope and scale of the major environmental problems that the Earth faces today, such as pollution, land degradation, ecosystem destruction, and species extinction. Early on, preservice teachers are asked to read White’s (1969) paper indicting Christianity as the cause for many of these problems.

In Part 2 of the course, the class explores the range of meanings of environmental literacy. Christian Creation Care is critically analysed alongside mainstream secular and non-Christian understandings of environmental literacy. The main tenets of

Creation Care, as described in the previous section, are introduced and explored through relevant readings (e.g. selections from Bouma-Prediger 2010; Kostamo 2013; and the Bible), multimedia formats, and discussion. With respect to secular understandings of environmental literacy, major themes such as technical-rational explanations for environmental degradation, consumptive lifestyles, ecojustice, deep ecology, and nature appreciation are explored from a wide range of thinkers and groups (e.g. Carson 1962; Gore 2006; Greenpeace 2018; Jensen and Schnack 2006; Leonard 2010; Naess 1988; Nolet 2016; Orr 2004; Sauv e 2005; Van Matre 1972). A critical point of difference that is emphasised is the underpinning humanist worldview and the absence of God that pervades secular responses. As a further contrast to a Christian position, Canadian First Nations animist-based understandings of environmental literacy are explored, as illustrated by the writings of Wagamese (2011). This latter is done so as to demonstrate the differences between non-Christian and Christian spiritual understandings of the natural world and care-based responses to it. This part of the course culminates in an assignment. Course participants are asked to write a reflective response demonstrating their growing understanding of environmentalism and environmental literacy. In their response, students are also expected to thoughtfully discuss how a Christian worldview can be variously interpreted either to support or hinder environmentalism and EE.

The third part of the course allows preservice teachers to develop practical pedagogical skills for EE for a diverse range of students. Preservice teachers are first introduced to a range of models and approaches that are currently used in EE programmes. The Ontario Ministry of Education's (2009) recommendation of using the "learning about-in-for the environment" model and the integration of EE across all subject areas and all levels are included here. Preservice teachers then explore a range of ways through which EE is currently being enacted in classrooms, such as through science, the arts, outdoor education, sustainability education, and whole school approaches. The major teaching strategy within this section of the course is the student-led seminar. Each course participant is required to lead an in-class seminar that highlights pedagogy for enacting EE in the classroom. The seminar may be based on relevant readings, or participants may choose to engage classmates with exemplar activities. Preservice teachers are encouraged to be as creative as they like by including provocative comments, outdoor components, multimedia components, artwork, and/or inquiry materials within the seminar. This part of the course ends with an instructor-led session entitled "Maintaining Hope in EE", which serves as a reminder of how scary and depressing environmental issues can be for young students (Sanera and Shaw 1999) and the need for teachers to be sensitive and responsive to this. The session offers the Christian values of hope and gratitude as a way to cope with this problem and serves as a positive end to the course.

The culminating assignment for the course is a curriculum design project. For this assignment, participants are required to plan a short unit or project appropriate for the elementary level that incorporates some of the ideas discussed in the course and reflects a positive Christian orientation to environmentalism. Preservice teachers may choose to take an existing unit/project and modify it into a form that better accords with their growing understanding of the theory and practice of EE, or



develop a new unit/project altogether. They are asked to preface the unit with a report describing and justifying why the particular topic was chosen, the strategy for teaching it, and some challenges an educator might encounter when implementing it.

The course has been enacted twice since it was developed. Based on anecdotal comments and completed assignments, participating preservice teachers appreciate the breadth of the course, as well as its Christian focus. They believe the course honours an important worldview while at the same time exposes them to a broader palette of ideas within the field. For those who intend to teach in Christian schools, the response is overwhelmingly positive. Creation Care will provide them with a base that they can use to create meaningful EE experiences in the future. As one participant noted:

I really liked the structure of the course ... especially the deeper theoretical parts. How my own faith [Christianity] is entangled in my environmental beliefs never really occurred to me before. Looking at Creation Care alongside the other theories helped me to clarify where I stand and make me more confident to speak about these topics. ... The curriculum development assignment was really practical. ... It showed me how I can apply these ideas to create environmental lessons for children that honors their Christian worldviews. (Karen)

For those who intend to teach in secular schools, the situation is more complicated. While many find Creation Care a compelling notion, they struggle with how they can use its ideas in a non-Christian setting, as shared by the following course participant:

Personally, I enjoyed the course. It allowed me to deepen my own views about environmentalism and [understand] where my own motivations to help the environment come from. But I may end up teaching in a non-Christian school, and while I believe in Creation Care myself I don't see how I can present these ideas in a secular setting. ... I mean we are always being told that we have to respect all beliefs and that we can't indoctrinate students into our own viewpoint. (James)

The latter is a troubling response which I discuss in the next, and final, section of the chapter.

## 14.4 Discussion and Conclusion

Stemming from a growing acceptance that environmental degradation is a real human-caused phenomenon, the past two decades have seen a growing call for the inclusion of EE in all levels of education systems worldwide. Most recently, this concern has been extended to teacher education (Inwood and Jagger 2014). A look at the field shows that a variety of perspectives on what EE means and how it should be enacted exist. Sauv  (2005), for example, suggests there are at least 15 currents or ways of enactment at work in the field. Despite the variety of perspectives and urgent calls, my own experience and a review of literature shows that EE in Christian education is underdeveloped. Based on my experience in developing and enacting a course introducing Christian preservice teachers to the field, I suggest many

Christians have not found an adequate point of entry into EE. Christianity is a comprehensive worldview including overarching ideas about the natural world, the purposes of human life, and God's relationship to both. For Christians, all human activity, including educational initiatives, must fit into this worldview if they are to be meaningfully taken up (Wolterstorff, 2004). Creation Care, as described in this chapter, offers a potential base from which teacher educators can introduce Christian preservice teachers to environmental issues and EE.

Earlier I noted that preservice teachers express doubts about the relevance of teaching Creation Care in secular settings. This presages the question: Are Christian perspectives significant to the broader field of EE? I would argue that they are. One of the most frequent criticisms of EE is its seeming lack of practical impact in society; some researchers and scholars doubt that EE initiatives lead to sustained, significant change in the habits and lifestyles of students (Rickinson 2001). Others have suggested that EE programmes do not contain sufficient values and moral components (Martin 2007) or that programmes are not sufficiently action oriented in providing students with the skills for change (Jensen and Schnack 2006). In this chapter, one underpinning premise I have worked from is that Christians need a programme of EE that fits into their larger worldview. I have described how Christian understandings of Creation Care act to bridge this disconnect. In a larger context, one lesson all environmental educators can garner from this example is the importance of worldview to EE; the way we view the natural world and our relationships to it are entwined with deep-seated ideas about the nature of existence and living. It follows that EE cannot be viable as a tag-on within existing educational contexts; feasible programmes of EE need to be developed to work within the worldviews of particular populations. The work described in this chapter serves as an example of how the complexity between one worldview (Christianity) and environmentalism can be introduced to preservice teachers and broach, for them, the need for creating programmes that connect deeply and meaningfully to the existing worldviews of their future students.

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# Chapter 15

## A Direction for Outdoor and Environmental Education: Assessing and Addressing UNECE Capacities for Preservice Teachers



Erin Sperling, Darren Hoeg, and Douglas D. Karrow

Brock University, with a main campus in St. Catharines and a satellite campus in Hamilton, Ontario, has the luxury of proximity to a variety of natural spaces and urban communities. An Outdoor and Environmental Education (O/EE) course has been available at the university for nearly a quarter-century, engaging preservice teachers in environmental education (EE) policy, pedagogy, and practice. This chapter shares the history, development, delivery, and outcomes of the O/EE course. We evaluate some EE approaches and outcomes from previous versions of the course in order to propose some potential improvements for future iterations of the course. We analyse some of our current practices using UNESCO-developed competencies for educators in education for sustainable development (ESD), through the competency categorisations of *Learning to know*, *Learning to do*, *Learning to live together*, and *Learning to be* (UNECE 2012). Examining our O/EE programme in relation to Karrow et al.'s (2016) work may help align our O/EE course with internationally recognised competencies centred on sustainable development, as well as other approaches to EE. It is our hope that in doing so, the course will continue to increase in relevancy and meaningfulness within the context of initial teacher education, while possibly elevating its status and credibility within provincial, national, and international contexts. In so doing, we offer a reimagining of our O/EE course as well as a critique of why we have selected this framework.

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The UNECE competencies are relevant to, and designed for, courses such as our O/EE course. The competencies are descriptors of general practices teachers should be engaged in to enact ESD. These competencies were developed in 2009 during several workshops involving the UNECE Steering Committee on Education for Sustainable Development. The Expert Group included EE scholars, government officials, and experts from international and nongovernmental organisations. These core competencies, as defined by UNECE (2012), include:

- Learning to know: The educator understands the urgent need for change from unsustainable practices towards advancing quality of life, equity, solidarity, and environmental sustainability.
- Learning to do: The educator is able to communicate a sense of urgency for change and inspire hope.
- Learning to be: The educator is someone who is willing to take considered action even in situations of uncertainty.
- Learning to live together: The educator works with others in ways that facilitate the emergence of new worldviews that address sustainable development (pp. 14–15).

From this example, we can identify themes related to understanding sustainable development problems and pedagogy, communicating the importance of changing existing unsustainable practices, and taking action, individually and with others to enact change. However, these competencies do not directly reference past or current unsustainable human development practices that require change, such as capitalism, colonialism, or overconsumption, to name a few (Kanemoto and Moran 2017). There is, however, some acknowledgement of these unsustainable practices in the more detailed section on the *Envisioning Change* area of competencies, stating “our world is characterized by massive inequality, with millions living in poverty while others engage in unsustainable use of the planet’s resources exceeding the carrying capacity of natural systems and hence compromising their regenerative capacities” (UNECE 2012, p. 17).

The competencies are further grouped according to three characteristics of ESD, again as defined by UNECE (2012): *A Holistic Approach* (integrative thinking and practice); *Envisioning Change* (past, present, and future); and *Achieve Transformation* (people, pedagogy, and education systems). These groupings illuminate linkages between teaching competencies and ESD perspectives.

There has been some critique of the concept of ESD, in relation to other approaches to EE, such as environmental sustainability education (ESE) or EcoJustice Education (EJE), among others. The notion of sustainable development is contentious because we might consider questions such as, Development for whom and when?. In their works, scholars such as Orr (2004), Sauvé (2005), Pedretti and Nazir (2011), and Martusewicz et al. (2015) offer various critiques of the limitations of ESD, but each shares a concern that an ultimate prioritisation of human development is not holistic to the needs of our planet and, thus, destined to fail. Having said this, we see the UNECE (2012) competencies as a starting point towards the pragmatic development of O/EE programming that can become more mainstream in

schools and universities, thus establishing O/EE discourses in these institutions due to a correspondence with established UN policy. Further, evolution of these programmes may address many of the potential shortcomings of ESD. However, O/EE programmes need to be established and sustained for this work to be achievable. It is in this regard that we see value in the UNECE (2012) teacher competencies.

As mentioned earlier, we are building on a chapter published by Karrow et al. (2016) that explains the distinction between what preservice teachers bring into their teacher education programmes in terms of their histories, identities, and life experiences and what is possible to nurture in them through their programme. UNECE (2012) states that “As many educators form their views about what it means to be an educator during initial teacher education, this is a critical area for action” (p. 10). Finally, it can be argued that there are few other frameworks with the global reach of these types of recommendations.

## 15.1 History and Context of the Course

The O/EE course in the Department of Teacher Education at Brock University has a long tradition. In fact, Dr. Doug Karrow inherited the course 15 years ago from his predecessor. Instrumental in its design and implementation, the instructor initially faced general opposition to the course’s development and implementation at the time. It has been understood that many early members of Brock University’s Department of Teacher Education did not feel that “outdoor/environmental education” was essential in teacher education. Nevertheless, the Faculty continued to offer the course at two campuses, primarily because of the determination and perseverance of the course founder and our ability to overcome ongoing challenges in maintaining the course. At the time of this writing, we have official support for offering the course and enough enrolment to offer an optional section at each campus, open to all Primary, Junior, and Intermediate (P/J/I) preservice teachers. Furthermore, an “elective” version of the course (one of four required by all Intermediate/Senior students) is now being offered. However, in this chapter, we focus on the P/J/I course only. As an optional course, preservice teachers may consider taking this O/EE course in addition to their regular credit course load. It has been taught in various modes, both as a regular term course (10 week, 2 h/day) and as an intense-delivery (3 day, 6 h/day) course. Currently, the course is offered over three Saturdays, 6 h each week, for 18 h total, and retains its credit weight both on and off campus.

As instructors, we share our current practices from the course, with each of us focusing on a foundational EE approach. We have been continually amazed at the high quality of student work. In general, student participation in the course was thought to be higher than average, and despite myriad other programme and personal commitments, student attendance was very high, perhaps reflecting students’ motivation for, and engagement with, the course content. The course includes



numerous core and supplementary activities, implemented to achieve the learning goals, including:

- Community/nature walks
- Sense of place and being assignment
- Community inquiry action plan assignment
- Building a birdhouse
- Stream study
- Community mapping
- Food justice workshop with family images
- Environmental art workshop
- A sensory walk
- Reviewing and sharing perspectives on related academic and practitioner articles

As instructors, each of us reflects on one of these activities, evaluating its successes and challenges in relation to O/EE course outcomes and UNECE teaching competencies. We believe it is important that any programme of study undergoes such ongoing review, to remain relevant in the context of emerging research and pedagogy.

### ***15.1.1 Doug Karrow's Reflection***

In what follows, I give some context to my delivery of the course and focus on one particular learning activity I developed upon inheriting the course. I should add, when I was originally hired by Brock University, my primary appointment was in science education. However, because my predecessor also taught the optional O/EE course, by way of tradition and convenience, I too assumed instructional responsibility over it.

The course, at the time, consisted of a variety of topics delivered at a local outdoor education centre owned and operated by the local board of education. I had the opportunity to observe the delivery of this course and discovered the course to be primarily oriented towards “practice”. When I took it on, I reconceptualised the course syllabus, aiming to balance current O/EE theory with practice. I have tried to strike a balance between learning activities situated in the outdoors and those EE activities that may occur indoors. *A caveat:* While I did have a strong academic and teaching background in science education, the same cannot be said for O/EE. This course has been a growing experience for me as much as it has been for my preservice teachers.

When I first conceptualised the course, its theoretical backbone was founded on Sauvé's (2005) “Currents of Environmental Education: Mapping a Complex and Evolving Pedagogical Field”. Sauvé provided a concise summary of the major philosophical movements of O/EE and their pedagogical approaches. A central tenet of

the course has been ecological literacy, possessing the knowledge, skills, and dispositions (attitudes) *in, for, and about* the environment (OME 2009). While these were recognised at the time I took over the course, their explicit consideration was rather superficial. The current exercise intends to examine just what internationally recognised preservice teacher EE competencies (knowledge, skills, and dispositions) might consist of and how these learning outcomes might be observed and assessed. At the time I took over the course, central concepts such as sustainability, interconnectedness, and interdependence transcended all course topics, which in turn were derived from Sauvé's EE "currents".

My most recent delivery of the course had two major assignments: (a) developing a sense of place and being and (b) an outdoor/environmental education action plan (see Inwood and Jagger 2014, p. 41). The first assignment is the focus here. It represents a personal line of inquiry for me as an early academic as I was successful in carving out a modest research agenda around it. From the students' perspective, and that of their instructor, I quickly discovered the experience to be truly transformative, in the sense that it required preservice teachers to question their relationship with *place* and its complex association with *being* (Malpas 2006). Through the experience, many students began to question many of their perceptions, assumptions, and understandings of their relationship with the natural world. Some even began to question their beliefs about teaching, learning, curriculum, and the milieu of K–12 education (Schwab 1969). These were unintended consequences of an activity I simply wished to expose them to, in hope they might begin to expand ontologically through the exercise of a phenomenological encounter. The following is an excerpt of a description of the activity contributed to Inwood and Jagger's (2014) *DEEPER* publication:

Early during the term, teacher candidates are taken on a field trip to a natural setting, e.g., Spencer Falls, one of many beautiful waterfalls along the Niagara Escarpment. We hike along the Bruce Trail, examining some of its geological, biological, and ecological features. Teacher candidates are surprised and amazed such beauty can be found so close to the industrial heartland of Canada. This activity requires they focus intently on a natural entity, such as a tree, insect, or river, developing what is referred to as a phenomenological stance. They are invited to describe the entity using as many of the senses as possible and record these descriptions in written, audio, and embodied forms, sharing narratives, poems, artworks, and even choreographies as a way to reflect deeply about this encounter with another natural entity (Kentel and Karrow 2007, p. 93).

Later in the term, preservice teachers share their developing senses of place and being with their classmates. For many, this is a challenging experience, requiring them to interrogate how they come to know, how their interpretive and perceptual frameworks shape their understandings and experiences, and ultimately who they are as human beings.

At the end of the term, preservice teachers are required to share their Developing Sense of Place and Being presentations with their peers. As part of this they are required to step back and ask how it is they came to understand and know their entity and what assumptions they had about it initially. How did they come to be attracted to their natural entity and what remains mysterious about it? They are asked to consider the interpretive frameworks at play in their understandings, and come to appreciate that they have multiple ways of knowing at their disposal, and that they affect who they are as human beings. (p. 41)

I have observed the experience for many students to be profound on many levels. It is not uncommon for preservice teachers to experience strong emotional responses as a result of this activity. Some even begin to question the all too common preoccupation with the technical aspects of teaching, learning, and curriculum, prescient and foremost in the minds of novice teacher candidates. Also, many preservice teachers develop lasting friendships and begin to appreciate a more poetic way of being in place.

Much of what is described here connects to the core competencies of *Learning to do* and *Learning to know*, both of which ask for educators to understand “why there is a need to transform the way we educate/learn” as well as “the importance of building on the experience of learners as a basis for transformation”, and *Learning to be* a “critically reflective practitioner” (UNECE 2012, pp. 14–15). Since this requires preservice teachers to literally move out of a position of comfort and familiarity, the exercise, for some, is fraught with apprehension, uncertainty, and frustration. True to any phenomenological encounter, this exercise makes the “familiar” become unfamiliar. In this sense, it can be challenging for preservice teachers to persevere; it can also be challenging for the instructor to remain true to the activity and not placate student doubts by acquiescing on the requirements of the activity.

### 15.1.2 *Darren Hoeg’s Reflection*

In the Spring of 2015, I taught the O/EE course at Brock University’s St. Catharines campus. I used the facilities at an outdoor education centre owned and managed by the local public school board, so students could learn about the conservation of birds and to build birdhouses. This is a standard EE activity for local school-aged children who visit the outdoor centre with teachers. It could be considered a “rich” activity because the teaching and learning involved in building birdhouses incorporates the three characteristics of ESD, and requires of the teacher most, if not all, of the competencies for sustainable development outlined in UNECE (2012).

This birdhouse building activity started with a presentation about the need to conserve various forms of wildlife in the Niagara region, focusing especially on bluebirds. This required me to become knowledgeable about conservation in the area, for competency in *Learning to know* (UNECE 2012). In Ontario, several bird species are endangered, including the Acadian flycatcher, various species of Warblers and owls, and several species of predatory birds, such as the golden eagle (Ontario Ministry of Natural Resources and Forestry 2019). The primary reason for declining bird populations is habitat loss. Although the birdhouses students build may become home to any number of bird species, they specifically target the Eastern bluebird by making the entry of the house a certain size. Conservation of the Eastern bluebird, a cherished bird for birdwatchers across its range, has been an ongoing endeavour since the 1950s in Ontario (Ontario Eastern Bluebird Society n.d.). Eastern bluebirds are seen as worthy of conservation because of these birds’ inherent qualities and characteristics, rather than for utilitarian benefits they may have for

humans (Ontario Eastern Bluebird Society n.d.). “The potential of this activity to foster such orientations is one of the primary reasons teachers choose to do this with students” (B. Murphy, personal communication, May 17, 2015). This rationale represents a competency of the educator to “envision change”, which UNECE (2012) describes as a feature of ESD, a programme “which explores alternative futures, learns from the past and inspires engagement in the present” (p. 13).

Well-managed predator-proof nest boxes (birdhouses) provide a means for Eastern bluebird populations to be successful, making this activity a favourite among outdoor educators in the region. By engaging students in the process of building habitats for Eastern bluebirds with other conservationists in Ontario, this activity can be seen as exemplifying a *Learning to live together* teacher competency (UNECE 2012). Since this was one of the first outdoor education experiences I planned and implemented as an instructor, there was also a large emphasis on *Learning to do* outdoor education for me (UNECE 2012). To build nest boxes, I had to teach students about lumber selection, using tools, and how to fasten materials (nails, screws), cut boards to proper shapes and sizes, and then assemble the birdhouses. The building process requires integrative practices and perspectives from diverse disciplines such as engineering, design, and biology/ecology, a characteristic of a “holistic approach” to ESD (UNECE 2012). For many students, this was the first time working with building materials, and the various disciplines and skills integrated in this activity made assembling the birdhouses challenging.

Student reflections after constructing their birdhouses indicated initial stages of affective responses to the bluebirds that would soon be living in their new houses. Students commented on being excited to be able to provide the birds a place to live, that they had never done anything like that (building birdhouses) before, and that they were excited to see who (what birds) might end up living in the birdhouse. I view these responses as evidence of students beginning to foster an affective connection with nature—an experience in which they start to be able to *envision change*.

This activity also had an enduring influence on some students. As birds start using the houses students erect around their own homes, there exists the possibility of experiencing joy and wonder from watching the behaviour of the birds, how their habits change with the seasons, and seeing mother, with new chicks, emerge from the birdhouse after a period of inactivity. For example, 2 years after the course was completed, a student mentioned to me the birdhouse he built was still supporting bird families. The student described a powerful impact the birdhouse had on his family’s life and that his family members watch as the birds come and go, raise families, and leave. The student demonstrated a real sense of care and concern for the well-being of the birds, and the student suggested that these feelings became extended to the environment as a whole.

The enduring learning that results from this activity is evidence of *achieving transformation* of “the way students learn and in the systems that support that learning” (UNECE 2012). The relationships with nature described by the student above are not only a desired but also an ideal outcome of O/EE (Orr 2004), which suggest the potential for conservation education to contribute to sustainable human interactions with nature. Such experiences provide a context for the development of in/corporeal experiences with nature (Alsop 2011), based on emotional or spiritual

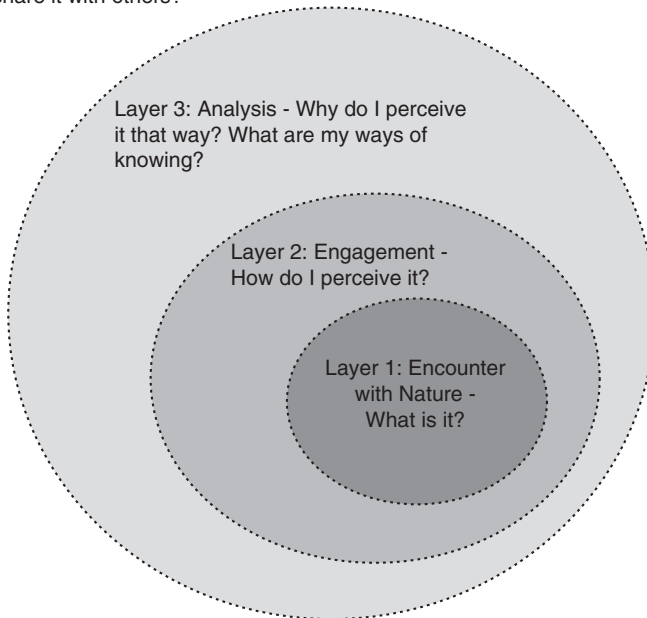
relationships with the living organisms involved—in this case, Eastern bluebirds. These relationships may transcend more analytical types of relationships, such as those stemming from science education—relationships more commonly associated with merely empirical observations of nature (Aikenhead and Ogawa 2007).

When I was in the early stages of designing the O/EE course, I was hesitant to include the birdhouse activity because its most obvious educational values first appeared to be more closely related to design than outdoor education. Upon reflection, however, I recognise its potential to foster deeper relationships with nature among students. Indeed, building a birdhouse may be an ideal outdoor education experience because it can provide an ongoing interaction with nature, as opposed to the brief interactions more typical of organised and/or institutionalised outdoor education courses.

### 15.1.3 Erin Sperling's Reflection

For me, the *Sense of Place and Being* activity, as described in detail by Doug Karrow, was also the most impactful and transformative activity in our O/EE course, both for my students and myself as an instructor. Fig. 15.1 is a visual representation

Layer 4: Representation - How  
do I share it with others?



**Fig. 15.1** A visual representation of the layers of the *Sense of Place and Being* assignment in an O/EE course for teacher candidates

of the layers of the assignment as I presented it to students. The particular focus of Layer 4 – Representation is highlighted here.

Because of the multilayered approach of this assignment, it required a span of time, a degree of reflection, and a slower pace than “usual” course assignments. The third layer, which called for an analysis of perceptions and influences, was a clear moment for students in their learning process. Many students commented that they had never been given a chance to think “that way” about the world and their connections to it. The metacognitive aspect, which is certainly growing in mainstream education circles these days, is still new to many learners (McCormick 2003). Even while they may have a theoretical understanding of thinking about their thinking, they had not had a chance to practise it in their own learning. So, many of them said that regardless of their discipline or subject area, they would find a way of integrating this activity into their teaching practice. They also commented that the requirement of this assignment was a “mind-opening” experience. There was also much reflection, both in writing and in oral presentations, that the act of doing the assignment was “restorative”, having the requirement to *be* in place, rather than rushing around and producing documentation of knowing.

The opportunity to model and offer moments of restoration is important in our work as environmental educators. Not surprisingly, research has shown a direct link between metacognition and “desirable” EE outcomes (Schraw et al. 2012). In addition, this form of learning is aligned with a *holistic* trait of the *Learning to know* competency (UNECE 2012). The intensity and urgency of the material we are teaching in, about, and for the environment can be daunting and invoke a sense of hopelessness. By giving our students time to pause, reset, and restore, we are helping them renew their energy and passion and giving them permission to just “be” and to rebuild hopefulness while removed from the immediate threatening burden of solving global problems (Orr 2005). This also connects to *Learning to live together*, growing towards the trait of *transformation*, where the educator may help learners clarify their own and others’ worldviews through dialogue and recognise that alternative frameworks exist. Furthermore, as per layer 4, many students created reflective products connected to family and community, noting that their environmental connections were not just personal. This resonates with the *Learning to live together* competency category, most notably from the *holistic* approach of actively engaging different groups across generations, cultures, places, and disciplines.

In our O/EE course, I felt grounded while facilitating this assignment, making it a transformative experience for me as an educator. I perceived that the students felt that their experiences and voices were being valued and respected. This was, in fact, my intention. Therefore, I had a sense that they were pushing their own personal boundaries, entering uncomfortable spaces, deconstructing their worldviews, and finding ways of expressing peace in the process. They had full reign of how they would represent their *Sense of Place and Being*, and, through the fourth layer of the assignment, they created pieces of art to share with the class. Many of my students claimed they had not had an opportunity to create this type of work. One student wrote and recited a poem she had written, explaining that she had never written

poetry before (outside of a required school project) and that the act of writing the poem allowed her to process some feelings about her time in a remote Northern community, which she had not taken time to do previously; thus, the process was cathartic for her. Another student painted a canvas to represent a flower he had encountered. It was remarkably beautiful. He mentioned never having painted before, and described the process of learning to paint, and how glad he was that he had carved out the time to do this. Clearly, his commitment to the project was surprising, not only to me and his classmates but even to himself.

In this assignment, the integration of art and environment seemed very impactful to students. Earlier in the course, I had environmental artist and esteemed teacher educator Dr. Hilary Inwood visit the class virtually, to share her perceptions of learning ecoliteracy through the visual arts. I think this introduction to the interaction of art as environmental action was useful to students, especially in helping them begin to think about how they would represent their *Sense of Place and Being* assignment. According to Inwood (2013), “Art education offers a dynamic way to increase the power and relevancy of environmental education by providing an alternative means of furthering learners’ ecological literacy” (p. 130). Based on reflections from their exposure to eco-art with Dr. Inwood, and their subsequent projects, eco-art can help students (a) make connections to the natural world, (b) support learning in other areas of the curriculum, and (c) undertake place-based learning and age-appropriate activism (Inwood 2013). Using art to represent the process and product of this assignment attends to the UNECE (2012) competencies of *Learning to live together*, and “actively engage[s] different groups across generations, cultures, places and disciplines”, as well as *Learning to know* “their personal worldview and cultural assumptions and seek to understand those of others,” through a *holistic* approach (p. 14).

In this O/EE activity, many students produced exemplary reports on the processes they employed; however, one of the challenges was that some students continued to struggle with the third layer of the assignment, which was to reflect on some of the influencing factors on their perceptions of the world. I think this layer, which poses the most metacognitive and philosophical questions of a phenomenological and ontological nature, can be the most challenging, especially because students have not had much exposure to this way of thinking about the world and perhaps struggle with pushing their own boundaries. For this, I think time is one constraint. I also think the education system, of which we are all products, is another constraining factor. While critical thinking is certainly a more prominent skill set in current times, it is still a spectrum of skills, and deep philosophical thinking is not always scaffolded or encouraged in a system that is bounded by assessments and evaluations and curriculum standards.

Other challenges in courses such as the one being discussed here are more generalised. These include resistance by students to spending time outdoors and the limitations described in Karrow et al. (2016) regarding what the students are already bringing into the classroom with them, such as minimal knowledge or experience of the outdoors and ecoliteracy.



## 15.2 Gaps

One of the core competency areas that stands out as needing greater attention in our O/EE programme is *Achieving transformation*—particularly in relation to the education system. Such competencies are expressed as the educator works in ways to challenge unsustainable practices across educational systems, including at the institutional level. Thus, the educator ought to be someone who is willing to challenge assumptions underlying unsustainable practices in educational institutions. These are bigger sets of skills, an enhanced degree of agency, and more ways of knowing than can be achieved in a relatively short course. In fact, they ought to be lifelong learnings. That being said, it is possible to incorporate more learning about educational systems and structures, and the powerful stakeholders therein, to engage with ways that we as educators may create positive structural and systemic change. This can start by exploring, analysing, and identifying ways in which learning about O/EE is itself constrained by institutional mechanisms that work against many of the O/EE competencies we hope to engender in our students. For example, the typical discourse of assessment, performance, and competency pertaining to student and instructor evaluation can be viewed as fuelling the competitive, unsustainable, capitalist systems in the world. Contradictions such as these offer problems that students and teachers can grapple with in their attempts to transform education systems in the context of ESD.

## 15.3 A New Course for O/EE

With the UNECE (2012) competencies in mind, the gaps we have identified in our foundation O/EE course activities suggest a renewed focus for preservice teacher EE. Since we have highlighted more strengths in the areas of *Learning to do* and *Learning to be*, we see a need to expand opportunities for *Learning to know* and *Learning to live together*. Based on these gaps, and what we have identified above, we could consider incorporating more activist-oriented activities in socially and developmentally appropriate ways. These approaches are loosely supported by the Ontario policy framework for EE (OME 2009). From a place-based approach, we will look to our local communities, since the course is offered in two distinct sites, and see what structures are in place that can be encountered and engaged with. For example, despite the short duration of the course, it may be possible to connect with a local EcoSchool that is looking to move from Gold to Platinum level. This shift in certification requires a degree of community engagement in ecoliteracy with which our students may be able to offer support, as well as giving them insight into the workings of EcoSchool certification (Ontario EcoSchools 2019).

Additionally, we could incorporate more opportunities for intergenerational and cross-cultural learning about the environment, such as having Indigenous elders visit our class to speak about their memories of their local environment. The stu-

dents could become familiar with the protocol and practices of such interactions for their future classrooms and also learn to present this information to young children, passing along the stories.

Based on our reflection of key activities, and the gaps we have noted, assignments in our O/EE course should continue to offer opportunities for student introspection, reflection, and community connections. There should be a balance of learning to know, do, be, and live together. Course materials, delivery, and requirements should be designed to facilitate the learning outcomes that:

- Provide preservice teachers with theory on ecological literacy, with a focus on themes of *interconnectedness*, *interdependence*, and *sustainability*.
- Model effective and diverse outdoor and EE teaching strategies to engage students in holistic, envisioning, and transformative practices.
- Familiarise students with historical, social, and political contexts of EE within the province of Ontario.
- Orient and familiarise students with EE policy directives.
- Provide opportunities to explore philosophical relationship with *place* and *being*.
- Acquaint preservice teachers with teaching and curriculum resources that support O/EE through exposure to local, provincial, and federal EE organisations.
- Provide opportunities for preservice teachers to teach elementary and secondary students and community members to become ecologically literate.
- Provide opportunities for preservice teachers to critically reflect on school setting, how setting may resist change related to ESD, and how to transform settings in institutional systems.

In our O/EE course experiences, we have drawn from the UNECE (2012) framework, and our own teaching and learning practices, to reconsider what our students may learn to do, be, know to do, and live together in their journey to become practicing teachers. We acknowledge the value of opportunities for reflection on, and connection to, nature and for interdisciplinary learning and doing. Our renewed vision suggests learning about power structures that inhibit holistic, visionary, and transformative teaching and learning in ESD, and we endeavour to more fully engage and connect with our community's Indigenous elders to support intergenerational learning for ecoliteracy.

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**Part III**  
**Supporting Environmental and**  
**Sustainability Teacher Education**

# Chapter 16

## Encouraging Pro-environmental Behaviour: Joining Theory and Practice to Inform Teacher Education



**Brittany A. Harding**

I grew up in a small town, about an hour's drive north of Toronto, nestled on the shores of Lake Simcoe. To some, we were considered cottage country. To most, we were just a pit-stop town on the way to that "promised-land". Every Friday and Sunday from May until October, I would watch as a line of cars trundled on, like ants diligently following one another, slowly making their way north and south on the highways that bordered our lake. Looking back now, I can remember my family and friends' frustration as our usually quiet roads became barricades to our normal comings and goings. As I grew older, learned to drive, and often found myself caught in that parade of ants, I found myself asking, "Why do people do this to themselves?". One particularly stagnant day, I did the math: in cottage traffic, 4 h north on Friday, 4 hours south on Sunday; 8 hours per weekend; about 16 weekends between Victoria Day and Labour Day (the unofficial start and end of the cottage season, respectively); 128 h spent in the car, per summer, travelling from the city, to a cottage, and back; I could only imagine the amount of fuel used, and exhaust produced by this tradition. What could possibly be so important as to warrant this commitment? Of course, in retrospect, I realise how blessed I was to have easy access to what all those people were chasing.

When I got older, I moved away from my little town to attend university. I found myself on a beautiful campus in Central Ontario, built along the shores of a river, and surrounded by drumlins and coniferous forests. Quiet and calm, this setting created a sense of peace and focus, with the hills and trees forming a tangible barrier between the campus and the nearby town. Over 4 years, I completed countless assignments while looking out across that river and sea of trees, and I learned to mark the passing of the semesters by the changing seasons. In time, I graduated, and

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moved to another institution, long-established in the heart of a city. Beautiful in their own ways, I have been honoured to study at both of these institutions.

In this new locale, for the first time in my life, I often found myself apathetic and unmotivated. In all honesty, I was so unhappy that I nearly withdrew from my programme mid-year. Under the encouragement of family, friends, and a wonderful faculty, I maintained my motivation to stay and finish my year and my programme. Little did I know at the time that my decision to persist would become a turning point in my life, as I had the opportunity near the end of my programme to complete a placement at an outdoor education centre. I will never forget entering the long, tree-covered driveway leading up to the centre. I can only convey the feeling to the reader in the following narrative.

Imagine a period in your life when you have been away from home for some length of time. Perhaps it was attending postsecondary studies, or perhaps some business trip or another. Now, imagine the moment you arrived home after this time away. Imagine you walk through the doorway and are greeted by your children, a beloved pet, or the smells of a loved one's cooking. That sense of homecoming—of belonging—truly captures the feelings and emotions that arose in me entering that educational setting. Looking around at the sea of trees, hearing the running water from a nearby creek, and feeling the cool, crisp winter air, I very suddenly realised why I had felt so lost. I recognised that by barring myself in an urban setting, in failing to tend to my connections with the natural world, I was failing to tend to a part of myself. In that moment, suddenly, all the cottage traffic made sense to me. The summer tradition served the purpose of tending to the innate needs that we all hold. It occurred to me that as someone raised in a small town, I had perhaps taken these connections for granted.

As the three short weeks of my placement sped by, I was astonished by the changes I saw in the students who attended the outdoor education centre. This particular centre offered residential programming to Greater Toronto Area schools. Classes visited for two to four nights, and with many students being from low-income areas, many had never encountered such a wild space. When they arrived, many students were unnerved by the natural space, and reluctant to engage with it, citing fear of insects and dirty shoes. However, as visits went on, students seemed to relax and became increasingly aware of their surroundings, astonished by signs of wildlife and the colourful birds that flew overhead. It seemed evident to me that in such a short period of time, students became more attuned, and perhaps even more attached, to the natural setting. At the time, I could not put words to that change, but was beguiled nonetheless.

Upon returning to my university classes for a few culminating weeks, I found myself with more questions than ever: Why did students' behaviours and attitudes change so much? How exactly did they change? How far-reaching could these changes be? Why are some people more attuned to nature, and how could we help everyone be that way? If people are more attuned to nature, will they take greater action to protect it? Such questions inspired me to pursue graduate studies in Education, exploring the strategies that educators can use to help develop students'

care for, attachment to, and actions with the natural environment. Throughout the remainder of this chapter, I will share my learning throughout this process of inquiry, concluding with a motivational model for pro-environmental behaviour (PEB) intended to help scaffold the educational planning process.

## 16.1 Theoretical Frameworks of PEB and Tests of Specific Interventions

In beginning my investigation, I first turned to the academic literature. Like many new academics, and with an ill-defined research question, I read anything I could get my hands on to make sense of such novel and complex concepts. During my review of the literature, I adopted two general approaches to undertake my study: theoretical frameworks and tests of the efficacy of specific interventions.

Multiple social and psychological theories explain the actualisation of PEB, including theory of planned behaviour (TPB; Ajzen 1985; Ajzen and Fishbein 1980), interdependence theory (Davis et al. 2011), personality correlates of environmental engagement (Milfont and Sibley 2012), and the value-belief-norm model of environmentalism (VBN; Stern et al. 1993). Although multiple theories demonstrate some ability to explain PEB, two such theories stood out as particularly salient: Stern et al.'s (1993) VBN, which captures internal motivators, and Ajzen (1985) and Ajzen and Fishbein's (1980) TPB, which captures external motivators.

### 16.1.1 *The VBN Model of Environmentalism*

With regard to internal motivators, VBN answers the question, "What causes people to act the way they do by choice?". VBN captures personal values, beliefs, and morals, described as a causal chain. This simply means that the traits of each variable in the chain influence those that follow. The five variables described in VBN are values (egocentric, or value for self; altruistic, or value for others; and biospheric, or value for the environment), New Ecological Paradigm (NEP) Worldview (often referred to as environmental attitudes), beliefs about consequences to what is valued, beliefs about personal responsibility to relieve those consequences, and personal moral norms (Stern 2000; Stern et al. 1993). Multiple studies have found this model successful in predicting PEB (e.g. Stern et al. 1999; Wynveen et al. 2011). In short, PEB becomes possible when individuals recognise a threat to what they personally value—be it to self, others, or the environment. Once a threat is recognised, individuals must identify the relationship between themselves and what is threatened and their capacity to relieve threats, and must possess the appropriate skills necessary to mitigate any threats in order for behaviour to ensue (Fig. 16.1).



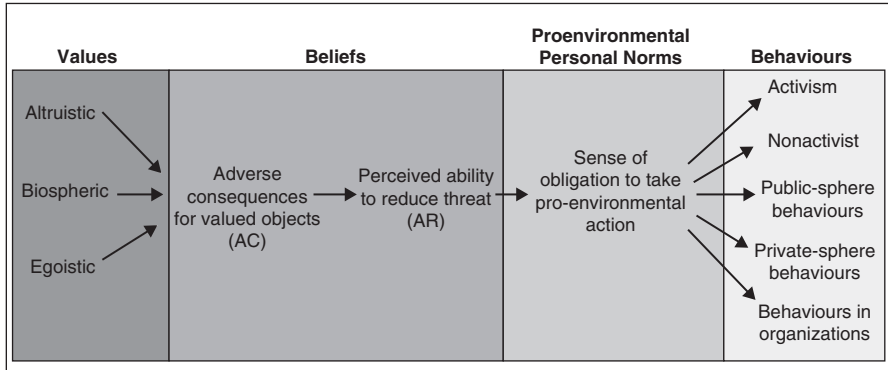


Fig. 16.1 Stern’s (2000) value-belief-norm model of environmentalism

### 16.1.2 Theory of Planned Behaviour (TPB)

In contrast to VBN, TPB answers the question, “What causes people to act in ways they might not typically act?”. Whereas VBN emphasises personal moral norms, TPB focuses on social norms. In the TPB model—in which behaviours are accepted according to social norms and an individual has a positive attitude towards and demonstrates a sense of personal control over the behaviour—an intention to exhibit the behaviour will arise. Where there are no significant barriers to the action, including no potential harm to the actor, socially accepted behaviours should ensue (Ajzen 1985; Ajzen and Fishbein 1980; Kaplan 2000; Kollmuss and Agyeman 2002). In other words, TPB suggests that PEB should ensue when it is the socially accepted norm, insofar as an individual views an action favourably, and where there are no significant barriers or consequences for an action. As an example, if sorting products for recycling is an expected behaviour in a classroom (i.e. social) setting and there are no significant barriers nor negative attitudes preventing a student from doing so (e.g. multiple recycling bins exist in the classroom to allow for sorting), sorting behaviour is expected to occur (Fig. 16.2).

### 16.1.3 Bridging Theory with Practice

Together, these theories suggest that it is possible to alter or appeal to both internal and external motivators to foster PEB. Several interventions have been considered within the literature for their ability to alter both internal and external variables, either explicitly or implicitly. Most of these have focused on internal variables.

When considering appeal to personal values, and the potential integration of community and environment within self-identity, various studies place strong emphasis on direct experience with natural features in both natural and urban environments (Chawla and Cushing 2007; Duerden and Witt 2010; Fisman 2005; Pelo

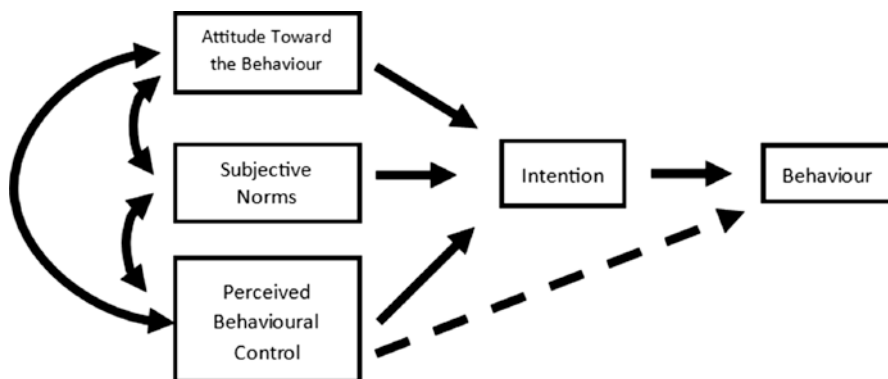


Fig. 16.2 Ajzen's (1991) theory of planned behaviour

2014). These experiences are expected to be particularly impactful when there is sustained contact with the local natural environment, developing attachment to place, and knowledge within a familiar environment (Chawla and Cushing 2007; Collado et al. 2013; Fisman 2005). Building upon the connection to a local space and the integration of self within community and the environment, Chawla and Cushing (2007) and Duhn (2012) encourage educators to engage individuals in setting personal goals, with specific emphasis on projects that address problems within the local community. Each of these interventions is thought to be most effective during childhood, when personal values are still developing (Zelezny 1999).

Beliefs, as noted in VBN, may be the easiest internal variable to influence, as beliefs about consequences or risks, or personal responsibility in a given scenario, are not strongly tied to one's self-identity (Schultz 2002). Beliefs about consequences to things of value are primarily influenced by subject- or topic-related knowledge (Wyles et al. 2013), which also informs individuals about associated potential risks. Tate et al. (2014) suggest that knowledge priming—in which individuals are told about an issue and potential risks immediately before making a choice in environmentally related behaviours—is a simple strategy that can quickly increase the prevalence of PEB. However, behaviour cannot ensue if individuals do not know what actions to take, or how to perform those actions. Wyles et al. (2013) refer to this necessary aspect as action-related knowledge.

PEBs and confidence in one's ability to act can be developed through active practice and involvement in environmental projects (Chawla and Cushing 2007; Clay 2006; Karpudewan et al. 2015; Osbaldiston and Schott 2011; Zelezny 1999) and through modelling of appropriate behaviours by role models (Aronson 1990; Osbaldiston and Schott 2011). With children, it is particularly important that efforts and actions be taken seriously and commended by adults (Chawla and Cushing 2007) in order to convey value and social acceptance. As teachers, this is perhaps one of the most valuable steps we can take in encouraging PEB within our classes and beyond (recall that TPB depicts PEB as a result of sufficient social normative

pressures). In classes where PEBs are applauded, and even expected, social normative pressures may be sufficiently high as to encourage PEB.

The participatory problem-solving (PPS) method described by Kaplan (2000) incorporates many facets of PEB described above. PPS enlists individuals' help in developing solutions to problems; in short, students are presented with a problem and are challenged to propose a viable solution to it. This approach not only fosters commitment to project outcomes but also provides opportunities to practise behaviours and to create plans that both relate to individuals' values and also reduce or mitigate barriers to action (Kaplan 2000). Self-efficacy—the belief in one's ability to control and guide actions to tackle problems—may be key to encouraging the development and activation of personal norms (Tabernero and Hernández 2012).

## 16.2 Exploring Change in Knowledge, Attitudes, and PEBs Through Outdoor Environmental Education

In reviewing this wealth of guiding information, I often thought back to the outdoor education programme during which I had completed my placement. I thought of the indescribable changes I had seen in students and wondered if the programme had influenced the variables I had read so much about. I came to recognise that the programme had incorporated many of the features I had seen described in the literature and returned to that same programme to pursue in-depth study. My initial guiding question came to be remodelled into the following research questions, explored using a predominantly quantitative survey method:

1. To what degree can participation in this outdoor education programme foster environmental knowledge and encourage pro-environmental attitudes and self-reported PEB?
2. How is this effect different among students of different genders and those who have different prior experiences in nature?

## 16.3 Programme of Study

The outdoor environmental programme of focus provided an integrated environmental learning experience for students in Grade 6 (aged 11–12), intended to facilitate an appreciation for, and a connection with, the local environment through direct interaction and immersion in a natural setting (Chawla and Cushing 2007; Collado et al. 2013; Fisman 2005). Structured around a traditional residential field trip model, this particular programme consisted of three phases. In Phase 1, an educator from the outdoor environmental education programme visited the school to introduce concepts that would become necessary during the trip; for example, the educator may introduce the concept of biodiversity and lead students in an activity in

which they measure biodiversity in their schoolyard. This concept would then become a topic of focus in Phase 2, when students arrive at the education centre for their field trip. Over 3 days, the students remain at the education centre and engage in curriculum-based activities. Building upon the example activity from Phase 1, students in Phase 2 may be asked to measure the biodiversity at the education centre and to discuss which of the two sites had greater biodiversity. Such facilitated understanding may then become an area of focus in Phase 3, when the educator returns to the school for a second time to consolidate learning and to lead the class in selection of a stewardship project. Following from the current example, students may be inspired to select a project that contributes to increasing the biodiversity of their schoolyard.

This programme was developed with the assistance of third-party funding and was offered exclusively to Grade 6 students from low socioeconomic status (SES) urban areas. The funding sought to extend outdoor environmental experiences for students who otherwise may lack such opportunities. All programming, both on-site and in-school, reflected grade-level curriculum expectations (Ontario Ministry of Education 2007); however, these expectations were expanded upon through emphasis on ecological literacy and leadership in environmental initiatives within local communities.

The expectation of classroom commitment to community stewardship and engagement in an environmental project within participating schools' local communities is a unique feature of this programme. This project is intended to foster active student engagement in environmental issues and the improvement of environmental quality in students' local communities. Programme educators assist students in choosing an attainable goal and developing plans and subgoals so that students can monitor their progress and success (Chawla and Cushing 2007).

## 16.4 Data Collection and Analysis

Data collected in this study were twofold. First, archived data reflecting students' self-reported frequency of PEBs was provided by programme administrators (Table 16.1). Data consisted of responses to a 10-item survey, rated along a 3-point scale (*Almost never*, *Sometimes*, and *Most times*). Each student completed the surveys three times: once during the pre-trip school visit, once during the field trip, and lastly during the post-trip school visit.

A second survey was developed and administered in order to expand upon the field of information available through the archived data, which captured only self-reported behaviour without consideration of motivational variables. Informed by VBN and TPB, this second survey (referred to henceforth as the contemporary survey) intended to capture as many motivational variables as possible within the scope of this study (Table 16.2), specifically the measurable variables within VBN. These included knowledge, as a proxy of students' beliefs and reflective of Ontario's Grade 6 curriculum (Ontario Ministry of Education 2007); attitudes, measured

**Table 16.1** Summary of responses to archival data

	Phase 1			Phase 2			Phase 3		
	n	Mean	SD	n	Mean	SD	n	Mean	SD
I walk or cycle to school whenever possible	265	2.41	.82	236	2.46	.79	265	2.53	.77
I bring a waste-free lunch to school or eat lunch at home	265	2.25	.67	236	2.45	.64	265	2.54	.61
I take short showers rather than baths	265	2.26	.75	236	2.40	.71	265	2.56	.66
I compost food waste rather than throw it in the garbage (when possible)	265	2.15	.75	236	2.38	.71	265	2.54	.65
I help my family choose locally produced food when shopping, or we grow it ourselves in our garden or on our balcony	265	1.94	.75	236	2.08	.70	265	2.25	.74
I drink tap water and use a refillable water bottle whenever possible	264	2.49	.68	235	2.65	.76	265	2.69	.56
I shut down electronic devices such as computers, video game systems, and stereos when I'm not using them	263	2.52	.65	236	2.68	.57	262	2.77	.51
I put waste in the right place by sorting and disposing of all my unwanted items correctly	264	2.31	.70	236	2.49	.66	263	2.56	.63
I use eco-friendly ways to keep warm or cool (sweaters, blinds, fans, etc.)	263	2.42	.65	234	2.62	.60	264	2.68	.55
I donate items I don't use or wear anymore to someone who can (games, clothes, etc.)	264	2.41	.88	235	2.47	.69	265	2.66	.96

according to the Children's New Ecological Paradigm Scale (Manoli et al. 2007); and self-reported behaviours (Stern et al. 2008). In all, the survey consisted of 23 questions (22 of which were quantitative); it scored knowledge questions as correct/incorrect and rated attitudes and behaviours on a 7-point Likert scale. The survey included demographic variables that identified students' gender and degree of previous experience in nature.

Finally, a single, open-ended question was included in the contemporary survey. This question asked students to write the first three words that came to mind when they thought "nature". This item was intended to support the quantitative data previously generated through the survey by allowing students an opportunity to convey their understanding of nature through an open-ended question.

All schools that had participated in the Spring 2015 programme were invited to participate in the current study. These included Grade 6 classes from schools within low SES areas of the Greater Toronto Area. Of those participating in the programme at the given time, two schools provided consent for data collection.

Quantitative data from both instruments were analysed, where appropriate, using descriptive statistics (frequencies, means, standard deviations, and sample sizes), independent samples t-tests, paired samples t-tests, factor analyses, and repeated measures ANOVA. Qualitative data were aggregated across participants, but with separation of pre- and post-programme responses intact. All terms identified by students were coded for emergent themes, and terms within each theme were

**Table 16.2** Summary of contemporary survey items and descriptive statistics

<b>Section 1: Environmental knowledge</b>						
	<b>Pre-programme (n = 48)</b>			<b>Post-programme (n = 31)</b>		
	% Correct	% Incorrect	% Don't know	% Correct	% Incorrect	% Don't know
Biodiversity means "the number of species in an area"	35.4	27.1	37.5	63.3	20.0	16.7
My school has more biodiversity than a forest	62.5	2.1	35.4	87.1	3.2	9.7
When the number of producers in an ecosystem goes down, so does the number of consumers	47.9	2.1	50.0	48.4	0	51.6
I can reduce my negative impact on the environment by getting a drive to school	72.9	4.2	22.9	87.1	3.2	9.7
If we can, it is better to reduce or reuse than it is to recycle	48.9	25.5	25.5	58.1	6.5	35.5
<b>Section 2: New Ecological Paradigm Scale</b>						
	<b>Pre-programme (n = 48)</b>		<b>Post-programme (n = 48)</b>			
	Mean	SD	Mean	SD		
1. Plants and animals have as much right as people to live	6.50	1.19	6.48	0.93		
2. There are too many (or almost too many) people on Earth	3.70	2.37	3.90	2.50		
3. People are clever enough to keep from ruining the Earth <sup>a</sup>	3.81	2.18	4.10	2.14		
4. People must still obey the laws of nature	6.52	1.19	6.65	0.66		
5. When people mess with nature, it has bad results	5.96	1.44	5.71	1.85		
6. Nature is strong enough to handle the bad effects of our modern lifestyle <sup>a</sup>	3.73	1.91	3.13	2.15		
7. People are supposed to rule over the rest of nature <sup>a</sup>	2.34	1.80	1.55	1.15		
8. People are treating nature badly	5.47	1.77	5.42	2.09		
9. People will someday know enough about how nature works to be able to control it <sup>a</sup>	4.92	1.91	4.71	1.99		
10. If things don't change, we will have a big disaster in the environment soon	5.79	1.79	5.97	1.72		

(continued)

**Table 16.2** (continued)

<b>Section 3: Self-reported behaviours</b>				
	<b>Pre-programme (n = 48)</b>		<b>Post-programme (n = 31)</b>	
	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>
I turn the lights out when I leave a room	5.96	1.44	6.29	1.30
I am careful not to waste food	5.21	1.74	6.06	1.26
I am careful not to waste water	5.77	1.64	6.35	1.05
I talk to my friends and family about the environment	3.52	2.14	4.03	2.09
I would like to participate in an environmental project in my community	4.70	2.18	5.06	1.90

<sup>a</sup>Item reverse coded in further analyses

compared between pre- and post-programme data in order to detect any changes in the words students associated with nature.

## 16.5 Results and Implications of Quantitative Data

In all, archival data were provided for a total of 265 students from 12 schools, while 54 students from two schools completed the survey. Of those students who responded to the contemporary survey, 24 (51.1%) identified as male and 23 (48.9%) identified as female. When asked to indicate how often they spend time in nature, students provided an average rating of 2.96 (SD = 0.99), indicating an average response of “Sometimes”.

Statistical analyses revealed no significant change in students’ environmental knowledge ( $p > 0.05$ ), or general environmental attitudes ( $p > 0.05$ ). However, one facet of environmental attitudes did appear to change in relation to gender. Human exceptionalism, captured as a factor within the Children’s New Ecological Paradigm Scale, depicts the perspective that humans are distinct from and superior to nature. Interestingly, it appears that male students in the programme came to see less of a distinction between humans and nature, while female students saw more of a distinction ( $p = 0.007$ ). Throughout my search of the academic literature, I have been unable to corroborate or explain this finding. I suspect that gender norms combined with some experiences in the programme may influence this shift. Further research is needed to explore this result.

Finally, analysis of both contemporary and archival data demonstrated a statistically significant increase in PEB ( $p < 0.01$  and  $p < 0.001$ , respectively). These findings are particularly rewarding in that they corroborate one another. They appear to suggest that, in this occurrence, PEBs ensued without change in environmental knowledge or attitudes. These results conflict with the VBN model. However, they may be explained by social normative pressures described by TPB. This result



prompted consideration of a new model of PEB, integrating VBN and TPB, as described below.

## 16.6 Results and Implications of Qualitative Data

When exploring the results of students' word associations with nature, I identified five distinct themes: adjectives, components of a natural setting, wildlife, places/activities, and educational concepts. Some terms were identified both before and after the programme. However, the most interesting changes occurred in less commonly identified words. Here, I will briefly speak about all terms and identify those that caught my attention.

### 16.6.1 Adjectives

Both before and after the programme, students identified descriptors of a natural setting. The terms *beautiful*, *green*, and *fun* were particularly common. However, as in many cases within these themes, I was most interested in the nuanced details. In this case, terms identified before the programme (*amazing*, *breezy*, *cool*, *exciting*, *friendship*, *healthy*, *love*, *lovely*, *natural*, *radiant*, *religious*, *serenity*) differed somewhat tacitly from those identified after (*abused*, *clean*, *dangerous*, *free*, *living*, *peaceful*, *quiet*, *vast*, *wild*). Overall, I can't help but think the terms described before the programme could be applied to more or less anything. For whatever reason, the terms described after seemed far more specific to a natural setting. Of these, I am particularly drawn to the contrast between the terms *healthy* and *natural*, identified before the programme, with *abused* and *dangerous*, identified after. This shift seems to provide evidence, albeit fairly insubstantial, for a growing awareness of environmental issues.

### 16.6.2 Components of a Natural Setting

This theme represented the largest grouping of terms. The terms *trees*, *plants*, *animal(s)*, and *flowers* were overwhelmingly common both before and after the programme, representing the four most common responses. Again, turning to those less common terms, students before the programme provided *earth*, *garden*, *leaves*, *outdoors/outside*, *oxygen*, *rock*, *seas*, *sticks*, and *wood*, while after provided *bushes*, *dirt*, *mud*, *soil*, *waterfalls*, *wildlife*, and *life*. Here, I was particularly interested in the theme of *dirt*, *mud*, and *soil* that arose after the programme. Without more detailed information, these terms draw to mind students' life experiences within urban concrete jungles, and a fear of dirty shoes, commonly witnessed.

### 16.6.3 *Wildlife*

Once again, the term *animal(s)* was commonly identified before and after the programme. However, prior to the programme, there was a clear focus on insect terms (*bugs, insects, flies*), while students' only reference to insects after the programme was the term *butterflies*. Further, after the programme students identified *bird* terms, more specifically *chirping birds*. This theme was particularly exciting for me, as the first term (*butterflies*) seemed to capture the only wildlife urban students are commonly in contact with: insects. However, this seemed to be quite dramatically contrasted with the phonetic descriptor *chirping birds*, which seemed to speak not only to a new experience but also to a new sensory awareness of nature.

### 16.6.4 *Places/Activities*

In another intriguing trend, terms within this theme showed the most extreme contrast between pre- and post-programme responses. In this theme, a number of places and activities associated with natural spaces were identified before the programme (*adventure, cabin, camp/camping, games, garden, park, soccer, sports*). However, no places or activities were identified after the programme. It was interesting to wonder if students may be focusing more on what nature is, rather than what human-made structures and activities exist within it.

### 16.6.5 *Educational Concepts*

This final theme relates to big ideas corresponding to the Ontario curriculum. Both before and after the programme, students mentioned *environment, food, and habitat(s)*. However, when considering terms that arose before and after the programme, there was an observed shift from the term *ecosystem* to the term *biodiversity*. Interestingly, this shift in concept focus reflects development of curriculum from Grade 5 to Grade 6 and may hint to the development of environmental knowledge.

Overall, these word associations are suggestive, at best. More in-depth investigation is certainly needed to expand upon and better understand students' understanding of nature. However, they do provoke some interesting thoughts. From these results, it would seem that students may have developed a deeper connection and awareness of nature and environmental issues.

### 16.7 An Integrated Model for Activism Education

This study intended to capture as many variables as possible based on both VBN and TPB in order to explore the activation of motivational variables and ultimately PEB. Due to constraints posed by a lack of availability of age-appropriate, validated measures, variables measured were inadvertently reduced to those included in VBN. Despite strength of evidence supporting VBN as a motivational model of PEB (Stern et al. 1999; Wynveen et al. 2011), this model failed to explain the resultant increase in reported PEB. This finding appears to suggest that VBN is perhaps insufficient in predicting PEB and raises the question of whether the two models might be more comprehensive if integrated. In seeking to reconcile these ideas, I have created a visual interpretation of one possible integration for these models (Fig. 16.3). Interestingly, I am not the first to come to such a conclusion, or to attempt such an integration of these models (see Kollmuss and Agyeman 2002). Figure 16.3 reflects a simplified version of these ideas and is intended to serve as a guide in choosing teaching strategies that may likely encourage PEB within and beyond the classroom. This guide is meant to respond to students’ individual values and beliefs at any given moment, acknowledging that values and beliefs may develop over time. This pedagogical framework can be applied by educators in all settings, be they teachers or teacher educators. For teacher educators, these principles may serve a dual purpose in that they may inform personal pedagogy and also can be shared with teacher candidates for consideration in their future practice.

This model integrates both the internal and external variables seen in VBN and TPB. Beginning with values, it incorporates the three value orientations: egocentric, altruistic, and biospheric. Taking inspiration from successful interventions described in the literature, it depicts the integration of altruistic and biospheric values in value for self, as done through integration of community and nature within one’s self-identity.

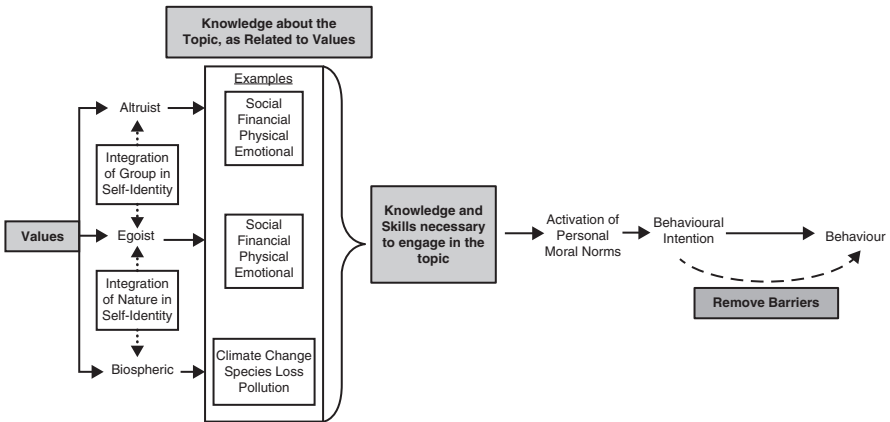


Fig. 16.3 Proposed integrated motivational model of pro-environmental behaviour

When considering possible consequences to self, others, and nature, this model provides some possible examples of the types of consequences that may arise. It operates under the assumption that failure to meet social normative pressures, as described in TPB, may result in perceived consequences. This assumption successfully integrates TPB within the VBN model. Emphasis is placed on knowledge related both to the importance of the issue as well as to the skills necessary to engage in action. The impact of barriers and the importance of relieving barriers are also emphasised. This model can be further simplified through the use of the following prompts:

1. Consider value orientations: What information is important as related to value for the environment, others, and self?
2. Consider action and issue-related knowledge: What do students need to know about the issue or action at hand? Are there potential consequences to what they value? Why is the issue important, as related to what is valued? What do they need to know to engage in that action?
3. Consider how you will help reduce barriers to action: Will you identify and relieve barriers yourself? Perhaps you may consider participatory problem-solving, whereby students are challenged to find a solution to a posed challenge (Kaplan 2000).

To clarify the use of this model by example, consider the case of a teacher hoping to encourage students' willingness to engage in community stewardship projects—in this case composting food waste. Following from this model, a first step in planning would be to consider students' respective values. For those with a high value for the environment, the focus may be on ways in which composting is good for the environment (e.g. nutrition for plants and decomposers, avoidance of fertilisers, etc.). For those with a high value for others, the focus may be on ways in which composting is good for others (e.g. by applying compost to edible plants, we may increase the amount of food produced, which can be shared with others.). Finally, for those with a high value for self, the focus can be on ways in which composting is good for oneself (e.g. using compost on plants saves money spent on fertiliser). Most students will possess some range of each of these three values, so it is important to consider all three perspectives, as overlooking one may result in a missed opportunity for motivation. Activities that help to develop self-identity as a part of the environment and community may help to strengthen the level of value for the environment and community.

Once the teacher is aware of students' values, the teacher should consider the types of knowledge that students need related to such values—both action- and issue-related knowledge (Wyles et al. 2013). In other words, content of lessons should reflect information on the importance of an action and any consequences if the action is not taken, in addition to the skills and knowledge necessary to carry out actions that the teacher hopes to see. Returning to the composting example, this model reminds us to tell students why composting is important to what they value (e.g. nutrition for plants and decomposers, food for other people, saving money on fertilisers). However, this model also reminds us to help students learn how to

compost. They may need to know what can be composted, what conditions are best for food waste to become compost, how often to turn their compost, or how to apply compost to their plants.

This model suggests that when knowledge connects directly to what is valued, students will feel a moral compulsion to capitalise on their knowledge and skills to the benefit of what is valued. This compulsion drives a personal motivation to act. If there are no barriers preventing an action, the action should ensue. The classroom teacher should remove as many barriers as possible. For example, if teaching in an urban community where composting may be difficult for students at home, consider working towards the creation of a composting site on the school grounds where students can dispose of biological waste from their lunches. Alternatively, participatory problem-solving may be used to challenge students to find ways in which they can compost. This challenge is shown to harness students' creativity, to foster motivation, and to help overcome barriers (Kaplan 2000).

## 16.8 Conclusion

To summarise, this study provides evidence of the success of an outdoor environmental education programme in relation to the encouragement of PEB. However, this outcome occurred without a measured change in students' environmental knowledge or attitudes, prompting questions regarding the appropriateness of the VBN model of environmentalism. After considering the VBN and TPB models discussed in this chapter, an integrated model was created to serve as a pedagogical framework for activism education. The integrated model presented in this chapter offers a simplified and accessible guide that can be used easily in the planning of educational programming, as demonstrated in the example noted above. Finally, the following prompts are offered as a further simplified guide; educators should consider (a) value orientations, (b) action- and issue-related knowledge, and (c) how they will help to reduce barriers. In the future, I hope to further refine and improve upon this model and its associated guide.

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# Chapter 17

## Preservice Teacher Professional Development in Education for Sustainable Development



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For the last four decades, education has been at the core of countless international conferences and reports related to environmental sustainability. Since *Agenda 21* (United Nations Division for Sustainable Development 1992), Education for Sustainable Development (ESD) has gained increasing recognition, highlighting the role of education as a catalyst for building a sustainable future for all. The premise of ESD is that enhancing citizens' understanding and awareness of the world's environmental and social challenges (e.g. climate change, renewable natural resources, and rural development) will be instrumental in mitigating these critical problems.

Such discourse of ESD has spread internationally in a number of ways, one of the most significant influences being the work of international agencies such as the United Nations (UN) and its subsidiaries. In particular, the UN declared 2005–2014 as the Decade of Education for Sustainable Development and called on all countries to reorient K–12 and teacher education towards an ESD framework (UNESCO 2018). As a follow-up to the UN Decade of Education for Sustainable Development, UNESCO (2014) endorsed the *Global Action Programme* to implement ESD at local levels. As a result, educators in UN member states now carry an important responsibility for facilitating the local implementation of environmental and/or sustainability education policies based on UNESCO's ESD framework.

According to UNESCO (2018), ESD incorporates environmental, social, and economic sustainability issues (such as climate change, biodiversity, poverty reduction, and sustainable consumption) into teaching and learning. The goal is to train future generations in systematic thinking and to empower them with the requisite analytical skills to understand and critically examine the world's environmental and social challenges (UNESCO 2005). More importantly, ESD encourages learners to reflect on the impact of their everyday choices in terms of sustainable development.

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It also seeks to cultivate students' sense of environmental responsibility, so they can challenge unsustainable practices and participate in changing them (e.g. avoiding overconsumption, engaging in political discussions that could produce legislation promoting environmentally sustainable living). To this end, a transformative pedagogical approach to teaching and learning is widely recommended at the international level: that is, educators and teachers are now expected to use "participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action for sustainable development" (Learning for a Sustainable Future n.d. para. 2).

Canada was an active contributor to the UN Decade of Education for Sustainable Development. In particular, the Council of Ministers of Education, Canada (CMEC), played a leading role in facilitating Canadian ESD activities and aligning them with international efforts. In the last decade, the CMEC has promulgated several official documents in collaboration with Environment Canada, the Canadian Commission for UNESCO, and the United Nations Economic Commission for Europe (UNECE). Notable examples include *Report to UNECE and UNESCO on Indicators of Education for Sustainable Development* (CMEC 2007); *Developing a Pan-Canadian ESD Framework for Collaboration and Action* (CMEC 2010); and *Canada's Response to UNESCO Questionnaires on the UN Decade of Education for Sustainable Development, 2005–2014: Education for Sustainable Development after 2014 and UN Decade of ESD Final Report* (CMEC 2014).

Across Canada, most provincial and territorial departments and ministries of education have also developed strategies and supporting programmes to foster the implementation of ESD at local educational institutions, including elementary and secondary education, higher education, and teacher education (CMEC 2014). To extend these efforts further, the Government of Québec (2013) proposed the official *Government Sustainable Development Strategy* to evaluate Québec's educational programmes (K–12). The goal was to ensure that the learning outcomes for K–12 levels are centred on key sustainable development concepts, such as cultural diversity, responsible citizenship, and environmentally sound and sustainable technology. As a result, Québec teachers are now tasked with an important responsibility to develop their students' understanding and appreciation of sustainable development. They are also expected to extend the existing curriculum and integrate the principles, values, and practices of sustainable development into all areas of education (CMEC 2010, 2012).

Recognising the challenges that in-service teachers may encounter when adapting ESD for the existing curricular programmes, many teacher associations and non-profit organisations have been providing various in-service training and professional development opportunities for schoolteachers in Québec. For example, the Centrale des syndicats du Québec (CSQ), which is a union organisation, has brought more than 1000 Québec schools into its Brundtland Green School (BGS) movement. The BGS movement aims to engage teachers and students in caring about the environment and to encourage action to create a "peaceful, united, and democratic world" (CSQ 2006, p. 2). In addition, the Québec Association for the Promotion of Environmental Education (Association québécoise pour la promotion de l'éducation

relative à l'environnement), also known as AQPERE, works closely with K–12 schools and local museums to develop teaching and learning activities related to sustainable development. Members of AQPERE are also encouraged to share their ideas and training materials with schoolteachers to help them involve their young children in sustainable actions.

Despite the growing involvement of education communities, this top-down approach adopted by the government to implement ESD is seemingly not practical for most preservice teacher education programmes at universities. The challenge mainly lies in the autonomous nature of the academic environment in which faculty members have the option to decide whether or not they will integrate ESD into their courses. Such concern has also been raised in a number of CMEC reports in which experts have called on university leaders and administrators to establish ESD as part of the teacher education curricula; as stated in the CMEC's (2012) ESD Report for Canada,

Universities are largely autonomous; they set their own admissions standards and degree requirements and have considerable flexibility in the management of their financial affairs and program offerings. Government intervention is generally limited to funding, fee structures, and the introduction of new programs. (p. 69).

As a result, many well-intentioned faculty members are still left alone trying to understand how to effectively engage university students in thinking about real-world issues (CMEC 2012). In many faculties of education, it has largely become an individual effort, as opposed to cross-curricular integration programming, to develop preservice teachers' knowledge and teaching competencies for ESD. In response to this challenge, we argue that student teachers can play a leadership role in fostering ESD in their universities, schools, and local communities. ESD would enable them to rethink their role in relation to sustainability issues and actively participate in finding ways to address these issues through their choices and actions. That is, university students can lead us in envisioning creative options for sustainable living, and the faculty members can turn to facilitating the process and providing their expertise to support the students. It is with this vision in mind that we initiated a student-led project to promote ESD among preservice teachers at McGill University.

In this chapter, we share a student-led initiative focusing on ESD in teacher education. We present the project objectives, student-led activities, and the ways in which this experience has contributed to the development of teacher leaders.

## 17.1 Professional Development in ESD

*Training Teachers for Sustainability* was a student-led project initiated by a team of Education students between 2015 and 2016. The project sought to offer professional development opportunities for Education students (preservice and in-service teachers) interested in integrating sustainability-related knowledge and concepts into

their teaching. This initiative was guided by Education faculty members, and professional staff from the McGill Office of Sustainability, and was supported by a grant from the McGill Sustainability Projects Fund.

The origin of this project dates back to October 2013 when the McGill Sustainability Projects Fund announced a call for proposals to support sustainability initiatives at the university. The Sustainability Projects Fund (SPF)—a campus “green” fund—is funded through a “student fee of approximately \$0.52 per credit (up to \$15/student/year), which is matched equally by McGill University. To date, McGill SPF has received close to \$3.1 million in student fees, which, when matched by the University, brings the Fund to a total value of approximately \$6.3 million” (McGill Office of Sustainability 2017, p. 3). An independent parity committee—the SPF Working Group—reviews and approves all allocations. The Working Group consists of four student members, two academic members, and two nonacademic staff members. Notably, all members of the McGill community are welcome to apply for SPF grants.

Our project was approved by the SPF Working Group in 2014 and funded between 2015 and 2016. Specific objectives of our project were to (a) explore Education students’ existing knowledge of sustainability issues; (b) enhance Education students’ understanding of ESD; (c) develop Education students’ pedagogical skills to facilitate the integration of ESD in their teaching practice; (d) develop Education students’ leadership skills as teacher leaders for promoting ESD; and (e) empower Education students as teacher leaders to develop a culture of sustainability.

## 17.2 Education Students’ Initial Understanding of ESD

At the initial phase of the project, the project team administered an online survey to Education students to explore their initial understandings of ESD. The survey was developed by Michalos et al. (2009) to examine secondary students’ and adults’ knowledge and attitudes related to ESD. The survey was administrated between the months of March and May 2016 and was sent to all undergraduate and graduate students (prospective and in-service teachers) in teacher education programmes at McGill University’s Faculty of Education. Student participation in the survey was voluntary, and respondents completed the survey in their own time. The results of the survey (see Tables 17.1 and 17.2) were useful in gaining an initial understanding of Education students’ knowledge of social, economic, and environmental sustainability issues.

Through the survey, we found that 84% of the Education students (44 respondents in total, 77% female and 23% male) thought that sustainable development requires “economic development, social development, and environmental protection”. Furthermore, most of the students who answered the survey questions generally seemed to have a basic familiarity with and understanding of the term “sustainable development”. Approximately 91% of the students were in favour of

**Table 17.1** Knowledge of sustainability development,<sup>a</sup> percentage of student responses

Statements	Percentage of student responses (n = 44)		
	<i>Agree</i>	<i>Disagree</i>	<i>Neutral OR I don't know</i>
A1. Economic development, social development, and environmental protection are all necessary for sustainable development.	84	7	9
A2. Education for sustainable development emphasises education for a culture of peace.	79	7	14
A3. Sustainable development is as much about the children in the future as it is about what we need today.	91	7	2
A4. Sustainable development has nothing to do with social justice.	11	73	16
A5. Canada's overall energy is improving.	16	25	59
A6. Sustainable consumption includes using goods and services in ways that minimise the use of natural resources and toxic chemicals, and reduces waste.	91	4	5
A7. Education for sustainable development emphasises gender equality.	48	23	29
A8. Helping people out of poverty in Canada is an essential condition for Canada to become more sustainable.	71	9	20
A9. Education for sustainable development seeks to balance human and economic well-being with cultural traditions and respect for the earth's natural resources.	91	2	7
A10. We cannot slow the rate of climate change.	5	84	11
A11. Corporate social responsibility is irrelevant to sustainable development.	5	95	0
A12. Conservation of fresh water is not a priority in Canada because we have plenty.	7	91	2
A13. Maintaining biodiversity—The number and variety of living organisms—Is essential to the effective functioning of ecosystems.	96	2	2
A14. Education for sustainable development supports cultural diversity.	64	9	27
A15. Use of non-renewable resources like oil should not exceed the rate at which sustainable renewable substitutes are used.	68	7	25
A16. It is useful to estimate the monetary value of the services that the ecosystem provides to us, such as neutralising air pollutants or purifying water.	75	7	18
A17. Education for sustainable development emphasises respect for human rights.	82	4	14

This survey is retrieved from Michalos et al. (2009)

**Table 17.2** Attitudes concerning sustainability development, percentage of agreeing or disagreeing with statements favourable to sustainable development

Statements	Percentage of student responses (n = 44)		
	<i>Agree</i>	<i>Disagree</i>	<i>Neutral ORI don't know</i>
B1. Every girl or boy should receive education that teaches the knowledge, perspectives, values, issues, and skills for sustainable living in a community.	93	2	5
B2. The present generation should ensure that the next generation inherits a community at least as healthy, diverse, and productive as it is today.	98	2	0
B3. Manufacturers should discourage the use of disposables.	79	7	14
B4. Overuse of our natural resources is a serious threat to the health and welfare of future generations.	93	7	0
B5. We need stricter laws and regulations to protect the environment.	93	2	5
B6. Poverty alleviation is an important topic in education for sustainable development.	75	9	16
B7. Sustainable development will not be possible until wealthier nations stop exploiting the labour and natural resources of poorer countries.	71	18	11
B8. Companies that are environmentally sustainable are more likely to be profitable over the long run.	68	7	25
B9. The teaching of sustainability principles should be integrated into the curriculum in all disciplines and at all levels of schooling.	89	7	4
B10. Governments should encourage greater use of fuel-efficient vehicles.	82	7	11
B11. Adopting sustainable development as a national priority is key to maintaining Canada's status as one of the most liveable countries in the world.	89	2	9
B12. Citizenship education is an important component of education for sustainable development.	79	7	14
B13. Taxes on polluters should be increased to pay for damage to communities and the environment.	79	7	14
B14. There is no point in getting involved in environmental issues, since governments and industries have all the power and can do what they like (reverse coded in attitudes index).	2	98	0
B15. Gender equality has nothing to do with sustainable development.	16	57	27

sustainable consumption, agreeing that “Sustainable consumption<sup>1</sup> includes using goods and services in ways that minimise the use of natural resources and toxic chemicals, and reduces waste”. Similarly, 91% of the students seemed to understand that balancing “human and economic well-being with cultural traditions and respect for the earth’s natural resources” is essential for ESD. However, although 71% of the students thought that poverty reduction in Canada is essentially tied to its sustainability, 29% of them either disagreed or were not sure about the relationship between poverty issues and sustainability of the society. At the same time, 75% of the Education students believed that “poverty alleviation is an important topic in education for sustainable development”, while 25% were either not sure or disagreed with this statement.

The majority of the Education students (98% of the respondents) agreed that “the present generation should ensure that the next generation inherits a community at least as healthy, diverse, and productive as it is today”. In addition, 93% of them believed that “overuse of our natural resources is a serious threat to the health and welfare of future generations”. Furthermore, 89% of the students (current and future K–12 teachers) thought that “the teaching of sustainability principles should be integrated into the curriculum in all disciplines and at all levels of schooling”. However, some Education students seemed to be unfamiliar with the social aspects of sustainability, including social equity, social harmony, and cultural diversity. Although 82% of the students agreed that “ESD emphasises respect for human rights”, only 48% of them thought that “ESD emphasises gender equality”. In other words, approximately 50% of the students either disagreed (23%) or were not sure (29%) about the relationship between gender issues and sustainability. In the same vein, 57% of the students viewed gender equality as an important component of sustainable development, while 16% believed that “gender equality has nothing to do with sustainable development” and 27% were not sure about the relationship between gender issues and sustainable development. On the same note, 64% of the students agreed to the statement “ESD supports cultural diversity”, while 27% of them were either neutral or did not agree with this statement. In addition, approximately 21% either disagreed (7%) or were not sure (14%) about the emphasis of ESD on developing a “culture of peace”.

### 17.3 Professional Development Workshops for Education Students

In the next phase of the project, we developed a series of professional development workshops for Education students based on the survey findings presented above. In this phase, the survey findings were shared with a project team to guide our thinking

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<sup>1</sup>A more complete definition of “sustainable consumption” is a practice that can be continued indefinitely without harmful effects. Because Michalos et al.’s (2009) entire survey was used in this study, its description of “sustainable consumption” was kept.



about the workshop content and educational materials for other Education students and faculty members. This project team, consisting of one graduate and three undergraduate students, collaboratively developed and organised three professional development workshops for Education students at McGill University to expose them to various topics and teaching activities related to ESD.

The first workshop focused on the importance of bringing scientific research on environmental sustainability issues into the classroom and engaging students in outdoor nature explorations. We also invited workshop participants to reflect on several important questions, including “How can teachers communicate complex scientific knowledge to students of all age groups?” Afterwards, we demonstrated how to use social media, such as Twitter and video blogs, to effectively engage young children with a wide range of complex socioenvironmental issues and concepts such as biodiversity, carbon footprint, and climate justice.

Our second workshop focused on engaging Education students in thinking about real-world issues, such as food security and poverty reduction. Our hope was to invite student teachers to reflect on the importance of creating a culturally and socially inclusive learning environment. We also aimed to reach out to Education students who were not yet familiar with the concept of ESD. Therefore, we initiated an awareness campaign around ESD to invite students and faculty members to share their views and concerns about infusing sustainability concepts into their teaching practices. In return, we offered a bilingual resource bank (English and French) including about 50 open-source online materials that are helpful for understanding different aspects of ESD. In this resource bank, prospective and in-service teachers can find various teaching and learning activities related to ESD to enrich their lessons.

Our final workshop, held in collaboration with McGill’s Redpath Museum, was one in which Education students participated in several hands-on outdoor activities. These activities sought to connect elementary and secondary students with nature. Furthermore, these experiential activities engaged them in exploring active learning approaches to understand how changes in the environment can affect social-ecological systems.

Towards the end of the project, the project leader (Ying-Syuan (Elaine) Huang) and the faculty supervisor (Anila Asghar) noticed that Education students who were part of the project team gradually began to take on more of a leadership role in initiating new ideas and activities to promote ESD. As indicated earlier, two undergraduate students in Education took part in organising the project activities (e.g. professional development workshops). Being interested in exploring ways to empower teachers and educators to develop a culture of sustainability, we decided to carry out participatory video research with Education students. In the following section, we discuss our participatory research with the two undergraduate students who were actively involved in this initiative as members of the project team. We will then highlight their learning journeys as teacher leaders during this project.

## 17.4 Participatory Video Research with Education Students

As discussed earlier, this chapter seeks to highlight the contributions of three teacher leaders to this project and examine how they mutually supported each other's professional development and growth as leaders in sustainability education as they engaged in participatory video research. Ying-Syuan (first author) was a third-year doctoral student in the Faculty of Education at the time of the project. Her research focuses on sustainability policy and education in Taiwan. She is interested in comparing the ways in which Western and Confucian approaches to sustainability shape teachers' and educators' practices around environmental issues. Charlie,<sup>2</sup> an undergraduate student, was in the third year of the undergraduate programme in Elementary Education at the time of this project. He was interested in looking at the impact of sustainability education on public policy. He joined this project to bring together social and environmental issues, such as democracy, social cohesion, civic responsibility, climate change, and renewable energy sources. He was passionate about using problem-based learning to promote students' engagement in these issues. Jamie<sup>2</sup> was in the fourth year of the undergraduate programme in Secondary Science Education when she participated in this research. She was interested in promoting the development of scientific literacy skills among her students by engaging them in critical questions around the ways in which science affects our society and vice versa.

Jamie and Charlie participated in video research projects to explore innovative ways to teach sustainability concepts and issues. Participatory video research methodology serves to empower individuals by offering them creative avenues to voice their feelings and views about critical issues in their local neighbourhoods and communities (Mitchell and de Lange 2013). Visual methodologies (including participatory video) have been used largely in the context of working with marginalised communities based on their personal experiences (Milne et al. 2012; Mitchell and de Lange 2013; Williams and Lykes 2003). Drawing on this methodology, we used "cellphilms" as a participatory research tool to explore ways to develop Education students' leadership skills for promoting ESD.

Cellphilms—short videos made using mobile phones—are often used to explore participants' perspectives on relevant issues in local communities; they tend to be short and concise with the main message elements taking priority (Dockney and Tomaselli 2009). We chose cellphilms as a participatory research tool because video production provided the prospective teachers with creative opportunities to bring people together and to help create a positive environment to engage in critical conversations around sustainability issues. Furthermore, cellfilm making is an innovative pedagogical approach to ESD because it helps to empower children and teachers to promote sustainable development through actions at the local level. In this study, Charlie and Jamie participated in the cellfilm-making process. We adapted the participatory video methodology used by Mitchell and de Lange (2011)

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<sup>2</sup>Pseudonyms are used for confidentiality.

in their research conducted with youths on critical health issues in African communities.

Ying-Syuan worked closely with Jamie and Charlie to support their professional development. The video project involved a number of stages that prepared the students to develop their cellphilms as teaching and learning resources for ESD. Specifically, a brainstorming session was held at the beginning to encourage the students to share ideas and to collaboratively develop specific objectives for the cellphilms. As Charlie and Jamie seemed interested in enhancing other Education students' understanding of ESD through cellphilms, the project team developed a prompt question to guide their cellphilms making (Mitchell and de Lange 2011). We asked, "What are the strengths or weaknesses of education for sustainable development?". The question prompt was meant to focus their thinking to help develop a critical understanding of the concept of ESD in teachers.

Subsequently, the project team participated in a training session to develop a plan to work with the camera. Two experts in participatory research methodology were invited to conduct this training. We asked Jamie and Charlie to write field notes when they discussed their scripts for the cellphilms, drafted their storyboards, and made their cellphilms. They were also encouraged to keep track of the process in order to be aware of their developing understandings of ESD and interpretations of the question prompt from their perspective. Jamie and Charlie then filmed their cellphilms. Jamie's cellphilms brought up issues of waste management in her neighbourhood. In particular, she highlighted the impact of human activities on river pollution. In order to engage her secondary students with these issues, she developed lesson plans to use this cellphilms in her classroom. Charlie's cellphilms focused on climate change issues in relation to human choices and actions. Through this cellphilms, he intended to engage teachers in critical conversations on this important issue. Ying-Syuan facilitated this film-making process by regularly meeting with the students to discuss their evolving ideas and offering the requisite materials and resources.

After making the cellphilms, the project team had a focus group conversation to share their experiences. Charlie and Jamie were first invited to share their cellphilms with the group. The focus group discussion was facilitated by the experts who had led the initial cellphilms training session. They invited the project team to reflect on and discuss on the following questions:

- What is it that you want your cellphilms to do?
- Who you are you making your cellphilms for?
- What decisions are you making along the way to help accomplish this goal?
- What aspects are you enjoying and what are you finding challenging? Is there anything that has surprised you about this process?
- How has the process solidified, changed, or influenced your thinking about ESD?
- How does this cellphilms process compare with the other activities and resources that have been developed through this project?

Ying-Syuan documented the entire process of cellphilm making including the brainstorming and training sessions, focus group discussions and informal conversations, the video-making process, and follow-up reflections.

## 17.5 Developing Teacher Leaders in ESD: Key Learnings

In order to track Education students' professional growth as teacher leaders, we drew on multiple sources of data to capture the richness of the learning process. Data collected included participatory video projects, focus group and informal conversations among the project team members, field notes, and researcher's journal entries (the first author, who was the project leader, wrote a journal to record her reflections on the entire process). These tools helped to document students' professional transformation through their involvement in various project activities and were used to examine Education students' emerging understandings of ESD. They also helped to explore the ways in which Education students developed the ESD knowledge and skills as teacher leaders to promote sustainability. A number of qualitative analysis tools and techniques—such as concept mapping and thematic analysis (Creswell and Poth 2017)—were used to analyse the data. This approach allowed us to identify common patterns, cluster salient themes, and explore relationships between them.

Our analysis was inspired by the *Competences in Education for Sustainable Development* (United Nations Economic Commission for Europe [UNECE] 2012) as these competencies encompass educators' knowledge of and attitudes towards ESD, professional values, and pedagogical skills to implement ESD effectively. We also believe that these competencies reflect leadership skills that we hoped to develop in teachers and educators through our project. These competencies are also important as they reflect the international vision for fostering sustainability in teacher education through empowering teachers to play a central role in ESD. Our project objectives were aligned to these competencies. Thus, we developed an interpretive framework (Fig. 17.1) drawing on these competencies (UNECE 2012) to inform our analysis of teacher development through their participation in these project activities.

## 17.6 Evolving Understandings of ESD

Drawing on our interpretive framework (Fig. 17.1), we first looked at project team members' developing understandings of ESD. We noticed that this experience broadened Charlie's and Jamie's conceptions of ESD as they began to make deeper connections between the natural, social, and economic components of sustainability. For example, at the beginning of the project, the students constantly referred to the challenges involved in teaching climate change issues to K–12 students. They



**Fig. 17.1** Interpretive framework

seemed to believe that teachers needed to first understand the science of climate change themselves before teaching these issues. As they engaged with the social and economic factors that are intimately tied to climate change, we noticed a shift in their thinking as they increasingly began to emphasise the importance of teaching the interconnections between the key pillars of sustainability (natural, social, and economic systems).

For example, Jamie, a prospective secondary science teacher, noted in a focus group discussion that the purpose of ESD is to educate students about how to “develop a society that is able to sustain its economic [development] and environment considering the people in the society”. Jamie believed that ESD can help us to rethink “what we need to survive” through considering the environmental, social, and economic aspects of the current sustainability issues. In the focus group discussion, these students also underlined that we, as teachers, should not just tell students to recycle and “turn off the light”; instead, teachers should take an “extra step of explaining” why these actions are important. The strength of an ESD curriculum, as the students noted, lies in providing students with opportunities to learn about interdisciplinary knowledge using real-world problems (researcher’s field notes).

Moreover, the Education students stressed the impact of human activities on ecological systems. While sharing his understanding of ESD, Charlie explained in a focus group that ESD refers to “the process of educating people” that “our actions have consequences” and “learning to be able to make the link between disaster and what’s causing the disaster”. For Charlie, “seeing a problem”, realising what is “causing the problem”, and then “thinking about what are the possible solutions” are the type of thinking that is required for sustainable living. When reflecting on the process of cellphilm making, Jamie said that she made the cellphilm to remind her students to “look at things around [them], and how that impacts [their] life style” (focus group). Jamie also talked about her intention of using her cellphilm to show her students how human activities are affecting the lakeshore in the neighbourhood. As Jamie said in her focus group,

I saw ESD as making links to direct to students, to direct to what's in your local areas, and how you can look at a second layer of that, and to look at how everything is making links in your local areas. ... Up North ... we can walk on the lake [sic walk along the lakeside]; we can go look at the organisms on the shore. Like algae, we actually just collect them and look at them under the microscopes. But then you can also walk on the lake [sic walk along the lakeside] and see all the wastes that people dumped off there, and how they [organisms and waste] both affect the shore.

Building on Jamie's point, Charlie added that we, as teachers, needed to think creatively about the curriculum and to integrate these complex issues into our lessons. For instance, as Charlie pointed out, teachers can engage students in thinking about the long-term economic benefits of electric cars and can engage them in critical thinking required for sustainable living. According to Charlie:

In terms of how do [teachers] integrate a discussion on economic [sustainability] back to the curriculum, it's just a different way of thinking. ... Yes, on one hand, it might go cheaper if you are using gasoline cars than electric cars because electricity is not necessarily less expensive than the gas, and the [electric] is certainly more expensive [than gasoline cars]. But on the other hand, if you run out of oil, and there is no more oil on the planet, that [gasoline] car you own now then cannot be driven. So, you can calculate the economic benefit over the long term. The problem is that it is difficult to see the economic benefit for a short term. So [students will] have to think in long term. (Focus group).

As outlined in our interpretive framework (Fig. 17.1), students' emerging understandings of ESD reflected a more holistic approach to teaching the complex sustainability issues in their classrooms. That is, they intended to engage their students in learning about complex sustainability issues in their local communities and rethinking the impact of their choices and actions on the environment.

## 17.7 Developing Teacher Leaders in ESD

Developing leadership skills in Education students was a key objective of this project. As noted earlier, three Education students were the core members of the project team. Ying-Syuan led the entire project and also mentored the undergraduate students—Jamie and Charlie—to organise and facilitate the professional development workshops for other Education students. She also guided them during their participation in the video research project. This process immensely contributed to Ying-Syuan's professional development as a scholar, education leader, mentor, and researcher. In the following section, we focus on the undergraduate students' development as teacher leaders through their engagement in this project. As noted in our interpretive framework (Fig. 17.1), the key leadership skills for teachers in ESD that we have described include creative and innovative thinking; promoting professional development in ESD; engaging with sustainability issues in local communities; and encouraging learners to consider the consequences of their actions and to envision different ways of living for a sustainable future.

Towards the end of the project, the undergraduate students seemed highly motivated to engage with real-life local sustainability problems. For example, they decided to interview the student activists who participated in the fossil fuel divestment campaign at McGill to gain an in-depth understanding of the concept of climate justice. Jamie also talked about her recent efforts to introduce the concept of local economic sustainability when her secondary students were learning about nutrition. In particular, she explained the benefits of buying local food to her Grade 10 Science class. According to Jamie, she brought tomatoes from local farmers and tomatoes imported from Mexico and asked her students to compare them. When her students noticed that the tomatoes from local farmers were more expensive, she engaged them in thinking about the impact of consumers' decisions on local economics. As Jamie explained in a focus group,

They are probably a few cents off. [But] it's just being aware of that consumers have to know where you are buying things from, and basically you are supporting your economy if you support [buying] locally. And you are actually helping your local neighbours and farmers.

Moreover, we also noticed that these undergraduate students became more willing to build constructive learning relationships with teachers to promote ESD. They said that there needs to be a platform for teachers and educators to exchange their experiences of successful and/or unsuccessful school-based sustainability initiatives. They believed that school-based projects such as investigating the local waste cycle could serve as a central motivation for changes in community living practices (researcher's field notes). In addition, Charlie volunteered to design and lead one of the project's professional development workshops that focused on the interrelationships among the social, economic, and natural components of sustainability. Charlie believed that we first needed to debunk the myth that ESD is related only to environmental protection. He also intended to address some common concerns about integrating ESD into the curriculum in this workshop. He asked critical, reflective questions during the workshop, such as "How can teachers get extra time to talk about sustainability issues when there is just simply not enough time and there are too many topics to cover in the regular curriculum?" (researcher's journal). In his presentation, Charlie noted that sustainability is, in fact, an integral part of the curriculum because there are a number of concepts in the Québec Education Programme (e.g. citizenship and community life, consumer rights and responsibilities) that are connected to environmental sustainability issues. As Charlie observed,

There are implications [of ESD] for different subject areas including: Science & Technology, Ethics and Religious Culture, Geography, History and Citizenship Education. ... For example, bringing in news articles for English Language Arts or calculating the fuel efficiency of a car in Math. ... Students also care more when they can see direct links between what they learn in school and the real world. This also fosters students' intrinsic motivation in [learning]. (Researcher's field notes).

Furthermore, through engaging in cellphilm making, we found that these student teachers became more willing to discuss the assumptions that are embedded in the current unsustainable practices. For example, Jamie used her cellphilm to highlight



the waste management problem in the neighbouring river. Charlie also used his cellphilm to discuss his concerns about our inability to change our behaviours to address climate change problems. He was particularly concerned that “we still don’t want to change anything” despite the increasing intensity of natural disasters, such as hurricanes” (Charlie, field notes, focus group). As Charlie further explained in his cellphilm,

There are rare instances in history when a disaster sparks drastic change in human behaviour. ... Is the action sparked by these disasters due to the scale of the disaster, a fear that something similar could happen, or, more likely, a combination of both and/or other factors. ... While there are always calls to action regarding climate change, rarely do enough people sit up and make a change in their life to respond to disaster. (Charlie, cellphim transcription).

In addition, these student leaders shared their passion about transforming education for a sustainable future. We believe that their willingness to engage in such a complex, and difficult, task will continue to enhance their leadership skills for promoting ESD. For instance, when asked to reflect on the challenges involved in the implementation of ESD in Canada, they shared their vision for transforming education for sustainable living. Charlie believed that current strategies of integrating ESD have not yet helped students to “see the link between sustainable development and the implications for themselves” (focus group). For Charlie, students still see “[sustainability] as a separate sphere of knowledge that is inconsequential in many ways like Math, Science, or other subject areas”. To overcome this challenge, Charlie believed that teachers need to spend more time in supporting their students to find “their passion and interests” and to explore potential “solutions to the problems that they are interested in investigating” (focus group).

Similarly, Jamie envisioned a learning environment in which students are engaged in project-based learning to investigate local sustainability issues. For example, Jamie discussed her next lesson plan on “where the coffee cups go in her neighbourhood”. Jamie explained that she was planning to engage her students in an ethnographic project that would connect the three pillars of sustainability issues. Specifically, she would encourage her students to interview people at the local coffee shops and observe “who the consumers are, what the most popular items are, and what happens to the used coffee cups” (focus group). For Jamie, this project can stimulate learning opportunities for high school students to think about the relationship between our ways of living and critical sustainability issues, including social justice, local versus cooperative economic models, and waste management.

## 17.8 Implications for Teacher Education

This project was the first student-led initiative focusing on ESD in the Faculty of Education at McGill. Such initiatives have transformative potential for enriching teacher education programmes to develop teachers as ESD leaders in their universities, schools, and local communities. Providing rich opportunities for student

teachers to develop and enact creative ESD pedagogies enabled them to engage other teachers and their students in rethinking what it means to create sustainable societies. This collaborative work facilitated a deeper and holistic learning of ESD as the participants critically examined the key pillars of ESD and reflected on real-world issues that are affecting their communities. In contrast with top-down ESD policies, such ground-up experiences seem to spark and sustain participants' passion for transforming education for a sustainable future.

Teacher education programmes need to offer creative opportunities and spaces to support effective professional development of prospective teachers. Such spaces stimulate teachers' innovative thinking, encourage them to question the assumptions underpinning unsustainable actions, promote collaborative leadership work, foster interdisciplinary connections, and inspire problem-based learning approaches. This professional development approach motivates teachers to develop productive learning relationships to advance their learning and growth as ESD leaders. Through this experience, we have learned that peer-to-peer exchange to promote ESD plays an important role in stimulating students' interests in the topic. Further, university students have a distinct advantage in terms of knowing how to approach other students and encourage them to participate in constructive learning opportunities. Such a ground-up model of professional development can be sustained by providing funding to support students to initiate and lead collaborative ESD projects (e.g. setting up a campus green fund to enhance university students' engagement and participation in ESD). Teacher Education institutions need to reorient their professional programmes to place ESD at the core of the curriculum to foster a culture of sustainability.

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# Chapter 18

## Supporting New Teachers in Environmental and Sustainability Education: The Pathway to Stewardship and Kinship



**Paul Elliott and Jacob Rodenburg**

There is much that can be done to prepare preservice teachers for their work in Environmental and Sustainability Education (ESE). They can be inspired to be leaders in the field, advised on how to integrate ESE work into the curriculum, and helped to develop effective pedagogic strategies. By preparing preservice teachers in this way, faculties of education enhance the status of ESE in the school system and provide examples of best practice in action. However, preservice and newly certified teachers can find it difficult to make headway in this work, during their placements or in their first teaching posts, because ESE often is not regarded as a central component of the education system and beginning teachers may find themselves discouraged from pursuing it. If an associate teacher is unsupportive or there is minimal culture of ESE in a school, it can be very difficult for preservice teachers to implement their ideas, however enthusiastic they may be. Assessment of their performance places pressure on preservice teachers to conform to their associate teacher's expectations. The situation is hardly any better for most newly certified teachers, as they frequently start their career in temporary positions within the school system, with their possibility of reappointment dependent on their ability to meet expectations (Greenwood 2010).

Faculties of education can play a part in changing these expectations in schools by placing greater emphasis on ESE in their work with associate teachers and also by working with other like-minded educators and community organisations to advance a common cause. If the environment into which we send new teachers can be made more supportive, then they will stand a better chance of implementing the

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ESE work that we would like them to do. By developing a framework that draws on the opportunities available within a community, including its schools, but also beyond them, we can create a culture in which new teachers feel encouraged, supported, and validated in their work on ESE. By planning around the needs of young people and the desire of community allies to foster a generation who can act as environmental stewards, perhaps we can make this vision a reality.

Today's young people face a set of formidable challenges the like of which have never been seen before. From climate change to habitat destruction, from oceans polluted with plastic to a decline in pollinating insects, the biodiversity that supports us all is in severe crisis (Monastersky 2014). This generation of students has inherited a set of problems that must seem daunting, overwhelming, and at times simply hopeless (Sobel 1996). Given the magnitude and scope of these problems, there is a danger that well-intentioned educators may inadvertently frighten children, causing them to become apathetic (Kelsey 2016). After all, from a child's perspective, what is the sense of doing anything at all when the future looks so alarmingly bleak? Yet despite the environmental challenges facing the planet, the average child is inundated with hundreds of advertising messages per day, urging them to buy more and consume more—habits that only serve to exacerbate the problems. These two conflicting messages, saying on one hand that the earth is in trouble and on the other that we can go on using up ever more resources, are difficult for children to reconcile and only add to their sense of confusion and hopelessness. These issues also pose a risk for new teachers, who may already feel ill-equipped to teach environmental and sustainability topics and who are themselves intimidated by the challenges facing the planet. Because of their lack of experience, new teachers may be especially at risk of making mistakes in the way they introduce ESE topics, particularly if they lack well-informed guidance (Ormond et al. 2014).

Perhaps, rather than dealing with reactions to problems and trying to solve environmental crises as they arise, we should be focusing on the type of citizen we want for our planet, or, as Simeon Ogonda (2015), a youth development leader from Kenya, says: "Many of us often wonder what kind of planet we're leaving behind for our children. But few ask the opposite: What kind of children are we leaving behind for our planet?" (para. 1). This parallels Sauv e's (2017) vision of "eco-citizens", a conception of citizenship that views eco-consciousness and responsibility as a core part of the endeavour to educate the next generation. We should recognise that raising an environmentally engaged citizen isn't something that just happens by itself and should not be the sole responsibility of teachers; much as former First Lady Hillary Clinton's (1996) book suggests, *It Takes a Village* to raise a child. All of us bear collective responsibility for fostering the environmental stewards of tomorrow. So, while enthusiastic new teachers should be prepared to play a pivotal role in this, they should not stand alone, but instead should be supported by a framework involving the wider community.

Studies show that there are rising levels of anxiety, attention deficit hyperactivity disorder (ADHD), and antisocial behaviour in children (Costello et al. 2003; Olfson et al. 2015; Twenge et al. 2010; Visser et al. 2010). The world is also witnessing unprecedented levels of childhood obesity (NCD Risk Factor Collaboration 2017;

The Standing Committee on Health (2007), in part a result of dietary changes. However, there is also evidence of children in the developed world adopting an increasingly sedentary, indoor lifestyle; indeed, the average child may spend more than 7 hours per day in front of a glowing screen, but less than 20 minutes per day in active outdoor play (ParticipACTION 2015). These trends mean that today's children may be the first in generations not to live as long as their parents (NCD Risk Factor Collaboration 2017). Mounting evidence suggests that exposure to nature while growing up leads to a reduction in stress levels, improved physical and mental health, greater creativity, more robust self-esteem, and a greater aptitude for cooperation, collaboration, and self-regulation. In his influential book *Last Child in the Woods*, Richard Louv (2005) contends that children need contact with nature (or, as he calls it, vitamin "N") as an essential part of healthy childhood development. Palmer et al. (1999) found that regular exposure to nature is the single most important factor in fostering care and concern for the environment. Yet we face a situation in which young people are increasingly isolated from nature, despite clear evidence that direct experience of the natural world, using all five senses, is critically important in fostering a desire to care for it (Chawla 2007). This begs the question: where will tomorrow's stewards of the environment come from? In the shorter term, it also raises the issue of where the next generation of teachers committed to ESE work will come from. This has implications for how teacher education programmes prepare preservice teachers (Esa 2010), how entrants to teacher education programmes are recruited and selected, and how knowledge in ESE is, or is not, valued by the school system (Greenwood 2010). Faculties of education should, perhaps, consider their selection criteria to help prioritise the recruitment to the teaching profession of people well-suited to nurturing a generation of environmental stewards (Karrow et al. 2016).

## 18.1 The Pathway to Stewardship and Kinship

In their report for UNESCO, Hopkins and McKeown (2005) called for community involvement in teacher education programmes to help address sustainability issues. This chapter offers an even wider vision of community involvement in an ESE framework centred on stewardship. For millennia, Indigenous peoples harvested, hunted, and lived in a close and sustainable relationship with the land. Many traditional teachings may help us to renew and strengthen our relationship with the environment (Beckford and Nahdee 2011; Bell et al. 2010). We envision a framework anchored in Indigenous ways of knowing, with its concepts of respect, relationship, reciprocity, and responsibility (Bell et al. 2010). The Anishinaabe word *Nwiikaanigana* (roughly meaning "all my relations") embodies the idea that we are part of a much larger family that includes the natural world.

While classroom teachers and environmental education specialists (such as those in outdoor centres) have a key role to play in fostering—if we truly want to foster—the environmental citizens of tomorrow, the "eco-citizens" as expressed by Sauvé

(2017), we need to involve our entire community: that means parents, grandparents, educators, schools, organisations, community leaders, health professionals, municipal officials, and businesses. And we need to coordinate our efforts so that we collaboratively foster stewardship throughout every age and stage of a child's development. Using theory of change methodology (Brest 2010), a project based on this notion of community-activated ESE was developed in Peterborough, Ontario, Canada. It resulted in the production of the ESE framework document *Pathway to Stewardship and Kinship* (Dueck and Rodenburg 2017).

For the purposes of this project, stewardship is defined as having a sense of connection to, and care and responsibility for, each other and the natural world. It should also entail personal action to protect and enhance the health and well-being of both natural and human communities and thus envisages engaged citizens of and for the earth. The definition does not imply entitlement, or power, or dominion over the earth. The ESE framework explores how to foster stewardship by providing children the tools and experiences needed at each age for them to come to know, love, respect, and protect the life systems that sustain and nurture us all. After consulting with representatives of local First Nations communities, it became apparent that it was also important to convey the idea of *Nwiikaanigana* by including the term "kinship".

The idea for the framework emerged out of a conversation between a group of community stakeholders in Peterborough, Ontario, including preschool, K–12, and teacher educators, Indigenous leaders, school board representatives, public health officials, and conservationists. The stakeholders aimed to explore how multiple sectors within the community could coordinate their efforts to promote stewardship throughout all stages of a child's development. Initial literature-based research was conducted across a broad range of topics, including aspects of ESE, Indigenous teachings, child development, and the factors promoting mental and physical health in children. A questionnaire was devised, based on Chawla's (1998, 2007) model of environmental sensitivity research, which investigates how people's childhood experiences of their local environment (external influences) interact with their personal developmental needs (internal influences) to shape their attitudes towards the environment. More than 80 local community leaders were interviewed, each of whom was known to engage with environmental issues in some way. Of particular interest was the opportunity to learn about any formative childhood experiences that may have helped shape these people's interest in the environment. By combining the findings from the interviews with the results of the meta-research, the group sought to identify themes that could provide a foundation for a workable stewardship framework for the community.

A number of clear themes began to emerge from the literature-based research; these were further validated by the interview responses. They can be summarised as tend and care, wonder, sense of place, interconnectedness, mentor support, explore and discover, and engage in action.



## ***18.1.1 Themes of Stewardship***

### **18.1.1.1 Tend and Care**

If children are to value all life, they need to practise the act of caring. Like a muscle, caring is something that should be exercised repeatedly, for instance, by gardening, by exercising a dog, or by raising monarch butterflies. Caring requires empathy and compassion and involves a deliberate attempt to imagine what it must be like from another being's point of view. In essence, caring is about developing relationships. From caring flows the idea of reciprocity, the mindful act of giving back; from reciprocity emerges respect and, finally, a sense of responsibility and in some cases of wanting to take action because one cares (Noddings 1984). These four “Rs”—responsibility, respect, reciprocity, and relationship—are central in Anishinaabe teachings. Project member and Trent University colleague Nicole Bell, of the Anishinaabe (bear clan) from Kitigan Zibi First Nation, explains it in this way: “Cultivating love and humility inspires sensitivity toward others and a desire to develop healthy relationships and a sense of balance with the world around us” (Rodenburg and Bell 2017, p. 63).

### **18.1.1.2 Wonder**

Curiosity provides a powerful incentive for learning. When applied to the natural world, such curiosity can be fuelled by a sense of wonder. Adults can play an important part in validating that sense, by responding appropriately to a child's enthusiasm. Use of encouraging language, such as “Wow, look what you've found? Isn't it amazing?”, provides positive reinforcement of the child's curiosity; expletives, such as “Put that down. Don't touch that, it's dirty”, are likely to have the opposite effect, sending a coded message that the outdoors is hazardous, unclean, and boring.

### **18.1.1.3 Sense of Place**

An important part of developing a sense of comfort and belonging is spending enough time outdoors in the same places to become deeply familiar and connected with them—to develop a sense of place (Ardoin 2006; Gill 2014). Such attachment can contribute to a person's sense of individual identity. It is important, therefore, to give a child plenty of time to develop those deep attachments to place (Gruenewald 2003). Such a place may be children's favourite park, a nearby green space, or, given opportunities to explore, the grounds of their school. The community leaders interviewed for the Pathway to Stewardship and Kinship project almost all referred to natural places that they grew to know and love as a very special and important part of their childhood.

#### 18.1.1.4 Interconnectedness

We are a part of the environment, not apart from it. As Sterling (2017) says: “The very idea of the environment as some sort of *separate* reality is delusional” (p. 40). It is important that children develop an understanding that we all live in the same biosphere, use the same air and water, and consume nutrients that have been used by others and recycled for eons. There are many ways in which children benefit from opportunities to learn about kinship and how their lives are connected to those of other people and other living things (Chawla 2015). Understanding this reinforces the innate need to belong. Central to the development of stewardship is the understanding that we are part of a community that extends far beyond our own friends and family and that it also includes the living (the more than human) and nonliving systems that support us all. At the same time, every action we take has a consequence that may not end in the present but may have implications for the future.

#### 18.1.1.5 Mentor Support

A theme emerging from interviews with community leaders is that having access to a caring mentor is central in developing environmental stewardship, a view supported by others (e.g. Chawla 2007, 2009; Louv 2005). During the early years, this is often a close relative, such as a parent or grandparent who spends time with the child, exploring together and sharing the delights of discovery (Wilson 2008). As Chawla (2009) points out, “A child’s experiences are not just shaped by a socializer’s beliefs and behaviors, but also by how this person reacts to characteristics of the child and the memories they form together” (p. 9). As a child grows older, a mentor is often a teacher or a youth leader who becomes a trusted and admired role model.

#### 18.1.1.6 Explore and Discover

The community leaders interviewed for this project recalled the “free range” time they were afforded as children and identified this as a formative experience. This supports the views of others (e.g. Gruenewald 2003; Wilson 2008) that giving children time and opportunities to explore nearby natural places appears to be a crucial element in the development of stewardship. Opportunities for this may be limited as children become increasingly distracted by screens and have their time taken up by organised after-school and weekend activities (Louv 2005). This may limit the time available to a child for physical, outdoor activity (ParticipACTION 2015), exploration of their natural surroundings, and, consequently, development of a sense of place. Time to play and explore in nature is likely to foster initiative, independence, creativity, and resiliency (Chawla 2015; Gill 2014). These are benefits that all adult carers should be aware of. Teachers, in particular, should be encouraged to identify opportunities to switch learning from the classroom to outdoors.

### **18.1.1.7 Engage in Action**

Knowing and caring about the natural world should only be a first step towards stewardship. The real measure of success in the development of an attitude of stewardship is when a young person is able and prepared to take action. There is no shortage of ways in which action can manifest itself since everyone, no matter their age or ability, can do something positive for the environment. A sense of agency can be nurtured in children by teaching them how to tend a garden, create bird and bat boxes, care for a natural area, reduce their energy consumption, or write to a politician about an issue that they are concerned about. These are all simple ways we can empower young people to make a positive impact that enhances or protects the environment and, at a personal level, helps them to develop a sense of self-worth as contributing members of their community. Promoting agency enables positive actions and this in turn can lead to a sense of hope (Kelsey 2016), which in itself is empowering. As young people grow older, they can begin to explore the idea of sustainable living and explore ways to reduce their carbon footprint, investigate alternatives to fossil fuels, and learn about product life cycles and issues of eco-social justice.

### **18.1.2 Nurturing Stewards**

Any attempt to promote the attributes of stewardship in young people needs to recognise elements of child development and the implications of these for pedagogy. It is important to recognise that children, at different ages, will respond to their environment and the challenges facing it in markedly different ways (Chawla 2009; Evans et al. 2007). To introduce young children to the imminent dangers of climate disruption would be counterproductive, because they will not have the cognitive and emotional faculties to process such a worrying and multidimensional issue (Kelsey 2016; Sobel 2008). Sobel recommends that ESE work with very young children should focus on activities that maximise the child's sense of pleasure and comfort. In the later elementary years, Sobel suggests they can be introduced to simple, pro-environment behaviours such as energy conservation because this is easy to comprehend and provides them with a sense of agency. Potentially overwhelming environmental problems, such as climate change, should not be introduced until middle school at the earliest, and even then it should be linked to an opportunity for efficacy. The way in which children value positive environmental action progresses with their age; young children are motivated by interest and enjoyment, while the intrinsic value of the activity becomes more important from around the age of 11 (Wigfield and Eccles 1992). As children develop they inhabit ever-widening fields of self, first discovering their own bodies, their senses, and the environment immediately around them. As they become older, they begin to recognise and experiment with cause and effect and action and reaction. Empathy and compassion are present in the very youngest children, who will, for instance,

start to cry in response to another's tears, but it becomes more sophisticated as they progress to develop sympathy for others and a more complex sense of kinship emerges (Hoffman 2000). As children mature they begin to recognise they are embedded in a complex community of fellow human beings and other living things. Further along, teenagers are ready to understand larger, more complex issues facing their community, their place in the natural world, and global issues. At this stage they can engage with social and environmental justice issues and are ready to further develop their sense of agency.

The Pathway to Stewardship and Kinship project team brought together what they had learned from the research literature with the themes gleaned from their interviews to develop a vision of how community players could collaborate to support young people and their educators in efforts to make effective environmental education a key component of growing up in Peterborough. The project aims to ensure that the nurturing of stewards becomes a proactive rather than a reactive undertaking. The Pathway to Stewardship and Kinship ESE framework includes an articulation of a number of stewardship principles and then suggests a scheme for progressively implementing these for children from early childhood to the teenage years (Table 18.1). By building on a sense of wonder—awe and curiosity—educators can start by modelling empathy and respect for all life. At each stage of their development, children need opportunities to develop their connections with the living world through their emotions, intellect, and body. As they gradually learn about how the world functions and begin to understand the impacts that people can have, they can start to explore solutions to challenges within their community and beyond. As youth develop leadership skills through their participation in local action, they will develop confidence, a sense of agency, and belonging. The ultimate aim is for engaged stewards to emerge from a process in which community players collaborate to teach our children to know, love, understand, and protect the land they stand upon.

This is a call for educators, parents, community leaders, and youth groups to coordinate their efforts to take collective responsibility for fostering stewardship. While this project is centred on one community, every community has its own resources that can be drawn upon and opportunities for environmental education. Similarly, every community has its own environmental challenges. Unfortunately, too often ESE initiatives are delivered in an ad hoc and siloed manner by individual teachers, schools, and/or by individual organisations. The inevitable danger is that efforts are sometimes duplicated while at other times key stewardship developmental opportunities may be missed. Preservice and newly certified teachers, in particular, can feel isolated when trying to do this type of work. One way to begin addressing this issue of isolation is to reach out to other community stakeholders.

The approach we propose is to form a group of like-minded individuals and organisations to develop a collaborative framework involving community organisations such as schools, school boards, teacher educators, early childhood programmes, youth leaders, Indigenous groups, non-governmental organisations, parent councils, municipalities, and faith groups. By working collaboratively it is possible to develop a framework plan that ensures every child has access to key

**Table 18.1** Some examples of the themes from the Pathway to Stewardship and Kinship approach to environmental and sustainability education

Core stewardship principle	Stewardship opportunity
<b>For young children (ages 3 to 6)</b>	
A time for deepening relationships and understanding	Choose an outdoor place to explore and play in. Visit regularly. Provide loose parts for children to manipulate (sticks, stones, tree slices)
Reinforce and expand the developing sense of empathy	Plant, tend, and harvest something that can be eaten. Raise butterflies; care for an animal
Celebrate seasons	Find simple ways to recognise and enjoy the change of each season
Cultivate sensory awareness of nearby nature	Identify natural sounds and smells. Explore micro-environments (peek under rocks/logs; create a mini trail)
Encourage the idea of “neighbourhood”—The idea that our community consists of other living things as well as humans and built structures	Get to know at least five plants, birds, and insects living in your area. Create a mural that depicts the characters of your “neighbourhood”
Offer a creative response to time spent outside	Develop art projects using natural materials. Create a story or a play about the characters in your “neighbourhood”
<b>For middle childhood (ages 7 to 12)</b>	
Develop more complex outdoor skills	Try non-motorised outdoor activities, such as hiking, survival skills (shelter building, fire making, foraging wild edibles), orienteering, birding, and astronomy
Explore human impacts on the environment; develop leadership and decision-making skills by planning and implementing a simple community-based project	Create a small naturalised area. Manage a school recycling or composting project. Plan a small stream/river clean-up project. Make a poster or video to educate your community about your project. Research and write about the history of the piece of land you occupy
Expand understanding of the relationships between living things and their habitats	Explore biodiversity in a nearby natural area. Conduct a small-scale biophysical inventory, finding at least 10 species each of plants, insects and other animals. Explain three ways this ecosystem helps the environment. Get involved in citizen science projects: Monitor bird, butterfly, and amphibian populations. Monitor ecosystem health by conducting basic water and soil tests
Expand understanding of sustainable lifestyles	Be an energy detective. Find out what kind of energy is used for heating, cooling, lighting, and appliances at home or school. What different renewable energy systems can you observe in your region? Design an energy-efficient home that’s healthy for both people and the planet. Think about using natural materials, passive solar design, rainwater harvesting, renewable energy, and innovative ways to treat human waste
<b>For older children (ages 13 and older)</b>	

(continued)

**Table 18.1** (continued)

Core stewardship principle	Stewardship opportunity
Expand skills and confidence in outdoor awareness, responsibility, and survival	Research the meaning of sustainable harvest. How can the environment provide our needs without being damaged by human impact? Learn how to find your way in a natural area using maps, compass, and/or GPS. Learn how to recognise at least two constellations in the night sky in each season. Learn how to tell the four directions using clues in the sky
Deepen understanding of how modern lifestyles affect the environment. Expand leadership and problem-solving skills by seeking solutions to ecological imbalances	Calculate your ecological footprint. Research how your country's lifestyle consumes global resources and how this compares with other countries. What does sustainability mean? Make a goal for yourself on reducing your ecological footprint. Try it for a month and assess how successful you've been. Get your family and school involved too
Expand abilities to understand and empathise with others while exploring and responding to local social and environmental issues	Find an organisation that is making a difference in your community. Volunteer. Teach someone younger than you an outdoor skill. Find someone to tell you how your area has changed over the years. Find a local hero who is working to protect the environment and arrange for them to speak at your school. Volunteer in a natural area to help with trail maintenance, ecological restoration, or control of invasive species. Help with a community tree-planting project. Participate in planning, planting, maintenance, and monitoring. Do you think it was a successful project? Would you make any changes in future projects?
Learn about social and environmental justice	Find an issue of local concern that you feel strongly about. What problem needs to be solved? How does this issue align with global issues? Get involved. Learn simple action skills: How to make a presentation, how to write a convincing letter, how to organise an event. Learn how to listen and try to understand multiple points of view. Find a mentor who can help you learn and do more to solve this problem
Express your feelings about your local environment	Write a story or a poem, create a visual art piece, or write a play that captures your feelings about the land you occupy. Write a letter to your ancestors. What would you say is worth protecting for your children and for their children?

stewardship opportunities throughout their development. This vision, if implemented in totality, or in part, can help new teachers by providing encouragement and support from the community. When new teachers are encouraged to reach out to their wider community, they can alleviate the sense of isolation and make the task of delivering successful environmental and sustainability education less daunting. Community partners can provide help in many ways, for instance, by providing in-class assistance, field experiences, pedagogical materials, real-world learning opportunities, co-op placements, and validation and approval initiatives. Through the implementation of the framework, we hope that preservice teachers in the Peterborough area will soon find a supportive culture for ESE work during their placements, both from within the school and from the community beyond.

We hope also that the ideas described here for our Pathway to Stewardship and Kinship ESE framework will inspire other communities to raise the kind of children who leave a nature-rich and healthy planet for their children and those many generations yet to come.<sup>1</sup>

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<sup>1</sup>For a copy of the complete Pathway to Stewardship and Kinship document, please go to [www.campkawartha.ca/pathway-to-stewardship](http://www.campkawartha.ca/pathway-to-stewardship)



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**Part IV**  
**Conclusion: Contextualizing, Assessing,  
and Projecting**

# Chapter 19

## Exploring Canadian ESE-PTE in the Context of International ESE-PTE



Douglas D. Karrow and Maurice DiGiuseppe

### 19.1 Connecting Canadian with International ESE-PTE

This book represents the first concerted effort by a dedicated group of Canadian educators, researchers, graduate and preservice students, policymakers, and non-governmental organisation (NGO) representatives to examine the state of Canadian Environmental and Sustainability Education in Preservice Teacher Education (ESE-PTE). In addition to providing a record of discussions and proceedings of National Roundtable ESE-PTE, and a baseline narrative of the current state of Canadian ESE-PTE, this chapter also serves to interpret, extend, and synthesise the volume's themes and topics, particularly in light of international ESE-PTE developments.

Recently, Evans et al. (2017) provide a synthesis of the literature on approaches to embedding ESE in PTE, focusing primarily on Australia, with supporting references to ESE-PTE activities in Scotland, the United Kingdom, and the United States. Canada is noticeably absent from this literature—save for an occasional reference to British Columbia. This silence is surprising given that Canada has, in general, established itself in ESE internationally through research (e.g. Hart 1990; Russell and McPherson 2001; Sauvé 2005), together with the significant contributions of Charles Hopkins, UNESCO Chair on Reorienting Teacher Education towards Sustainability, the work of professional organisations such as the Canadian Network for Environmental Education and Communication (EECOM), and the contributions of NGOs such as Learning for a Sustainable Future (LFS). There is a

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significant body of work being done in this field in Canada, as demonstrated in this book.

### ***19.1.1 Recent Studies Focusing on the State of Canadian ESE-PTE***

In Canada, education is a provincial and territorial responsibility; thus, there is no coordination of pre-college education at the national level. And, given Canada's provincial/territorial ethnic, cultural, and political diversity, it can be challenging to characterise ESE-PTE approaches on a national level. Recognising this challenge, we refer to two Canadian national surveys on ESE-PTE, conducted in 1996 (Lin 2002) and 2012 (Swayze et al. 2012), and discuss the findings of these studies in relation to topics and themes addressed in the chapters of this book.

In 2002, Lin reported findings of her pan-Canadian survey titled, "Trend of Environmental Education in Canadian Pre-Service Teacher Education Programs from 1979 to 1996", and in 2012, Swayze et al. conducted a national survey titled "Education for Sustainable Development in Canadian Faculties of Education" for the Council of Ministers of Education, Canada (CMEC). It is worth noting that 14 years separates Lin's study from Swayze et al.'s survey. This is significant because there was much change in the education landscape across Canada during this decade and a half. Not only did provincial governments change educational mandates and establish new emphases and priorities, but so did the federal government, despite not having direct jurisdictional authority over K-12 education, by, for example, emphasising Indigenous education and climate change education. Furthermore, while the sample in Lin's (2002) survey was largely comprised of faculty of education members who may have been teaching some facet of sustainability, Swayze et al.'s (2012) survey involved deans of education across Canada. What's more, in terms of research design, Lin's (2002) survey posed binary response (yes/no), questions, while Swayze et al.'s (2012) survey asked respondents to assess implementation of ESE-oriented activities and programmes on the basis of a 5-point Likert scale: 1, full implementation; 2, significant progress; 3, preliminary efforts; 4, emerging interest; and 5, no action. Therefore, the two studies differed significantly because of their respective historical-political contexts, including aspects such as who the survey participants were, the types of questions asked, and the manner in which questions were structured to elicit certain responses. These elements of the two surveys significantly impacted the studies' results and conclusions.

For the purposes of this chapter, we base our discussion on comparisons among select findings in Lin's (2002) survey, Swayze et al.'s (2012) study, and Evans et al.'s (2017) international synthesis. Furthermore, we organise our discussion according to five themes stemming from five questions employed by Evans et al. (2017), namely:

1. Programmatic approaches for embedding ESE in PTE.

2. Rationales used for embedding ESE in PTE.
3. Theoretical frames underpinning the embedding of ESE in PTE.
4. Pedagogical approaches used for embedding ESE in PTE.
5. Problems and/or challenges faced by teacher educators who wish to embed ESE in PTE.

We also cross-reference the chapters in this book as part of our analysis, to demonstrate that Canada does have an empirical base to contribute to the international scene, while further substantiating Evans et al.'s framework (2017).

### 19.1.1.1 Programmatic Approaches for Embedding ESE in PTE

Evans et al.'s (2017) review indicated that there are four key approaches used to embed ESE in PTE, namely, (a) across whole curriculum areas, courses, or institutions, (b) through dedicated core/compulsory courses, (c) through a component of a core/compulsory course, or (d) through a dedicated elective course. Table 19.1 compares the degree to which each of the four approaches in Evans et al. (2017) have been adopted in the countries addressed in their study to adoption rates in Canada, as discerned in Lin's (2002) and Swayze et al.'s (2012) studies.

It is obvious in Table 19.1 that a systemic approach to ESE-PTE was minimally reported in the international review conducted by Evans et al. (2017), while in Canada, Lin (2002) did not examine this aspect of ESE-PTE at all. Swayze et al. (2012) found that no faculties of education had adopted a systemic approach. In general, systemic approaches to ESE-PTE have not been implemented in Canadian faculties of education, and this is consistent with international efforts. In terms of ESE-PTE being offered as a dedicated core/compulsory course, on an international level Evans et al. (2017) described this as an "unusual" approach in the countries included in their study. In Canada, Lin (2002) concluded that approximately 34% of Canadian faculties of education offered such courses (at the time of her study), whereas Swayze et al. (2012) reported only a 16% adoption rate approximately 14 years later. This apparent reduction in compulsory course offerings in Canada, over time, may be attributed to a growing view that ESE should be more interdis-

**Table 19.1** Comparison of Canadian and international ESE-PTE programming

Programming	International	Canada	
	Evans et al. (2017)	Lin (2002) n = 35	Swayze et al. (2012) n = 37
(1) "Systemic" or across the whole curriculum, courses, or institution	minimally adopted	n/a	none
(2) Dedicated core/compulsory subject	unusual	34%	16%
(3) A component of a core/compulsory subject	the most common	26%	5%
(4) A dedicated elective subject	second most common	n/a	n/a

plinary in nature, and integrated into all curricula, not just a single compulsory course, resulting in a more decentralised approach to ESE-PTE.

In terms of ESE being a component of a core/compulsory course within PTE, Evans et al. (2017) indicated that this is “the most common” approach for addressing ESE-PTE internationally. In Canada, Lin (2002) reported that approximately 26% of Canadian faculties of education adopted this approach at the time of her study, while Swayze et al. (2012) report only a 5% adoption rate. This, again, seems to indicate an overall decrease in implementation of this approach in Canadian PTE programmes in the decade between these two studies. It is interesting that while this approach was employed with minimal frequency (only 5% of faculties) in Canada, internationally it is the “most common” approach used. In this case, Canada appears completely at odds with international trends.

Finally, in terms of providing ESE through elective courses, Evans et al. (2017) indicated that this was the “the second most popular” approach employed in PTE programmes in the countries studied. However, Lin (2002) and Swayze et al. (2012) did not formally address this approach in their Canadian studies; thus, comparisons cannot be made with any reliability.

To summarise, in Canada, during the 14 years between the surveys reported in Lin’s (2002) and Swayze et al.’s (2012) studies, there appears to have been a general decline in ESE within PTE programmes. However, these conclusions may be premature given the distinct populations surveyed across the Lin (2002) and Swayze et al. (2012) studies. While we may assume that the faculty members surveyed in Lin’s (2002) study may have had a better grasp of ESE programmes and their approaches, the same cannot be assumed about the deans surveyed in Swayze et al.’s (2012) study, since deans may not have been as familiar as faculty members with curricular details. Furthermore, papers presented at the 2016 National Roundtable ESE-PTE, and the chapters included within this volume, indicate that ESE programmes are being implemented in Canadian faculties of education in a variety of forms, though there continues to be much debate about which programmatic approaches are most desirable and effective (see Elliott and Inwood, Chap. 3, of this volume). In Chap. 2 of this volume, Hopkins and Kohl demonstrate that by repurposing the central aim of education from “teaching about sustainability” to “teaching for a sustainable future” and adopting a whole-systems or faculty-wide framework, ESE will be embraced by Canadian faculties of education, as it is in the 190 countries around the world who support *Education 2030*, a framework within the 17 sustainable development goals (SDG) (United Nations 2016), where “education” is a priority.

### 19.1.1.2 Rationales Used for Embedding ESE in PTE

Evans et al. (2017) conclude that the following four rationales support and advance ESE-PTE (though there may be others): (1) preparing student teachers to develop the capacity and/or commitment to embed ESE into their teaching practices; (2) responding to international educational policy priorities; (3) disrupting



instrumentalist, neoliberal education systems; and (4) “others” (implying any rationale that does not fit into any of the three previous rationales) (p. 411). However, Lin (2002) and Swayze et al. (2012) did not explicitly address rationales for embedding ESE in PTE. Therefore, we have tried to ascertain undergirding rationales for embedding ESE in PTE by examining other sources, such as K–12 policy and curriculum.

There is a wide range of ESE policies in K–12 settings across Canada and an equally diverse spectrum of rationales for embedding ESE in K–12 education. Table 19.2 provides a summary of secondary provincial/territorial sources and the rationales for embedding ESE.

The four rationales identified by Evans et al. (2017) are useful in analysing various Canadian provincial/territorial rationales for ESE.

Canadian provinces and territories that are leaders in the field of ESE include British Columbia, Yukon (Yukon commonly adopts British Columbia’s curriculum), Manitoba, and Ontario. All four jurisdictions have implemented curriculum policies that identify, promote, and rationalise ESE in the context of K–12 education. And, while faculties of education are not subject to these policies, they certainly must remain relevant and prepare future teachers to adequately address ESE in the classrooms. However, more often than not, there is a clear and significant gap between ESE outcomes in faculties of education and K–12 education. While ESE has a strong presence in K–12 education, it may not always have the same prominence in faculties of education. Conversely, there are cases in which ESE plays a more significant role in PTE than in K–12 education, as is the case of the PTE programmes at the University of Regina and University of Saskatoon (Inwood and Jagger 2014). This gap likely exists because, in Canada, a number of different, and often competing, provincial/territorial governing and regulatory bodies influence K–12 and postsecondary curriculum policy development. Nevertheless, strong ESE adopters, such as British Columbia (and Yukon), Manitoba, and Ontario, subscribe to three of the four rationales justifying ESE in PTE (Evans et al. 2017; Table 19.2). Of these four, British Columbia is perhaps the most strident—rationalising ESE on grounds of critiquing a “neoliberal” agenda (see rationale 3). However, all four of these jurisdictions subscribe to rationales 1 and 4. To a lesser degree, Quebec, Northwest Territories, Nunavut, Newfoundland and Labrador, and Alberta express two of Evans et al.’s (2017) four rationales for embedding ESE in PTE, namely, rationales 1 and 4. At the other end of the spectrum, New Brunswick, Prince Edward Island, Nova Scotia, and Saskatchewan appear to acknowledge only very superficial forms of ESE in their curriculum policies, with ESE being embedded within a science, technology, society, and environment framework and aligning only with rationales 1 and 4.

To this point, we have discussed several rationales underpinning Canadian provincial/territorial curriculum and related educational policies, and one would expect ESE in PTE to reflect those rationales. And, while we are not in a position to generalise, some of the authors in this volume discuss the rationales framing their ESE-related courses and programmes (see Sauvé, Chap. 4; Gwekwerere, Chap. 10; Howard, Chap. 11; Beeman and Sims, Chap. 12). Most of these rationales align

**Table 19.2** Provincial/territorial rationales for ESE

Province/ territory	Curriculum or other educational policies	Rationale for embedding ESE (1–4)
British Columbia	“Environmental learning can and should include a sustained critique on dominant societal and industrial practices that often contribute to widespread and localized environmental problems” (BC Ministry of Education 2007, pp. 6–7)	1, 3, 4 (ethics)
	“[We] must also turn to ourselves as individuals and as educational professionals to make changes and develop a new ethic – a responsible attitude toward caring for the Earth” (BC Ministry of Education 2007, pp. 6–7)	
Alberta	“The course provides for growth of students as individuals and as responsible citizens. It will assist students in their quest to live harmoniously with others and with the world” (Alberta Education 1990, p. 2)	1, 4 (ethics)
Saskatchewan	Integrated only within science education	No explicit rationale (science, technology, society, and environment (STSE))
Manitoba	“The vision of ESD is of a world in which everyone has the opportunity to benefit from quality education and learn the values, behaviours, and lifestyles required for a sustainable future and for positive societal transformation” (Swayze et al. 2011, p. 4)	1, 2, 4 (ethics)
Ontario	“Environmental education is a vital tool that helps young people understand the nature and complexity of environmental challenges and builds their capacity to take appropriate action” (Ontario Ministry of Education [OME] 2009, p. 3)	1, 2, 4 (ethics)
	“Today’s students will shape the world of tomorrow. More than ever, it is vitally important that our education system not only prepare students academically but also provide them with the skills, perspectives, and practices they will need to meet the social and environmental challenges of the future” (OME 2009, p. 4)	
Quebec	Minimally integrated within the science curriculum	1, 4 (ethics)

(continued)

**Table 19.2** (continued)

Province/ territory	Curriculum or other educational policies	Rationale for embedding ESE (1–4)
The Maritimes	Nova Scotia	No explicit rationale
	-integrated only marginally within the science curriculum (STSE)	No explicit rationale (STSE)
	New Brunswick	No explicit rationale (STSE)
	-integrated only marginally within the science curriculum (STSE)	
	Prince Edward Island	1, 4 (ethics)
	-integrated only marginally within the science curriculum (STSE)	
Newfoundland and Labrador		
	-“Changes in human behaviour should create a more sustainable future that supports environmental integrity and economic viability, resulting in a just society for all generations” (Government of Newfoundland and Labrador Department of Education 2017, p. 14)	
Yukon	Same as British Columbia	1, 3, 4 (ethics)
Northwest Territories	Integrated only marginally within the science curriculum.	1, 4 (ethics)
	There is also “northern Education”	
	“All students would know about our land, languages, histories and cultures. Northern Studies continues to be an important place for our Northern stories to be shared and where capable, engaged people of the North can deepen their learning. Meeting the challenges first set for Northern Studies remains to be the goal of this renewed curriculum, and we hope this document will help communities connect with issues which matter to all Northern peoples” (Northwest Territories Education 2015, p. 1)	
Nunavut	See Northwest Territories	1, 4 (ethics)

with rationale 1, some with rationale 2, and several with rationale 3 in Evans et al.’s (2017) classification. Regarding rationale 3—disrupting instrumentalist, neoliberal education systems—it is not surprising that this rather provocative rationale guides curriculum development in a postsecondary setting; however, with the exception of British Columbia, it was not discussed in any of the other provincial/territorial ESE policy documents.

### 19.1.1.3 Theoretical Frames Underpinning the Embedding of ESE in PTE

Lin (2002) and Swayze et al. (2012) did not survey respondents about underlying theoretical frames for embedding ESE in PTE. However, Sauvé (2005) provides a typology of “currents of environmental education”, providing a taxonomy of theoretical perspectives on which ESE in PTE courses and programmes may be framed.

In this section, we focus our discussion only on provinces/territories that explicitly adopted at least three of Evans et al.’s (2017) four rationales for ESE in PTE, including British Columbia (Yukon), Manitoba, and Ontario. Each of these Canadian provinces/territories explicitly emphasise ESE in K–12 education in their curriculums and/or other educational materials. As in the previous section, we extrapolate from the K–12 context to PTE. Furthermore, in many cases, theoretical frameworks are not explicitly discussed in these materials; however, we may infer theoretical frames from descriptions of curricular goals, objectives, and learning outcomes.

British Columbia’s Ministry of Education published an ESE policy document in 2007, titled *Environmental Learning and Experience: An Interdisciplinary Guide for Teachers*. In this document, the Ministry presents a conceptual framework for ESE, based on the following four principles: *complexity*, *aesthetics*, *responsibility*, and *ethics*. Manitoba, on the other hand, published *Guide for Sustainable Schools in Manitoba* (Swayze et al. 2011) in which the Ministry presents a compelling case for providing “sustainability education” in all Manitoba schools. Emphasising “change” as a guiding principle, sustainable school programmes are to be built on *participative*, *holistic*, and *sustainable* concepts. In the province of Ontario, the Ministry of Education released an ESE policy framework in 2009, titled *Acting Today, Shaping Tomorrow*. This policy framework draws upon several theoretical frames and states that “The framework reflects, promotes, and guides the implementation of environmental education [ESE] that:

- is locally relevant;
- is culturally appropriate;
- enhances understanding that local issues often have provincial, national, and global consequences;
- builds capacity for community-based decision making and environmental stewardship;
- supports lifelong learning; and,
- supports the definition of environmental education provided in *Shaping our Schools, Shaping our Future*. (Ontario Ministry of Education, 2009, p. 4).

The principles and concepts underlying British Columbia (Yukon), Manitoba, and Ontario’s ESE policies can also be aligned with Sauvé’s (2005) typology, as shown in Table 19.3.

As can be seen in Table 19.3, at least 10 of Sauvé’s (2005) 15 ESE currents align closely with elements of British Columbia’s (Yukon’s), Manitoba’s, and Ontario’s ESE policy statements. British Columbia’s (Yukon’s) ESE policy, in particular,

**Table 19.3** Theoretical frames underpinning ESE in K–12 education

Sauvé's (2005) Currents of Environmental Education	British Columbia/ Yukon	Manitoba	Ontario
Scientific	Complexity	n/a	Inquiry-based
Holistic	n/a	Holistic	
Sustainable development/ education	n/a	Principles of sustainable education	n/a
Ethnographic	Aesthetics	n/a	Culturally appropriate
Humanistic/mesological	Responsibility	n/a	n/a
Value-centred	Ethics	n/a	Environmental stewardship
Bioregionalist	n/a	n/a	Local relevance
Praxic	In, about, and for the environment	Participative	In, about, and for environment
Problem-solving	n/a	n/a	Community-based decision-making
Ethnographic	n/a	n/a	Lifelong learning

includes a number of Sauvé's (2005) theoretical constructs, including scientific, ethnographic, humanistic/mesological, value-centred, and praxic. Manitoba, on the other hand, is primarily oriented toward a sustainable development/education theoretical framework while alluding to holistic and praxic constructs to a lesser degree. The province of Ontario seems to be somewhat more eclectic in its theoretical underpinnings, drawing mainly from ethnographic, value-centred, bioregionalist, scientific, praxic, and problem-solving theoretical traditions.

While there may be many reasons as to why a particular faculty of education's ESE-PTE programming may not neatly correspond with a province's/territory's ESE policies, the chapters in this book illustrate the great diversity of theoretical frameworks undergirding provincial ESE-PTE programmes. Ostertag et al. (Chap. 8) describe the tensions that resulted when their bioregionalist-founded course attempted to negotiate the larger university and ministry contexts that prioritise other theoretical frameworks (e.g. scientific, ethnographic, humanistic/mesological, value-centred, and praxic). From the Manitoban perspective, Beeman and Sims (Chap. 12) describe their efforts to create a course founded on an awareness sensitive to new ontological spaces founded on Indigenous cosmologies. They are realistic in admitting that the humanistic/mesological and holistic frameworks that provide a theoretical basis for their courses will be at odds with provincial ESE policy that favours more sustainable development frameworks. And, in Ontario, contributing authors' descriptions of their programmes indicate that most courses provide rich learning experiences rooted in many theoretical frameworks. DiGiuseppe et al. (Chap. 9), Gwekwerere (Chap. 10), Inwood (Chap. 13), Nazir (Chap. 14), and Sperling et al. (Chap. 15) reinforce the eclecticism of ethnographic, value-centred, bioregionalist, scientific, praxic, and problem-solving theoretical traditions, among other theoretical frameworks and currents.

Since Evans et al. (2017) were “[unable] to create a useful taxonomy of theoretical approaches to embedding sustainability in teacher education” (p. 412), we have utilised Sauvé’s (2005) *Currents of Environmental Education* and a simple content analysis of provincial/territorial ministry ESE policy and/or other curriculum materials to identify those theoretical frameworks that are emphasised by provincial/territorial jurisdictions. This has been an inferential process. In British Columbia (Yukon), Manitoba, and Ontario, certain currents or theories of ESE seem to prevail at ministerial policy levels. Respective faculties of education may or may not choose to emphasise/de-emphasise these currents. Regardless, the innovative and progressive strategies various Canadian faculties of education employ provide strong empirical evidence of what is possible when we heed the call by Hopkins and Kohl (Chap. 2) to realign the purpose of education with the aim of “teaching for a sustainable future”.

#### 19.1.1.4 Pedagogical Approaches for Embedding ESE in PTE

While Lin (2002) did not explicitly survey participants on the pedagogical approaches used for embedding ESE in PTE, Swayze et al. (2012) did examine this aspect, albeit only in very cursory ways:

Over half of the respondents are either well on their way to addressing, or have already addressed, the need for *interdisciplinary learning* and pedagogical approaches that are consistent with ESD (for example, *systems thinking*, *futures thinking*, *active learning*, and emphasizing *local and global perspectives* [emphasis added]). (p. 44)

Ministry of education curriculum and other education policy documents suggest that pedagogical approaches for embedding ESE in K–12 education are diverse and varied. Assuming that outcomes in Canadian provincial/territorial K–12 curriculums align significantly with the outcomes of corresponding PTE programmes, we may obtain some understanding of the pedagogical approaches emphasised in British Columbia (Yukon), Manitoba, and Ontario.

British Columbia’s curriculum policy indicates that direct experience, critical reflection and negotiation, and experiential learning, occurring within an interdisciplinary framework, are key pedagogical approaches that should be employed when embedding ESE in K–12 curriculum-based activities (British Columbia Ministry of Education 2007). Manitoba, on the other hand, emphasises cross-curricular integration, project-based learning, systems thinking, inquiry, active learning, futures, thinking, problem-solving from local/global perspectives, and student and community engagement (Swayze et al. 2011). Finally, the Ontario curriculum only vaguely suggests specific pedagogical strategies, opting instead to emphasise knowledge, skills, and attitude competencies students should develop through field-based experiences, experiential learning, and community service learning experiences that are *integrative* in nature (Ontario Ministry of Education 2009).

Comparing these pedagogical approaches with Evans et al.’s (2017) international review of ESE in PTE, many similarities prevail. According to Evans et al. (2017), “Many [approaches] emphasize engaging students in place-based, experiential and/

or inquiry methods, modelling strategies for teaching SE [ESE] that student teachers can apply in schools” (p. 412). Furthermore, Evans et al. (2017) add that it is impossible to “evaluate” the approaches used because the respondents in their study were not asked to comment on the effectiveness of the various pedagogical approaches they may have used. The diversity of pedagogical approaches summarised within Evans et al.’s (2017) international study are also found within Canadian provincial/territorial K–12 contexts, and one would expect these approaches to be used within PTE programmes as well. In fact, this is supported by some of the empirical evidence collected within this book. For example, Miller and Wotherspoon (Chap. 6) describe a variety of pedagogical approaches in their PTE programme, including collaboration, cross-curricular integration, inquiry-based learning, and anti-oppressive education to facilitate the place-based education. Howard (Chap. 11) emphasises “interdisciplinary”, “participatory learning”, and “shared decision-making” approaches as essential to creating “powerful opportunities to foster the values of sustainability”, and Harding (Chap. 16) refers to “community stewardship projects” as powerful and effective learning experiences facilitating value awareness and development.

#### **19.1.1.5 Problems and/or Challenges Faced by Teacher Educators Who Wish to Embed ESE into PTE.**

Building on the well-established tradition of having survey respondents describe problems and challenges they may be experiencing when embedding ESE in PTE, we turn our attention again to Lin’s (2002) and Swayze et al.’s (2012) surveys, comparing relevant findings to those of Evans et al.’s (2017) international study.

Lin (2002) and Swayze et al. (2012) describe “barriers and challenges” as including “lack of communication between stakeholders, [and] funding limitations” (Inwood and Jagger 2014, p. 16). Swayze et al. (2012) go further, indicating that there are many more factors potentially impeding the effective embedding of ESE in PTE, including:

Competing interests and priorities within faculties ... lack of professional development opportunities ... the relationship between the faculties and the corresponding ministries and departments of education ... and the need to examine more carefully [how each] can align mutual interests and mandates for ESD [ESE]. (p. 66)

In a similar vein, Evans et al.’s (2017) review indicates that PTE faces a variety of “constraints at the institutional, faculty/school, and subject/course levels, as well as pedagogical challenges and individual professional issues in their efforts to embed SE [ESE] in initial [preservice] teacher education” (p. 413). However, Evans et al. (2017) acknowledge that they were not able to ascertain if there were any patterns between particular approaches to embedding ESE in PTE and problems or challenges faced by teacher educators. They did, however, acknowledge that there were no evident patterns linking rationales for ESE and any one particular approach to embedding SE [ESE] in PTE programmes.



The collective works of the authors in this book further attest to the problems and/or challenges faced by teacher educators as they embed ESE in PTE. What becomes apparent is the scale of the problems and/or challenges. Some authors consider these problems and/or challenges from a micro-level (e.g. competencies, courses, or programmes) (Bell, Chap. 5; Miller and Wotherspoon, Chap. 6; Karrow et al., Chap. 7; DiGiuseppe et al., Chap. 9; Gwekwerere, Chap. 10; Inwood, Chap. 13; Sperling et al., Chap. 15; Harding, Chap. 16; Huang and Asghar, Chap. 17; and Elliott and Rodenburg, Chap. 18), while others identify more systemic problems and/or challenges operating at macro-levels (e.g. institutional, political, philosophical, ontological, or worldviews) (Hopkins and Kohl, Chap. 2; Sauvé, Chap. 4; Ostertag et al., Chap. 8; Howard, Chap. 11; Beeman and Sims, Chap. 12; and Nazir, Chap. 14). International research conducted at various sites in Australia commonly refers to such challenges and/or problems as “constraints to enabling the *mainstreaming* [emphasis added] of ESE in PTE” (Steele 2010, p. 10). The researchers in this study identify the major challenges and/or problems as including teacher educators’ “limited time to develop ESE unit plans, the inhibitory nature of the university structure, and the crowded nature of the curriculum” (Steele 2010, p. 10). It is interesting to note that the authors of this report frequently cite the latter two challenges and/or problems as significant barriers to ESE-PTE but did not identify the former as posing a significant challenge.

## 19.2 Conclusions, Future Directions, and Research Priorities

The limited though sufficiently revealing analyses rendered in this chapter appear to indicate that there are a variety of provisions in K–12 education policies obliging K–12 schools and districts to integrate ESE into their courses and programmes. British Columbia (Yukon), Manitoba, and Ontario have unique provincial/territorial ESE policies. Saskatchewan, Quebec, and some maritime provinces often include ESE outcomes in the context of subject areas such as Science or Geography. In general, analysis of Canadian and international ESE-PTE scholarship (Evans et al. 2017; Lin 2002; Swayze et al. 2012) indicates significant gaps in programmatic approaches, rationales, theoretical frames, and pedagogical approaches employed for embedding ESE in PTE. Importantly, however, it is evident that educators in Canada continue to face many seemingly intractable challenges in their efforts to embed ESE in PTE, including inadequate funding, lack of professional development opportunities, and competing interests among disciplines (Inwood and Jagger 2014). Many of the authors in this volume discuss these challenges.

While Evans et al. (2017) observe that “the range of problems and/or challenges discussed by teacher education academics which attempt to embed SE [ESE] is well established in the literature” (p. 412), their literature review describes these challenges as involving pedagogical challenges and individual professional issues and also including constraints at institutional, faculty/school, and subject/course levels. Steele (2010) categorises the constraints for mainstreaming ESE in PTE as limited time for unit planning, systemic institutional constraints imposed by universities,

and competing subjects producing an overcrowded curriculum. While literature discussing barriers for mainstreaming ESE-PTE is well established, research on strategies for overcoming challenges is less established. Ferreira et al. (2009) have researched several models for mainstreaming ESE in PTE, including “whole-of-system change”, and the more recent, reflective/critical work of Gough (2016) cites teacher education institutes as “often being the biggest obstacles” while offering a variety of solutions for overcoming barriers.

In addition to the empirical research discussed in the chapters of this book, we have demonstrated in this chapter that there is great need for further research in ESE-PTE on a national and international level. In addition to Evans et al.’s (2017) study, several additional countries are doing research in ESE-PTE, including Latvia (Pipere et al. 2015), Israel (Yavetz et al. 2009), and Spain (Álvarez-García et al. 2015). While Australia, and to a lesser degree Scotland, the United Kingdom, and the United States lead in contributions to the growing ESE-PTE literature base, Canadian researchers have an important role to play in this field. In particular, we require further research on programmatic approaches employed in Canadian PTE programmes, the theoretical frameworks undergirding and informing these approaches, curricular emphases and outcomes employed in these programmes, and the lived experiences of EST-PTE students, instructors, administrators, and policymakers.

In a recent Research Roundtable (October 2018) hosted one day in advance of EECOM’s annual conference in Cranbrook, British Columbia, Canada, a group of 30 Canadian ESE-TE scholars presented and discussed ongoing research in ESE-TE (it should be noted that since National Roundtable 2016, the mandate of the ESE-TE Standing Committee of EECOM has broadened from its initial focus on Preservice Teacher Education (PTE) to Teacher Education (TE), more broadly). A publication venue has been recently confirmed for the dissemination of selected works, among others from across Canada, further adding to the body of research in this developing field in a special issue of the *Canadian Journal of Environmental Education*. Momentum generated through National Roundtable 2016 and the national efforts of our governing body (the ESE-TE Standing Committee of EECOM) will provide additional research exploring factors facilitating and hindering the enhancement of ESE in TE. It is anticipated that in a relatively short period of time, Canada will move from the periphery to the mainstream of ESE-TE research, expanding its empirical base to further substantiate Evans et al.’s (2017) international survey of ESE-TE research. This should secure Canada’s reputation as a comparable leader in the field and help bolster international and national efforts to make ESE-TE a priority.

In their international review of the research, Evans et al. (2017) conclude that future priorities should include (a) the necessity for academics working at programme and course levels to make ESE more comprehensive and integrated, (b) an evaluation of the effectiveness of ESE-PTE pedagogies, and (c) continued qualitative and quantitative research in ESE-PTE, strengthening its theoretical base.

In their appeal to faculties of education, Hopkins and Kohl (Chap. 2) emphasise the importance of research endorsing ESD [ESE] as a “central purpose—to ensure the education, training, and professional development of teachers and other educa-

tors to successfully integrate ESD [ESE] into teaching and learning”. This was confirmed in 2014/2015 by ministers of education from around the world endorsing ESD as a central purpose (UNESCO 2014a, 2014b, 2015). Principles of environmental sustainability, engendered in the United Nations’ sustainable development goals (SDG)—including ending poverty and hunger; improving education and healthcare; developing sustainable economies; achieving gender, race, and ethnic equality; and abating climate change, pollution, and biodiversity loss (United Nations 2017)—though applicable locally, are universal because all living and other-than-living beings share planet Earth equally. Correspondingly, the principles of ESE-PTE—including engaging all students, especially preservice teachers, in learning activities with opportunities to think critically and creatively on environmental issues, making informed judgements about those issues, and engaging in pro-environmental behaviour (Wals et al. 2014)—though applied variously in local ESE-PTE programmes and contexts, possess universal qualities that ought to pervade ESE-PTE programmes around the world. Gough (2016) concurs, emphasising “This content [ESD-content], needs to be a mandatory component of teacher accreditation, not an option, as teachers have a pivotal role in the education of future generations” (p. 120). It is, therefore, vitally important for all members of the broader ESE-TE community to share their knowledge and experiences globally and to engage in disciplined inquiry aimed at enhancing ESE in TE everywhere. Canada is developing as an international player in this field and, through the coordinated efforts of the ESE-TE Standing Committee of EECOM, is poised to contribute much more significantly to a developing body of research in ESE-TE.

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# Glossary

- Action-related knowledge** Knowledge and skills necessary for action in the face of environmental issues.
- Activism** Actively clarifying, justifying, and pursuing a goal concerning the transformation of realities (of a socioecological nature, for instance) which corresponds to an activist stance.
- Anishinaabe** The term Algonquian nations of the First People in Canada use to name themselves in their language.
- Anishinaabeg** The plural form of ‘Anishinaabe’.
- Anthropocentric** Possessing a worldview that places human interests at its centre.
- Bimaadiziwin** Anishinaabe word that translates as ‘living a good life’.
- Biocentric** Possessing a worldview that acknowledges that humans are only one of many species on Earth, that humans are dependent on other living organisms, and that humans’ actions impact other living organisms.
- Bioregional** Living organisms found in a defined and limited geographic area.
- Brundtland, Gro Harlem** A Norwegian politician who served as Prime Minister of Norway and as Director-General of the World Health Organization. She is also known for having chaired the Brundtland Commission which presented the Brundtland Report on sustainable development.
- Christian teacher education** programmes intended to prepare teachers for teaching in Christian and/or secular schools that privilege established Christian ideologies and theories.
- Civic engagement** Working to make a difference in the life of one’s community through political and non-political processes.
- Community field experience (CFE)** After successfully completing a 10-week practicum in local schools, the CFE is a 3-week opportunity for UBC student teachers to broaden their pedagogical perspectives in non-formal educational settings, based on diverse community partners.
- Competencies** The knowledge, skills, and dispositions (attitudes) required of a learner.

- Concurrent education programme** An initial teacher education programme that provides students with an opportunity to pursue a bachelor of education degree (or equivalent) while earning an undergraduate degree.
- Council of Ministers of Education, Canada (CMEC)** A council formed in 1967, including all of the Ministers of Education in Canada. CMEC serves as a mechanism for nationwide consultation and cooperation with national education organizations and the federal government and an instrument to represent the education interests of the provinces and territories internationally.
- Creation care** A set of ideas derived from a Judeo-Christian worldview that explains environmental degradation in terms of spiritual disconnects and prescribes solutions for it in terms of restoring relationships between God, humans, and the rest of the living and nonliving world.
- Criticality** The convergence of rational critical thinking and values-based socio-critical analysis.
- Sense of place** Connecting to one's environment in order to establish knowledge of, and appreciation for, its resources.
- Earth Charter** An ethical framework that was published in 2000 and is recognized as a global consensus statement on the meaning of sustainability and the principles by which sustainability will be achieved.
- Ecocitizenship** Citizenship involving care of our shared home (*oikos*) and engaging in democratic, ethical, and reflexive processes for preserving and enhancing the environment as a common good.
- Ecocivics** The adoption of behaviours/habits such as recycling and daily energy saving, responding to socially constructed moral codes guiding environmental choices.
- Eco-Mentor Program/Enviro-Mentor Program** An extracurricular opportunity offered to teacher candidates at several Ontario faculties of education, including Trent University and University of Ontario Institute of Technology, to help teacher candidates develop skills in environmental and sustainability education.
- Ecopedagogy** An approach to education that seeks to re-educate citizens to care for and respect life on Earth.
- Ecopoetry** A form of creative writing grounded in acknowledging and valuing the ecological interdependence of human and more-than-human entities through humility, respect, and listening.
- Ecological justice education (eco-justice) (EJE)** An emerging perspective that addresses the confluences of social and environmental injustice, oppression for humans and nature, and ecological degradation. EJE challenges the deep cultural assumptions underlying modern thinking that undermine those systems and recognizes the need to restore the cultural and environmental commons.
- Ecological literacy (ecoliteracy)** An understanding of the principles of the organization of ecosystems and the application of those principles for creating sustainable communities and societies.
- Education for the environment (E4E)** An extracurricular opportunity offered to teacher candidates at Nipissing University to help them develop skills in environmental sustainability education.



**Education for sustainable development (ESD)** Education focused on exploring the interdependencies of ecological, social, and economic systems. ESD is about respecting and preserving our histories, valuing culture and community, caring for others and the environment, and taking action to create a fair, healthy, and safe world for all beings. ESD also supports flexibility, creativity, and critical reflection and fosters a sense of responsibility for the economy, society, and environment.

**Environmental education (EE)** Education *about, for, and in* the environment that promotes an understanding of, and appreciation for, the dynamic interactions of Earth's physical and biological systems. EE emphasizes the dependency of our social and economic systems on natural systems, the scientific and human dimensions of environmental issues, and the positive and negative intended and unintended consequences of interactions between human-created and natural systems.

**Environmental stewards** People who take responsibility for the well-being of all community members, both human and more than human.

**Environmental sustainability education (ESE)** Education that encompasses environmental education, education for sustainable development, nature-based learning, outdoor and experiential education, place-based education, eco-justice education, Indigenous education, education for sustainability, humane education, and sustainability for well-being.

**Garden-based learning (GBL)** A form of experiential, interdisciplinary, holistic, and environmental education grounded in gardening practices. GBL has a long history and is currently a growing global phenomenon.

**Indigenous knowledge** Knowledge that has been passed down in Indigenous communities through generations regarding how to live successfully in a particular place. Indigenous knowledge includes a variety of interrelated dimensions: physical, biological, linguistic, spiritual, social, and economic.

**Issue-related knowledge** Knowledge associated with understanding environmental issues.

**Kinship** Close relationships involving equality and reciprocal sharing for the benefit of all.

**Learning for a sustainable future (LSF)** An organization founded in 1991 by a diverse group of youth, educators, business leaders, and government and community members. LSF is a non-profit Canadian organization that was created to integrate sustainability education into Canada's education system.

**Medicine wheel** An Anishinaabe cultural construct consisting of a circle divided into four equal quadrants that is representative of many Anishinaabe cultural teachings.

**Muzzling of scientists** Instituting policies that prevent scientists from freely expressing their research findings and environmental knowledge.

**Nanaboozhoo** A trickster/teacher figure in Anishinaabe storytelling.

**Neoliberalism** Ideology and policy model that emphasizes the value of free markets, free trade, privatization, minimal government intervention in business, and reduced public expenditure on social services.



- New ecological paradigm worldview** A worldview representing positive attitudes toward the environment.
- N'kaniganaa** Anishinaabe word that translates as 'all my relations'.
- Ontological** A philosophical tradition concerned about the nature of being.
- Participatory problem-solving** An approach to environmental problem-solving, wherein students are presented with an environmental problem and are challenged to devise a viable solution to it.
- Participatory research (PR)** A qualitative research methodology that emphasizes participation of a studied community. PR emphasizes equal involvement from researchers and participants (often local people) in the research process. Often, participants have control over the research agenda, the process, and actions. They also collaborate with researchers to analyse and reflect on the information generated from the research.
- Phenomenological** The philosophic tradition concerned with the science of phenomenon.
- Pro-environmental behaviour** Behaviour that is comparatively more environmentally responsible than other behaviour options in any given scenario.
- Self-study** A research methodology used by educators and others to understand what they do, how they do it, and how they can improve their practice.
- Seven-generation principle** An Anishinaabe teaching that instructs the current generation of people to consider the effects of their decisions on the people seven generations to come.
- Seven Original Teachings** Also called the Seven Grandfather Teachings are the foundational values of love, humility, respect, honesty, bravery, truth, and wisdom.
- Sustainable development** Described by the United Nations Economic Commission for Europe (UNECE) as an ethic of solidarity, equality, and mutual respect among people, countries, cultures, and generations; it is development in harmony with nature, meeting the needs of the present generation without compromising the ability of future generations to meet their own needs.
- Sustainable happiness** A concept developed by Catherine O'Brien of the University of Cape Breton, Nova Scotia, to describe happiness that contributes to individual, community, or global well-being and does not exploit people, the environment, or future generations.
- Theory of planned behaviour** A motivational model depicting behaviour as a result of attitudes, beliefs, and social normative pressures.
- Traditional ecological knowledge and wisdom (TEKW)** A component of Indigenous knowledge relating to an understanding of, and care for, the land, living organisms, and the cycles in nature.
- Transversality** In a school context, includes cross-curricular themes, contents, objectives, approaches, or strategies.
- United Nations Educational, Scientific and Cultural Organization (UNESCO)** A UN organization, established in 1945, to promote dialogue among cultures and peoples and to contribute to the building of peace, eradication of poverty,

sustainable development, and intercultural dialogue through education, science, culture, communication, and information.

**Value-belief-norm model of environmentalism** A motivational model of pro-environmental behaviour, depicting environmental action as a result of one's values, beliefs, and personal moral norms.

**Whole-systems thinking** A way to understand how relationships and interactions between elements in a system influence the whole.

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