

Place-Based Environmental Education in the Ontario Secondary School Curriculum

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Abstract

This study reviews the Ontario secondary school curriculum in light of recommendations made by the 2007 Bondar Report, Shaping Our Schools, Shaping Our Future. It analyzes curriculum expectations and enrollment data for the purpose of reporting upon and providing recommendations for place-based environmental education. The extent and prescriptiveness of the coverage of place-based environmental education by subject, course, grade, and course progression or pathway are presented. Environmental education in Ontario does not have its own discrete compulsory courses and despite having been “embedded” in the curriculum, the important arenas of place-based environmental education are being applied inconsistently across the compulsory curriculum. Poor enrollment in electives shows that the focus of students remains elsewhere, fracturing progression of environmental education in Ontario’s secondary schools.

Resumé

Ce travail examine le programme d’études secondaires de l’Ontario à la lumière des recommandations formulées en 2007 dans le rapport Bondar, Préparons nos élèves – Préparons notre avenir. Nous analysons les attentes définies dans le programme et les taux d’inscription dans le but de formuler des recommandations pour favoriser une éducation à l’environnement axée sur les réalités locales. Nous présentons également en fonction des matières, des cours, des niveaux et des différents parcours académiques dans quelle mesure et avec quelle obligation cette approche est appliquée. En Ontario, l’éducation à l’environnement ne fait pas l’objet de cours obligatoires dédiés, et même si elle a été « intégrée » au programme, certains éléments importants sont parfois négligés. Les faibles taux d’inscription dans les cours à option témoignent d’un intérêt mitigé chez les étudiants, et freinent la progression de l’éducation à l’environnement dans les écoles secondaires de la province.

Keywords: place-based environmental education, curriculum, Ontario, secondary school, enrollment, electives, Bondar Report, field study

Introduction

Rooting environmental education (EE) in one's own community and outdoor environment is key to conceptualizing environmental education. Often referred to as "place-based" environmental education, this aspect of EE fosters student engagement in and connection to their immediate environment, grassroots innovation, and environmental stewardship. In Ontario, the report titled *Shaping Our Schools, Shaping Our Future* (OME, 2007b) recognized the importance of making opportunities for place-based EE a regular part of the classroom (Borland, 2015). Furthermore, the provincial *Standards for Environmental Education in the Curriculum* (OME, 2008), which "help curriculum writers devise and incorporate environmental education expectations and opportunities across the curriculum," recommend that the curriculum provide students with opportunities to:

1. Engage in authentic learning situations and interactions in their local environment (e.g., natural, built, cultural);
2. Explore and appreciate the outdoors, to help develop their understanding of the local environment;
3. Develop and communicate a sense of connection with the local and global environments; and
4. Demonstrate environmental stewardship by thinking globally and acting locally.

The question still arises as to how rooted place-based EE is in the curriculum in light of these and other changes made following the publication of *Shaping Our Schools, Shaping Our Future* in 2007. Using the secondary curriculum and environmental policy documents, as well as enrollment data from the Ministry of Education, this research aims to: determine the extent of place-based EE coverage in the compulsory Ontario secondary school curriculum; assess the prescriptiveness of the curriculum in this regard; and provide curriculum, as well as pedagogic and programming recommendations, to promote EE.

Literature Review

History of Environmental Education (EE) Curriculum in Ontario

From the late 1980s to the late 1990s, Ontario secondary schools offered two Environmental Science courses in grades 10 and 12. These courses contained units such as microbiology, environmental health hazards, and environmental air and water quality (Puk & Makin, 2006). Designated as "electives", these courses were offered by just over a quarter of Ontario schools (Cundiff, 1989). Under the Conservative government in 1998, the "stand-alone" Environmental Science courses, dedicated to EE, were removed from the curriculum (Puk &

Behm, 2003). Furthermore, the funding and infrastructure for outdoor education programs were cut (Kopar, 2013). In their stead, the Ministry made a decision to “infuse” environmental science content into other subjects such as biology, physics, chemistry, and geography (Puk & Makin, 2006). Described by many as a “patchwork approach” rather than a concrete plan, the new model did not sit well with the public (Puk & Behm, 2003; Environmental Education Ontario, 2003). Research which surveyed teachers on the coverage of the materials that were incorporated into other subjects from the cancelled Environmental Science courses indicated that very little time was spent in addressing environmental science topics or promoting ecological literacy in the curriculum (Puk & Behm, 2003).

In 2007, under the Liberal government, concerted efforts were made to improve the condition of EE in Ontario schools (Kopar, 2013). The Ministry of Education’s Curriculum Council convened a Working Group on Environmental Education with the mandate “to analyze needs and research successful approaches to teaching and learning about the environment in elementary and secondary schools” (OME, 2007b). Chaired by Dr. Roberta Bondar, the panel published the aforementioned report in 2007, titled *Shaping Our Schools, Shaping Our Future* (OME, 2007b). This publication, which will be referred to in this article as “the Bondar Report,” provided a new vision for reshaping EE in the province of Ontario.

The most significant change in the Bondar Report’s recommendations was the integration of EE into all grade and subject curriculum (OME, 2009). This was a significant shift from stand-alone courses to an integrated approach where the responsibility for EE lies with all educators. In terms of curriculum, the report recommended the incorporation of the policy vision of EE into all elementary and secondary subject-specific curriculum documents and the inclusion of environment as an overarching principle in the curriculum. With regard to the secondary curriculum, the report recommended that the curriculum:

1. Ensure that all secondary students are exposed to EE through its substantial presence in compulsory grade 9 Geography, grade 9 and 10 Science, and grade 10 Civics expectations (in recognition that secondary students have reached a critical capacity to engage more deeply in environmental education);
2. Identify and support opportunities to engage students in environmental action projects within the current Civics course;
3. Ensure that secondary students have the opportunity to take at least one additional course with an environmental focus during their senior high school program (preferable in grade 11 to maintain continuity); and
4. Identify interdisciplinary links for environmental education at the secondary level so that schools can offer integrated programs of courses with an environmental theme.

Responding to the Bondar Report, the Ontario Ministry of Education released *Acting Today, Shaping Tomorrow: A Policy Framework for Environmental Education in Ontario Schools* (OME, 2009). This led to curriculum makers' adoption of an integrated approach in which they embedded environmental curriculum expectations in the majority of grades and subjects. The framework also called for the development of EE resource documents to aid in the policy's advancement (OME, 2007a, 2011). It recommended the inclusion of Environmental Plans and EE Professional Learning Committees (at the school and board levels) and teacher support (to be achieved through pre-service teacher programs, additional qualification courses, and PD opportunities). The policy framework explicitly recognizes the importance of place-based education, as well as the value of "increasing student engagement by fostering active participation in environmental projects and building links between schools and communities" (OME, 2009). Traditional EE programs often focus on fundamental ecological concepts or global issues of environmental sustainability. Accessing a different scale, place-based EE allows students to examine their communities and regions as complex, relevant areas of study; promoting future citizens who will engage in community-based environmental stewardship and innovation. Although not without criticism (e.g., Pardy, 2010), these initiatives were well received by the mainstream media and the general public.

More recently, a number of studies have undertaken the task of identifying the continuing challenges of implementing EE in Ontario schools (Tan and Pedretti, 2010; Steele, 2011; Pedretti et al., 2012; OISE, 2013; Chowdhury, 2015; Mnyusiwalla et al., 2016). These challenges include overcrowded curricula, lack of alignment between curriculum and existing ministry expectations, a disconnect between conventional science and EE pedagogies, low priority of environmental education in schools, lack of resources, access to the outdoors, the need to raise teacher awareness of the EE policy documents, a deficiency in professional development and pre-service education in environmental and outdoor education, and improved accountability measures for EE programming and policy implementation at all levels.

Place-Based EE

Place-based environmental education has been linked to environmental education since its inception. Woodhouse and Knapp (2000) describe the key components of place-based education as:

1. Emerging from the particular attributes of place;
2. Being inherently multidisciplinary;
3. Being inherently experiential;
4. Having a philosophical agenda that is broader than "learning to earn;" and
5. Connecting the individual, community, and environment.

Place-based EE shares the components described by Woodhouse and Knapp (2000) but focuses on environmental study. It benefits both students and their communities by empowering them to develop solutions to local problems (Sanders, 2003; Barratt & Hacking, 2011).

Using first-hand experience and out-of-classroom study are important aspects of place-based EE because they: give relevance to topics which could otherwise remain as second-hand learning; provide pupils with opportunities to talk about their own world; offer students the chance to look closely at aspects of a local environment; and introduce the idea of environmental responsibility (Palmer & Neal, 1994). More recent avenues of place-based EE are applying a critical lens to the environment and the factors that shape it (Gruenewald, 2003). Educators and researchers have shown the enormous benefits, especially in secondary schools, of using place-based education within the context of eco-justice (Lowenstein, Martusewicz, & Voelker, 2010) to empower marginalized groups and forge intergenerational partnerships (Mannion & Adey, 2011).

Ontario Curriculum and EE

In Ontario, the Ministry of Education is responsible for the development of curriculum policy and resource documents, while school boards and schools are responsible for implementing them. Curriculum policy documents “identify what students must know and be able to do at the end of every grade or course in every subject in Ontario publicly funded schools” (OME, 2014). They are organized by subject (e.g., The Arts, Science, Business Studies, Canadian and World Studies) and by grade level, with one document for grades 9/10 for each subject, and another for grades 11/12 for each subject. The documents are reviewed for content and alignment with government policies and frameworks before they are published and implemented in classrooms (OME, 2014).

The core of curriculum policy documents consist of: critical foundational information about the curriculum and how it connects to Ministry policies, programs, and priorities; and the curriculum expectations (overall and specific expectations), including the knowledge and skills that students are expected to demonstrate by the end of the grade (OME, 2014). A curriculum policy document incorporates a number of courses. Each course has several strands (formerly known as units). Strands are defined by a set of overall expectations which “describe in general terms the knowledge and skills that students are expected to demonstrate by the end of each course” (OME, 2014, Canadian and World Studies, p23). There are also specific expectations within each strand.

Specific expectations vary greatly in their nature, depending on the subject, course, and objective. They range from the very explicit to the abstract. Within a specific expectation it is not unusual to find examples and/or sample questions. The examples and sample questions provide clarification, guidance, and/or possible directions for study. It is often not possible to pursue all of the opportunities in the examples and sample questions—the specifics are for departments,

teachers and students to decide upon in their individual contexts. This can empower educators and students to take control of their own education and tailor lessons to their needs and interests. On the other hand, concepts that are important to the public can be covered superficially or ignored if they are not made prescriptive enough. With public education's competing priorities (i.e., literacy, numeracy, equity), prescription may be the only means to ensure their inclusion.

Method

The objective of this study is to assess the depth and breadth of the Ontario secondary school curriculum in place-based EE. Two methods are employed: a content analysis of curriculum expectations in compulsory courses to identify opportunities for place-based EE and assess their prescriptiveness; and an examination of enrollment in elective course offerings with substantial EE content.

Curriculum Review

To obtain a secondary school diploma in the province of Ontario, a student must amass a total of 30 credits, of which 18 must be in specific subjects and are referred to as “compulsory” (OME, 2014). Within the 18 compulsory credits, some course choices are available. Compulsory credits are taken by all Ontario secondary school diploma recipients and, as such, the content in the variety of courses available represents the basic environmental curriculum.

Guided by the Bondar Report (OME, 2007b), those credits with the greatest potential for EE content were identified as those in Geography, Science, and Civics. The various courses, known as course types (i.e., open, academic, applied and workplace), can be available at multiple levels (OME, 2014). In addition, the following credits were also included: Career Studies, since it is often delivered in conjunction with Civics, and Environmental Science (workplace course type), which can be counted as a second compulsory science credit following grade 9 academic, applied, or locally developed Science. Table 1 lists the courses identified for review.

As the pathways through the Ontario curriculum stem from two main course types in grade 9, they are often referred to as the academic and applied pathways by educators and policy makers. The difference in place-based EE curriculum content between course pathways was assessed in this study.

To review the compulsory courses identified for curriculum review, a qualitative content analysis was conducted. Curriculum expectations are qualitative and diverse in nature. Their focus ranges from a skills basis to a content basis, and their prescriptiveness varies as a result. Eight EE themes were identified, in part derived from Godfrey (2010): politics, sociodemographic, systems, planning, immigration and settlement, ecological, sustainability, and climate. For

Table 1: Compulsory Courses Identified for Curriculum Review

GRADE	COURSE TITLE	TYPE	COURSE CODE
9	Issues in Canadian Geography	Academic	CGC1D
9	Issues in Canadian Geography	Applied	CGC1P
10	Civics and Citizenship	Open (0.5 credits)	CHV2O
10	Career Studies	Open (0.5 credits)	GLC2O
9	Science	Academic	SNC1D
9	Science	Applied	SNC1P
10	Science	Academic	SNC2D
10	Science	Applied	SNC2P
*11	Environmental Science	Workplace	SVN3E

*Included because it can count as a second compulsory Science credit (prerequisite is grade 9 academic, applied, or locally developed Science).

each course listed in Table 1, curriculum expectations (overall and specific), their associated examples, and sample questions were screened for any content and associated key words related to these eight themes. Raw counts of the presence or absence of any place-based EE content in each curriculum expectation were determined. Prescriptive content, that is, content requiring the topic to be taught as opposed to providing an opportunity for it to be taught, was noted.

EE content was categorized by the scale of study: “Place-based EE” was identified if the scale of study was regional/municipal or smaller and specific to a student’s own region; “indirect place-based EE” was identified if the scale of study was regional/municipal or smaller in general (i.e., it did not specify the student’s own region); and “neither” was identified if the scale of study was not defined or was not at a regional/municipal or smaller scale. A key word search of the curriculum provided the means of differentiation. “Place-based EE” curriculum was identified by terms such as “your community,” “their community,” “area in which you live,” “area in which they live,” “your region,” and “local.” “Indirect place-based EE” content was identified by terms such as “a community,” “communities,” “a region,” and “a city.” Furthermore, any direct expectations with place-based EE content that was only present in the examples and sample questions were treated as “indirect place-based EE.” The purpose of examples and sample questions is to suggest options for the expectation. In other words, they provide possible avenues for study but do not require it.

Any expectation that prescribed field study was also identified. To be classified as requiring field study, the expectation did not have to occur outdoors or even off school property, but it was to take place outside of the classroom (e.g., conducting a school waste inventory to assess recycling practices in the school).

Finally, curriculum expectations that are participatory with action outcomes (i.e., that involve a real-world issue and require a product or action that is useful outside the classroom) were identified. This could take the form of community or school action (e.g., the greening of school grounds), writing letters to politicians regarding environmental concerns, and creating local land use improvement plans.

Enrollment in EE Elective Courses and Course Offerings

The province of Ontario has published secondary curriculum for hundreds of courses in various subjects, grades, and types. The majority of these courses are designated as electives. In this study, course titles were reviewed for potential links to any of the eight EE themes, and a list of relevant courses was compiled. Student enrollment and course offering data for these courses were obtained from the Ministry of Education for the 2012-2013 school year (the most recent year of available data). The Ontario School Information System was used to provide context to these values by providing data on the total number of public secondary schools in Ontario and the number of students registered in each grade (9-12) for the 2012 school year (OSIS, 2013).

Results and Discussion

Curriculum Review

Of the 675 expectations, 124 contained themes related to EE (i.e. 18.4% of expectations). These are not stand-alone EE courses (with one exception); nonetheless, the frequency with which these themes are present is substantial. This aligns well with the Bondar Report's curriculum recommendations to "Ensure that all secondary students are exposed to EE through its substantial presence in compulsory grade 9 Geography, grade 9 and 10 Science, and grade 10 Civics expectations" (OME, 2007b, p15). Of the 675 expectations, only 33 contained place-based EE content (i.e., 4.9% of expectations). Table 2 provides a summary of the 675 expectations, listing raw counts by course.

Considering the expectations by grade, place-based EE content is more prevalent in grade 9, with 3.0% of course expectations, than it is in grade 10 (1.2%). The importance of Issues in Canadian Geography (CGC1D/CGC1P) in contributing to EE in grade 9 is clear—CGC1D and CGC1P had the highest proportion of place-based EE expectations.

Table 2: Place-based EE Content in Compulsory Courses

Grade	Course Code	Course Title	Type	# of expectations (n)	# of expectations containing EE themes (n)	% of course expectations containing EE themes	Expectations related to place-based EE (n)	Prescribed expectations related to place-based EE (n)
9	CGC1D	Issues in Canadian Geography	Academic	70	31	44	4	0
9	CGC1P	Issues in Canadian Geography	Applied	68	28	41	14	8
10	CHV2O	Civics and Citizenship	Open half credit	45	12	27	4	0
10	GLC2O	Career Studies	Open half credit	42	2	4.8	2	0
9	SNC1D	Science	Academic	90	11	12	0	0
9	SNC1P	Science	Applied	86	13	15	2	2
10	SNC2D	Science	Academic	95	5	5.3	2	1
10	SNC2P	Science	Applied	89	1	1.1	0	0
11	SVN3E	Environmental Science*	Workplace	90	21	23	5	4
TOTALS				675	124	100	33	15
% of TOTAL (675)				100	18.4		4.9	2.2

*Included because it can count as a second compulsory Science credit (prerequisite is grade 9 academic, applied, or locally developed Science).

With respect to theme distribution, summarized in Table 3, most of the 124 EE expectations fall under the category of Ecological and Planning. Most expectations are not multidisciplinary, falling only under one theme. For example, the expectations in the Sciences focused on Ecology. Although Issues in Canadian Geography (CGC1D/CGC1P) is more multidisciplinary, covering multiple themes, each subject does tend towards focusing on a single or narrow set of EE themes.

Table 3: EE Content by Theme in Compulsory Courses

Grade	Course Code Code	Course Title	Type	# of expectations containing EE themes (n)	Number of expectations related to:							
					Planning	Ecology	Sustainability	Climate	Politics	Immigration and Settlement	Systems	Socio-demographic
9	CGC1D	Issues in Canadian Geography	Academic	31	13	3	1	3	0	8	12	4
9	CGC1P	Issues in Canadian Geography	Applied	28	13	5	1	1	0	5	4	7
10	CHV2O	Civics and Citizenship	Open	12	5	0	4	0	5	0	1	0
10	GLC2O	Career Studies	Open	2	0	0	2	0	0	0	0	0
9	SNC1D	Science	Academic	11	1	11	0	0	1	0	0	0
9	SNC1P	Science	Applied	13	0	12	1	0	0	0	0	0
10	SNC2D	Science	Academic	5	1	3	0	1	1	1	0	0
10	SNC2P	Science	Applied	1	0	1	1	0	0	0	0	0
11	SVN3E	Environmental Science	Workplace	21	0	19	0	0	2	0	1	0
TOTALS				124	33	54	10	5	9	14	18	11
% of 124				100	26.6	43.5	8.1	4.0	7.3	11.3	14.5	8.9

Concerns have been expressed by educators and administrators regarding “academic students” being more involved than “applied students” in EE (Mnyusiwalla et al., 2016). Although these may have been partly rooted in programming differences between pathways rather than in curriculum differences, they are not supported by the data. Comparing academic and applied courses of the same grade and subject (e.g., Science SNC1D and Science SNC1P), there is little difference between the major grade 9 and 10 pathways. Overall, 18% of course expectations in the academic courses and 17% in the applied courses contain EE content. Only if a student opted to take Environmental Science SVN3E instead of Science SNC2D or Science SNC2P as their second compulsory science credit would she or he have more exposure to EE. As will be seen, few students enroll in Environmental Science (SVN3E).

Table 2 (above) includes information concerning the numbers of place-based expectations in which the content is prescriptive. Of the 33 curriculum expectations related to place-based EE, only 15 were prescribed. Most of these are in Issues in Canadian Geography (CGC1P). It is interesting to note that no prescribed expectations were found in the academic stream, Issues in Canadian Geography (CGC1D). Applied courses are designed to be more “practical,” “concrete,” and “hands-on,” and, because place-based EE is rooted in the familiar and accessible (OME, 2014), they make greater use of it. Academic courses, on the other hand, tend to focus more on theory and abstract concepts (OME, 2014). The only other course with significant prescribed place-based content was Environmental Science (SVN3E), where the majority of expectations were related to Ecology. Prescriptive expectations related to place-based EE are essentially absent in grade 10 courses.

Very few place-based expectations are located in the Science curriculum. This may reflect the juxtaposition between conventional science and EE pedagogies observed by Steele (2011). Some of the impediments to place-based EE that she raises include overemphasis on “the scientific knowledge base that is deemed necessary for students” rather than application of those skills to a real-life context, and “the influence of textbooks” which are based on a provincially standardized curriculum and tend not to include community specific study (Steele, 2011).

Curriculum Expectations Involving Field Study and Action Outcomes

An analysis was also undertaken of expectations that prescribed field study. Only six were found in the curriculum—five of which were in Environmental Science (SVN3E). These expectations required students to conduct field studies on the water quality, soil quality, and biodiversity of their home or school, as well as to conduct a waste audit of the same. One expectation was also found in Science (SNC1P), which required students to graph and interpret electricity consumption data from meters at home or in the community.

Participatory expectations with action outcomes were even rarer in the compulsory curriculum, with only two—in Civics and Citizenship (CHV2O)—providing students with the possible opportunity to communicate their local environmental ideas or data to an intended audience. These two expectations listed “environment” as one of many areas of study. Curriculum recommendation #17 of the Bondar Report makes the suggestion to “Identify and support opportunities to engage students in environmental action projects within the current Civics course” (OME, 2007b, p15). There are currently limited opportunities within the Civics and Citizenship (CHV2O) course for this kind of expansion.

Action competence” (Barratt & Hacking, 2011), which requires experience and knowledge, is an important goal of successful EE. Part of this experience should be acquired in secondary schools if students are to become active citizens with the tools necessary to enact positive change in their environment. Local field study and action projects can also be viewed as measures of community involvement. Community connections are vital to “community health and development” and “student well-being” (Sanders, 2003, p. 162). For many, these can be unique and rewarding experiences that deepen connection to the environment. In the province of Ontario, such field studies and action projects are sparsely prescribed in the compulsory curriculum.

Enrollment in EE Elective Courses and Course Availability

Statistics on course availability and enrollment beyond the compulsory courses can provide some insight into the effectiveness of EE progression and integration into the curriculum. The Bondar Report recommended that students be offered opportunities to pursue EE in the senior grades (11 and 12) to provide continuity with material introduced in earlier grades and to reinforce the importance of EE (OME, 2007b).

Table 4: Secondary Enrollment 2012-2013 (OSIS, 2013)

Grade	Number of Students in Public Schools	Number of Students in Roman Catholic Schools	Total
Grade 9*	100,856	49,341	150,197
Grade 10	103,040	50,318	153,358
Grade 11	108,061	51,849	159,910
Grade 12	153,408	67,724	221,132
Total	638,220	219,232	684,597

* Data include students designated as “Pre-grade 9”. Data include public and Roman Catholic schools and school authorities. Data exclude: private schools; publicly funded hospital and provincial schools; care, treatment, and correctional facilities; summer, night, and adult continuing education day schools. Data are based on headcount of students.

Table 4 provides a basis for reference for secondary enrollment by grade in the 2012-2013 school year. As of 2012-2013, there were 913 secondary schools in the province of Ontario, with 684,597 students enrolled (OSIS, 2013). Tables 5-7 provide course availability and enrollment data, grouped by grade, for those elective courses containing themes related to EE.

Table 5 provides a summary of course availability and enrollment for grade 9 and 10 electives related to EE. All of the electives courses offered in grades 9 and 10 are open, meaning that they are appropriate for a broad range of students and do not have prerequisites.

Table 5: Grade 9 and 10 Course Availability and Enrollment

Course Code	Course Name	Grade	Course Type	Place-Based EE Themes	# of Schools Offering Elective	% of Schools Offering Elective	# of Students Taking Course	% of Students Taking Course*
HFN1O	Food and Nutrition	9	Open	Planning (regional food production, urban agriculture) Climate (regional food production) Ecological (regional food production) Systems (food distribution)	170	18.6	6686	4.5
HFN2O	Food and Nutrition	10	Open	Planning (regional food production, urban agriculture) Climate (regional food production) Ecological (regional food production) Systems (food distribution)	503	55.1	24963	16.3
THJ2O	Green Industries	10	Open	Politics (green incentives) Sustainability (resource availability)	68	7.4	1254	0.8
TTJ2O	Transportation Technology	10	Open	Planning (land use) Systems (transportation)	534	58.5	17403	11.3

* % of students in grade

There is little opportunity to take electives at the grade 9 level. Most students have room for only one elective course in this grade because, in addition to compulsory courses in Mathematics, English, Science, and Geography, they choose to fulfill their Arts, Health and Physical Education, and French as a Second Language requirements. The only elective course identified as containing EE themes is Food and Nutrition (HFN1O). Although 19% of schools offered the course, only 4.5% of grade 9 students province-wide were registered in it.

In grade 10, there is a greater selection of courses with EE themes. If Arts, Health and Physical Education, and French as a Second Language requirements are met in grade 9, the only compulsory courses are History, Civics and Citizenship (0.5 credits), Careers (0.5 credits), Mathematics, English and Science. In grade 10, a majority of schools offer Food and Nutrition (HFN2O) and Transportation Technology (TTJ2O), although a relatively small proportion of students took these courses. Green Industries (THJ2O) contains the most direct link to EE. However, only 7.4% of secondary schools in Ontario offered the course, and a very small proportion of students were enrolled (0.8% province-wide).

Many reasons can contribute to poor availability of a course. These include a lack of expertise among teachers, a lack of interest by students, timetabling conflicts, poor perceived need for future endeavours, or a combination of these factors. For any one course, the causes may vary from school to school. With more place-based EE found in the compulsory courses in grade 9 than in grade 10, the few options among the grade 10 electives for EE content are significant.

In grade 11, students must think more carefully about their “exit plan”. There are four major destinations that students pursue: university, college, skilled trade and apprenticeship programs, and workplace. Courses exist in every pathway for students interested in EE in grade 11 (Table 6). This aligns with the Bondar Report curriculum recommendation to “Ensure that secondary students have the opportunity to take at least one additional course with an environmental focus during their high school program (preferable in grade 11 to maintain continuity)” (OME, 2007b). However, with the exception of Understanding Canadian Law (CLU3M) and Travel and Tourism: A Geographic Perspective (CGG3O), the proportion of schools (<50%) offering these courses is low. Notably, Environmental Science (SVN3E), which can also count as a student’s second compulsory science requirement, and Environmental Science (SVN3M) are offered in less than half of schools (and, province-wide, are taken by a total of 6.6% of students). Considering the attention given to them in provincial policy, enrollment appears to be low.

Table 6: Grade 11 Course Availability and Enrollment

Course Code	Course Name	Grade	Course Type	Place-Based EE Themes	# of Schools Offering Elective	% of Schools Offering Elective	# of Students Taking Course	% of Students Taking Course*
HLS3O	Housing and Home Design	11	Open	Planning (land use and zoning) Sociogeographic (population distribution) Politics (affordable housing) Sustainability (materials, energy)	187	20.5	2047	1.3
SVN3E†	Environmental Science	11	Workplace Preparation	Ecological (pollution, habitat restoration and protection) Politics (responsibilities, jurisdictions)	390	42.7	5827	3.6
SVN3M	Environmental Science	11	University/ College Preparation	Ecological (pollution, habitat restoration and protection) Politics (responsibilities, jurisdictions)	263	28.8	4760	3.0
CLU3E	Understanding Canadian Law in Everyday Life	11	Workplace Preparation	Politics (environmental responsibilities, governance)	167	18.3	2047	1.3
CLU3M	Understanding Canadian Law	11	University/ College Preparation	Politics (environmental responsibilities, governance)	722	79.1	32427	20.3
CPC3O	Politics in Action: Making Change	11	Open	Politics (environmental responsibilities, governance) Sustainability (community action)	12	1.3	144	0.1

CGD3M	Regional Geography	11	University/ College Preparation	Planning (land use, zoning) Sociogeographic (population distribution) Immigration and Settlement (growth, access to resources)	5	0.5	130	0.1
CHT3O	World History since 1900: Global and Regional Interactions	11	Open	Planning (land use, zoning) Sociogeographic (population distribution) Immigration and Settlement (growth, access to resources) Ecological (pollution, habitats)	131	14.3	16263	10.2
CGG3O	Travel and Tourism: A Geographic Perspective	11	Open	Sociogeographic (population distribution) Climate (characteristics of region) Systems (accessibility)	565	61.8	14523	9.1

* % of students in grade

† Not considered to be a true elective because it can count as the second compulsory science requirement (with grade 9 academic, applied, or locally developed science as a prerequisite).

The other courses—Housing and Home Design, (HLS3O), Understanding Canadian Law (CLU3E), and World History since 1900: Global and Regional Interactions (CHT3O)—are offered at best by a modest number of schools. In two cases—Politics in Action (CPC3O) and Regional Geography (CGD3M)—fewer than 10% of schools offer these options and less than 1% of students enroll.

In grade 12, courses exist in every pathway; however, there is only one course offered at the workplace level (Table 7). At least 25% of schools offer Environment and Resource Management (CGR4M), World Issues: A Geographic Analysis (CGW4U), Food and Nutrition Sciences (HFA4M), and Challenge and Change in Society (HSB4M). The proportion of grade 12 students taking these courses range from 2.6% to 11%. The remaining courses, Living in a Sustainable World (CGR4E), Spatial Technologies, (CGO4M), World Geography: Urban

Patterns and Interactions (CGU4C), and World Geography: Human Patterns and Interactions (CGU4U), are offered in less than 5% of schools and enrollment numbers show that less than 1% of students enroll in each. The latter three courses have clear links to EE. Living in a Sustainable World (CGR4E) is the only workplace elective containing EE themes that is available in grade 12.

Table 7: Grade 12 Course Availability and Enrollment

Course Code	Course Name	Grade	Course Type	Place-Based EE Themes	# of Schools Offering Elective	% of Schools Offering Elective	# of Students Taking Course	% of Students Taking Course*
CGO4M	Spatial Technologies in Action	12	University/ College Preparation	Planning (land use and zoning) Sociogeographic (population distribution) Immigration and Settlement (growth, access to resources)	21	2.3	409	0.2
CGR4E	Living in a Sustainable World	12	Workplace Preparation	Planning (land use) Systems (linear vs. cyclical) Ecological (pollution, habitat protection) Politics (government incentives and policy)	62	6.8	398	0.2
CGR4M	Environment and Resource Management	12	University/ College Preparation	Systems (materials, energy) Planning (land use) Politics (policy, jurisdiction) Sustainability (community action)	248	27.1	5661	2.6
CGW4U	World Issues: A Geographic Analysis	12	University Preparation	Planning (land use, zoning) Sociogeographic (population distribution) Immigration and Settlement (growth, access to resources) Politics (governance)	558	61.1	16263	7.4

CGU4C	World Geography: Urban Patterns and Interactions	12	College Preparation	Planning (land use) Systems (linear vs. cyclical) Ecological (pollution, habitat protection) Politics (government incentives and policy) Sociogeographic (population distribution)	33	3.6	499	0.2
CGU4U	World Geography: Human Patterns and Interactions	12	University Preparation	Planning (land use) Systems (linear vs. cyclical) Ecological (pollution, habitat protection) Politics (government incentives and policy) Sociogeographic (population distribution)	44	4.8	1049	0.5
HFA4M	Food and Nutrition Sciences	12	University/ College Preparation	Planning (regional food production, urban agriculture) Climate (regional food production) Ecological (regional food production) Systems (food distribution)	369	40.4	16972	7.7
HSB4M	Challenge and Change in Society	12	University/ College Preparation	Planning (land use, zoning) Sociogeographic (population distribution) Immigration and Settlement (growth, access to resources) Politics (governance)	533	58	24816	11.2

* % of students in grade

Conclusions

The curriculum review of required courses shows 4.9% of the 675 expectations contain some place-based EE content. The frequency with which these themes are present is substantial. However, only a small proportion of these expectations are prescribed: Much place-based EE content is found in the optional sections (i.e., examples, sample questions) of an expectation. As such, the inclusion of EE content needs to overcome the barriers of an overcrowded curriculum, apathy, and lack of resources, as well as the feelings of unpreparedness and lack of EE policy awareness felt by educators (Tan & Pedretti, 2010; Chowdhury, 2015, Mnyusiwalla et al., 2016).

Analysis of grade 9 and 10 electives highlighted only four course options for continuing EE studies beyond those in the compulsory courses. In grades 11 and 12, options are greater. However, the proportion of schools offering these courses varies from high (i.e., up to 79% of schools) to very low (i.e., 0.5% of schools). Opportunities to continue study exist in every grade and pathway. However, the enrollment in elective courses is generally very low. This either means that students do not see a need to take these courses (e.g., they are not a prerequisite for post-secondary studies), are not interested in their content, experience timetabling conflicts, or do not have these courses offered at their school. Despite the Ministry of Education's focus on promoting EE, inconsistent continuity in senior grades undermines its perceived importance.

The number of expectations involving field study (6 of 675 expectations) and action outcomes (2 of 675 expectations) is obviously very limited. This is surprising given that those are a major focus of the *Standards for Environmental Education in the Curriculum* (OME, 2008).

The public criticized the “patchwork approach” to EE, introduced in 1998, for its lack of time spent in covering environmental science topics and promoting ecological literacy (Puk & Behm, 2003). Recent policy changes have placed EE at the forefront but despite the attention given to it, it does not yet appear well-positioned in the Ontario curriculum. The Bondar Report only recommended a “substantial presence in compulsory grade 9 Geography, grade 9 and 10 Science, and grade 10 Civics expectations” (OME, 2007b). Senior grades see even less commitment to EE in the Bondar Report, which ensures only that secondary students “have the opportunity” to take “at least one course” with an EE focus (OME, 2007b). However, poor enrollment in senior electives fractures place-based EE's progression in the latter part of secondary school. Teachers and administrators agreed that the Bondar Report's vision of EE would be better translated if EE curriculum, programming, initiatives, and community partnerships were more explicitly worded, better promoted, or consistently mandated (Mnyusiwalla et al., 2016). Within policy documents, the goals of place-based EE are often stated in such general terms as to become difficult to use as a guide for program development. Furthermore, curriculum expectations are not worded strongly enough to demand instruction of EE concepts. There remains an identifiable need to close the gap between EE policy objectives and its central inclusion in relevant curriculum.

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