

## **Chapter 7**

### **Developing Competencies for Education for Sustainable Development: A Case Study of Canadian Faculties of Education (Manitoba)**

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### Abstract

Education is paramount when trying to enable a change in values and attitudes towards sustainability. Higher education in faculties of education plays an important role in working toward this change because of its impact on future and practicing teachers in the school systems. This study inquires into the current role of education for sustainable development (ESD) in undergraduate and graduate teacher education programs at Canadian universities, with a particular focus on promising practices and initiatives toward a reorientation of teacher education for sustainability. A qualitative case study approach was used, identifying promising initiatives as well as challenges and enablers of reorienting teacher education toward sustainability at four Canadian universities. The discussion of results is framed by how identified initiatives relate to the development of core ESD competences for educators as established by the UNECE. The results of the study suggest the following as being important for developing the ESD competencies: experiential, inter-disciplinary, and problem-based learning around real-life issues with community and the natural environment; and building partnerships with colleagues, students, community organizations, and other institutions.

*Keywords:* education for sustainability, faculties of education, teacher competencies

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### Abstrait

L'éducation est essentielle pour rendre possible le changement des valeurs et des attitudes orientées vers la durabilité. L'éducation au niveau supérieur joue un rôle important réalisable vers ce changement, à cause de son impact sur les enseignants présents et futurs dans les conseils scolaires. Cette étude se renseigne dans le rôle actuel de l'éducation pour le développement de la viabilité (ESD) dans l'éducation du premier cycle et d'un programme de formation des enseignants dans les universités canadiennes en mettant plus particulièrement l'accent sur les pratiques prometteuses et les initiatives vers la réorientation de la formation des enseignants pour la viabilité. Une approche d'étude de cas qualificatif utilisé a identifié des initiatives promettantes ainsi que les enjeux et les obstacles de faire la réorientation à la faculté d'éducation vers la viabilité à quatre universités canadiennes. La discussion des résultats est encadrée par la façon dont les initiatives identifiées sont associées au développement du cadre des compétences ESD: expérimental, pluridisciplinaire et l'apprentissage basé sur la résolution de problèmes autour des situations dans un contexte réel avec la communauté et l'environnement naturel; établir des partenariats avec des collègues, des étudiants, dans les organisations communautaires et d'autres institutions.

*Mots clés:* l'éducation de la viabilité, les facultés d'éducation, les compétences des enseignants.

**Developing Competencies for Education for Sustainable Development:  
A Case Study of Canadian Faculties of Education**

Sustainable development is concerned with creating and sustaining the conditions for current and future generations of humans to live well on this planet. The notion of sustainable development was introduced by Brown (1981) and then adopted by the United Nation's World Commission on Environment and Development (UNWCED). According to UNWCED (1987), "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 43). Hence, right from the beginning, a multi-pronged approach to sustainable development was taken that went beyond concerns for the destruction of the natural environment, included concern for meeting the essential needs of all people in a sustainable way, and was in consideration of the needs of future generations. This comprised a concern for equitable access to, and distribution of, resources (Jucker, 2002), a link that is especially brought into focus in a critical pedagogy of place (Greenwood, 2008; Gruenewald, 2003; Stevenson, 2008). Although not all scholars share this multi-pronged approach to sustainable development (Scott & Gough, 2003), many scholars do take a holistic, system-theoretical view of the way in which the elements of sustainable development are interlinked (Capra, 2002; Clayton & Radcliffe, 1996; Senge et al., 2008). In this regard, Summers, Childs, and Corney (2005) "identify in the literature a growing consensus that sustainable development must be conceptualised at the very least in terms of three dimensions: environment, economic [economy] and social [society]" (p. 629).

The UNWCED report in 1987 recognized that "sustainable development requires changes in values and attitudes towards environment and development" (p. 111), and that education has to play a central role in achieving those changes. Furthermore, researchers have identified education as "a critical tool in the transformation towards sustainability" (Firth & Winter, 2007, p. 600) in the K-12 school system (Robertson & Krugly-Smolka, 1997; Summers et al., 2003); the tertiary system (Minguet, Martinez-Agut, Palacios, Piñero, & Ull, 2011; Mochizuki &

Fadeeva, 2010); and in informal/non-formal education settings (Mahruf et al., 2011; Wheeler, 2007). Research has also identified three domains of the educational process relevant for such transformation. The first is the content of what is being taught at both the tertiary and post-secondary level (Blewitt & Cullingford, 2004) and the K-12 school system (Hopkins, Damlamian, & López Ospina, 1996; Paige et al., 2008; Robertson & Krugly-Smolka, 1997). The second is pedagogy, with some scholars suggesting that sustainability education requires a constructivist approach to teaching (Firth & Winter, 2007), an ecopedagogy—a critical pedagogy of environment—that “overcomes the anthropocentrism of traditional pedagogies” (Gadotti, 2010, p. 205), and perhaps a complete new paradigm of teaching to account for a holistic perspective on education for sustainability (Sterling, 2001). The third domain is the education and professional development of those who are responsible for implementing education for sustainable development (ESD), namely teachers. Furthermore, UNECE (2012) proposed a number of core ESD competencies for educators, organized into the following four clusters:

- Learning to Know (refers to understanding the challenges facing society both locally and globally and the potential role of educators and learners);
- Learning to Do (refers to developing practical skills and action competence in relation to ESD for sustainable development);
- Learning to Be (addresses the development of one’s personal attributes and ability to act with greater autonomy, judgement and personal responsibility in relation to sustainable development); and
- Learning to Live Together (contributes to the development of partnerships and an appreciation of interdependence, pluralism, mutual understanding, and peace).

The study presented in this chapter focuses on the latter domain: the education and professional development of teachers in faculties of education.

### **The Problem: Reorienting Teacher Education Toward Sustainability**

In 1998, the United Nations Educational, Scientific and Cultural Organization (UNESCO) initiated work on reorienting teacher education toward sustainability, which led to:

the formation of an International Network of Teacher Education Institutions (McKeown & Hopkins, 2007); a series of monographs on integrating ESD into teacher education programs (Hopkins et al., 2007; Hopkins & McKeown, 2005; McKeown, 2006; Tilbury, 2011); a list of relevant competencies for educators (UNECE, 2012); and, a reoriented teacher education curriculum (UNESCO, 2010). The reorientation of teacher education, often referred to as the “mainstreaming” of education for sustainability in teacher education, means the “incorporation of ESD philosophy, content, and activities within an initial teacher education system to such an extent that ESD becomes embedded within all policies and practices” (Ferreira, Ryan, & Tilbury, 2007, p. 226). Despite the work of UNESCO, the International Network, and others, we are not aware of any studies that report such mainstreaming of a teacher education program in any country. Quite to the contrary, Nolet (2009), for instance, writes that “today, sustainability education is almost nonexistent in the teacher education curriculum in the United States” (p. 430). Ferreira et al. (2007) report a similar situation for Australian teacher education programmes. Despite the lack of mainstreaming, there are studies documenting the integration of ESD into teacher education programs around the world to various degrees (Alsop, Dippo, & Zandvliet, 2007; Down, 2006; Ferreira et al., 2007; Fien & Maclean, 2000; Firth & Winter, 2007; McKeown & Hopkins, 2007).

Based on reports by members of the International Network of Teacher Education Institutions, Hopkins and McKeown (2005) have identified four types of challenges in the reorienting of teacher education toward ESD (see also Down, 2006; Falkenberg & Babiuk, 2014; Firth & Winter, 2007). These four types of challenges are:

- lack of awareness, support, and resources at the teacher education institutional level;
- lack of prioritizing sustainability in the educational community;
- the common approach to reforming education systems and structures (that does not give consideration to education for sustainability and is generally undertaken within the traditional disciplinary curriculum frameworks, which makes the incorporation of the transdisciplinary education for sustainability a challenge); and,

- lack of establishing and sustaining partnerships (lack of partnerships with communities in which education for sustainability is taking place and lack of coordinated efforts between different branches of governments besides ministries of education). (Hopkins & McKeown, 2005, p. 30)

### **Focus of the Study: Reorienting Teaching Education for Sustainability in Canada**

In Canada, education, including post-secondary education, is under provincial jurisdiction. Teacher education programs that prepare students for certification in the K-12 teaching profession are offered as undergraduate or graduate programs. Some graduate programs (some masters and doctoral programs) may be offered to practicing teachers as systematic professional development. The focus of this study is to inquire into the current role of ESD in undergraduate and graduate teacher education programs in Canadian universities.

Currently, there is very little known about this topic in Canada. There are studies on particular initiatives around the teaching of particular courses by individual course instructors (Alsop et al., 2007; Diplo, 2013), and there are only a few baseline-type studies, including Falkenberg and Babiuk (2014) and Swayze, Creech, Buckler, and Alfaro (2012). The former is a baseline study using in-depth interviews on the status of ESD in the preparation of teachers in faculties of education in Manitoba and the latter uses survey and follow-up interviews on the status of ESD in Canadian faculties of education. The study reported in this chapter builds upon the baseline study by Swayze et al. (2012) by using in-depth interviews with a sample of faculty members from selected Canadian faculties of education to explore promising practices and initiatives aimed toward a reorientation of teacher education for sustainability in undergraduate and graduate programs, in particular, at Canadian faculties of education.

## **Method**

### **Case Study Approach**

The general focus of the study was to inquire into the current role of ESD in

undergraduate and graduate teacher education programs at Canadian universities. The study had two specific research questions: (a) What are the ESD-related course designs, pedagogical approaches, and other initiatives used in Canadian teacher education programs (undergraduate and graduate) to help school teachers develop competencies for ESD? (b) What are the challenges and enablers faced by university instructors who intend to develop those competencies? In order to address these research questions, this study explored multiple cases within a bounded system (Creswell, 2007), where the bounded system included the teacher education programs at Canadian universities. The design of the study was a single-case, multiple-units case study (Yin, 2009) where the Canadian teacher education context was the single case of the world-wide teacher education context and the selected teacher education programs of the selected faculties of education in Canada were the different units of analysis within the single case. Due to the lack of understanding of the status of ESD in Canadian teacher education programs, this study had the character of an exploratory case study (Yin, 2009).

#### **Site Selection, Data Collection, and Analysis**

The following purposive sampling procedure was used to identify interviewees for the study. Based on initial findings from the study by Swayze et al. (2012), four faculties of education (the units of the case study) were identified as particularly noteworthy in their attempts to integrate ESD into different aspects of their undergraduate and/or graduate programs. Key faculty members in each of the four institutions were identified, who, in turn, identified other members of their faculty who had contributed to the integration of ESD. In total, twenty faculty members across all four faculties of education were interviewed using semi-structured, in-depth interviews in face-to-face meetings or by phone by Sims between April and September 2012. The guiding interview questions were designed to explore interviewees' response to the two research questions of the study. The interviews were transcribed verbatim for analysis, which consisted of coding and interpretation processes (Coffey & Atkinson, 1996; Creswell, 2007; Maxwell, 1996) using the two research questions as guides. Nvivo (Muhr, 1997) was used to select and code data segments, create memos, and build families of codes based on themes that



emerged from the data. Member checking was used for feedback on the accuracy of data presentation. Relevant documents (referenced below) were also reviewed.

### **The Case Study Sites**

In the presentation of the study results, real names of participants are used unless otherwise stated, a practice approved by the research ethics board and the respective participants. Participants were from faculties of education from four different universities (the units of this case study). Two of them are located in Toronto, the largest city in Canada in the province of Ontario: the Ontario Institute for Studies in Education /University of Toronto (OISE/UT), and York University. The other two universities were located in Vancouver in the province of British Columbia: the University of British Columbia (UBC) and Simon Fraser University. (SFU). The results are organized and reported by university.

## **Results**

### **Case 1: OISE/UT**

OISE/UT has a long-standing focus on social justice and equity issues as well as a more recent one on environmental education. Particularly under the leadership of Dr. Hilary Inwood, initiatives to integrate sustainability and environmental education at OISE/UT started in 2007. Over the years, she, in close collaboration with other individuals and university groups, worked to realize their goals through what has become the Environmental & Sustainability Education (ESE) Infusion Initiative (n. d.). This initiative :

Aims . . . to support one of the tenets, Social and Ecological Responsibility, of OISE's new institutional vision. It provides a nexus for ESE-related groups at OISE . . . to share information, co-develop events and programs, and work towards a greater level of sustainability in all that OISE does. (Environmental & Sustainability Education Infusion Initiative, n. d., p. 1)

**Awareness-raising initiatives.** OISE/UT implements a variety of creative initiatives that aim to reduce its impact on the environment, and raise awareness amongst students and staff who

frequent the institute. Examples of its activities included, promoting awareness through their Fatal Light Awareness Program to prevent migrating birds from hitting their campus high-rise building, or motivating people to walk the stairs by installing art in the stairwells. In 2012-2013, they installed four eco-art projects showcasing a variety of student-created pieces of art related to ESE environmental and sustainability education (for more details: [http://www.oise.utoronto.ca/ese/ESE\\_in\\_Practice/Eco-Art\\_Projects.html](http://www.oise.utoronto.ca/ese/ESE_in_Practice/Eco-Art_Projects.html)). In 2012-2013, OISE/UT created a community learning garden to:

Support integrated learning about ESE in our graduate and teacher education program. . . . The garden is found in six large concrete planters at the front of the OISE/UT building, each with its own theme related to the foundational concepts of OISE/UT's programs: Aboriginal Education, Equity and Inclusive Education, Holistic Education, Creativity in Education and Environmental and Sustainability Education. Our hope is that these gardens will become a symbolic and physical manifestation of collaborative learning around social and ecological learning across all of OISE/UT's programs, and act as demonstration sites to inspire our students to integrate nature-based learning into their own personal and professional lives.

([http://www.oise.utoronto.ca/ese/OISE\\_Learning\\_Garden/index.html](http://www.oise.utoronto.ca/ese/OISE_Learning_Garden/index.html))

OISE/UT also created a website with resources for pre- and in-service teachers (<http://www.oise.utoronto.ca/ese/>).

**Undergraduate teaching.** The integration of sustainability and environmental perspectives into OISE/UT's undergraduate program was manifested in a number of ways including:

- Environmental and sustainability learning goals, which are listed explicitly in the vision for the qualities with which students graduate from OISE/UT's programs (OISE/UT, 2011).
- The cohort system used in teacher education programs, which allows for theme-based learning groups. Within the courses offered in each particular cohort program, that theme

was woven into all of the courses. OISE/UT offered a Global Citizenship and Sustainable Development secondary cohort and an elementary Social and Eco-Justice cohort. At the highest level, cohort instructors took a team approach, regularly discussing student progress and how best to integrate the theme across the disciplines. Ideally, students' practica complemented the desired thematic focus, allowing students to see best practices in action. However, in less-than-ideal conditions, there was little to no time for instructors to meet, and high instructor turn-over makes consistent integration challenging.

- The offering of an elective course linked to sustainability/environmental education. Dr. Inwood made an effort to provide some theory in her ESD elective, but also built bridges with the community by taking students on field trips, and by having local, non-governmental organizations come to give seminars. For the 2013-2014 academic year, this elective, along with 17 others, was, unfortunately, cut as a cost-saving measure.
- The hiring of a doctoral student with expertise in ESD to infuse environmental and sustainability education themes across the broader curriculum offered to B.Ed. students, through, for instance, presentations on environmental and sustainability education in many methods courses. In 2010-2011, this doctoral student spoke to 750 students. Funding for this position was provided through the Teacher Education Program Assistant (TEPA) program. In 2013, funding for this doctoral student was cut by half as a cost-saving measure.
- The integration of ESD into some of the curriculum and instruction courses. Jane Forbes, an elementary science educator in the program, argued that instructors must look to infuse sustainability education concepts into their courses, not just have a one-day intervention. Forbes explained how "in science, we want a critical question that could guide what we look at throughout our six classes with students like: 'How can we promote sustainability and environmental responsibility amongst diverse learners?'"
- The opportunity for interested teacher education students to have their experience and knowledge in ESE to be formally recognized through a certificate in environmental leadership. There is no financial cost associated with pursuing this certificate. To earn the

certificate, students must complete the following three components: (a) a formal learning component (which includes course work, mentorship, or intern learning opportunities); (b) a co-curricular learning component (which includes attending ESE talks, workshops, or field trips); and (c) a service learning component (which includes volunteering or participating in an ESE initiative at OISE/UT). In 2012-2013, the pilot year for this initiative, 60 students earned the Environmental Leadership Certificate. The hope is to be able to open this certificate program to graduate students as well (for more details see [http://www.oise.utoronto.ca/ese/EE\\_Leadership\\_Certificate.html](http://www.oise.utoronto.ca/ese/EE_Leadership_Certificate.html)).

**Graduate teaching.** In terms of ESD opportunities for graduate students:

- OISE/UT offered an Adult Education for Sustainability Certificate Program. This program was also open to the general public.
- Graduate students in the Master of Teaching Program attended a one-day conference on ESD as part of their program.
- A variety of graduate courses related to ESD have been offered, including: Adult Education for Sustainability; The Pedagogy of Food; Environmental Studies in Science, Math and Technology; and Environmental Health, Education and Policy Change.

Furthermore, OISE/UT offered a mini-research grants program, “Inquiry into Practice,” which has been used to investigate ESD-related topics. David Montemurro, lecturer and coordinator of the Critical Global Citizenship and Environmental Sustainability teacher education cohort at OISE/UT, explained:

For the past decade we've had an “inquiry into practice.” . . . They're mini-research grants to support school-university partnerships that are thematic so recently it was teaching global matter in local classrooms. Profs and teachers put in an idea around a question, and this time it was “How are students making sense of global content into local context in the greater-Toronto-area classroom?” That research money provides instructors the opportunity to do things other than just teaching—an inquiry project to think deeply about

something and to work with schools.

### **Case 2: York University**

York's Faculty of Education ESD work was built on a very strong focus on equity and social justice issues in teacher education (Dippo, in Hopkins & McKeown, 2005). According to Dr. Dippo, over the past 15 years, in order to better integrate a focus on the environment, elective courses have been offered in both the undergraduate and graduate programs. An effort has been made to integrate the three components of ESD into the overall teacher education program through a specific core course in the preservice program. He suggested that one of York's particular strengths in the area of ESD lies in providing a joint graduate diploma with the faculty of environmental studies and close collaboration with Learning for a Sustainable Future (see <http://www.lsf-lst.ca>) and the UNESCO Chair on Reorienting Teacher Education to Address Sustainability.

**Undergraduate teaching.** The integration of ESD into the undergraduate program in the Faculty of Education at York University was manifested in a number of ways, including:

- Offering two electives related to ESD. Dr. Dippo taught his ESD elective course on campus, but outside the conventional classroom (i.e., in the outdoors), actively making the link between the environment where students learn, and the students' future teaching practice. Examples included finding authentic places which would act as appropriate learning environments and teaching mock lessons from there. For instance, on a dull November day, to commemorate Remembrance Day, a future teacher recited a poem by Wilfred Owen and then had his classmates "write letters from the trenches," in the drizzle, with dull pencils, crouching against a concrete wall.
- Infusing ESD across courses in the undergraduate program by, for example, replacing a mandatory course in general teaching methods by a course called "Teaching and Learning for Inclusive Classrooms," Dr. Dippo described the course as follows:

That course was ostensibly about general teaching methods—just focussing on lesson and long-range planning, curriculum documents. . . . About five years

ago there was an effort to come up with a broad vision of a more coherent, compelling course. Those teaching it worked on revisions for a year or two. . . . Now, this course has an explicit social justice agenda and it's where climate change and environmental education are taken up. That was a pretty remarkable achievement where the course had to be redesigned and approved at all levels. . . . However, in practice, that course is sometimes team taught but more often it's taught by an individual and the extent to which that person has knowledge in those areas, that's the extent to which EE/ESD gets taken up. But it's there, and that's significant.

**Graduate teaching.** At York University, a joint graduate diploma in ESE has been offered through the Faculty of Education and Environmental Studies. In this program, students must take courses from both faculties, with a few courses being mandatory and the rest elective. Dr. Diplo explained:

We've a fairly good mix of interested people some of whose lives are grounded in schools and others whose lives are grounded in the NGO community. . . . For those who want to learn about environmental sustainability, I think the collaboration between the two faculties serves them well. . . . I think that this jointly-offered graduate diploma enables the faculty of education students to work more closely with community activists and that has been a good thing.

### **Case 3: UBC**

According to Dr. Mark Edwards of UBC, with respect to the broader university context, UBC has a long history of being a “sustainability mecca.” UBC’s strategic plan, called Place and Promise, led to the creation of the UBC Sustainability Initiative, which further developed dedicated resources for support faculty, staff, and students in their ESD work. More specifically, within UBC’s Faculty of Education, Indigenous scholarship is a strong area of expertise. These experts, in collaboration with other faculty members, help define what ESD means at UBC’s Faculty of Education. Additionally, UBC’s Faculty of Education includes a diverse group of

individual faculty members whose areas of expertise closely and innovatively link the environment with pedagogy and social justice. ESD work is highlighted in research, graduate courses, and in UBC's teacher education program. Much work has been done through the creation of a common vision for the faculty, particularly through groups like the Environmental Education Caucus (Environmental Education Caucus, 2011), and the creation of sustainability-focused graduate programs in the Faculty of Education. According to Dr. Edwards, some part of this work has been university-driven and other parts have been grassroots-driven, particularly through student initiatives.

**Undergraduate teaching.** The integration of ESD into the undergraduate program in the Faculty of Education at UBC has been manifested in a number of ways, including:

- Having had a thematic cohort that integrated sustainable education and social justice in the two-year program for elementary teachers. However, this cohort is not offered anymore.
- Offering electives related to education for sustainability, including a long-standing outdoor education course.
- Several initiatives for infusing ESD into different courses of the program. For instance, Dr. Susan Gerofsky, in collaboration with graduate students and colleagues from Land and Food Systems, has created a learning garden on the UBC campus. She recognized that if learning through gardens in schools was to be supported, future teachers would need to learn to teach their subject areas (e.g., history, music, science, and mathematics) in a garden through their university course-work. A learning garden can take many forms depending on the specific context: at UBC, after years of advocacy, Dr. Gerofsky and her team built the Orchard Garden, which includes a small-scale version of a traditional Chinese market garden and reflects the historical relationship of Chinese-Canadian and Musqueam First Nation cultures. In 2011-12, over 500 preservice teachers from various disciplines engaged with the garden through outdoor learning experiences. Dr. Gerofsky said that to maintain a learning garden one needs to get a broad spectrum of people involved in the planning, construction, and use of the garden (e.g., students, faculty, administration, planning and operations, and

community members). Accessing available grants is also important. The challenges that she has encountered in sustaining a learning garden have been: setting up an online commons (to share ideas) that is actually meaningful to users; engaging a broad and diverse community in garden activities; learning from, and valuing, different cultural approaches, and gardening methods; and overcoming logistical challenges, like organizing volunteers.

- Various initiatives to integrate ESD into undergraduate courses. Dr. Gerofsky has conducted research linking math concepts with the natural environment, including using the learning garden to provide opportunities for students to do math in a living environment. She explained:

In the winter we did workshops with student teachers on math and body measurements in the garden. . . . We researched different ways that people have measured spaces and objects with our bodies, using a pace, or a hand-span, or the width of a thumb to measure distances like a foot or an inch. We'd think about seed packets and how far apart particular seeds have to be planted. . . calculate how many packages of seeds were needed to seed a given garden bed. We used trigonometry to figure out how tall a certain tree was, and noticed where the shadow falls at different times of day. . . . We thought about ideas like embedding shapes in the walls and pathways of the garden that embody mathematical ideas and puzzles like, for example, the 17th-century Königsberg Bridge problem.

Furthermore, other instructors have done workshops on teaching history, drama, science, and classroom management in the garden. In the summer, they offered courses for in-service teachers on how to meaningfully integrate a learning garden into their teaching.

Dr. Charlene Morton, an instructor at UBC, discussed how creating music relates to the concepts of sustainability and how these might be used in a classroom. Through activities like the “sound walk,”<sup>1</sup> she has taken students outside so that they can become

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<sup>1</sup> See the National Film Board of Canada's documentary *Listen* by Murray Schafer for more



more aware of sounds present in the environment through active listening and a contemplative practice, reflecting upon how we judge these sounds and how these relate to underlying social and environmental issues in the community. Dr. Morton elaborated:

What does integrating sustainability across the curriculum mean in the context of music education? To help teacher candidates understand . . . we begin by considering the commercial and true costs of the musical instruments in well-equipped university music classrooms. Following initial discussion . . . teacher candidates learn about the instruments' maintenance and replacement costs. . . . For example, we find out how many new plastic recorders are purchased yearly and what this means in assessing how many are disposed of. This . . . usually leads to a discussion about the wide discrepancy among schools in what programming they can afford and the assumption that, for some, band and string programs are a right even though [they] may or may not be environmentally, culturally, or economically sustainable. The most salient question is “What’s the most sustainable musical practice?” It doesn’t take long . . . to surmise that singing is the best option. . . . Nonetheless, more time is needed to accept singing as a sustainable alternative to playing with a variety of musical toys (acoustic/electronic) and surrender to the musical temptations of consumer marketing. I also explore sustainability through a PlayList assignment: students share personally-selected recorded music by posting it to an online forum. They comment about each others’ reviews incorporating musical, social, and cultural aspects of their choices. . . . However, it’s too difficult for one assignment to foster a critical awareness about the economic, social, or environmental impact of our musical appetites.

**Graduate teaching.**

- Robert Vanwynsberghe explained recent planning initiatives focussed on sustainability:

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details.

[UBC recently examined] the principles and some of the possibilities of advancing sustainability programming in a way that brought together all of the departments. We met for a year. . . . we have a Master's of Arts in sustainability and a Ph.D. program coming forward, a Master's of Education program,<sup>1</sup> all in the faculty of education, all focussed on sustainability. We also have certificates, one in urban farming, another in teaching using gardens, and another in outdoor and environmental education. . . . The other piece is a seminar series which argues for education for sustainability as a kind of field. It provides these kinds of rock-star people as resources who can come in and talk to others in the community and to university classes.

- Through the Peru Summer Institute called Ecology, Technologies and Ecoliteracies (see <http://www.students.ubc.ca/global/learning-abroad/group-study-programs/current-programs/peru/>), indigeneity and sustainability are brought together. Two elective courses have provided an international service-learning experience with Kichwa-Lamista communities in the High Amazon. These 4-week courses took place at the Sachamama Center for Biocultural Diversity in Lamas, Peru.
- Dr. Vanwynsberghe described an inter-institutional graduate-level course using a transdisciplinary approach as follows:

We had four institutions, UBC, Simon Fraser University (SFU), Emily Carr, and British Columbia Institute for Technology (BCIT); we had students and instructors from all four places. We also had government employees who sat in the course. We ran it out of Science World one summer and out of another building downtown on another occasion. The focus was stakeholders' issues on the building of the Urban Trail. We brought together stakeholders and asked them what they saw as issues; they may raise an issue of riparian zones, or women's safety. Then a group of students would work together to address

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<sup>1</sup> See link <http://pdce.educ.ubc.ca/med-in-curriculum-studies-ejs1-2/> for details.

these issues and then brought them back to the stakeholders and in some cases implemented the solutions with them. Each summer we would pick up where we left off, we did that for three summers. Again this was all towards creating the possibility for inter-institutional courses for moving forward. At Emily Carr they're all artists and designers. They bring an aspect to your course that, until you experience it, you can't believe how valuable it is. For example, they would say, here's the stream, if we built this bridge, and they would build it with designer software, this is how it would protect the environment. SFU students are extremely strong and very community-oriented and BCIT are purely technical-oriented, we had this nice complement.

#### **Case 4: SFU**

SFU's Faculty of Education has provided leadership in innovative pedagogies for teaching for and about ESD at both the undergraduate and graduate levels. It has, arguably, offered the longest-standing environmental education summer institute in North America, now in its 44th year of continuous course offerings. According to Dr. David Zandvliet, SFU's non-departmentalised structure at the Faculty of Education allows certain innovative collaborations in both teaching and research.

**Undergraduate teaching.** The integration of ESD into the undergraduate program in the Faculty of Education at SFU manifests in a number of ways, including:

- A Sustainability Education and Environment of Diversity (SEEDs) cohort in the Faculty of Education's undergraduate teacher education program.
- Elective courses with a focus on environmental education. Dr. Zandvliet has offered two environmental education courses which share a common process, approach, and broad focus, yet with unique contexts and content. One has taken place with the Haida Gwaii First Nations community, and another in metro-Vancouver. The latter was created 12 years ago to be more logistically accessible for students. To realize these courses, a "strategic partnership" was created with the communities involved. Establishing courses like these

involves a multi-year commitment as building these strong, long-standing, respectful relationships with communities takes time. Community members act as resource people and have input into the course, including teaching and assignments. The focus is on how the community works: students learn about the aspects that sustain a community (e.g., social programs, and waste management systems). The course outline reflects a process of inquiry, experiential learning, and community engagement more than a specific content. Zandvliet and Brown (2006) describe how these courses directly link what the students are experiencing in the communities with their future teaching. By living a place-based pedagogy, pre- and in-service teachers interpret curriculum in a way that focusses learning within the context of a physical community. For students in the sustainability cohort, an “alternative” academic year—one that runs January to December—has provided a unique opportunity to take courses in the summer, thus enabling student-teachers the possibility to integrate and experiment with their new ideas and understandings into their final practicum in the fall term. The theme of the metro-Vancouver course is “city as a living organism,” and has been open to preservice and in-service teachers.

At SFU, these unique courses have included twice the credit hours of a “normal course” (eight credit hours) usually lasting three weeks in the intensive residential format or over six weeks in the intersession format. Also, these courses are not graded courses. According to Dr. Zandvliet, being ungraded seems important as the courses become “more about what students want to experiment with . . . , more inquiry and open-ended” (Zandvliet, personal communication). Though subject to some critique, these courses’ long history and faculty advocacy helps maintain their longevity (see Zandvliet & Brown, 2006).

**Graduate teaching.** The Faculty of Education at SFU offers a two-year master’s program focusing on environmental education. According to Dr. Zandvliet, in the two-year master’s program, students stay together in a cohort and take different courses, part-time, on alternate weekends, and they do intensive summer-school courses. A summer course could include an international experience (e.g., a three-week field course in Australia). This program

has also included an action research component in which students study their own practice to become more critically reflective and in which they propose teaching projects for their own milieu. Advisors support students through this process. This program has also included a project-based comprehensive exam.

## **Discussion**

### **Promising Practices Developing Competencies in ESD**

As mentioned in this chapter's introduction, UNECE (2012) identified a number of core competencies for ESD educators. The promising initiatives described in this chapter reflect many of UNECE's (2012) recommendations to integrate ESD approaches across the curriculum in innovative ways, and to provide ongoing professional development opportunities for teachers, such as through critically reflective practice. The various initiatives support UNECE's (2012) recommendation that establishing partnerships between education and other sectors ensures that the wider systems embrace ESD. Furthermore, these initiatives reflect a process of engaging people in the university and the community in meaningful ways in the planning and implementation of learning projects. These processes of inclusive collaboration within and outside of institutions to problem-solve around locally-relevant, real-world issues, have potential for creating interdisciplinary opportunities that reflect ESD goals and strategies.

For instance, Dr. Zandvliet's environmental education courses at SFU and Dr. Vanwynsberghe's inter-institutional graduate course at UBC are clear examples of inquiry-based, integrated, and locally-relevant learning opportunities in which students may take action on real world problems directly with stakeholders or in their field placements (practica). UBC's and York's joint master's programs are examples of programs that try to increase integration by breaking down the traditional disciplinary "silos" still very common in post-secondary education today. These examples enable, to a greater or lesser extent, the development of competencies in systems thinking, problem-setting, critical reflection, visioning, and creative thinking (UNECE, 2012). The programs in these the cases, discussed in this chapter, provide opportunities for learners to develop competencies through active engagement with different groups across

generations, cultures, places, and disciplines. They also help learners clarify their own (and others') worldviews through dialogue and the recognition of the existence of alternative frameworks (UNECE, 2012). In terms of the UNECE (2012) "Learning to Do" competencies, these university experiences might enable future educators to better create opportunities for sharing ideas and experiences without prejudice and preconceptions; to work with different perspectives on issues; and to connect learners with their local and global spheres of influence. In regards to the "Learning to Be" competencies, these promising practices may help educators be more inclusive of different disciplines, cultures, and perspectives, including Indigenous knowledge.

The promising practices shared in this chapter may vary in scale, but they are clearly connected to their communities. For example, OISE/UT's work with local non-government organizations (NGOs); UBC's speaker' series, or the "sound walk" activity, are inherently community-based. Furthermore, UBC's learning garden, Peru's summer institute and inter-institutional graduate course, and SFU's environmental education courses, are larger-scale initiatives, but also very much embedded in the local and natural environment. In regards to UNECE's (2012) "Learning to Do" competencies, these examples, as well as Dr. Dippo's teaching outdoors program at York University, make use of the natural, social, and built environment, including their own institutions, as a context and source of learning. To a greater or lesser extent, they all facilitate the assessment of potential consequences of different decisions and actions. With respect to competencies related to "Learning to Be," these activities, are, in general, inclusive of different disciplines, cultures, and perspectives. These, and other examples, like OISE/UT's mini-research grants or SFU's master's action research project, provide opportunities for practitioners to be critically reflective, creative, and innovative.

### **Challenges and Enablers of Reorienting Teacher Education toward Sustainability**

**Challenges.** This study suggests that there are challenges in reorienting faculty of education programming toward sustainability. The first challenge is programmatic. The

undergraduate programs of the four cases of this study were all one-year programs at the time, which limited the amount of time available for introducing stand-alone ESD courses to the roster of elective courses. Only where ESD was integrated into already existing courses has ESD found its way into courses that reached all students (e.g., OISE/UT and York). However, the new two-year teacher education programs in Ontario (including those at York and OISE/UT) might open up opportunities for new courses with a stronger, more direct focus on ESD. Further, the current elective courses integrating ESD are vulnerable as they can fall prey to changing institutional priorities. At the moment, ESD seems to be a priority area in the four case universities; however, priority areas can, and often do, change over time. For instance, in spite of the strong focus on sustainability at OISE/UT, its ESD undergraduate elective was cancelled in the 2013-14 academic year. This potential challenge is further exacerbated by a turnover of deans and others in leadership positions.

The second type of challenge concerns logistical matters. Some of the innovative approaches to ESD in teacher education programs require particular logistical accommodations in terms of time and place, which has, for instance, been the case for SFU's environmental education courses. Logistical challenges also play a role in cross-disciplinary programming, which can be complex and time consuming. This challenge was articulated by many interviewees, but particularly with respect to the community-based courses (e.g., SFU's environmental education course) and programs which attempt to meaningfully integrate ESD throughout a theme-based cohort's course work. These challenges align well with the larger challenges inherent in efforts to integrate ESD into universities—challenges identified by, for example, Lidgren, Rodhe, and Huisingh (2006), and Stephens et al. (2008).

**Enablers.** Although challenges exist in implementing ESD initiatives in teacher education programs (Hopkins & McKeown, 2005), the initiatives discussed in this chapter show how some of these barriers can be overcome by, for example, enabling interdisciplinary learning opportunities; collaborating with a community of experts to tap into local knowledge; and by providing direction with a clear university-wide mandate to integrate ESD into university

activities.

In the cases discussed in this chapter, there were many factors that provided a fertile context, both at institutional and broader levels, for the various practices to occur. At an institutional level, which, depending on the context, could mean the faculty or university level, the champions of ESD programming built upon their institutions' strengths. A successful approach was to begin program development by coming to a better understanding of their colleagues' views and perspectives, and what resources already existed at that particular institution or part of the institution. The evolution of OISE/UT's Environmental and Sustainability Education Infusion Initiative provides a glimpse of how this was done. Swayze et al. (2012) found, as confirmed by some participants in the current study, that the UN's "Decade on ESD" contributed significantly in helping early adopters to create a legitimate space for ESD debate and action across their faculties. However, while faculty and university integration of ESD initiatives is increasing, the study reported here affirms Swayze et al.'s (2012) findings that ESD adoption is still primarily based on individual faculty members' commitment than on a faculty-wide response.

As with most Canadian universities (Swayze et al., 2012), these cases all have some sort of policy related to sustainable development. With respect to a vision or clear mandate for ESD, in all case contexts, some kind of inclusive process was facilitated to create a guiding vision or document for the work they were doing at a faculty and/or university level. At OISE/UT, for example, these included: the creation of a vision statement for the Environmental and Sustainability Education Infusion Initiative, its *Learner Document*, which outlines capacities, including ones directly related to environmental and sustainability education that they are trying to embed through various faculty of education programs; and the *DEEPER* guide, *Deepening Environmental Education in Pre-Service Teacher Education Resource* (Inwood & Jagger, 2014), which was created collaboratively, via a provincial roundtable on EE. At UBC, guiding documents have included: *Transforming Sustainability Education at UBC: Desired Student Attributes and Pathways for Implementation*, led by the University Sustainability Initiative



Teaching and Learning Office; the *Environmental Education Caucus Green Paper*, created by the Environmental Education Caucus/Sustainability Working Group; and a *Faculty of Education Plan*. This process of planning together has provided significant opportunities for people to get to know each other and to build community. As mentioned previously, participatory decision-making is an important characteristic of ESD (McKeown, 2006; UNECE, 2012). Sinclair, Diduck, and Fitzpatrick (2008) stress the importance of inclusive planning processes since meaningful participation can result in participant empowerment and learning. Directly addressing challenges identified by Hopkins and McKeown (2005), such as having a clear mandate, helps raise awareness and prioritize sustainability in the education community. Moreover, when there is a clear mandate, it gives legitimacy to ESD work and provides space where individuals can pressure institutions and expect them to provide resources for these initiatives.

A challenge identified by participants in this study, when collaborating on ESD, has been the search for appropriate language (especially when creating guiding documents like those discussed above). This challenge was also identified by Stephens, Hernandez, Román, Graham, and Scholz (2008) in their findings. Most interviewees articulated the need to look critically at the language being used and the concepts represented. Depending on the context, a language should be used that will enable collaboration and understanding, and one that will not create barriers. For example, at OISE/UT, they chose the expression “environmental and sustainability education,” and at York, the acronym “ESD” was commonly used.

Logistical supports at an institutional level are also important. These could include support for the overall coordination of ESD initiatives or enabling collaboration with national and international organizations. OISE/UT provided release time for an “infusion lead” in its Faculty of Education. Release time and funding support are two particularly important enablers identified by Hopkins and McKeown (2005). UBC created a University Sustainability Initiative Office to coordinate a fully-integrated, university-wide approach to ESD. York University supported broader national and international ESD work by providing office space to house the

Learning for a Sustainable Future Program and Dr. Chuck Hopkins' UNESCO Chair on Reorienting Teacher Education to Address Sustainability. Supportive institutional leadership, as a central enabler for reorientation in faculties of education, has also been identified in other studies, including Falkenberg and Babiuk (2014).

Faculties of education are grounded within a broader educational context. Interviewees identified outside enablers that have helped create a fertile environment for ESD initiatives at universities. Across Canada, much work has been done by provincial and territorial ministries of education, as well as other organizations, to build awareness, and to support programming and policy change consistent with ESD (Buckler & MacDiarmid, 2013; Swayze et al., 2012). Findings showed that recent Ontario and BC provincial EE policies (i.e. *Acting Today, Shaping Tomorrow* in Ontario and *Environmental Learning and Experience* in BC) served as enablers for ESD initiatives in faculties of education—affirming Hopkins' and McKeown's (2005) recommendation that ministries of education and faculties can mutually support each others' work. For example, Dr. Inwood (OISE/UT) noted how in 2007, the forthcoming Ontario environmental education policy helped create a legitimate entry-point to discuss the integration of ESD into OISE/UT's B.Ed. program. Many interviewees from UBC and SFU mentioned how helpful BC's Ministry of Education curriculum document, coupled with a general appreciation for sustainability in Vancouver, have been in terms of enabling the integration of ESD into their undergraduate and graduate programs.

### **Conclusions**

Overall, as this study illustrates, preparing for competencies in ESD involves meaningful and experiential learning in nature and communities, and connecting with place and people. The importance of building partnerships was seen in the close collaborations with colleagues, students, and community organizations. Moreover, the initiatives studied highlight the importance of “thinking outside the box” to provide inter-disciplinary and inter-institutional learning opportunities that problem-solve around real-life issues within communities and the

environment. Indigenous perspectives were suggested to greatly enrich our understanding and practice of ESD. Inclusive and participatory decision-making processes were important with respect to engaging people meaningfully, building a broader support base, and raising awareness. These various initiatives highlight possibilities for integrating, into higher education, discussions that explore values and attitudes towards sustainability and social justice. Further, strong administrative support has helped to support individual and collective work on reorienting teacher education toward sustainability.

The study discussed in this chapter elucidates how faculties of education in four Canadian universities successfully integrated ESD into their teacher education programs through curriculum, pedagogical approaches, and ESD-related initiatives, and what challenges and enablers created the particular contexts for these initiatives. Others might consider adopting, adapting, and/or building upon these initiatives according to their specific contexts. The initiatives reported in this study align well with Hopkins and McKeown's (2005) *Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability*. Future research should involve assessing the impact of these promising practices on the awareness and ESD competencies of university students in faculties of education.

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