ENVIRONMENTAL AND SUSTAINABILITY EDUCATION IN CANADIAN FACULTIES OF EDUCATION, 2017-2018

A research report for the EECOM Standing
Committee on Environmental and Sustainability
Education in Teacher Education

March 31, 2021

Research and Author Team

Richard Kool, Royal Roads University
Douglas D. Karrow, Brock University
Maurice DiGiuseppe, Ontario Tech University (retired)

Research Development Group

Maurice DiGiuseppe, Ontario Tech University (retired)
Paul Elliott, Trent University
Patrick Howard, Cape Breton University
Douglas D. Karrow, Brock University
Richard Kool, Royal Roads University
Emily Lin, University of Nevada-Las Vegas
Janet McVittee, University of Saskatchewan
Laura Sims, Université de St. Boniface
Robert vanWynsberghe, University of British Columbia

Royal Roads University

University of Nevada-Reno

Ontario Institute for Studies in Education/

Université de Saint-Boniface

Ontario Tech University

Cape Breton University

Brock University

Trent University

University of BC

University of Saskatchewan

Kool, R., Karrow, D.D. & DiGiuseppe, M. (2021). Environmental and Sustainability Education in Canadian Faculties of Education, 2017-2018: A research report for the EECOM Standing Committee on Environmental and Sustainability Education in Teacher Education. Available at *http://www.eseinfacultiesofed.ca/research-pages/policy-reports.html*

Contents

Tables

Figures

Acknowledgements

Executive Summary

Environmental and Sustainability Education in Canadian Faculties of Education, 2017-2018

Introduction and Background

Human activities are causing serious, often irreversible damage to Earth's environment. While reasons for this are complex and manifold (Hansen et al., 2019; Rockström et al., 2013), the education system has a critical role to play in reducing the effects of environmental devastation, and teacher education, in particular, is key in our efforts to create sustainable societies. Thus, all educators, including Kindergarten-to-Grade 12 (K-12) teachers, and Early Childhood Education (ECE) educators, need to develop skills enabling them to effectively teach Environmental and Sustainability Education (ESE) in their classrooms. ESE refers to the "various forms of education that help us appreciate and maintain the integrity of the biosphere….the transmission, growth, and application of environmental knowledge across all sectors of society." (Environmental Education Ontario, in https://www.oise.utoronto.ca/ese/About/Definitions.html).

In this report, we present findings of a 2019 online survey assessing ESE in preservice teacher education (PTE) programs across Canada. This work will update and extend information provided by similar earlier studies, especially Towler (1980), Lin (2002), and Swayze et al. (2012). Each of these studies provided timely data-based assessments of ESE-PTE in Canada, and in each, researchers found that ESE was either minimally addressed or seriously lacking in most programs, with very few programs offering what the researchers considered to be adequate ESE preparation, and none offering exemplary programs.

In 2018, there were 62 PTE programs within Canada's 10 provinces, with no endemic institutions offering PTE programs in Nunavut (NU), Northwest Territory (NT), and Yukon Territory (YT). And, while ESE has a long history in Canadian education, it continues to have the character of an emerging field (Yueh et al., 2010) with seemingly little curricular legitimacy in the K-12 context, and as an outcome, only marginal legitimacy in PTE programs. This situation leads one to wonder

whether Canadian PTE programs provide preservice teachers adequate opportunities to increase competency in teaching ESE-related subjects.

The study reported here was conceived in June 2016 at the first National Roundtable on Canadian ESE-TE (ESE-TE stands for "Environmental Sustainability Education in Teacher Education") held at Trent University in Peterborough, Ontario, Canada, where a "National Action Plan" was prepared, suggesting that a survey-based study be conducted to "assess the state of ESE-PTE in Canada" (Karrow & DiGiuseppe, 2019, p. 16). Eventually, a group of National Roundtable participants established the "EECOM Standing Committee on ESE-TE", which, in the fall of 2017, formed a "Research Development Group" that planned and designed the current study. Three members of this Group formed a "Research and Author Team" that created the research materials, carried out the study, analyzed the data, and prepared this report.

Research Design, Participants, and Methods

In this study, we employed a cross-sectional survey design to collect quantitative (survey) and qualitative (written comments) data to assess the status of ESE-PTE programs across Canada. Cross-sectional survey design is survey-based research in which a researcher "collects data at one point in time" (Creswell & Guetterman, 2019, p. 386). Furthermore, the study was guided by the following four research objectives:

1. Provide survey-generated information about ESE-PTE programming in a representative sample of Canadian PTE programs;

2. Provide survey-generated information on barriers that may affect ESE-PTE programs in Canada;

3. Explore survey participants' ESE-PTE program perceptions and experiences; and

4. Provide recommendations on how ESE-PTE programs may be enhanced/improved, and suggestions for further research in this field of study.

Our data collection instrument was an online survey in the form of a questionnaire facilitated by use of the *"QuestionPro"* online survey platform (https://www.questionpro.com/). In obtaining a survey that suited our research

objectives, we modified and adapted several existing Canadian ESE-PTE surveys, including those employed in Lin (2002) and Swayze et al. (2012), making various technical changes to item, structure and format, especially to accommodate online delivery. Some survey items were inspired by the theoretical contributions of Evans et al. (2017) and the seminal work of Sauvé (2005). Evan's et al.'s (2017) programmatic approaches for embedding ESE in PTE courses/programs were adapted, as were Evan's et al.'s (2017) rationales used by faculty members for embedding ESE in PTE. Sauvé's (2005) work characterized fifteen "currents"; we added a sixteenth current, the "Indigenous" current, that we believed was gaining greater and greater emphasis in Canadian PTE programs.

In general, our questionnaire included closed-ended questions (e.g., yes/no; rank-order, multiple choice; Likert scale) and open-ended questions (e.g., questions asking participant to freely place comments within textboxes) focusing on participants' personal/professional demographic information, and also on their ESE-PTE program knowledge, views, and experiences.

Survey development occurred from fall, 2017 to fall, 2018, with the survey being written in English and professionally translated into French for use by francophone participants. The survey was pilot tested by members of the Research Development Group, and more broadly by members of the EECOM Standing Committee on ESE-TE. Participant recruitment was through purposive sampling— inviting only faculty members known to be currently working in Canadian PTE programs. Invitations were sent to 11 faculty members in francophone faculties or schools of education, and to 41 faculty members in anglophone institutions, giving a total of 52 invitees (representing 46 institutions). Data collection began on Monday March 11, 2019, when invitations and informed consent documents (in English and French) were emailed to prospective participants. The survey was active online from March 11, 2019 to November 15, 2019, with reminders sent in September 2019 and October 2019. Quantitative data were initially examined using QuestionPro software and further examined in Microsoft Excel, with descriptive statistics (percentages; scale ratings) used to summarize quantitative survey results. Qualitative data involved participants commenting on, extending, and elaborating on their responses

to select quantitative, scale-based, questions in the survey. The objectives of the qualitative portion of the study were to explore faculty members' views and experiences relating to various aspects of their PTE programs, including their assessment of various ESE theoretical frameworks, approaches to ESE teaching and learning, ESE curriculum design and implementation, barriers to ESE program development and implementation, and the overall status of ESE within their institution's PTE program.

Study limitations included limitations regarding recruitment, geographic distribution, participants from francophone institutions, and potential participant bias. Although our response rate was more than adequate for a survey-based study (62%), most participants were from English Canada or English-speaking institutions, with few participants from Quebec or francophone institutions, And, while participants were generally well distributed across Canada, we did not receive responses from teacher education faculties in Prince Edward Island or from Newfoundland and Labrador. As our participants do not represent the views and experiences of all faculty members involved in ESE-PTE in Canada, we caution against generalizing our findings to the entire Canadian ESE-PTE faculty member population. Also, our survey was developed and piloted by some individuals who also responded to the survey as faculty members, possibly resulting in some response bias in the results.

Key Findings

Of the 46 Canadian faculties/schools of education who were invited to participate in the survey, 26 faculties/schools of education responded (58%), resulting in 32 faculty members completing the survey—a response rate of 62%. Furthermore, survey participants were fairly well distributed across Canada, with 25% from British Columbia; 25% from the prairie provinces (Alberta, Saskatchewan, and Manitoba); 44% from the central provinces (Ontario and Quebec); and 6% from the maritime provinces of New Brunswick and Nova Scotia).

The vast majority of survey participants were full-time faculty members, with just under two-thirds having backgrounds in education, and over three-quarters having backgrounds in life sciences, ecology/environmental science, and/or

12

environmental education. A majority of participants felt that in 2017-2018, ESE was accorded low priority status in their PTE programs, with less than a quarter stating that it was given a high priority status. Conversely, the vast majority indicated that ESE should have been accorded a much higher priority level, with none thinking it should have been afforded low priority.

Results have also indicated that most ESE-related courses were either science-based, survey-oriented, or field-based courses, with "survey-oriented" referring to courses that briefly address a variety of the topics in a broad discipline. Just over half of participants indicated that their PTE programs offered elective/optional courses focused on ESE teaching methods, with just under half indicating that their PTE programs included elective/optional courses mainly focused on ESE content. Additionally, less than half of participating faculties/schools of education included either compulsory ESE courses or non-ESE compulsory courses that included a significant amount of ESE content.

In terms of the rationales participants valued for justifying inclusion of ESE in PTE programs, results show that developing the "capacity" for integrating ESE into preservice teachers' future teaching practices was the most important rationale, followed by developing preservice teachers' "commitment" to ESE-embedding practices, and in terms of the effectiveness of various pedagogical approaches in ESE teaching and learning, participants rated "active, experiential learning," "field-based experiences," and "nature-based experiences," as the three most effective approaches in ESE-PTE.

Results also indicate that "competition with other PTE courses" and "lack of time in packed PTE program timetables" were two key barriers in ESE-PTE programs. Many participants also felt that the interdisciplinary nature of ESE may cause it not be taken as seriously as more traditional "hard" science subjects, and that a "lack of senior administrator support", "lack of faculty colleague support for ESE" and "lack of professional governing body leadership" were "very important" or "important" barriers in ESE-PTE. Participants were split on whether "lack of fit, or alignment, between ESE in PTE programs and ESE in K-12 Curriculum" was a significant barrier, while a majority clearly felt that relatively "unimportant" or non-

problematic barriers in ESE-PTE included "lack of communication among ESE educators", "lack of research in effective ESE teaching", "lack of ESE teaching resources and equipment," "lack of Canadian content in learning materials", "inadequate access to online resources", and "inadequate tools for assessing ESE in K-12 students in schools".

In this study, we examined various aspects of ESE-oriented practicum activities. Just over a third of participants indicated that ESE-oriented preservice teachers placed in public schools were able to engage in ESE-oriented practicum activities. Overall, nearly 75% of participants indicated that their students had opportunities to engage in ESE-related practica, either in schools or in other learning environments. Further, a third of participants indicated that ESE-oriented preservice teachers placed in non-school-based environments were able to engage in ESE-oriented practicum activities, with most participants indicating that these ESE-oriented practica mostly occurred in museums, science centres, outdoor education centres, and zoos.

In terms of the degree to which participants felt their preservice teachers were prepared for addressing ESE in their future careers as teachers, results indicate that an overwhelming majority felt that more than half of their preservice teachers were not adequately prepared to address ESE in the classroom.

In the survey, we also asked participants to assess the degree to which Sauvé's various currents (including the added Indigenous current) were addressed in their PTE programs in 2017-2018, and found that the three highest-rated currents were the Indigenous current, the bioregionalist/place-based current, and the praxic current, with the least-rated currents being the problem-solving current, the sustainable development/sustainability current, the conservationist/resourcist current, and the feminist current.

Recommendations

The research study reported here should be viewed as a continuation of research focused on assessing the status of ESE in Canadian PTE programs (Lin, 2002; Swayze et al., 2012; Towler, 1980), and in relation to the findings, we make several suggestions for further studies, including:

- A study focused on assessing the effectiveness of ESE-PTE programming methods, integration models, program preparation, and currents of ESE

- A retrospective and/or current policy study on the development of ESE-PTE policy at the government level (ministry-level), association level (e.g., ACDE-, CMEC-level), or institution level (e.g., PTE provider-level, university-level, faculty-level).

- A longitudinal survey study of national and international trends in ESE-PTE.

Furthermore, in relation to the results of this study, we recommend that:

- members of the EECOM Standing Committee on ESE-TE, and ESE educators more broadly, focus more of their energies on ESE-PTE advocacy/lobbying with relevant government bodies (e.g., ministries of education), professional associations (e.g., ACDE, provincial teacher accreditation bodies), and other policy-making bodies to raise the profile and legitimacy of ESE-related curricula in K-12 systems across Canada.

- teacher accreditation bodies be more willing to recognize preservice teachers' credentials in undergraduate (or graduate) environmental/sustainability education, environmental/sustainability science, and related disciplines, and recognize ESE as a K-12 "teachable subject".

- universities and their faculties/schools of education seek to create "major" or "minor" designations for ESE-related streams; admit many more applicants into PTE programs whose credentials focus on environmental/sustainability studies, environmental/sustainability science and related disciplines; and recognize ESE-related secondary school courses as being appropriate in meeting university entrance requirements.

- ESE-PTE stakeholders prioritize research and policy development, and support efforts to enhance the professional development of ESE-PTE instructors/providers.

Introduction

Human activities are causing serious, often irreversible damage to Earth's environment—our home. This is not news; experts and the general public have acknowledged the seriousness of this problem for many decades, though, in general, little has changed—environmental degradation continues unabated. And, while an obvious question is: Why is this occurring?, we know that the answers are manifold and complex (Hansen et al., 2019; Rockström et al., 2013). Nevertheless, we believe that the education system has a critical role to play in reducing the extent of environmental devastation and its concomitant social and economic upheavals. and that teacher education, in particular, is key to ensuring we can make an impact in creating sustainable societies. This means that all educators, including Kindergarten-to-Grade 12 (K-12) teachers, and Early Childhood Education (ECE) educators, need to develop skills enabling them to effectively teach Environmental and Sustainability Education (ESE)[1] in their classrooms.

In this report, we present findings of a 2019 online survey assessing ESE in Preservice Teacher Education (PTE) programs across Canada. In addition, the study also intends to initiate further conversations among ESE-PTE researchers and organizational stakeholders about the possibilities of facilitating ESE-PTE program implementations; systematically mainstreaming ESE-PTE programs in schools or faculties of education; and improving ESE-PTE programs across Canada. In a key part of the survey, study participants[2] were asked to describe barriers to incorporating ESE in their PTE programs. In essence, this work will update and extend similar earlier studies, especially Towler (1980), Lin (2002), and Swayze et al. (2012).

---

[1] "Environmental and Sustainability Education (ESE) is about healthy relationships between humans and Earth's living systems. It includes the many and varied forms of education that help us appreciate and maintain the integrity of the biosphere....the transmission, growth, and application of environmental knowledge across all sectors of society." (Environmental Education Ontario, in https://www.oise.utoronto.ca/ese/About/Definitions.html)

[2] Unless otherwise indicated, the word "participant" refers to faculty members who responded to our survey.

Background

Historical Context

After UNESCO declared 2005-2014 the "Decade of Education for Sustainable Development," some Canadian ministries of education and related entities developed policies or recommendations promoting the inclusion of ESE within K-12 education (e.g., Alberta Council for Environmental Education, 2012; British Columbia Ministry of Education, 2007; Ministry of Education Manitoba, 2014; Ontario Ministry of Education, 2009). Additionally, some of these policies also recommended that post-secondary institutions provide ESE in their PTE programs (e.g., Ministry of Education Manitoba, 2014; Ontario Ministry of Education, 2009).

Historically, studies have indicated that ESE is most often offered in Canadian faculties/schools of education in an unsystematic fashion, essentially relying on the work of the few individuals on staff who take particular interest in ESE, and whose initiatives may or may not leave a lasting legacy of instruction in this domain. For example, Lin (2002), examined trends in PTE in Canada from 1979 to 1996 and found that "for nearly two decades, the number of Canadian teacher preparation institutions offering environmental education courses to preservice teachers has remained generally low and the level of priority granted nominal (p. 199). More recently, Swayze et al. (2012) noted that "there is modest but promising progress toward reorienting teacher education to address education for sustainable development" (p. 3), but that "there is divergence between individual and institutional responses, in which ESD[3] adoption is still primarily an individual faculty member commitment rather than a faculty-wide response" (p. 4).

Provision of ESE-PTE in Canada

In Canada, PTE occurs in postsecondary institutions, typically university faculties, or schools, of education, most of which are funded by the federal (national)

---

[3] "ESD" refers to "Education for Sustainable Development." As a discipline, ESD, is highly related to Environmental Education (EE), Climate Change Education (CCE), and Environmental and Sustainability Education (ESE). Though related in many ways, each of these fields possesses unique attributes, philosophies, and understandings. We will use the term Environmental and Sustainability Education (ESE) in this report to denote the broad areas of environmental learning common to each field.

and provincial/territorial governments and broadly administered at the provincial/territorial level. There is no federal ministry of education in Canada with country-wide jurisdiction; provincial/territorial ministries of education are responsible for K-12 education. In 2017-2018, there were 62 PTE programs in Canada: 9 in British Columbia (BC), 8 in Alberta (AB), 2 in Saskatchewan (SK), 5 in Manitoba (MB), 16 in Ontario (ON), 12 in Quebec (QC), 3 in New Brunswick (NB), 5 in Nova Scotia (NS), 1 in Prince Edward Island (PE), and 1 in Newfoundland and Labrador (NL). In 2017-2018, there were no endemic institutions offering PTE programs in Nunavut (NU), Northwest Territory (NT), and Yukon Territory (YT). In 2020, the University of Regina (SK) provided PTE programs in partnership with Yukon College in YT, Memorial University of Newfoundland was partnered with Nunavut Arctic College in NU, and Aurora College, in NT, offered a teacher education program provided by the University of Saskatchewan.

In the absence of a national education system in Canada, the various territorial and provincial ministries of education may or may not include ESE in K-12 curricula, depending on the philosophical orientation of the particular government in power. Similarly, teacher accrediting bodies in each Canadian jurisdiction may or may not consider ESE-focused courses suitable for certifying teachers, and these agencies may not consider undergraduate degrees in environment-related disciplines as being suitable for admission into the teaching profession (Karrow et al., 2016). It is evident that while ESE has a long history in Canadian education, it continues to have the character of an emerging field (Yueh et al., 2010) with seemingly little curricular legitimacy in the K-12 context, and as an outcome, only marginal legitimacy in PTE programs as well. This situation leads one to wonder whether Canadian PTE programs provide preservice teachers adequate opportunities to increase knowledge and competency in teaching ESE-related subjects, and whether there is curricular "space" for graduates to apply their learnings once they enter the teaching profession.

Assessing the Status of ESE-PTE in Canada over the Years

Historically, three survey-based studies have assessed the status of ESE-PTE in Canadian faculties of education, namely, Towler (1980), Lin (2002), and Swayze et

al. (2012). Towler (1980) and Lin (2002) focused on the views and experiences of faculty members who teach and conduct research within PTE programs across Canada, while Swayze et al.'s (2012) study focused specifically on information provided by PTE program administrators (e.g., principals, deans, associate deans). Each of these studies have provided timely data-based assessments of ESE-PTE in Canada, and each included publications articulating implications, outlooks, and recommendations for improvement. In each case, the researchers found that ESE was either minimally addressed or seriously lacking in most Canadian PTE programs, with very few programs offering what the researchers considered to be adequate ESE preparation, and none offering programs that were considered to be exemplary.

Interestingly, each of these studies indicated that excellence within particular programs was not systemic in nature, but due to the heroic efforts of handfuls of dedicated faculty and administrators. In particular, Towler (1980) concluded, among other things, that at the time of his study, there existed a "neutral if not a negative attitude towards the subject [ESE] and its importance" (p. 15), and Lin (2002) remarked that at the time she collected her data (spring, 1996),

> Many of the problems associated with the preparation of pre-service teachers in Towler's study … remain relatively unchanged in the current study. Environmental education is still generally regarded as a low priority in the training of effective pre-service teachers in Canadian institutions. (p. 212)

Further, Swayze et al. (2012) indicated in 2012 that "although many faculties of education are beginning to make progress toward reorienting their curricula and contributing to DESD [Decade of Education for Sustainable Development], there is progress yet to be made toward full implementation" (p. 38).

The Current Study: Antecedents, Purpose, and Justification

In 2013, a small group of concerned ESE educators met at the Ontario Institute for Studies in Education of the University of Toronto (OISE-UT) to discuss perceived deficiencies in ESE in their own PTE programs, and in PTE programs in Canada more generally. Since then, the group has made ESE-PTE, and more broadly, Environmental and Sustainability Education in Teacher Education (ESE-TE), a focus of their academic teaching, research, and service. To date, this collaboration has

resulted in a number of local, regional, national, and international conference presentations and invited keynote deliveries, academic publications in the form of journal articles, invited journal editorships, conference proceedings, and two edited book volumes. Additionally, in June 2016, this group hosted the first National Roundtable on Canadian ESE-TE at Trent University in Peterborough, Ontario, Canada. A key product of the National Roundtable on Canadian ESE-TE was a "National Action Plan", which, among other recommendations, included the following action item:

> Assess the state of ESE-PTE in Canada. We aim to collect data to ascertain the state of ESE-PTE in Canada. By collecting quantitative and qualitative data using a variety of research methods (meta-analysis, surveys, and document analysis), a clearer picture of the state of ESE in faculties of education can be created, and used as a benchmark to direct future action and advocacy, and monitor progress in this field. (Karrow & DiGiuseppe, 2019, p. 16)

Eventually, in June 2017, the group formally joined the Canadian Network for Environmental Education and Communication (EECOM) as a standing committee of this national organization, becoming the first "EECOM Standing Committee on ESE-TE" in the organization's history. In the fall of that same year, several members of the EECOM Standing Committee on ESE-TE formed a group, the Research Development Group[4], that planned and designed the current study, and a smaller team of individuals, the Research and Author Team[5], created the research materials, carried out the study, analyzed the data, and prepared this report. In October 2018, the EECOM Standing Committee on ESE-TE hosted the very first "ESE-TE Research Symposium" as part of the 2018 EECOM conference in Cranbrook, British Columbia, Canada.

At the time of this writing, almost 10 years have passed since Swayze et al. (2012) published their administrator-based study on ESE-TE, and almost 20 years

---

[4] Maurice DiGiuseppe (University of Ontario Institute of Technology), Paul Elliott, (Trent University), Patrick Howard (Cape Breton University), Douglas D. Karrow (Brock University), Richard Kool (Royal Roads University), Emily Lin (University of Nevada-Las Vegas), Rob vanWynsberghe (University of British Columbia), Janet McVittee (University of Saskatchewan), Laura Sims (Université de St. Boniface)

[5] Maurice DiGiuseppe (University of Ontario Institute of Technology), Douglas D. Karrow (Brock University), Richard Kool (Royal Roads University)

have passed since Lin (2002) published her faculty-member-based results. Over these decades, much has occurred in Canada and around the world in terms of environmental knowledge, policy, law, and action. And so, it seemed only fitting that a team of researchers take up the challenge of conducting another survey-based study on the status of ESE-PTE in Canada, to update interested parties on the current status of ESE-PTE in Canada, and to provide some research-informed recommendations for improving ESE-PTE, and ESE-TE, more generally.

Research Methodology

To achieve a broader and richer portrayal of the status of ESE-PTE programs across Canada, we employed a survey-based, cross-sectional research design, incorporating both quantitative (survey) and qualitative (written comments) components.

Research Objectives

The research conducted in this study was guided by the following objectives:

1. Provide survey-generated information about ESE-PTE programming in a representative sample of Canadian PTE programs;

2. Provide survey-generated information on barriers that may affect ESE-PTE programs in Canada;

3. Explore survey participants' ESE-PTE program perceptions and experiences; and

4. Provide recommendations on how ESE-PTE programs may be enhanced/ improved, and suggestions for further research in this field of study.

Research Design

Cross-sectional Survey-based Research

In this study, we employed a cross-sectional survey design to collect data to assess the status of ESE-PTE programs in Canadian faculties of education. Consistent with Creswell and Guetterman's (2019) description of cross-sectional survey design[6], we employed this approach to solicit faculty members' "attitudes, opinions and beliefs" about ESE-PTE (p. 386). As such, this study will contribute to the growing literature base assessing trends in ESE-PTE across Canada over time (e.g., Lin, 2002; Sims & Falkenberg, 2013; Swayze et al., 2012; Towler, 1980), and will also be a source of useful information for similar/related studies in the future.

---

[6] "In cross-sectional survey design, the researcher collects data at one point in time" (Creswell & Guetterman, 2019, 386).

Data Collection Instrument: Online Survey

Our data collection instrument was an online survey in the form of a questionnaire. The advantages of an online survey are consistent with the scope of our research objectives, our project timeline, and project budget. Our goal of collecting relatively large amounts of data from faculty members in PTE programs across Canada was facilitated by use of the "QuestionPro" online survey platform, which allowed us to communicate with our research participants over the Internet, and to efficiently manage, process, and analyze the collected data.

In keeping with recommendations by Creswell and Guetterman (2019), we first considered whether a suitable pre-existing survey instrument was available for use in our study. However, we could not identify an instrument adequately aligned with our research objectives. Thus, we modified several existing Canadian ESE-PTE surveys, including those employed in Lin (2002) and Swayze et al. (2012). Survey items were developed as follows:

1. *Composing survey items*: Although our survey items were adapted from those in Lin (2002) and Swayze et al. (2012), we made various technical changes to item, structure and format, especially to accommodate online delivery. Our questionnaire included closed-ended questions (e.g., yes/no; multiple choice; Likert scale) and open-ended questions (e.g., questions asking participant to freely place comments within textboxes). In general, survey items focused on participants' personal/professional demographic information, and also on their ESE-PTE program knowledge, views, and experiences.

While most survey items were based on those used in Lin (2002) and Swayze et al. (2012), some were inspired by the theoretical contributions of Evans et al. (2017) and the seminal work of Sauvé (2005). In particular, the conceptual framework in Evan's et al.'s (2017) research was used in the development of questions about ESE-PTE programming, including questions regarding programmatic approaches for embedding ESE in PTE courses and programs; rationales used by faculty members for embedding ESE in PTE; theoretical frames underpinning the embedding of ESE in PTE; pedagogical approaches used for embedding ESE in PTE; and problems and challenges faced by teacher educators who wish to embed ESE in PTE. Additionally,

Sauvé's (2005) classic study provided a typology of "currents of environmental education," useful in designing various content-based questions that we included in the survey.

2. *Pilot-testing survey items*: We pilot tested our survey by administering it to members of the Research Development Group, and more broadly, to various members of the EECOM Standing Committee on ESE-TE. We asked all of these individuals—each possessing expertise in various aspects of ESE-PTE—to complete the survey, analyze the questions, and provide the Research and Author Team with feedback for improving the structure, content, and comprehensibility of individual survey items and the survey as a whole. After receiving feedback regarding clarity and readability, word/question redundancies and duplications, and alignment between survey items and the study's research objectives, adjustments were made by members of the Research Development Group in preparation for making the survey available on the Internet for use by prospective participants.

Data Collection and Analysis Procedures

Survey development occurred from Fall, 2017 to Fall, 2018. The survey was written in English and professionally translated into French for use by francophone participants. Professional French translations were reviewed and edited by francophone faculty and staff from the Université de Saint Boniface in Winnipeg, Manitoba. Through the spring and summer of 2018, all members of the Research Development Group obtained ethics clearance from their respective institution's research ethics board.

In terms of participant recruitment, we employed purposive sampling—inviting only faculty members known to be currently working in a Canadian PTE program, and focusing especially on ESE-PTE in their teaching, research, and service. We searched the Association of Canadian Deans of Education (ACDE) website for contact information of institutions providing PTE programs in 2017-2018. Additionally, teacher education websites were searched for courses that might include ESE and to identify faculty members that teach those courses. However, faculty members who taught ESE-related courses or administered ESE-based programs not related to teacher education (e.g., those teaching only in graduate

programs in education), were not considered for participation in this study. Invitations were sent to 11 faculty members in francophone faculties or schools of education (Appendix A), and to 41 faculty members in anglophone institutions (Appendix B), giving a total of 52 invitees. We did not contact all of the institutions in the 2017-2018 ACDE list of education faculties/schools since, after additional investigations, we could not identify faculty members in some institutions who were teaching or had taught ESE-focused/ESE-related courses. While we did not send invitations to Wilfred Laurier University's Faculty of Education in Ontario and the University of New Brunswick's Faculty of Education in New Brunswick (for the reasons just stated), one faculty member from each of these institutions provided informed consent and responded to our survey, and we included these responses in our dataset.

All surveys were distributed using the *QuestionPro* online survey platform (www.questionpro.com). Data collection began on Monday March 11, 2019, when invitations and informed consent documents, in English and French, were emailed to prospective participants across Canada (see Appendices A and B for the names of institutions that were contacted). Invitations were sent in French to identified faculty members in most of the francophone universities in Quebec, New Brunswick, and Manitoba, and the weblink provided took them directly to the French-language survey. English invitations and links were sent to identified faculty in anglophone institutions. All invitations indicated that the survey would be active online from March 11, 2019 until November 15, 2019. Reminders were sent to invitees in September 2019 and October 2019.

Quantitative Data

As mentioned, the quantitative elements of the study involved participants responding to online survey items involving yes/no responses and rating scales, and items involving Likert-like scales. Quantitative data were initially examined using *QuestionPro* software and further examined in Microsoft Excel. Descriptive statistics (percentages; scale ratings) were used to summarize quantitative survey results. In most cases, quantitative results are illustrated using bar charts.

Qualitative Data

The qualitative part of the survey involved participants commenting on, extending, and elaborating on their responses to select quantitative, scale-based, questions in the survey. Participants were asked to place written comments within textboxes that were included in a select number of survey items. The objectives of the qualitative portion of the study were to explore faculty members' views and experiences relating to various aspects of their PTE programs, including their assessment of various ESE theoretical frameworks, approaches to ESE teaching and learning, ESE curriculum design and implementation, barriers to ESE program development and implementation, and the overall status of ESE within their institution's PTE program.

Limitations of the Study

A primary objective of the study was to extend and update the findings of earlier similar survey-based research on the state of Canadian ESE-PTE, including studies conducted by Towler (1980), Lin (2002), Swayze et al. (2012), and the theoretical works of Evan's et al. (2017) and Sauvé (2005). As in these and other similar survey-based studies, our study entailed several limitations, including:

1. *Limitations in the recruitment of study participants.* While we focused our survey on those individuals that the Research Development Group had considered to be active in the ESE-PTE community, we recognize that our participants do not represent the views and experiences of all faculty members involved in ESE-PTE in Canada. Survey length and/or complexity may have discouraged some invited faculty members from completing the survey.

2. *Limitations in the geographic distribution of study participants.* Although faculty member participants were generally well distributed across Canada (see "Survey demographics" section below), we did not receive survey responses from teacher education faculties in Prince Edward Island and in Newfoundland and Labrador.

3. *Limitations on study participants from Northern Canada.* At the time of conducting this study, Canada's northern jurisdictions (Northwest Territories

(NT), Nunavut (NU), and Yukon Territory (YT)) did not have their own teacher education programs. As noted earlier, PTE programs in these northern parts of Canada were provided in partnership with various provincial post-secondary institutions that may have participated in this study.

4. *Limitations on responses from francophone institutions.* Responses from francophone institutions were very limited. In total, we received one (1) response from each of three (3) francophone institutions, for a total of three (3) responses from francophone faculty members. These data were added to all other responses received to create a single, composite dataset.

5. *Participant bias.* Our survey questionnaire was developed and piloted by some individuals who also responded to the survey as faculty members. This may have introduced a certain level of response bias in the results. In this situation, survey participants who also were involved in developing the survey questionnaire, and who participated in discussions about broad research motives, aims, and hypotheses, may have introduced response bias by, for example, second-guessing their responses to survey items they may have helped adapt, adopt, or create (Nichols & Manner, 2008).

<center>**Results**</center>

Survey Demographics

Number of Participants and Survey Response Rate

Table 1 indicates the number of faculties/schools of education in Canada; the number of Canadian faculties/schools of education invited to participate in the study; the number and proportion of faculties/schools of education that responded to our survey; the number of individual faculty members invited to participate in the study, and the number and proportion of faculty members that responded to the survey.

Table 1: Participating institutions and faculty members

1.	Number of faculties/schools of education in Canada[7]	62
2.	Number of Canadian faculties/schools of education invited to participate in this study[8].	46
3.	Number of faculties/schools of education that responded to the survey (percentage of faculties/schools of education that responded to the survey)	26 (57%)[9]
4.	Number of individual faculty members invited to participate in this study.	52
5.	Number of faculty members that responded to the survey (response rate; percentage of faculty members that responded to the survey).	32 (62%)[10]

Geographic Distribution of Participating Institutions

The geographic distribution of participating institutions is illustrated in Figure 1.

As can be seen in Figure 1, responses were generally well-distributed across Canada, with 5 institutions responding from British Columbia (19% of responding institutions); 1 from Alberta (4%); 2 from Saskatchewan (8%); 4 from Manitoba (15%); 10 from Ontario (38%); 2 from Quebec (8%); 1 from New Brunswick (4%); and 1 from Nova Scotia (4%). No responses were received from Prince Edward Island and from

---

[7] This value represents the total number of faculties/schools of education in Canada as found in the ACDE website plus others identified by the research team in the 2017-2018 academic year.
[8] See Appendices 1 and 2 for institution names.
[9] (Row 3 value ÷ Row 2 value x 100%)
[10] (Row 5 value ÷ Row 4 value x 100%)

Newfoundland and Labrador. As indicated in the "Limitations" section of this report, post-secondary institutions in Northwest Territories, Nunavut, and Yukon were not invited to participate in this study since none of these institutions provided their own PTE programs at the time invitations to participate were emailed to prospective participants.

Figure 1: Geographic distribution of participating institutions.
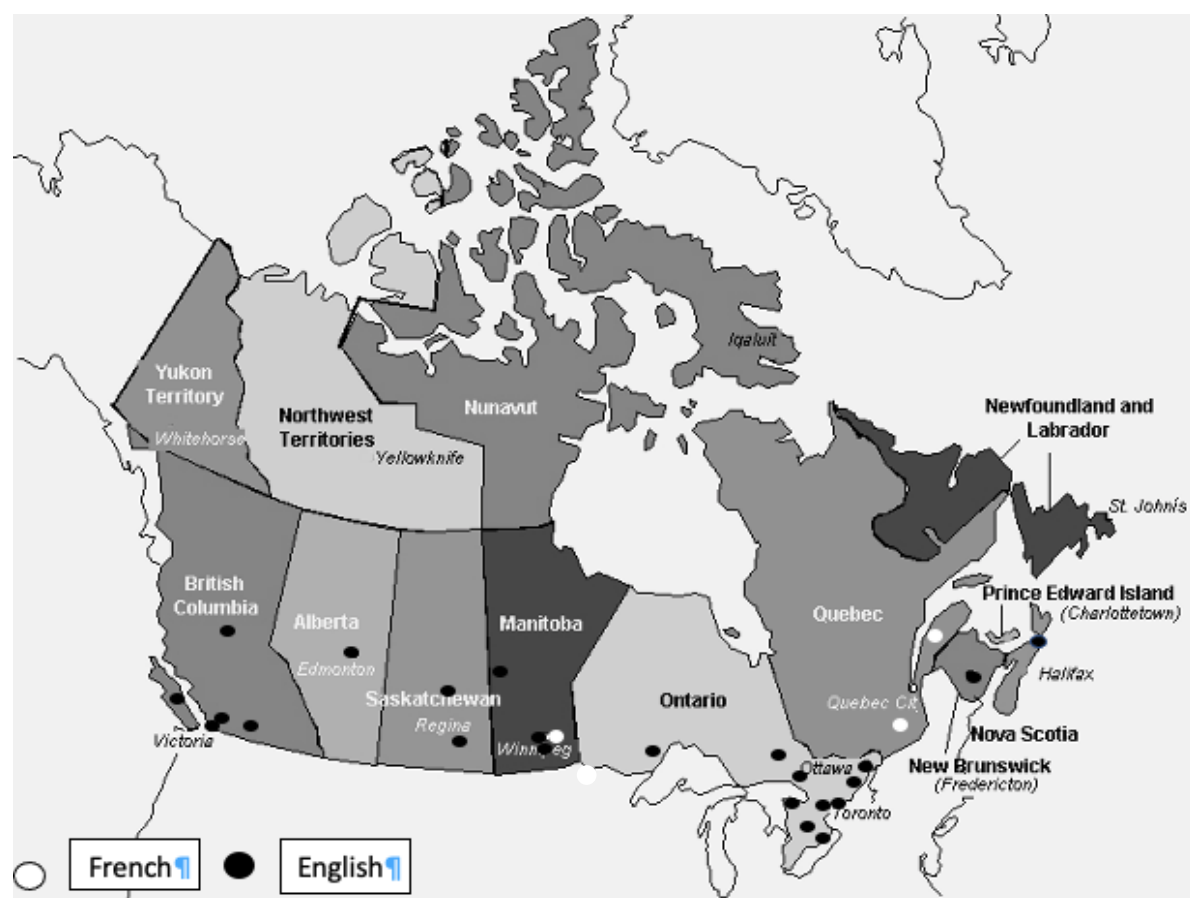
Geographic Distribution of Participating Faculty Members

The number of individual faculty members who responded to the survey included eight (8) faculty members from British Columbia (25% of all participants); two (2) from Alberta (6%), two (2) from Saskatchewan (6%), four (4) from Manitoba (13%); twelve (12) from Ontario (38%), two (2) from Quebec (6%), one (1) from New Brunswick (3%), and one (1) from Nova Scotia (3%).

Participants' Professional Status

When considering participants' professional status, our data indicate that the vast majority of our participants were full-time faculty (29; 88%), with 3 participants (9%) being part-time faculty, and 1 participant (3%) being a department head.

Participants' Academic Background

In terms of academic background, while a majority of our study's participants indicated a background in Education (20; 63%), relatively large proportions also indicated backgrounds in Life Sciences (13; 41%), Environmental Education (13; 41%), and Ecology/Environmental Science (11; 34%), with the rest having backgrounds in Earth Science (5; 16%), Humanities (5; 16%), Social Science (4; 13%), Environmental Studies (3; 9%), and Fine Arts (2; 6%). Please note that in this survey item, participants were asked to choose all backgrounds that applied to them, from a list of backgrounds (See Appendices C and D for details). Thus, percentages do not necessarily add to 100%.

Importance of ESE in PTE Programs

An important survey question asked participants to indicate the extent to which they felt ESE was a priority in their faculty's 2017-2018 PTE program, and also to indicate the extent to which they felt ESE should have been considered a priority. Results for this question are illustrated in Figures 2 and 3.

Figure 2: Degree to which ESE was considered a priority in 2017-2018
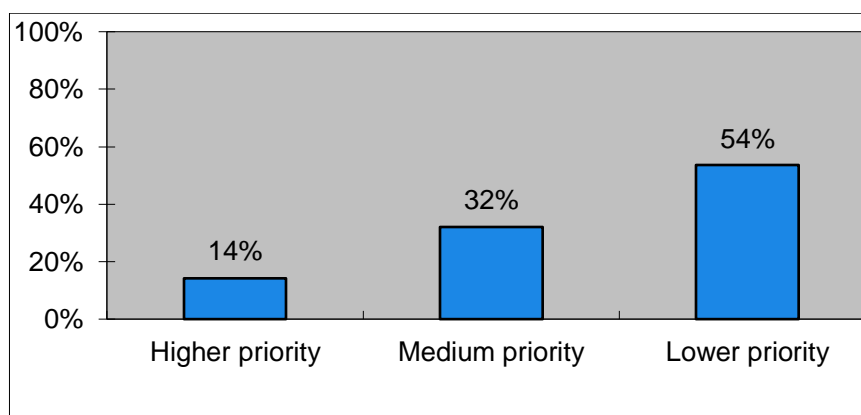
As can be seen in Figures 2 a majority (54%) of our participants felt that ESE was of lower priority in their faculty in 2017-2018, while 32% indicated that ESE was

of medium priority, and only 14% felt it was a higher priority element in the program. Conversely, in Figure 3 we see that the vast majority of participants (96%) felt that ESE should have been considered a higher priority in 2017-2018, with only 4% indicating that it should have been a medium priority, and none indicating that it should have been a lower priority.

Figure 3: Degree to which ESE should have been considered a priority in 2017/2018
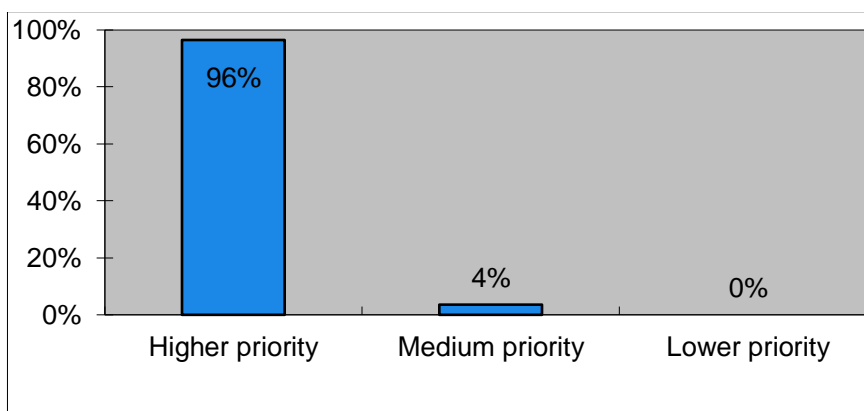
ESE-PTE Program Offerings

Evans et al.'s (2017) review of ESE in PTE programs indicated that there are four key approaches used to embed ESE in PTE: (a) across whole curriculum areas, courses, or institutions; (b) through dedicated core/compulsory courses; (c) through a component of a core/compulsory course; or (d) through a dedicated elective course. In the survey, we asked our participants five questions in relation to Evans et al.'s (2017) four approaches. The five questions and their results are shown in Table 2.

Table 2: ESE-PTE Program Offerings

Survey Question	Results
1. What type of ESE-related courses does your faculty/program offer?	• Science-based courses (n=19; 28%) • Survey courses (n=12; 17%) • Field-based courses (n=11; 16%) • Methods courses (n=10; 14%) • Humanities-based courses (n=7; 10%) • Social sciences-based courses (n=5; 7%) • "Other" (non-specified) types of courses (n=5; 7%)

2. Did your preservice teacher education program offer non-required (e.g., elective/optional) ESE courses primarily focused on ESE-related teaching methods in the 2017/2018 academic year?	• 52% of participants answered "Yes" • 48% of participants answered "No" • No comments were provided.
3. Did your preservice teacher education program offer non-required (e.g., elective/optional) courses primarily focused on ESE-related *content* in the 2017/2018 academic year?	• 48% of participants answered "Yes" • 36% of participants answered "No" • 16% of participants did not answer "Yes" or "No" but provided verbal comments instead. Comments included: "[ESE was] integrated within the elementary science program." "[An elective] begins in 18/19." "Not this year, but in previous years yes, and next year there will be an elective for senior years." "A series of extra-curricular workshops [were offered]."
4. In the 2017/2018 academic year, did your preservice teacher education program include an ESE course that all preservice students were required to take?	• 42% of participants answered "Yes" • 33% of participants answered "No" • 25% did not answer "Yes" or "No" but provided verbal comments instead. Comments included: "We tried to embed [ESE] across curricula." "The two courses where ESE was integrated were officially designated as Science Education and Curriculum Design." "[ESE content was provided] in combination with Indigenous education."
5. In the 2017/2018 academic year, did your preservice teacher education program have courses that included ESE content as one of a number of components and that all preservice students were required to take?	• 42% of participants answered "Yes" • 33% of participants answered "No" • 25% did not answer "Yes" or "No" but provided verbal comments only. Comments included: "We tried to embed across curricula - place-based indigenous perspectives are a

	strong emphasis for us and in BC curriculum."
	"[ESE was] integrated within the elementary science program."
	"It [ESE] may have been part of a required course in Indigeneity"

Rationales for Justifying ESE in PTE Programs

According to Evan's et al. (2017), there are four key rationales teacher educators may use to justify ESE programming in PTE:

A. Preparing preservice teachers to develop the capacity and/or commitment to embed ESE into their teaching practices;

B. Responding to international educational policy priorities;

C. Disrupting instrumentalist, neoliberal education systems; and

D. "Others" (implying any rationale that does not easily fit into the three previous rationales) (p. 411).

In the survey, participants were asked to rank rationales A, B, and C, in order of importance, using a ranking scale in which "1" represented "most important" and "4" represented "least important." Also, please note that in the survey, we separated the first rationale into two separate items, and asked participants to rate the following two rationales:

A(i). "Preparing student teachers [preservice teachers] to develop the *capacity* to embed ESE into their teaching practices."

A(ii). "Preparing student teachers [preservice teachers] to develop the *commitment* to embed ESE into their teaching practices."

This would allow us to obtain rankings for preservice teachers' development of "capacity" to embed ESE into teaching practices separately from rankings for preservice teachers' development of "commitment" to embed ESE into their teaching practice.

Results for this item are illustrated in Figure 4.

Figure 4: Rationales for Supporting or Advancing ESE-PTE
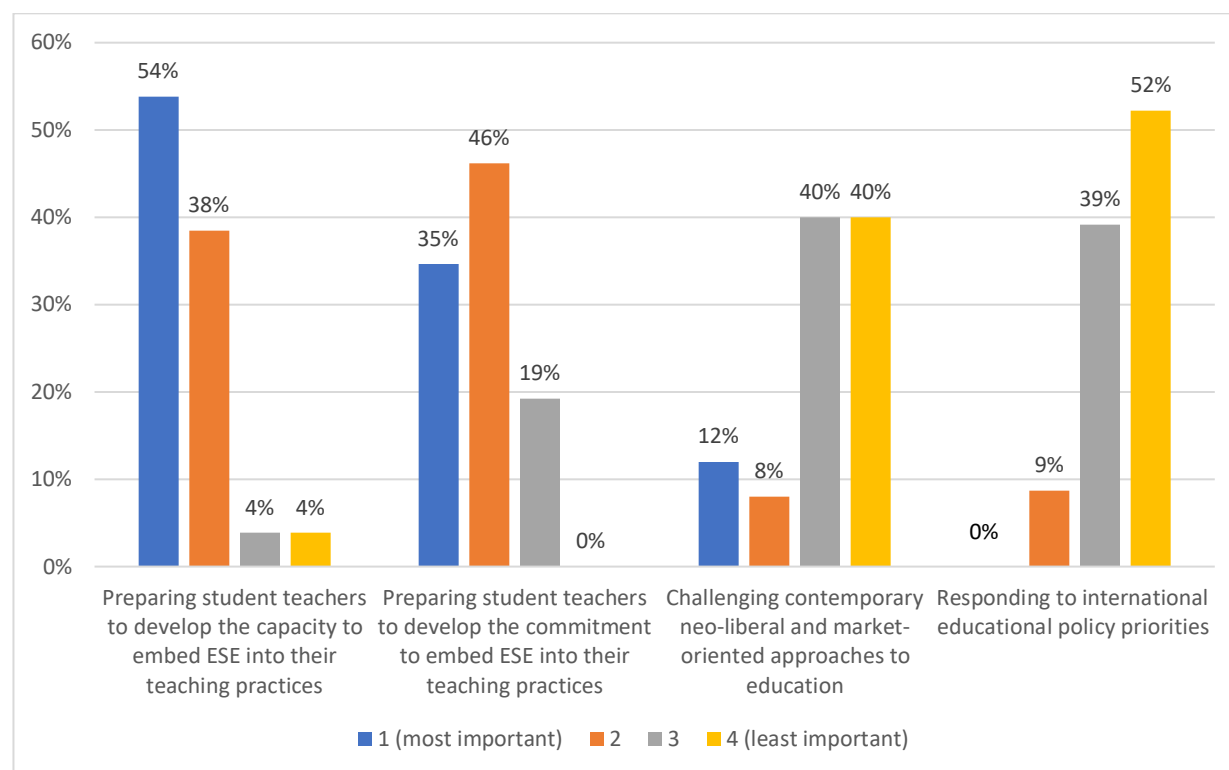
As can be seen in Figure 4, a majority of our participants ranked "Preparing student teachers to develop the *capacity* to embed ESE into their teaching practices" as the most important rational for justifying the inclusion of ESE in PTE programs, with 92% ranking this rational 1 or 2 out of 4, and only 8% ranking it 3 or 4 out of 4. The rationale, "Preparing student teachers to develop the *commitment* to embed ESE into their teaching practices" was the second-most highly ranked rationale, with 81% of participants ranking this rational 1 or 2 out of 4, and only 19% ranking it 3 or 4 out of 4. In terms of rationales "B" and "C", only 20% of participants ranked "Challenging contemporary neo-liberal and market-oriented approaches to education" 1 or 2 out of 4, with 80% ranking this rationale 3 or 4 out of 4. Only 9% of participants ranked "Responding to international educational policy priorities" as1 or 2 out of 4, with 91% ranking it 3 or 4 out of 4). It is obvious that, in general, our participants viewed rationales A(i) and A(ii) as more important justifications for including ESE in PTE programs than rationales B and C.

Major/Minor ESE Specialization

In her survey, Lin (2002) asked her participants whether or not their PTE programs provided "a sequence of courses leading to a form of specialization such as major and/or minor in environmental education" (p. 203). In designing our survey, we felt this was an interesting and useful question, and therefore, we included a similar question in our survey.

When asked whether their 2017-2018 PTE program allowed for major or minor ESE specialization, only 2 participants, who both worked in the same institution, noted that they offered preservice teachers a "minor" specialization in ESE; the rest answered "No" or "Not sure".

It appears from these results that offering "major" or "minor" specializations in ESE was not an important ESE-PTE programming consideration for most Canadian ESE-PTE programs at this time, or that most ESE-PTE programs had not considered the possibility of providing this option for their preservice teachers in the 2017-2018 academic session.

Effectiveness of Pedagogical Approaches in ESE-PTE

Previous studies (e.g., Evans et al., 2017; Lin, 2002; Swayze et al., 2012; Towler, 1980) have indicated that PTE instructors employ a variety of pedagogical approaches in their ESE courses and programs. While Evans et al. (2017) included descriptions of various pedagogical approaches employed internationally, they did not explore instructors' views on the effectiveness of those approaches. Thus, in our survey, we asked participants to rate the effectiveness of ten (10) different ESE-oriented pedagogical approaches on a 1-5 rating scale, where 1 represented the most effective strategy and 5 represented the least effective strategy. Results of this survey item are summarized in Table 3.

Table 3. Effectiveness of Pedagogical Approaches in ESE-PTE

Pedagogical Approach	Average Rating SCALE 1 (most effective) → 5 (least effective)	Percentage of participants who rated the approach 1 or 2 out of 5
Active, Experiential Learning	1.9	81%
Field-based Activities	2.5	67%
Nature-based Experiences	2.5	50%
Critical Pedagogy	3.0	36%
Community-based Learning	3.1	29%
Cross-Curricular Learning	3.5	12%
Project-based Learning	3.7	22%
Interdisciplinary Learning	3.8	25%
Inquiry-based Learning	3.8	18%
Community Service Learning	4.3	0%

As Table 3 shows, our participants rated "Active, Experiential Learning," "Field-based Experiences," and "Nature-based Experiences," as the three most effective pedagogical approaches in ESE-PTE (rating these 1.9, 2.5, and 2.5, respectively). Other relatively highly rated strategies included "Critical Pedagogy" (3.0), "Community-based Learning" (3.1), and "Cross-Curricular Learning" (3.5).

Strategies rated as least effective were: "Project-based Learning" (3.7), "Interdisciplinary Learning" (3.8) "Inquiry-based Learning" (3.8) and "Community-Service Learning" (4.3).

Barriers in ESE-PTE Programs

In her survey, Lin (2002) asked her participants to describe "major problems concerning the teaching of environmental education courses," and "the most commonly identified barrier[s] to implementing environmental education" (p. 209). When designing the current study, we felt that these were important questions, and asked participants to rate, on a 5-point Likert scale, a variety of barriers previously identified in the literature as hindering ESE-PTE programs (esp. Lin, 2002). In this

Likert scale, "1" indicated that a particular barrier was considered to be "unimportant"; "2" indicated that the barrier was "somewhat unimportant"; "3" indicated that the barrier was "neither important nor unimportant"; "4" indicated that the barrier was "important"; and "5" indicated that the barrier was "very important."

Barriers considered included:

1. Competition with other PTE courses, and lack of time in the PTE program timetable;

2. Lack of senior administrator support;

3. Lack of faculty colleague support;

4. Lack of professional governing body leadership;

5. Lack of fit, or alignment, between ESE-PTE curriculum and K-12 curriculum;

6. Lack of communication among ESE educators;

7. Lack of research in effective ESE teaching;

8. Lack of ESE teaching resources; and

9. Inadequate access to online ESE resources.

Results for each of these barriers are discussed below and illustrated in Figures 5 – 16.

Competition with other PTE courses, and lack of time in the PTE program timetable

Participants in this study indicated that competition with other PTE courses (Figure 5) and lack of time in packed PTE program timetables (Figure 6) were key barriers impeding Canadian ESE-PTE programs.
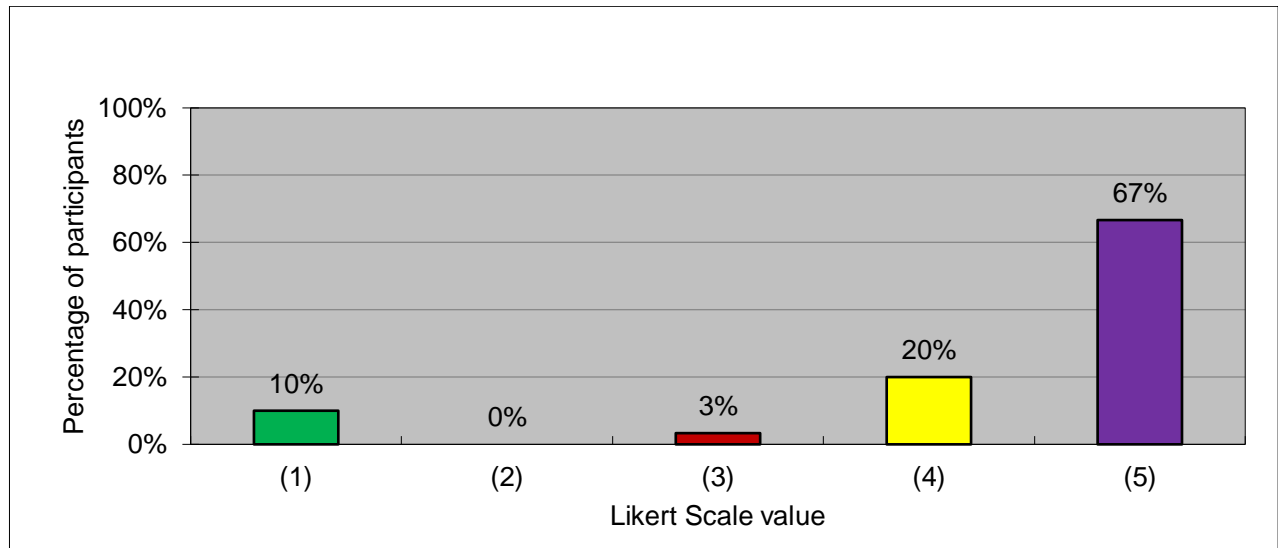
Figure 5 clearly indicates that the vast majority of our participants felt
"competition with other preservice courses" was an important barrier in ESE in PTE
programs (a combined total of 87% of participants indicated this to be a "very
important" barrier (67%) or "important" barrier (20%), with a mean Likert scale
rating of 4.3/5).

Figure 6: Lack of time in the PTE program timetable

Figure 6 shows that a significant majority of participants indicated that "lack
of time in the PTE program timetable" was an important barrier (combined total of
67% of participants indicating this to be a "very important" barrier (57%) or

"important" barrier (10%), with a mean Likert scale rating of 3.6/5). It should be noted, however, that a small, but not insignificant proportion of our partic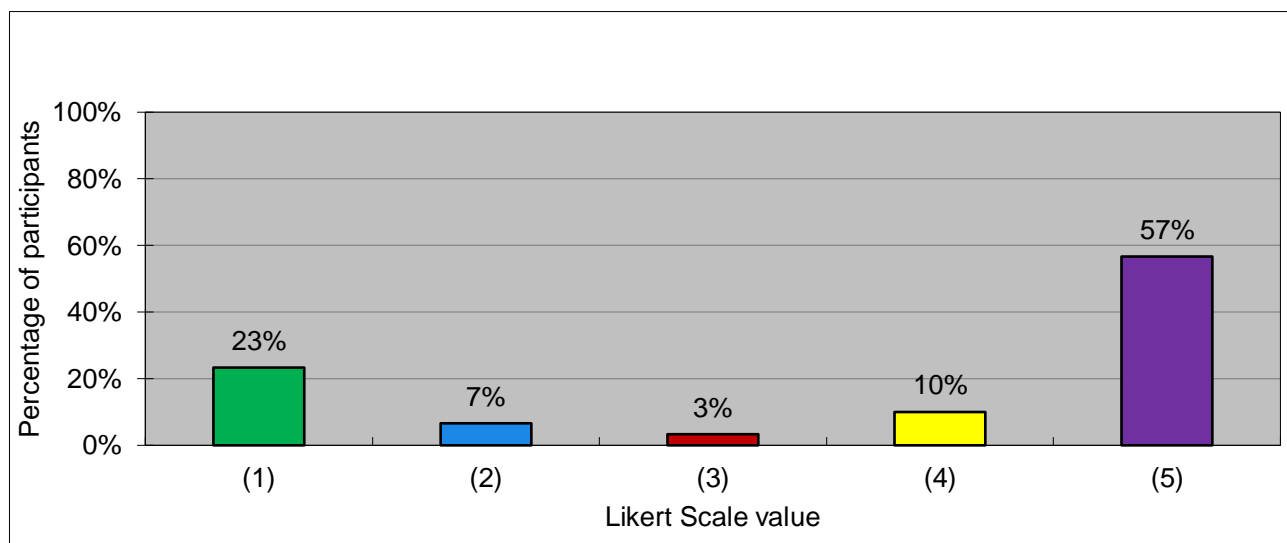ipants considered "lack of time in the PTE program timetable" not to be a major barrier, with a combined total of 30% believing it to be "unimportant" (23%) or "somewhat unimportant" (7%).

Lack of Senior Administrator Support for ESE-PTE

In addition to asking participants to assess the relative importance of competition with other courses and lack of time in PTE program timetables in ESE-PTE, we also asked them to evaluate the importance of senior administrator support in these programs. Participants in the current study placed "lack of senior administration support" among the top five barriers in PTE-ESE. Results for this item are illustrated in Figure 7.

Figure 7: Lack of senior administrator support for ESE-PTE
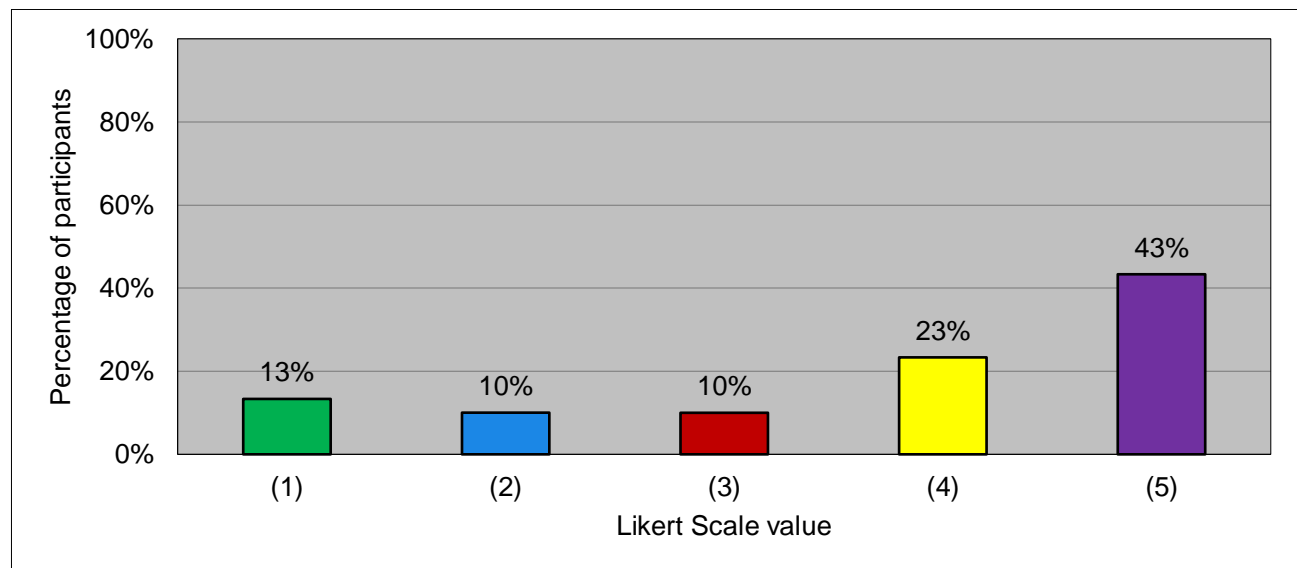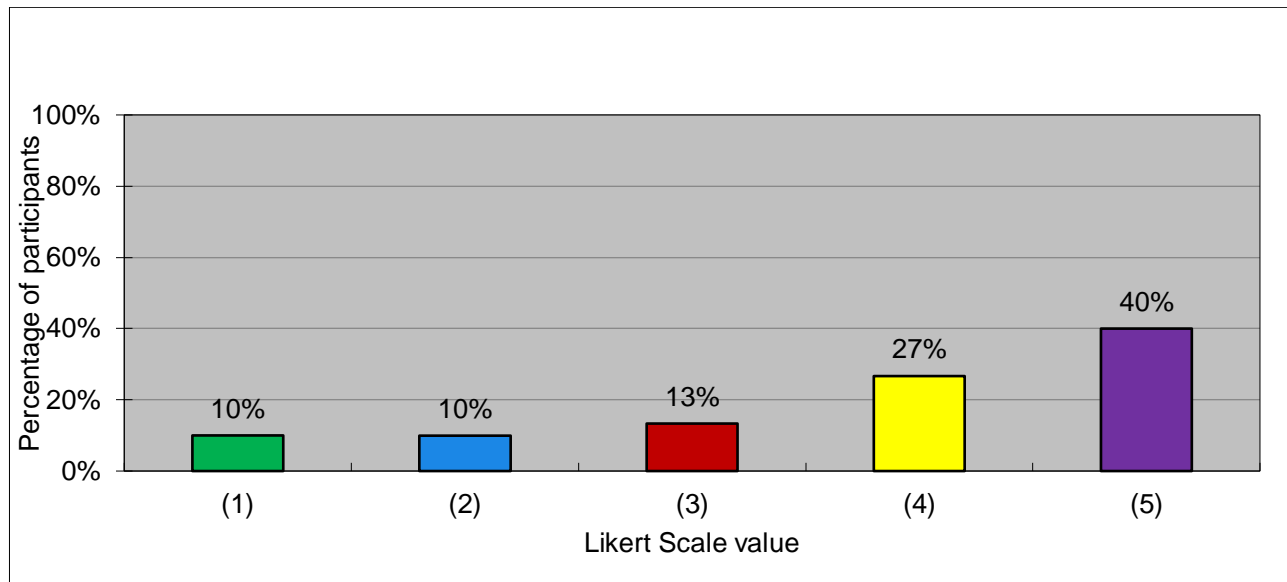

As Figure 7 shows, a combined total of 66% of participants indicated this to be a "very important" barrier (43%) or "important" barrier (23%), with a mean Likert scale rating of 3.6/5. This result indicates that, in general, without the support of senior administrators, ESE-oriented courses and other ESE program elements will likely not make inroads into PTE curricula and timetables.

Lack of Faculty Colleague Support for ESE-PTE

The second-most important barrier noted by our study's participants was "Lack of faculty colleague support for ESE" (Figure 8).

Figure 8: Lack of faculty colleague support for ESE

As can be seen in Figure 8, a combined total of 67% of participants indicated this to be a "very important" barrier (40%) or "important" barrier (27%), with a mean Likert scale rating of 3.8/5.

Lack of Professional Governing Body Leadership

Teacher certification bodies (e.g., college of teachers) are arms of government or self-governing entities that authorize/certify qualified individuals to teach in the public school systems of the country. In general, our participants indicated that "Lack of recognition by college of teachers … that ESE is a legitimate teachable subject" poses a significant barrier in ESE in Canadian faculties of education (Figure 9).

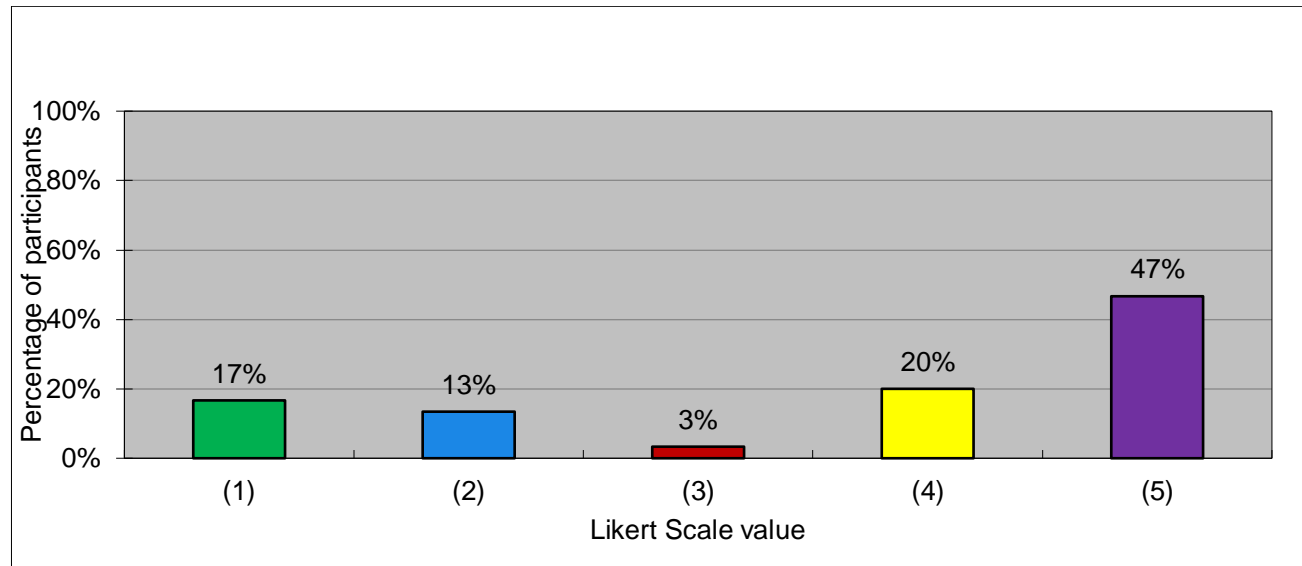*Figure 9: Lack of professional governing body leadership*

As can be seen in Figure 9, a combined total of 67% of participants indicated this to be a "very important" barrier (47%) or "important" barrier (20%), with a mean Likert scale rating of 3.7/5. Also, it should be noted that a much smaller, though not insignificant, proportion of our participants indicated that lack of professional governing body leadership is not a very important barrier in ESE-PTE programs, with a combined total of 30% indicating "somewhat unimportant" (13%) or "unimportant" (17%).

Lack of fit, or alignment, between ESE in PTE programs and ESE in K-12 Curriculum

For a school to achieve curricular integration, there has to be a match between the explicit curriculum (e.g., Eisner, 1985)—what a ministry of education requires— and the domain of a particular subject. By "lack of fit", we mean lack of alignment between ESE-PTE program curricula and ESE in K-12 curricula. In the survey, our participants were asked to assess the relative importance of "Lack of fit of ESE content with K-12 curriculum in schools" as a barrier in ESE-PTE. Results for this item are illustrated in Figure 10.

Figure 10: Lack of fit, or alignment, between ESE in PTE program curricula and ESE in K-12 curriculum

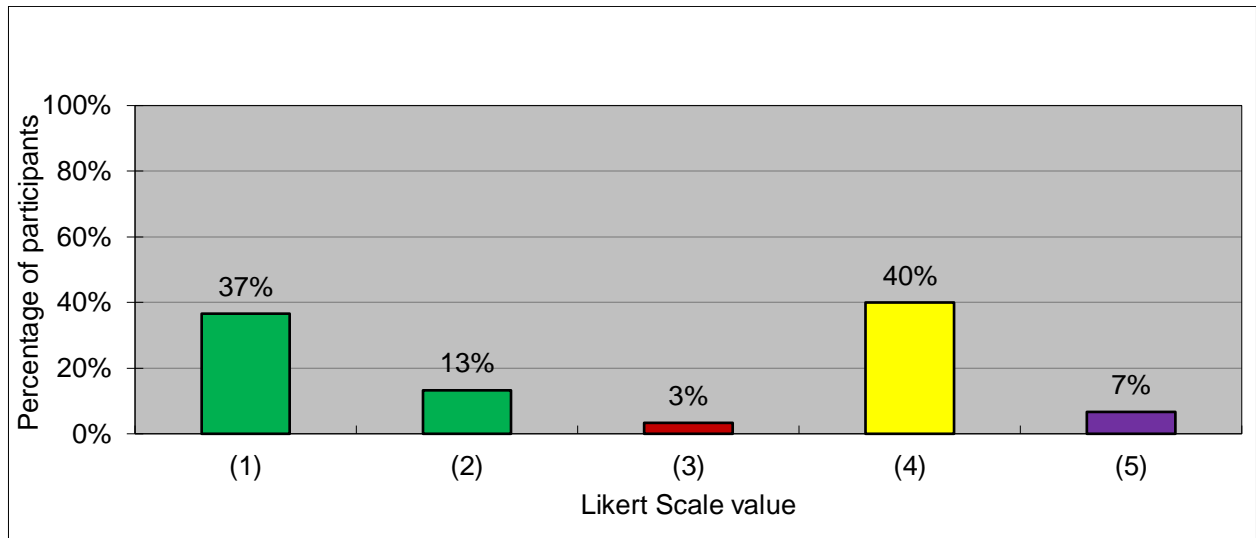As can be seen in Figure 10, our study participants differed widely in their responses to this survey item. A combined total of 47% of participants indicated this to be a "very important" barrier (7%) or an "important" barrier (40%), and a similar combined total of 50% indicated that a lack of fit between these two curricula is a "somewhat unimportant" barrier (13%) or an "unimportant" barrier (37%).

Lack of Communication among ESE Educators.

In the survey, our participants were asked to indicate how important a "lack of communication between ESE educators" is as a barrier in ESE-PTE programs. Results for this item are illustrated in Figure 11.

Figure 11: Lack of communication among ESE educators
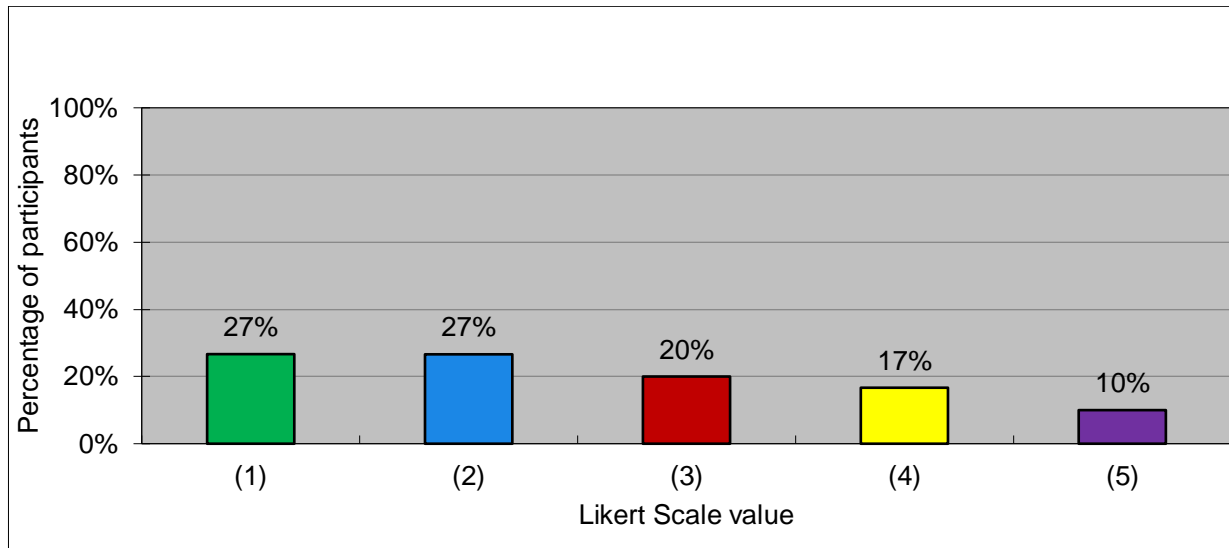
As can be seen in Figure 11, more than 50% of our survey participants did not consider "lack of communication between ESE educators" as being a major barrier, with a combined total of 54% indicating that this potential barrier was "somewhat unimportant" (27%) or "unimportant" (27%), and only a combined total of 27% considering this barrier as being "important (17%) or "very important (10%).

Though it seems reasonable to assume that it is beneficial for ESE educators to share their knowledge, experiences and expertise with one another, it appears that a majority of the participants in our study did not feel this lack of communication is a major barrier in ESE-PTE programs.

Lack of Research in Effective ESE Teaching

Participants in this study were also asked to assess the relative importance a "lack of research in effective ESE teaching" may have in ESE-PTE programs. Results for this item are illustrated in Figure 12.

Figure 12: Lack of research in effective ESE teaching
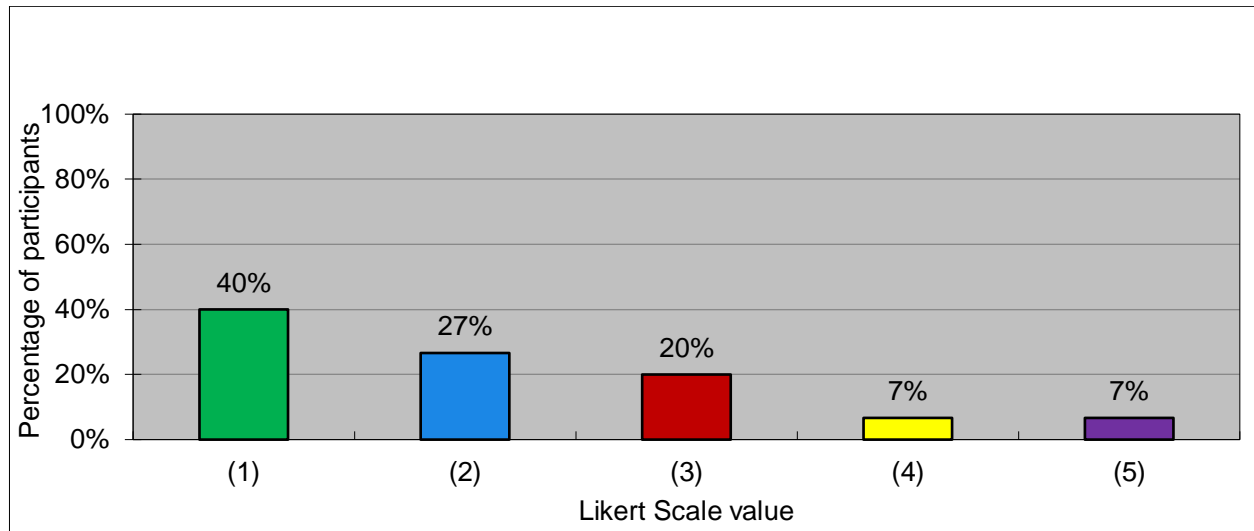
As can be seen in Figure 12, a combined total of 67% of our participants felt that a "lack of research in effective ESE teaching" is an "unimportant" (40%) or "somewhat unimportant" (27%) barrier in ESE-PTE programs. Thus, in general, participants in our study did not think that a "lack of research in effective ESE teaching" is a significant hinderance in ESE-PTE programs.

Lack of ESE Teaching Resources

Following Lin's (2002) survey, we asked participants to assess the relative importance of each of the following potential teaching resource-based barriers in ESE-PTE programs:

1. Inadequate teaching materials and equipment;

2. Lack of Canadian content in learning materials;

3. Inadequate access to online ESE resources; and

4. Inadequate tools for assessing ESE in K-12 students in schools.

Results for each of these potential barriers are illustrated in Figures 13-16.

Figure 13: Inadequate teaching materials and equipment
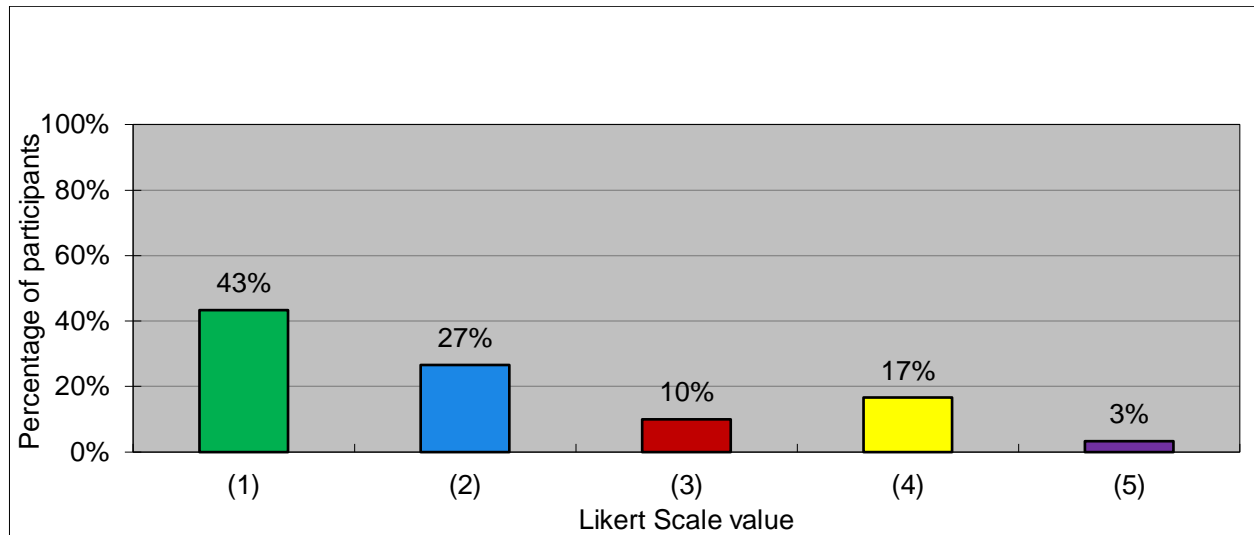
Figure 13 indicates that a significant majority of our participants (70%) indicated that "Inadequate teaching materials and equipment" was "unimportant" (43%) or "somewhat unimportant" (27%) as a barrier in ESE-PTE programs.

Figure 14: Lack of Canadian content in learning materials
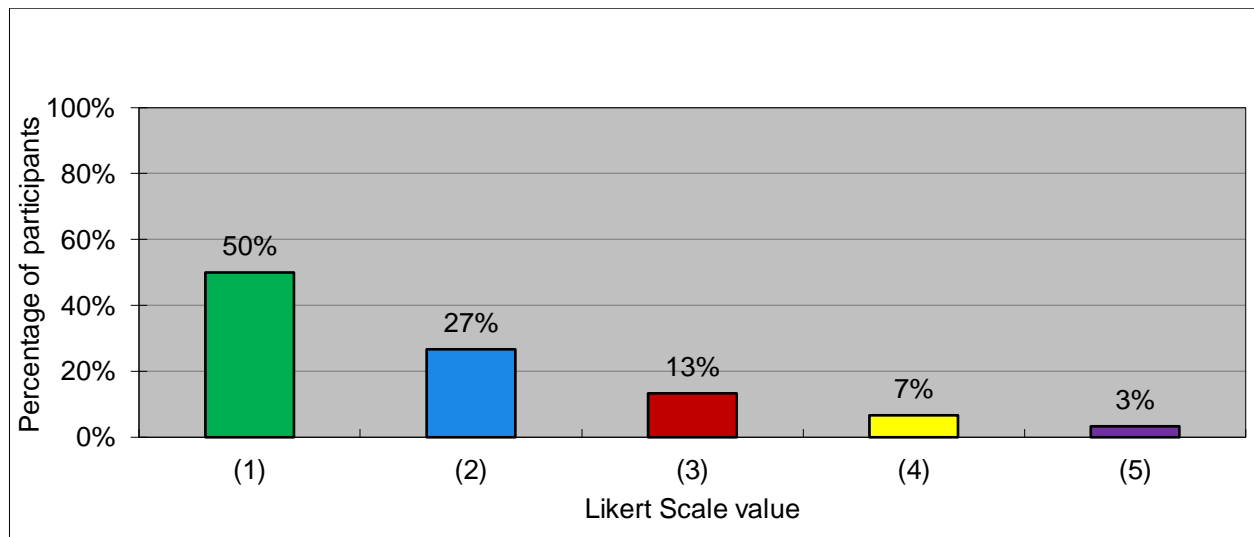
Figure 14 indicates that a significant majority of participants (77%) believed "Lack of Canadian content in learning materials" to be an "unimportant" (50%) or "somewhat unimportant" (27%) barrier in ESE-PTE programs.

Figure 15: Inadequate access to online ESE resources
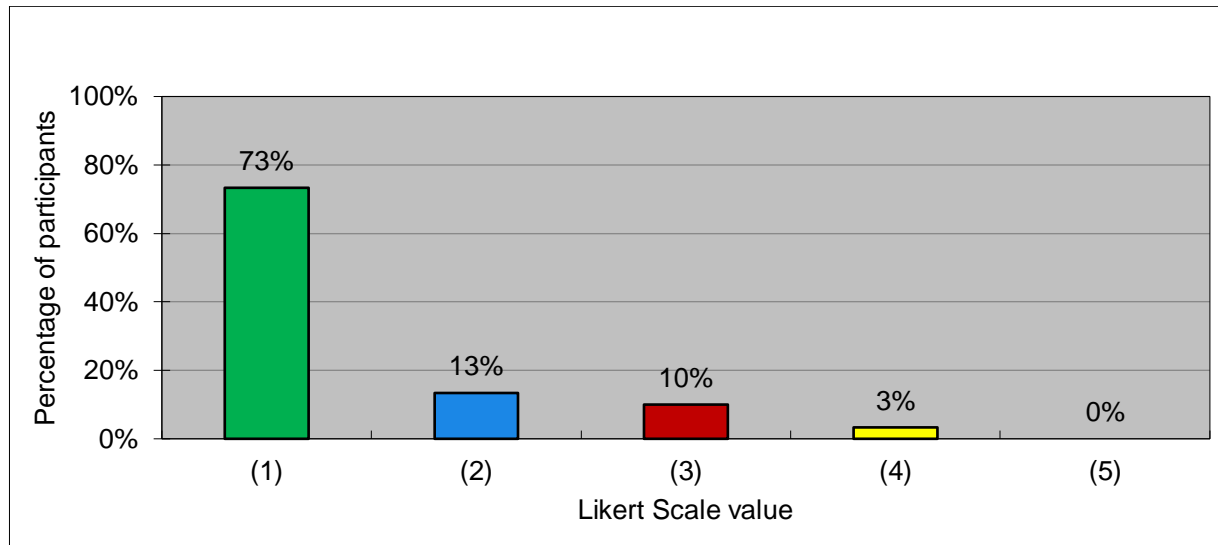
Figure 15 clearly indicates that a large majority of our participants (86%) viewed "Inadequate access to online ESE resources" as an "unimportant" (73%) or "somewhat unimportant" (13%) barrier in ESE-PTE programs.

Figure 16: Inadequate tools for assessing ESE in K-12 students in schools
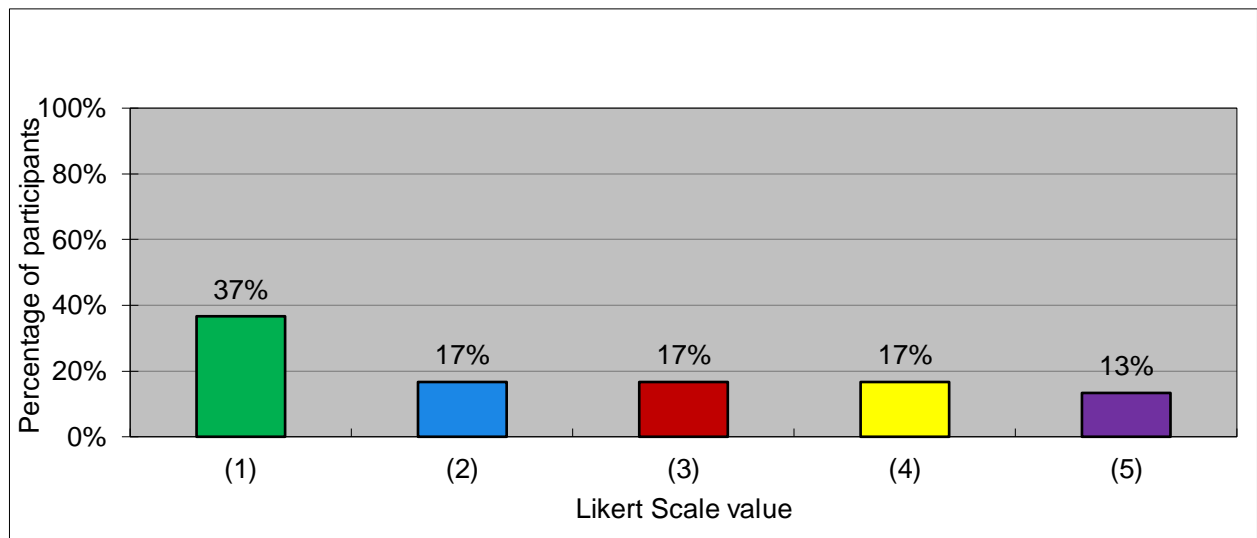
Figure 16 shows that a majority of participants (54%) viewed "Inadequate tools for assessing ESE in K-12 students in schools" as an "unimportant" (37%) or "somewhat unimportant" (17%) barrier in ESE-PTE programs. It should be noted, however, that a small, but not insignificant proportion of our participants considered "Inadequate tools for assessing ESE in K-12 students in schools" to be important,

with a combined total of 30% believing it to be "important" (17%) or "very important" (13%).

The results described in Figures 13-16 indicate that, in general, our participants found the four possible teaching resource-based barriers to be relatively unimportant or non-problematic as barriers in ESE-PTE programs.

ESE-Infused Practicum Experiences

In our survey, we asked participants the following questions focused on preservice teachers' ESE-oriented practicum experiences:

1. If your preservice teacher education program offers ESE-related courses, is there an expectation that preservice teachers taking such courses will engage in ESE practice during school-based practica? (Options included "Yes", "No", "Not sure", "Not applicable).

2. (a) Do preservice teachers that are particularly interested in ESE have opportunities to engage in public school-based practica, non-school-based experiences, private school-based practica? (check all that apply).

Participants who selected "non-school-based experiences" in 2. (a) were asked the following follow-up question:

2. (b) *As your program offers non-school based experiences, indicate the settings where those activities take place (check all that apply).* Options included: City farms, Rural farms, Environmental Non-Governmental Organizations (ENGOs), Social justice NGOs, Zoos, Museums, Outdoor education centres, Science centres, other.

3. In your opinion, during the 2017/2018 academic year, which categories (if any) of your preservice teachers engaged in ESE work during their school-based practica? School division categories included Elementary School (Grades K-5), Middle School (Grades 6-8), and Secondary School (Grades 9-12). Curriculum area categories included Science, Social Studies, Physical Education, Arts, Language Arts, Technology Education, and Maths.

4. If preservice teachers engage in school-based ESE work during practica, is this recognized, recorded, celebrated, or assessed in any way?

Results for Question 1, exploring whether preservice teachers had opportunities to engage in ESE activities during practicum, indicated that 38% of participants responded "Yes", 35% responded "No", 27% responded "Not applicable", and none (0%) of participants responded "Not sure" (Figure 17).

Figure 17: Expectation that preservice teachers taking ESE-oriented courses will engage in ESE activities during school-based practica
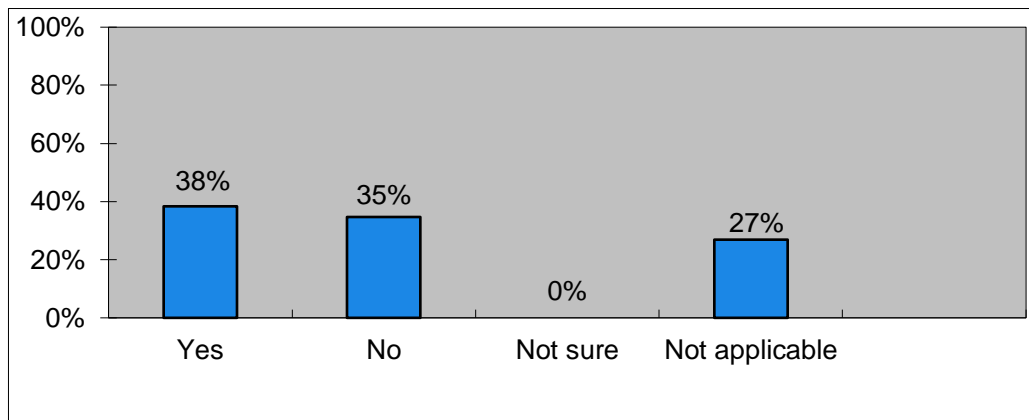
It is assumed that the 27% of participants who responded "Not applicable," did so because their PTE programs did not offer ESE-oriented courses in the 2017-2018 academic year.

Results for Question 2. (a) —exploring the types of practica preservice teachers participated in—are summarized in Figure 18.

Figure 18: Types of Practica
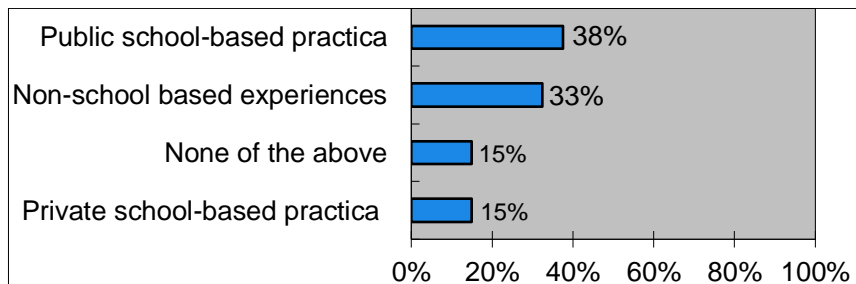
The values in Figure 18 show that a modest proportion of participants (38%) indicated that PTE students interested in ESE who completed their practica in public schools were able to engage in ESE-oriented activities during their practica.

A smaller, but still significant proportion of participants (33%) indicated that interested PTE students who completed practica in non-school-based locations (e.g., science centres, outdoor education facilities) were able to engage in ESE-oriented activities during their practicum experiences.

A smaller proportion of participants (15%) indicated that interested PTE students who completed practica in private schools were able to engage in ESE-oriented activities during their practicum experiences, with a further 15% answering, "None of the above," and indicating that ESE-interested PTE students could not engage in ESE-oriented activities in practicum (regardless of the type of practicum placement).

Results for Question 2. (b), exploring the types of settings in which ESE-oriented practicum activities occurred, are illustrated in Figure 19.
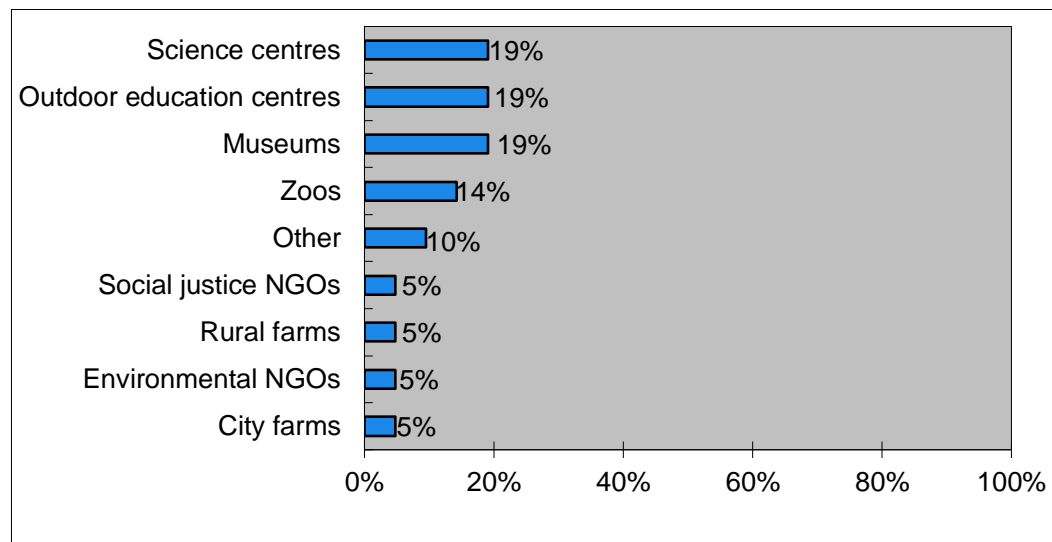
Figure 19: Settings in which non-school-based ESE-oriented practicum experiences occurred

The values in Figure 19 indicate that non-school-based practicum experiences occurred mostly in museums (19%), science centres (19%), outdoor education centres (19%), and zoos (14%), with much smaller proportions occurring in city farms (5%), rural farms (5%), environment-oriented non-governmental NGOs (5%), and social justice-oriented NGOs (5%). Nine percent (9%) of participants indicated that non-school-based practica occurred in unspecified "other" settings.

Results for Question 3—exploring the degree to which preservice teachers specializing in various school divisions were able to engage in ESE-oriented

49

practicum activities in the context of suggested curriculum areas—are illustrated in Figure 20 below.

Please note that for this survey item, participants were asked to use the rating scale shown in Table 4 to indicate the proportional range of their preservice teachers, specializing in either Elementary School, Middle School, or Secondary School, that were able to engage in ESE-oriented practicum activities in the various suggested curriculum areas.

Table 4: Rating Scale exploring the degree to which preservice teachers specializing in various school divisions were able to engage in ESE-oriented practicum activities

Rating	Meaning
1	Less than 10% of preservice teachers engaged in ESE activities during practica.
2	11% - 30% of preservice teachers engaged in ESE activities during practica.
3	31% - 50% of preservice teachers engaged in ESE activities during practica.
4	51% - 70% of preservice teachers engaged in ESE activities during practica
5	71% - 90% of preservice teachers engaged in ESE activities during practica
6	91% - 100% of preservice teachers engaged in ESE activities during practica

Also, please note that the ratings shown in Figure 20 are averages (arithmetic means) for all faculty members who indicated (using the rating scale) that a certain proportional range of their preservice teachers focusing on the various school curricular divisions were engaged in ESE-oriented practicum activities in the context of the curriculum areas.

Figure 20: Degree to which preservice teachers specializing in various school divisions and curricular areas were able to engage in ESE-oriented practicum activities
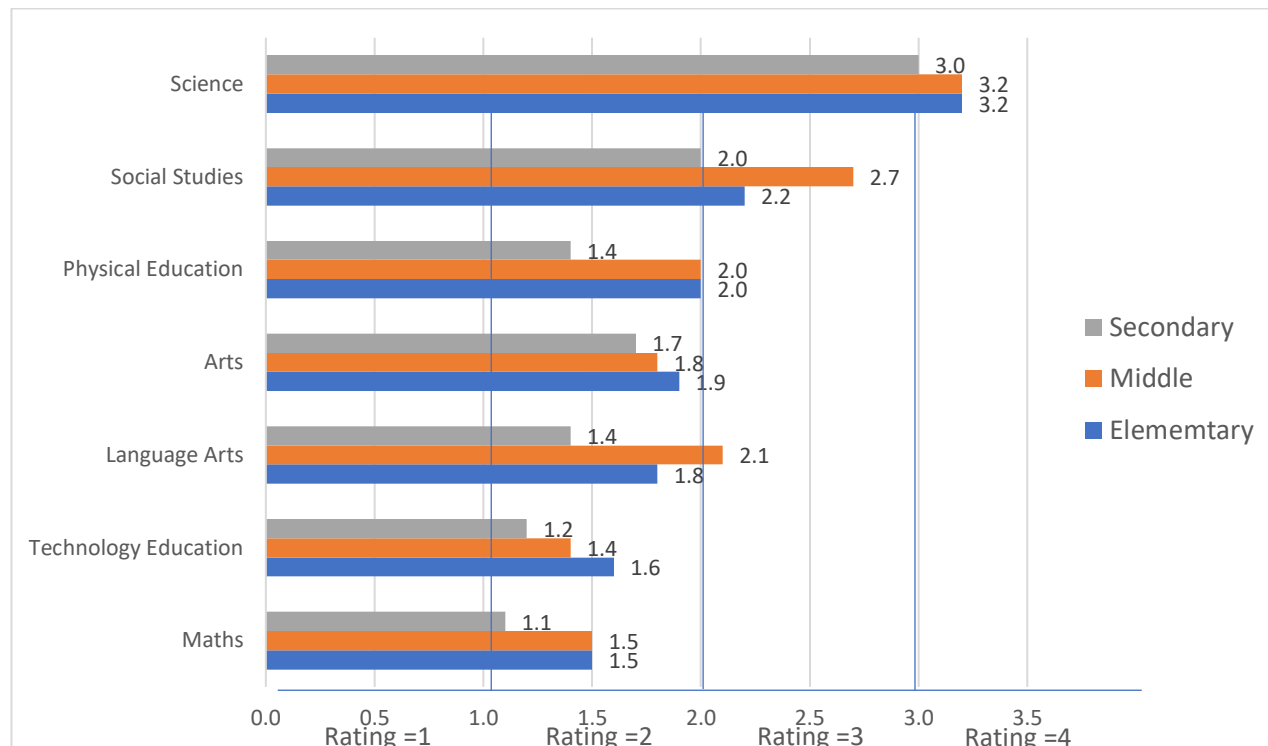
Figure 20 clearly shows that very few of the participants who completed this survey item felt that their preservice teachers were able to engage in meaningful ESE work during their school-based practica. Only in the Elementary Science domain did more than 20% of those responding (3 of 13 participants) indicate that more than 70% of their students were able to engage in ESE-related work during their practica. In all other cases, less than 20% of those responding felt that more than 70% of their preservice teachers had opportunities for ESE work in practicum. Also please note that we gave participants an opportunity to "skip" this question if they had "no opinion" or "no students in this category." Overall, the relatively low response rate to this question (13/32; 41%), may be an indication that the majority of participants felt their preservice teachers may have been in a position to apply ESE learnings in their practica, but, in fact, did not engage in ESE-oriented activities while out on placement.

Results for Question 4—exploring whether PTE programs provided recognition of preservice teachers who engaged in ESE-oriented practicum activities—are illustrated in Figure 21.

Figure 21: Recognition for engaging in ESE-oriented activities in practicum
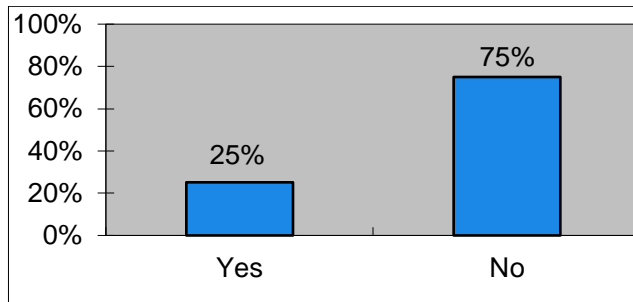
The values in Figure 20 indicate that the vast majority of our participants (75%) did not provide any type of recognition for ESE-oriented activities their preservice teachers engaged in during practicum.

Adequacy of ESE Preparation in PTE Programs

Although Towler (1980), Lin (2002), and Swayze et al. (2012) indirectly provided assessments of the adequacy of ESE preparation in PTE programs through their posing of questions that gauged the importance of ESE in PTE programs, and other questions that identified ESE-PTE enablers and barriers, a simple yet comprehensive question that assesses the adequacy of ESE preparation in PTE programs has been wanting. In our effort to update and extend the works of the aforementioned research studies, we included a question in our survey that asked whether participants felt their preservice teachers received adequate preparation for teaching ESE in their future teaching careers. Our results show that the vast majority of our participants indicated that their preservice students received inadequate preparation to teach ESE-related topics (Figure 22).

Figure 22: Adequacy of preparation in ESE-related teaching
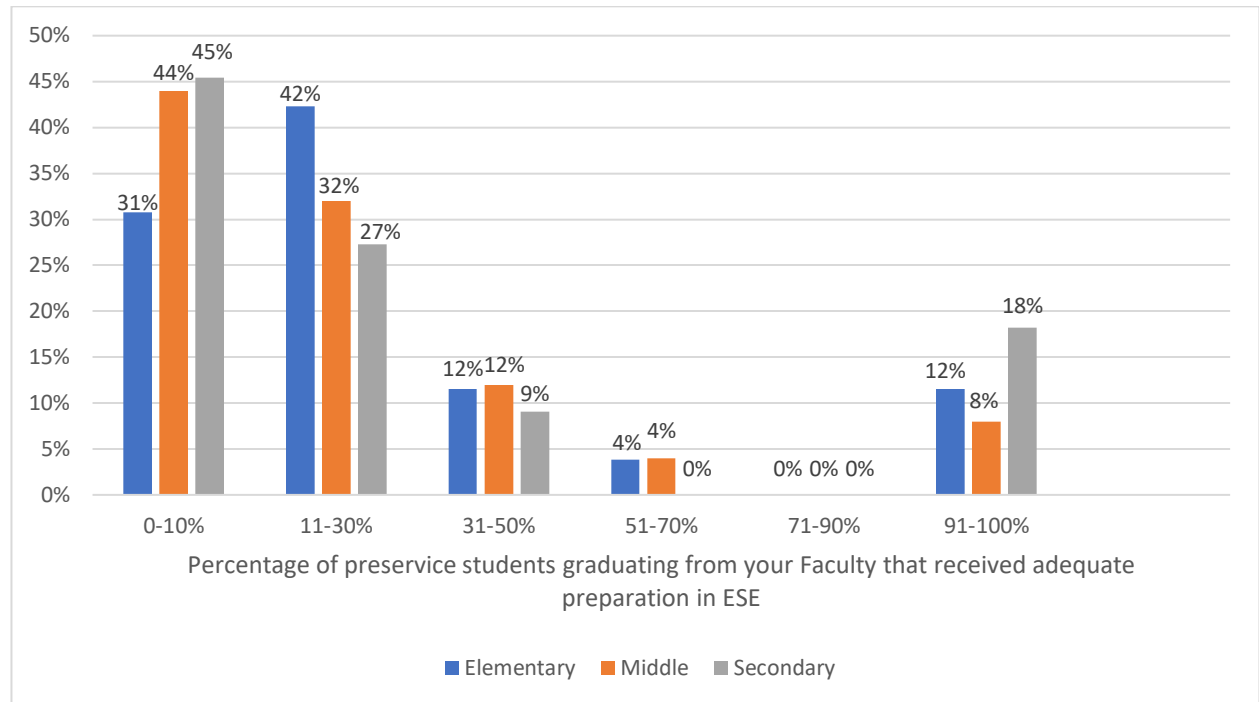
Figure 22 shows that 85% of participants commenting on preservice teachers specializing in elementary education; 88% of those commenting on preservice teachers in middle school education; and 81% of those commenting on preservice teachers in secondary school education indicated that 50% or fewer of these preservice teachers received adequate preparation in ESE. Further, a significant majority of our participants indicated that 30% or fewer of their preservice teachers received adequate preparation in ESE (73% of participants commenting on elementary education specialists; 76% of participants commenting on middle school education specialists; and 72% of participants commenting on secondary school education specialists).

Sauvé's (2005) ESE Currents

Sauvé (2005) outlined what she referred to as environmental education (i.e., ESE) "currents"—a set of 15 propositions relating to an area of emphasis and practice in the field of environmental education. Sauvé (2005) noted that while ESE currents may be considered as "a general way of envisioning and practicing environmental education …. these currents must not be reified" (p. 12). Sauvé's (2005) ESE Currents are listed in Table 5.

Table 5: Sauvé's ESE Currents (adapted from Sauvé (2005), Figure 1, p. 13)

Among those Currents with a Longer Tradition in Environmental Education (ESE)	Among those Currents more Recently Emerged in Environmental Education (ESE)
Naturalist Current	Holistic Current
Conservationist/Resourcist Current	Bioregionalist Current
Problem-Solving Current	Praxic Current
Systemic Current	Socially Critical Current
Scientific Current	Feminist Current
Humanist/Mesological Current	Ethnographic Current
Value-centered Current	Eco-Education Current
	Sustainable Development/Sustainability Current

Given that Sauvé's (2005) work is now more than 15 years old, and significant progress has been made in recognizing the imperative of coming to a deeper understanding and appreciation of Indigenous peoples of Canada, we made, for the purposes of our study, a small, but important, modification to Sauvé's (2005) currents. In Sauvé's description of the "Ethnographic" current, she notes that this current "emphasizes the cultural dimension of environmental relationships" (p. 26), and then makes repeated note of perspectives taken from "Amerindian" cultures. However, in our opinion, the term "ethnographic" is far broader than a concern for "Amerindian" cultures. Thus, in addition to the "Ethnographic" current, we added another current, the "Indigenous" current, that we believed was becoming increasingly prominent in Canadian ESE-PTE programs (see definition of "Indigenous Current" in Table 6 below).

In our survey, we asked participants to a) identify how Sauvé's "currents" (including our newly-created "Indigenous" current) were present in their faculty's ESE-PTE courses and programs, and then b) to rank the currents as to which ones were the most influential in their programs. In the rating scale for this item, "1" meant that the current was "not at all" present in the program, and 5 meant that the

current was a "principal current" in the program. The descriptors that participants were to use in their rankings are summarized in Table 6.

*Table 6: Descriptors used in this study for ranking Sauvé's (2005) ESE currents*

- Bioregionalist/Place-based Current: This current "leads us to see a place from the point of view of natural and social systems, whose dynamic relations contribute to creating a sense of "living place" rooted in natural as much as cultural history."

- Conservationist/Resourcist Current: This current is "centered on resource "conservation ... Concern for environmental 'management' is a recurring theme."

- Eco-Education Current: This current is "dominated more by educational concerns than environmental ones. There is no question of pragmatic solving problems or 'managing' the environment, but rather of leveraging our relationship with the environment to further personal development as the basis of meaningful and responsible action."

- Ethnographic Current: This current is "proposes not only that pedagogy should be adapted to different cultural realities, but also that inspiration be drawn from the pedagogy of these diverse cultures, which have another relationship to the environment."

- Feminist Current: This current "sheds light on the relations between the domination of women and the domination of nature."

- Holistic Current: This current "develop[s] the many dimensions of one's being in interaction with all aspects of the environment, ... develop[s] an 'organic' understanding of the world and participatory action in and with the environment."

- Humanist Current: This current "places the accent on the human dimension of the environment, forged at the junction of nature and culture."

- Indigenous Current: This current "actively connects indigenous and traditional understandings of human connections and participation in the natural world."

- Naturalist Current: This current is "centered on human relationships with nature."

- Praxic Current: This current "emphasizes learning in action, by action, and for the ongoing improvement of action."

- Problem-Solving Current: In this current, "the environment is considered first as a set of problems."

- Scientific Current: This current involves "tackling environmental realities and problems rigorously, of better understanding them and more specifically identifying their cause-and-effect relationships."

- Socially Critical Current: This current "promotes analysis of the social dynamics underpinning environmental realities and problems."

- Sustainable Development/ Sustainability Current: This current focuses on "economic development is at the basis of human development and recognizes that a 'sustainable'

economy is closely linked to the conservation of natural resources and the equitable sharing of resources."

- Systems/systemic Current: "Systemic analysis allows for identification of the various components of an environmental situation or issue, as well as for distinguishing their interrelations, including the relations among biophysical and social elements."

- Value-centered Current: "…the foundation of our relationship to the environment is moral or ethical in nature."

Results for this item are illustrated in Figure 23.

Figure 23: Presence of Sauvé's (2005) ESE currents in PTE programs
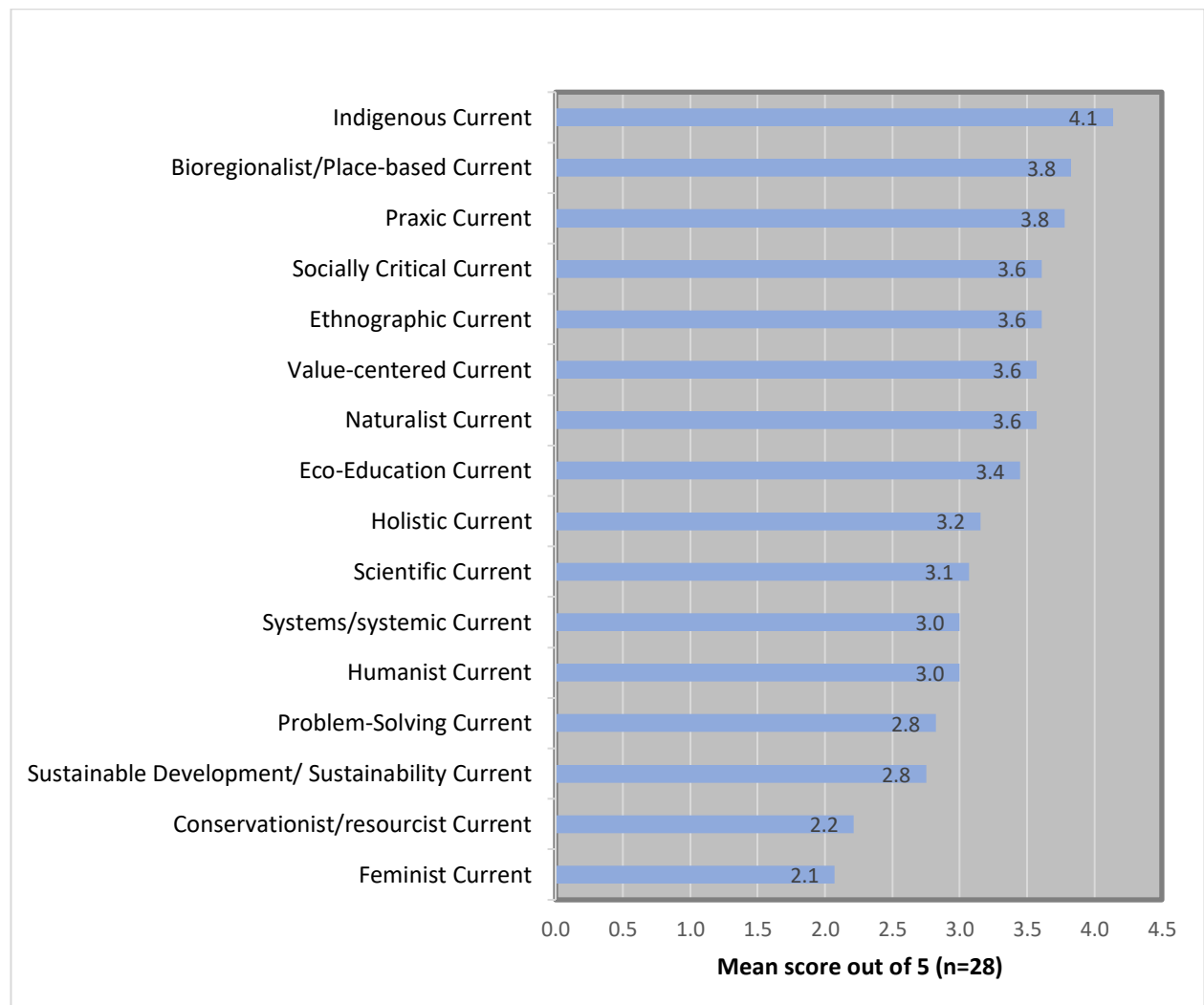
As may be seen in Figure 23, the three highest-rated currents are the Indigenous current, the Bioregionalist-Place-Based current, and the Praxic current. The lowest-rated currents include the Problem-solving current, the Sustainable

Development/Sustainability current, the Conservationist/Resourcist current, and the Feminist current.

Faculty Members' ESE-based Research Practices

In addition to teaching, and developing courses and programs, many PTE program faculty members conduct research in many different areas of education, including ESE-oriented research. Lin (2002) asked her participants to describe their ESE-oriented research-based activities, and we decided to do likewise in our survey. The three (3) questions asked in our survey and their results are summarized in Table 7.

Table 7: Faculty Members' ESE-based Research Practices

Question	Yes	No
Are you or any of your faculty colleagues involved in funded research projects in ESE?	55% (n=15)	45% (n=11)
Are you or any of your faculty colleagues involved in non-funded research projects in ESE?	54% (n=15)	46% (n=13)
Are you or any of your faculty colleagues involved in funded non-research projects in ESE (e.g., development of learning resources or curricula)?	50% (n=14)	50% (n=14)

The results in Table 7 indicate that a majority of our participants were involved in funded and/or non-funded ESE-oriented research in 2017-2018, with only half of the faculty members surveyed indicating involvement in funded non-research-oriented projects, such as curriculum development or learning resources development.

Key Findings

A primary objective of the current study was to provide a snapshot of the status of ESE-PTE in Canadian faculties/schools of education in 2017-2018. Lin (2002) was the last survey-based study of faculty members to provide a similar review, and we hope this study helps to update and extend Lin's (2002) findings. In this section, we provide a review of the salient findings in this study.

Survey Demographics

A total of 46 Canadian faculties/schools of education were invited to participate in this study, and 26 faculties/schools of education responded, resulting in a 57% faculty/school response rate. In total, 52 faculty members were invited to participate and 32 faculty members completed the survey, for a faculty member response rate of 62%). This response rate is greater than or equal to the response rate of 50% or more of survey-based studies reported in "leading education journals" (Creswell & Guetterman, 2019, p. 399).

Survey participants were fairly well distributed across Canada. Faculty members from British Columbia represented 25% of all participants; the prairie provinces (Alberta, Saskatchewan, and Manitoba) represented another 25% of all participants; the central provinces (Ontario and Quebec) represented 44% of all participants; and the maritime provinces (New Brunswick and Nova Scotia) represented 6% of all participants. No responses were received from institutions in Prince Edward Island and Newfoundland and Labrador; and Yukon Territory, Northwest Territories, and Nunavut were not invited to participate since they did not have their own PTE programs in 2017-2018.

Participants' Professional Status and Background

The vast majority of our participants were full-time faculty members. In terms of academic background, just under two-thirds had backgrounds in education, over three-quarters of them had backgrounds in life sciences, ecology/environmental science, and/or environmental education.

Priority of ESE in PTE Programs

According to the results, a majority of our participants felt that ESE was accorded lower priority status in their PTE programs in the 2017-2018 academic year, with less than a quarter asserting that it was given higher priority status. Conversely, the vast majority of participants felt that ESE should have been accorded a much higher priority level than it was given in the 2017-2018 year, with none thinking it should have been afforded lower priority.

ESE-PTE Program Offerings

PTE programs across Canada offered their preservice teachers a variety of ESE-oriented courses and other program elements in the 2017-2018 school year. Our results indicated that most ESE-related courses were either science-based, survey-oriented[11], or field-based courses. Just over half of participants indicated that their PTE programs offered their preservice teachers elective/optional courses specifically focused on ESE teaching methods, and just under half of all participants indicated that their PTE programs included elective/optional courses mainly focused on ESE content. In addition to determining the types of elective/optional courses offered in PTE programs across the country, we were also very much interested in determining whether faculties/schools of education included compulsory ESE courses in their PTE programs in 2017-2018. As a result, less than half of the faculties/schools of education that participated in the study included either compulsory ESE courses in their programs, or non-ESE compulsory courses that included a significant amount of ESE content.

Rationales for Including ESE in Canadian PTE Programs and Effectiveness of Pedagogical Approaches

In this study, we assessed the importance our participants attributed to various rationales for justifying inclusion of ESE in PTE programs and our results show that, overall, our participants felt that developing the "capacity" for integrating ESE into preservice teachers' future teaching practices was the most important

---

[11] Survey course: "a course treating briefly the chief topics of a broad field of knowledge" Merriam-Webster (2021)

rationale, followed by developing preservice teachers' "commitment" to ESE-embedding practices. We also assessed our participants' views on the effectiveness of various pedagogical approaches in the context of ESE teaching and learning, and found that, overall, participants rated "Active, Experiential Learning," "Field-based Experiences," and "Nature-based Experiences," as the three most effective pedagogical approaches in ESE-PTE.

Barriers in ESE-PTE

An important part of our study involved assessing the types of barriers our participants felt are mostly responsible for impeding ESE-PTE programs across Canada. In response to this query, our participants indicated that "competition with other PTE courses and lack of time in packed PTE program timetables" were two key impediments. Many of our participants felt that the interdisciplinary nature of ESE may cause it not be taken as seriously as other courses by colleagues teaching in the more traditional "hard" science disciplines, noting that this was also a barrier in ESE-PTE programs.

A strong majority of participants felt that a "lack of senior administrator support" was a "very important" or "important" barrier, indicating that without the support of senior administrators, ESE-oriented courses and other ESE program elements will likely not make inroads into PTE curricula and timetables. Furthermore, significant proportions of our participants indicated that "lack of faculty colleague support for ESE" and "lack of professional governing body leadership" were "very important" or "important" barriers in ESE-PTE.

An interesting finding was the split in participants' responses to "lack of fit, or alignment, between ESE in PTE programs and ESE in K-12 Curriculum" as a barrier. In this case, about half of our participants believed this to be a "very important" or "important" barrier, with the other half believing it to be a "somewhat unimportant" or "unimportant" barrier. This may be a reflection of provincial differences in curricular fit.

A majority of our participants did not feel that "lack of communication among ESE educators" was a major barrier in ESE-PTE, and a majority also did not consider "lack of research in effective ESE teaching" as an important barrier.

Furthermore, a majority of our participants indicated that "lack of ESE teaching resources and equipment," "lack of Canadian content in learning materials," "inadequate access to online resources," and "inadequate tools for assessing ESE in K-12 students in schools," were relatively "unimportant" or non-problematic barriers in ESE-PTE.

Opportunities for Preservice Teachers to Engage in ESE-Oriented Practicum Activities

Critically important components of all PTE programs in Canada are the various practica preservice teachers experience either in school-based placements (public or private) or non-school-based environments. In this study, we examined the degree to which preservice teachers focusing on ESE, or those interested in ESE, were given opportunities to engage in ESE-oriented practicum activities. As a result, just over a third of our participants indicated that ESE-oriented preservice teachers placed in public schools were able to engage in ESE-oriented practicum activities; a third indicated that ESE-oriented preservice teachers placed in non-school-based environments were able to engage in ESE-oriented practicum activities. Taken together, it is interesting that nearly 75% of our participants indicated that their students had opportunities to engage in ESE-related practica, either in schools or in other learning environments such as museums, zoos or nature centres. and only 15% indicated that their ESE-oriented preservice teachers in private school placements were able to engage in ESE-oriented practicum activities. In this line of questioning, we also asked our participants to describe the most common types of non-school-based practica that their preservice teachers participated in, and as a result, most of our participants indicated that these types of practica mostly occurred in museums, science centres, outdoor education centres, and zoos.

Extent to which PTE Programs Prepared Preservice Teachers to Address ESE in the Classroom

In this study, we asked our participants to judge the degree to which they believed their 2017-2018 ESE programming adequately prepared their preservice teachers for addressing ESE in their future careers. Our results indicate that an

overwhelming majority of participants felt that more than half of their preservice teachers were not suitably prepared to adequately address ESE in their future careers as teachers.

Sauvé's (2005) ESE Currents in Canadian PTE Programs

Sauvé (2005) suggested that ESE programs may engender a number of different "currents", or areas of ESE emphasis and practice. She characterized fifteen "currents" and, as discussed earlier, we added a sixteenth current, the "Indigenous" current, that we believed is gaining greater and greater emphasis in Canadian PTE programs. We asked our participants to assess the degree to which Sauvé's various currents (including the Indigenous current) were addressed in their PTE programs in 2017-2018, and found that the three highest-rated currents were the Indigenous current, the Bioregionalist/Place-Based current, and the Praxic current, with the least-rated currents being the Problem-solving current, the Sustainable Development/Sustainability current, the Conservationist/Resourcist current, and the Feminist current.

Recommendations

The mission statement of the EECOM Standing Committee on ESE-TE includes a commitment to "[a]dvance and support the development of high-quality ESE through research, policy, and professional development in Teacher Education across Canada" (ESE-TE, 2021). This mission statement, along with the call in the National Action Plan of the National Roundtable on ESE in PTE to advance research in ESE-PTE, have led us to suggest the following recommendations aimed at enhancing ESE in PTE across Canada.

Research

The research study reported here should be viewed as a continuation of research focused on assessing the status of ESE in Canadian PTE programs. As such, we encourage others to consider conducting research in this area, and we make the following suggestions for further studies:

- A study focused on assessing the effectiveness of ESE-PTE programming methods, integration models, program preparation, and currents of ESE.

- Survey-based research on the status and current development of Canadian ESE-PTE in the context of faculty administrators (deans, associate deans, provosts).

- Mixed methods research on the status and current development of Canadian ESE-PTE in the context of faculty members (instructors, professors, researchers).

- Retrospective and/or current policy research on the development of ESE-PTE policy at the government level (ministry-level), association level (e.g., ACDE-, CMEC-level), or institution level (e.g., PTE provider-level, university-level, faculty-level).

- Self-study of a Canadian faculty member or administrator engaged in the development of ESE-PTE programs, courses, or learning resources.

- Comparative research examining how formerly marginalized fields (e.g., feminism, multiculturalism, information technology) have successfully moved

from post-secondary curricular margins to the curricular mainstream, in relation to curricular developments in ESE-PTE.

- Longitudinal survey study of national and international trends in ESE-PTE.

- Case study research into underrepresented faculty members with academic backgrounds other than life sciences, ecology/environmental science, or environmental education, focusing on how these members support ESE-PTE program implementation.

- Comparative case study research into compulsory ESE-PTE courses (e.g., concurrent education programs versus consecutive education programs).

- In depth case study research into ESE-PTE barriers.

- Evaluation studies focused on opportunities preservice teachers have for engaging in ESE-oriented practicum activities.

- Survey research on Canadian preservice teachers' expectations in regard to ESE (e.g., the extent to which PTE programs prepare preservice teachers to address ESE in K-12 classrooms).

- Recasting Sauvé's (2005) "Currents of Environmental Education" study to further explore theoretical perspectives undergirding ESE-PTE programming.

- Descriptive research focused on the nature of faculty members' funded and non-funded ESE-PTE research.

This list of potential research topics is suggestive. However, given the diversity of topics, implied methodologies, and theoretical perspectives, we strongly recommend the development of a Canadian national research agenda in ESE-PTE.

Policy

ESE-PTE Advocacy

Although the current study has elucidated some positive developments in Canadian ESE-PTE programs, it has also brought to light a number of significant challenges, some of these being long-standing in nature. As our findings indicate that communication among ESE faculty members is important and still wanting, and that

a lack of professional body leadership on ESE may hinder implementation ESE in PTE programs, *we recommend that members of the EECOM Standing Committee on ESE-TE, and ESE educators more broadly, focus more of their energies on ESE-PTE advocacy/lobbying with relevant government bodies (e.g., ministries of education), professional associations (e.g., ACDE, provincial teacher accreditation bodies), and other policy-making bodies.*

Government Priorities. Governments in Canada understand that care for the biosphere is, and should be, the essential concern of our time, and that we cannot sustain any meaningful culture if we systematically destroy the natural elements on which our societies and economies are based. Therefore, the most critical part of the work that the EECOM Standing Committee on ESE-TE, and ESE educators more broadly, should focus more of their energies on are the linkages between ministries of education and ministries of environment to raise the profile and legitimacy of ESE-related curricula in K-12 systems across Canada. Once governments officially recognize the essential nature of ESE-related curricula and instruction, teacher accreditation bodies should then be more willing to recognize preservice teachers' credentials in undergraduate (or graduate) environmental/sustainability education, environmental/sustainability science, and related disciplines, and recognize ESE as a K-12 "teachable subject".

Universities and Faculties/Schools of Education. We strongly encourage universities and their faculties/schools of education to admit many more applicants into PTE programs whose credentials focus on undergraduate (or graduate) education in environmental/ sustainability studies, environmental/sustainability science and related disciplines.

Universities and their faculties/schools of education should seek to create "major" or "minor" designations for ESE-related streams, similar to the current practice of offering preservice teachers Science or English as a teaching focus. Efforts such as this will need the support of senior administrators and efforts should be expended to garner support of officials responsible for setting university/faculty policy in this regard.

Additionally, greater voice is needed to advocate for university admissions processes that recognize ESE-related secondary school courses as being appropriate in meeting university entrance requirements that might normally be met by courses such as Grade 12 Biology, Chemistry, and Physics.

Sauvé's (2005) ESE-PTE Currents. The high ratings our participants gave Sauvé's "Bioregionalist/Place-Based" and "Indigenous" currents was not expected, and opens a door for potential collaborations among education faculty who teach ESE-related courses and those involved in Indigenous education. Bringing these two currents together will involve overcoming two of the major barriers we noted in our findings: the lack of support from colleagues, and lack of support from senior administrators. We recommend the creation of creative strategies for overcoming these barriers, perhaps through regular gatherings at national research conferences (e.g., annual Canadian Society for the Study of Education, (CSSE) meetings), discussions at ACDE meetings, and local initiatives (e.g., mini-conferences, colloquia) at the institutional level.

Professional Development

Though our survey did not address issues regarding faculty member professional development directly, our study indicated that the availability of ESE teaching resources, Canadian ESE content, and access to quality online ESE resources is not particularly problematic. We recommend that ESE-PTE stakeholders prioritize research and policy development, and support efforts to enhance the professional development of ESE-PTE instructors/providers.

References

Alberta Council for Environmental Education (2012). *Advancing pre-service environmental education in Alberta: A discussion paper*. https://www.abcee.org/sites/default/files/cms/wp-content/uploads/2011/02/Advancing-Pre-Service-Environmental-Education-in-Alberta-24-Jan-2012-draft.pdf

British Columbia Ministry of Education (2007). *Environmental learning and experience: An inter-disciplinary guide for teachers*. https://www2.gov.bc.ca/assets/gov/education/kindergarten-to- grade-12/teach/teaching-tools/environmental-learning/environ_learning_exper.pdf.

Creswell, J. W., & Guetterman, T. C. (2019). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research.* Pearson.

Eisner, E. (1985). *The Educational Imagination: On the design and evaluation of school programs* (2nd ed.). Macmillan Publishing Co.

Environmental and Sustainability Education in Teacher Education (ESE-TE). (2021, January). *Welcome! Bienvenue*? http://eseinfacultiesofed.ca/index.html

Evans, N., Stevenson, R. B., Lasen, M., Ferreira, J.-A., & Davies, J. (2017). Approaches to embedding sustainability education in teacher education: A synthesis of the literature. *Teaching and Teacher Education, 63*, 405–417. https://doi.org/10.1016/j.tate.2017.01.013.

Goodson, I. (1987). *School subjects and curriculum change.* Falmer.

Hansen, J., Sato, M., Ruedy, R., Schmidt, G. A., & Lo, K. (2019). *Global Temperature in 2018 and Beyond*. http://www.columbia.edu/~jeh1/mailings/2019/20190206_Temperature2018.pdf?utm_source=SDSN&utm_campaign=df622ada70-EMAIL_CAMPAIGN_2018_03_02_COPY_01&utm_medium=email&utm_term=0_2302100059-df622ada70-177817213

Karrow, D., & DiGiuseppe, M. (2019). Exploring Canadian preservice teacher environmental and sustainability education with international practices. In D. Karrow & M. DiGiuseppe (Eds.), *Environmental and Sustainability Education in Teacher Education: Canadian Perspectives,* (pp. 305-320). Springer Nature AG.

Karrow, D. DiGiuseppe, M., Elliott, P., Inwood, H., & Fazio, X. (2016). Initial teacher environmental education capacities. In. M. Hirschkorn & J. Mueller (Eds.), *What Should Canadian Teachers Know? Teacher Capacities: Knowledge, Skills, and Dispositions,* (pp. 162-191). Canadian Association for Teacher Education (CATE).

Layton, D. (1972). Science as general education. *Trends in Education*, 11-15.

Lin, E. (2002). Trend of environmental education in Canadian pre-service teacher education programs from 1979 to 1996. *Canadian Journal of Environmental Education*, *7*(1), 199-215.

Merriam-Webster (2021). *Dictionary*. https://www.merriam-webster.com/dictionary/survey%20course

Ministry of Education Manitoba (2014). *Education for Sustainable Development in Manitoba Education and Advanced Learning.* https://www.edu.gov.mb.ca/k12/esd/pdfs/esd_mb.pdf

Nichols, A. L., & Maner, J. K. (2008). The Good-Subject Effect: Investigating Participant Demand Characteristics. *The Journal of General Psychology, 135* (2), 151–165. doi:10.3200/GENP.135.2.151-166. PMID 18507315.

Ontario Ministry of Education. (2009). Acting today, shaping tomorrow. Queen's Printer for Ontario.

Rockström, J., Sachs, J. D., Öhman, M. C., & Schmidt-Traub, G. (2013). *Sustainable Development and Planetary Boundaries: Background Research Paper*. https://www.eesc.europa.eu/resources/docs/sustainable-development-and-planetary-boundaries.pdf

Sauvé, L. (2005). Currents in Environmental Education: Mapping a complex and evolving pedagogical field. *Canadian Journal of Environmental Education*, 10, 11-37.

Sims, L., Asselin, M., & Falkenberg, T. (2020). Environmental and sustainability pedagogical approaches in pre-service teacher education. *Canadian Journal of Environmental Education*, *23*(1), 14-32.

Sims, L. and Falkenberg, T. (2013) Developing Competencies for Education for Sustainable Development: A Case Study of Canadian Faculties of Education.

International Journal of Higher Education, 2, 1-14.
https://doi.org/10.5430/ijhe.v2n4p1

Swayze, N., Creech, H., Buckler, C., & Alfaro, J. (2012). *Education for Sustainable Development in Canadian Faculties of Education*. Council of Ministers of Education, Canada.

Towler, J. O. (1980-81). A survey of Canadian pre-service training in environmental education. *Journal of Environmental Education*, 12(2), 11-16.

UNECE. (2011). *Learning for the future: Competences in education for sustainable development*. United Nations Economic Commission for Europe.
https://unece.org/fileadmin/DAM/env/esd/ESD_Publications/Competences_Publication.pdf

Yueh, M.-C. M., Cowie, B., Barker, M., & Jones, A. (2010). What influences the emergence of a new subject in schools? The case of environmental education. *International Journal of Environmental and Science Education, 5*(3), 265-285.
http://www.ijese.com/IJESE_v5n3_Yueh-et-al.pdf

Appendices

Appendix A: French language institutions contacted.

Université de Moncton	Université du Québec en Abitibi-Témiscamingue
Université de Saint Boniface	Université du Québec en Outaouais
Université du Quebec a Montreal*	Université du Québec à Rimouski
Université du Sherbrooke*	Université du Québec à Trois-Rivières
Université Laval	

* two invitations to this institution

Appendix B: English language institutions contacted.

Acadia University	Bishop's University
Brandon University	Brock University
Burman University	Cape Breton University
King's University College	Lakehead University
Laurentian University	Memorial University of Newfoundland
Mount Royal University	Nipissing University
Queen's University	Red Deer College
Saint Francis Xavier University	Simon Fraser University*
Thompson Rivers University	Trent University
Trinity Western University	University College of the North
University of Alberta	University of British Columbia*
University of Lethbridge	University of Manitoba
University of Northern British Columbia	University of Ontario Institute of Technology*
University of Ottawa	University of Prince Edward Island
University of Regina	University of Saskatchewan*
University of Toronto/OISE	University of Victoria
University of Windsor	University of Winnipeg
Vancouver Island University	Western University
York University	

* two invitations to this institution

Appendix C: English language survey.

The Canadian Network for Environmental Education and Communication (EECOM) Standing Committee on Environmental and Sustainability Education in Teacher Education (ESE-TE)* is conducting a survey to examine the status of ESE and associated domains in Canadian Faculties of Education.

We invite you to participate in this survey, which will help us develop a contemporary picture of ESE in preservice teacher education in Canada and allow us to begin to draft recommendations to help advance programs, policy, and practice.

Please answer the survey questions in the context of this past academic year, 2017/2018.While the survey will use the term Environmental and Sustainability Education (ESE) throughout, we are referring to a range of approaches including Environmental Education, Sustainability Education, Education for Sustainability, Education for Sustainable Development, Energy Education, Outdoor Education, Place-based Education etc.

Your responses will be anonymous. This survey will not collect any identifying information beyond your institutional affiliation and your position/rank within the institution; however, this information may make you identifiable and this should be taken into consideration in your decision to participate. In reports and presentation emerging from the study, data will be pooled and responses will be reported in a way that minimizes the possibility of participant identification. There will be no linkage between your consent to participate and the answers you provide in the survey.

The data collected will be stored on a Canadian server and will not be subject to scrutiny under the US Patriot Act. There are no anticipated risks involved in your participation in the survey, although it is possible that you may experience some emotional distress related to the topic. If you do not want to participate, please do NOT press the final 'submit' button on the survey; you do not have to submit the completed survey. Your submission of the completed survey is an indication that you have read and are fully informed about and give consent to participate in the project. Once the survey is submitted, we will not be able to find and remove your submission. Raw data will be archived for future comparative studies.

If you do not have enough time to complete the survey in one sitting, you can return to the partially-completed survey by clicking on the link you received in your invitation email. The survey should take approximately 30-45 minutes to complete and includes options for open-ended responses. Once you click on the final 'submit' button, you will not be able to enter the survey again.

The project has been reviewed and has received ethical approval from each of the participating institutions as required.

Findings from the research will be shared with those who have been invited to participate and others who are interested in the findings.

Many thanks for your willingness to engage in this research project.

* Members of the ESE-TE Research group (alphabetical order)Maurice DiGiuseppe (University of Ontario Institute of Technology), Paul Elliott, (Trent University), Patrick Howard (Cape Breton University), Douglas Karrow (Brock University), Richard Kool (Royal Roads University), Emily Lin (University of Nevada-Las Vegas), Janet McVittee (University of Saskatchewan), Laura Sims (Université de St. Boniface), Rob vanWynsberghe (University of BC)Please start by clicking on the NEXT button below.

---

1. Part-time/sessional faculty

2. Full-time faculty
3. Department head
4. Faculty administrator (Assistant or Associate Dean)

_____

In your view, relative to content currently required in your Faculty's preservice teacher education, ESE:

	High priority		Medium priority		Low priority
is considered to be a...	❏	❏	❏	❏	❏
should be considered to be a...	❏	❏	❏	❏	❏

_____

What type of ESE-related courses does your faculty/program offer? Select all that apply.
1. General survey course(s)
2. Field-based courses
3. Methods courses
4. Science-based courses (e.g., ecology, sustainability, natural history)
5. Humanities-based courses (e.g., environmental philosophy, environmental arts)
6. Social science-based courses (e.g., environmental psychology)
7. None
8. Comments / Other _____

_____

Lucie Sauvé (2005) identified 'currents', or theoretical frameworks, which influence environmental pedagogy (see Currents in Environmental Education: Mapping a complex and evolving pedagogical field. Canadian Journal of Environmental Education, 10, 11-37).
How are these 'currents', outlined below, present in your Faculty's ESE-TE courses or program?

	Not at all (1)	2	3	4	A principal 'current' (5)
Bioregionalist/Place-based Current: "...leads us to see a place from the point of view of natural and social systems, whose dynamic relations contribute to creating a sense of "living place" rooted in natural as much as cultural history."	❏	❏	❏	❏	❏
Conservationist/resourcist Current: "...centered on resource "conservation... Concern for environmental "management" is a recurring theme."	❏	❏	❏	❏	❏
Eco-Education Current: "dominated more by educational concerns than environmental ones. There is no question of pragmatic solving problems or 'managing' the environment, but rather of leveraging our relationship with the environment to further personal development as the basis of meaningful and responsible action."	❏	❏	❏	❏	❏
Ethnographic Current: "... proposes not only that pedagogy should be adapted to different cultural realities, but also that inspiration be drawn from the pedagogy of these diverse cultures, which have another relationship to the environment."	❏	❏	❏	❏	❏
Feminist Current: "...sheds light on the relations between the domination of women and the domination of nature..."	❏	❏	❏	❏	❏
Holistic Current: "... an exclusively analytic and rational approach to environmental realities is at the origin of many contemporary problems..."	❏	❏	❏	❏	❏

72

Humanist Current: "...places the accent on the human dimension of the environment, forged at the junction of nature and culture."	❑	❑	❑	❑	❑
Indigenous Current: "... actively connects indigenous and traditional understandings of human connections and participation in the natural world	❑	❑	❑	❑	❑
Naturalist Current: "...centered on human relationships with nature."	❑	❑	❑	❑	❑
Praxic Current: "...emphasizes learning in action, by action, and for the ongoing improvement of action."	❑	❑	❑	❑	❑
Problem-Solving Current: "the environment is considered first as a set of problems."	❑	❑	❑	❑	❑
Scientific Current: "...tackling environmental realities and problems rigorously, of better understanding them and more specifically identifying their cause-and-effect relationships."	❑	❑	❑	❑	❑
Socially Critical Current: "...promotes analysis of the social dynamics underpinning environmental realities and problems..."	❑	❑	❑	❑	❑
Sustainable Development/ Sustainability Current: "...economic development is at the basis of human development and recognizes that a "sustainable" economy is closely linked to the conservation of natural resources and the equitable sharing of resources...."	❑	❑	❑	❑	❑
Systems/systemic Current: "Systemic analysis allows for identification of the various components of an environmental situation or issue, as well as for distinguishing their interrelations, including the relations among biophysical and social elements."	❑	❑	❑	❑	❑
Value-centered Current: "...the foundation of our relationship to the environment is moral or ethical in nature..."	❑	❑	❑	❑	❑

Of the "currents" you rated 4 or 5, please rank the top 5 currents you believe are the most influential in your Faculty (with 1 being the most influential).

- Bioregionalist/Place-based Current: "...leads us to see a place from the point of view of natural and social systems, whose dynamic relations contribute to creating a sense of "living place" rooted in natural as much as cultural history." _____
- Conservationist/resourcist Current: "...centered on resource "conservation... Concern for environmental "management" is a recurring theme." _____
- Eco-Education Current: "dominated more by educational concerns than environmental ones. There is no question of pragmatic solving problems or 'managing' the environment, but rather of leveraging our relationship with the environment to further personal development as the basis of meaningful and responsible action." _____
- Ethnographic Current: "... proposes not only that pedagogy should be adapted to different cultural realities, but also that inspiration be drawn from the pedagogy of these diverse cultures, which have another relationship to the environment." _____
- Feminist Current: "...sheds light on the relations between the domination of women and the domination of nature..." _____
- Holistic Current: "..develop new forms of understanding"_____
- Humanist Current: "...places the accent on the human dimension of the environment, forged at the junction of nature and culture." _____
- Indigenous Current: "... actively connects indigenous and traditional understandings of human connections and participation in the natural world _____
- Naturalist Current: "...centered on human relationships with nature." _____
- Praxic Current: "...emphasizes learning in action, by action, and for the ongoing improvement of action."

_____
- Problem-Solving Current: "the environment is considered first as a set of problems." _____
- Scientific Current: "...tackling environmental realities and problems rigorously, of better understanding them and more specifically identifying their cause-and-effect relationships." _____
- Socially Critical Current: "...promotes analysis of the social dynamics underpinning environmental realities and problems..." _____
- Sustainable Development/ Sustainability Current: "...economic development is at the basis of human development and recognizes that a "sustainable" economy is closely linked to the conservation of natural resources and the equitable sharing of resources...." _____
- Systems/systemic Current: "Systemic analysis allows for identification of the various components of an environmental situation or issue, as well as for distinguishing their interrelations, including the relations among biophysical and social elements." _____
- Value-centered Current: "...the foundation of our relationship to the environment is moral or ethical in nature..." _____

_____

Please rank according to importance to your program or Faculty, some rationales commonly cited as supporting and advancing ESE in preservice teacher education (select all that apply).
- Preparing student teachers to develop the capacity to embed ESE into their teaching practices _____
- Preparing student teachers to develop the commitment to embed ESE into their teaching practices _____
- Responding to international educational policy priorities _____
- Challenging contemporary neo-liberal and market-oriented approaches to education _____

_____

Below are some commonly-reported problems or barriers concerning the teaching of ESE in a preservice teacher education program. How important are these commonly-reported problems or barriers to your preservice teacher education program?

	Unimportant (1)	2	3	4	Very important (5)
Lack of senior administration support for ESE in my Faculty of Education	❏	❏	❏	❏	❏
Inadequate access to online ESE resources	❏	❏	❏	❏	❏
Lack of communication among ESE educators	❏	❏	❏	❏	❏
Inadequate funding for field experiences	❏	❏	❏	❏	❏
Inadequate teaching materials and equipment	❏	❏	❏	❏	❏
Lack of research in effective ESE teaching	❏	❏	❏	❏	❏
Lack of faculty colleague support for ESE	❏	❏	❏	❏	❏
Too much competition with other preservice courses	❏	❏	❏	❏	❏
Lack of time in timetable within my Faculty of Education	❏	❏	❏	❏	❏
Lack of Canadian content in learning materials	❏	❏	❏	❏	❏
Lack of fit of ESE content with K-12 curriculum in schools	❏	❏	❏	❏	❏
Lack of recognition by College of Teachers (or equivalent) that ESE is a legitimate teachable subject	❏	❏	❏	❏	❏
Inadequate tools for assessing ESE in K-12 students in schools	❏	❏	❏	❏	❏

Of the problems or barriers you rated 4 or 5, please rank the top 5 you believe are the most pressing in your Faculty (with 1 being the most influential).

- Lack of senior administration support for ESE in my Faculty of Education _____
- Inadequate access to online ESE resources _____
- Lack of communication among ESE educators _____
- Inadequate funding for field experiences _____
- Inadequate teaching materials and equipment _____
- Lack of research in effective ESE teaching _____
- Lack of faculty colleague support for ESE _____
- Too much competition with other preservice courses _____
- Lack of time in timetable within my Faculty of Education _____
- Lack of Canadian content in learning materials _____
- Lack of fit of ESE content with K-12 curriculum in schools _____
- Lack of recognition by College of Teachers (or equivalent) that ESE is a legitimate teachable subject _____
- Inadequate tools for assessing ESE in K-12 students in schools _____

If there are other constraints and/or challenges faced by teacher educators who wish to embed ESE into preservice teacher education at your institution, please explain.

Do you plan on initiating an ESE program or ESE courses in your Faculty?
1. Yes, we do plan on implementing ESE courses/program
2. No, we do not intend on implementing ESE courses/program

Can you please explain what your preservice teacher education program intends to do around incorporating ESE.

What would you find most helpful in initiating an ESE program or ESE courses in your Faculty. Please rank the top 5 initiatives you believe would be most helpful from the list below (with 1 being the most helpful).

- Developing basic ESE knowledge and skills and understanding about the role of the teacher educator _____
- Exploring how to integrate ESE into existing teacher education programming _____
- Continuing Professional Development with teacher educators' to grow and gain confidence through critical reflective practice _____
- Developing partnerships and networks of Teacher Education Institutions for developing teacher educators competencies in ESE through collaboration _____
- Developing novel ESE curriculum and resources _____
- Developing monitoring and assessment strategies and Quality Assurance instruments to assess programs _____
- Recognition of ESE as a teachable subject by provincial accreditation boards _____

Below are some commonly-reported problems or barriers concerning the teaching of ESE in a preservice teacher education program. How important are these commonly-reported problems or barriers to your preservice teacher education program?

	Unimportant (1)	2	3	4	Very important (5)
Lack of senior administration support for ESE in my Faculty of Education	❑	❑	❑	❑	❑
Inadequate access to online ESE resources	❑	❑	❑	❑	❑

Lack of communication among ESE educators	❑	❑	❑	❑	❑
Inadequate funding for field experiences	❑	❑	❑	❑	❑
Inadequate teaching materials and equipment	❑	❑	❑	❑	❑
Lack of research in effective ESE teaching	❑	❑	❑	❑	❑
Lack of faculty colleague support for ESE	❑	❑	❑	❑	❑
Too much competition with other preservice courses	❑	❑	❑	❑	❑
Lack of time in timetable within my Faculty of Education	❑	❑	❑	❑	❑
Lack of Canadian content in learning materials	❑	❑	❑	❑	❑
Lack of fit of ESE content with K-12 curriculum in schools	❑	❑	❑	❑	❑
Lack of recognition by College of Teachers (or equivalent) that ESE is a legitimate teachable subject	❑	❑	❑	❑	❑
Inadequate tools for assessing ESE in K-12 students in schools	❑	❑	❑	❑	❑

Of the problems or barriers you rated 4 or 5, please rank the top 5 you believe are the most pressing in your Faculty (with 1 being the most influential).
- Lack of senior administration support for ESE in my Faculty of Education _____
- Inadequate access to online ESE resources _____
- Lack of communication among ESE educators _____
- Inadequate funding for field experiences _____
- Inadequate teaching materials and equipment _____
- Lack of research in effective ESE teaching _____
- Lack of faculty colleague support for ESE _____
- Too much competition with other preservice courses _____
- Lack of time in timetable within my Faculty of Education _____
- Lack of Canadian content in learning materials _____
- Lack of fit of ESE content with K-12 curriculum in schools _____
- Lack of recognition by College of Teachers (or equivalent) that ESE is a legitimate teachable subject _____
- Inadequate tools for assessing ESE in K-12 students in schools _____

In the 2017/2018 academic year, did the preservice teacher education program include an ESE course that all preservice students were required to take?
1. Yes
2. No
3. Comments _____

As the preservice teacher education program includes an ESE course(s) in the 2017/2018 academic year that all preservice students were required to take, tell us about those specific courses:

	Course name	Primary (P), Intermediate (I) or Secondary (S) Years	Duration (hours)	Total 2017/2018 enrollment	Do students receive recognition upon completion

	Course name	Primary (P), Intermediate (I) or Secondary (S) Years?	Duration (hours)	Total 2017/18 enrolment	Do students receive recognition upon completion (e.g., a certificate)
Course 1	❏	❏	❏	❏	❏
Course 2	❏	❏	❏	❏	❏
Course 3	❏	❏	❏	❏	❏
Course 4	❏	❏	❏	❏	❏
Course 5	❏	❏	❏	❏	❏

In the 2017/2018 academic year, did the preservice teacher education program have courses that included ESE content as one of a number of components and that all preservice students were required to take?
1. Yes
2. No
3. Comments _____

As the preservice teacher education program had courses in the 2017/2018 academic year that included ESE content as one of a number of components that all preservice students were required to take, tell us about those specific courses:

	Course name	Primary (P), Intermediate (I) or Secondary (S) Years?	Duration (hours)	Total 2017/18 enrolment	Do students receive recognition upon completion (e.g., a certificate)
Course 1	❏	❏	❏	❏	❏
Course 2	❏	❏	❏	❏	❏
Course 3	❏	❏	❏	❏	❏
Course 4	❏	❏	❏	❏	❏
Course 5	❏	❏	❏	❏	❏

Did the preservice teacher education program offer non-required (e.g., elective/optional) ESE courses primarily focused on ESE-related teaching methods in the 2017/2018 academic year?
1. Yes
2. No
3. Comments _____

As the preservice teacher education program included non-required (e.g., elective/optional) ESE courses primarily focused on ESE-related teaching methods, tell us about those specific courses:

	Course name	Primary (P), Intermediate (I) or Secondary (S) Years?	Duration (hours)	Total 2017/18 enrolment	Do students receive recognition upon completion (e.g., a

					certificate)
Course 1	❏	❏	❏	❏	❏
Course 2	❏	❏	❏	❏	❏
Course 3	❏	❏	❏	❏	❏
Course 4	❏	❏	❏	❏	❏
Course 5	❏	❏	❏	❏	❏

Did the preservice teacher education program offer non-required (e.g., elective/optional) courses primarily focused on ESE-related content in the 2017/2018 academic year?
1. Yes
2. No
3. Comments _____

As the preservice teacher education program included non-required (e.g., elective/optional) ESE courses primarily focused on ESE-related content, tell us about those specific courses:

	Course name	Primary (P), Intermediate (I) or Secondary (S) Years?	Duration (hours)	Total 2017/18 enrolment	Do students receive recognition upon completion (e.g., a certificate)
Course 1	❏	❏	❏	❏	❏
Course 2	❏	❏	❏	❏	❏
Course 3	❏	❏	❏	❏	❏
Course 4	❏	❏	❏	❏	❏
Course 5	❏	❏	❏	❏	❏

In the 2017/2018 academic year, did the preservice teacher education program charge students additional fees (e.g., incidental fees) for ESE-based courses?
1. Yes
2. No
3. Not sure _____

As your preservice teacher education program charged students additional fees for ESE-based courses, indicate the approximate amount(s) charged per course.

In the 2017/2018 academic year, in your opinion, what percentage of preservice students graduating from your Faculty received adequate preparation in ESE?

	0-10%	11-30%	31-50%	51-70%	71-90%	91-100%

Elementary (primary /junior, grades k-5) preservice teachers	❏	❏	❏	❏	❏	❏
Middle School (junior /intermediate, grades 6-8) preservice teachers	❏	❏	❏	❏	❏	❏
Secondary (intermediate /senior, grades 9-12) preservice teachers	❏	❏	❏	❏	❏	❏

In the 2017/2018 academic year, did the preservice teacher education program allow "major" and/or "minor" specialization in ESE?
1. "Major" specialization
2. "Minor" specialization
3. Both
4. None
5. Not sure
6. Comments (please describe what your major or minor specialization in your program) _____

Below are some common pedagogical approaches employed in ESE. Considering the choices below, please rank the top 5 approaches that, in your opinion, are most effective in addressing ESE in a preservice program (with 1 being the most effective in your opinion).
- Active, experiential learning _____
- Community-based learning _____
- Community-service learning _____
- Critical pedagogy _____
- Cross-curricular integration and learning _____
- Field-based experiences _____
- Inquiry-based learning _____
- Interdisciplinary learning _____
- Nature-based learning _____
- Project-based learning _____

What acknowledgements, encouragements and/or incentives (if any) are offered to teacher educators who wish to embed ESE into preservice teacher education at your institution?

Are you or any of your faculty colleagues involved in funded non-research projects (e.g., development of learning resources or curricula) in ESE?
1. Yes
2. No

As you or your colleagues are involved in funded non-research projects (e.g., development of learning resources or curricula) in ESE, can you give project title(s) and brief descriptions?

Are you or any of your faculty colleagues involved in funded research projects in ESE?
1. Yes
2. No

As you or your faculty colleagues are involved in funded research projects in ESE, can you give project

title(s) and brief descriptions?

[   ]

_____

Are you or your faculty colleagues involved in non-funded research projects in ESE?
1. Yes
2. No

_____

As you are involved in non-funded research projects in ESE, can you give project title(s) and descriptions?

[   ]

_____

In your opinion, during the 2017/2018 academic year, which categories (if any) of your elementary school (~grades k-5) preservice teacher candidates engaged in ESE work during their school-based practica? (if you have no opinion or have no students in this category, skip this question)

	0-10%	11-30%	31-50%	51-70%	71-90%	91-100%
Elementary Science	❏	❏	❏	❏	❏	❏
Elementary Language Arts	❏	❏	❏	❏	❏	❏
Elementary Maths	❏	❏	❏	❏	❏	❏
Elementary Social Studies	❏	❏	❏	❏	❏	❏
Elementary Physical Education	❏	❏	❏	❏	❏	❏
Elementary Technology Education	❏	❏	❏	❏	❏	❏
Elementary Arts	❏	❏	❏	❏	❏	❏

_____

In your opinion, during the 2017/2018 academic year, which categories (if any) of middle school (~grades 6-8) preservice teacher candidates engaged in ESE work during school-based practica? (if you have no opinion or have no students in this category, skip this question)

	0-10%	11-30%	31-50%	51-70%	71-90%	91-100%
Middle-school Sciences	❏	❏	❏	❏	❏	❏
Middle-school Language Arts	❏	❏	❏	❏	❏	❏
Middle-school Maths	❏	❏	❏	❏	❏	❏
Middle-school Social Studies	❏	❏	❏	❏	❏	❏
Middle-school Physical Education	❏	❏	❏	❏	❏	❏
Middle-school Technology Education	❏	❏	❏	❏	❏	❏
Middle-school Arts	❏	❏	❏	❏	❏	❏

_____

In your opinion, during the 2017/2018 academic year, which categories (if any) of secondary school (~grades 9-12) preservice teacher candidates engaged in ESE work during school-based practica? (if you have no opinion or have no students in this category, skip this question)

	0-10%	11-30%	31-50%	51-70%	71-90%	91-100%
Secondary Sciences	❏	❏	❏	❏	❏	❏
Secondary Language Arts	❏	❏	❏	❏	❏	❏
Secondary Maths	❏	❏	❏	❏	❏	❏
Secondary Social Studies	❏	❏	❏	❏	❏	❏
Secondary Physical Education	❏	❏	❏	❏	❏	❏
Secondary Technology Education	❏	❏	❏	❏	❏	❏
Secondary Arts	❏	❏	❏	❏	❏	❏

If your preservice teacher education program offers ESE-related courses, is there an expectation that teacher candidates taking such courses will engage in ESE practice during school-based practica?
1. Yes
2. No
3. Not sure
4. Not applicable
5. Comments _____

If preservice teacher candidates engage in school-based ESE work during practica, is this recognized, recorded, celebrated or assessed in any way?
1. Yes
2. No

Please explain how preservice teacher candidates engaged in school-based ESE work during practica are recognized, recorded, celebrated or assessed in any way.

Do teacher candidates that are particularly interested in ESE have opportunities to engage in (check all that apply):
1. Public school-based practica that support the candidates interest in ESE
2. Private school-based practica that support the candidates interest in ESE
3. Non-school based experiences (e.g., science centres, outdoor education facilities, camps) that support the candidates interest in ESE
4. None of the above

As your program offers non-school based experiences, indicate the settings where those activities take place (check all that apply).
1. City farms
2. Environmental NGOs
3. Museums
4. Outdoor education centres
5. Rural farms
6. Science centres

7. Social justice NGOs
8. Zoos
9. None of the above
10. Other _____

Please provide the name of the institution you are reporting on in this survey.
1. Acadia University
2. Bishop's University
3. Brandon University
4. Brock University
5. Cape Breton University
6. Carleton University
7. Concordia University
8. Concordia University of Edmonton
9. Dalhousie University
10. Lakehead University
11. Laurentian University
12. McGill University
13. Memorial University of Newfoundland
14. Mount Saint Vincent University
15. Nipissing University
16. Queen's University
17. Redeemer University College
18. Saint Francis Xavier University
19. Saint Mary's University
20. Simon Fraser University
21. St. Thomas University
22. Thompson Rivers University
23. Trent University
24. Trinity Western University
25. Université de Moncton
26. Université de Montréal
27. Université de Saint-Boniface
28. Université de Sherbrooke
29. Université du Québec à Chicoutimi
30. Université du Québec à Montréal
31. Université du Québec à Rimouski
32. Université du Québec à Trois-Rivières
33. Université du Québec en Abitibi-Témiscamingue
34. Université du Québec en Outaouais
35. Université Laval
36. University College of the North
37. University of Alberta
38. University of British Columbia
39. University of British Columbia-Okanagan
40. University of Calgary
41. University of King's College
42. University of Lethbridge
43. University of Manitoba
44. University of New Brunswick
45. University of Northern British Columbia
46. University of Ontario Institute of Technology
47. University of Ottawa
48. University of Prince Edward Island
49. University of Regina
50. University of Saskatchewan
51. University of the Fraser Valley
52. University of Toronto

53. University of Victoria
54. University of Windsor
55. University of Winnipeg
56. Vancouver Island University
57. Western University
58. Wilfrid Laurier University
59. York University
60. Other _____

What is your academic background? (Please indicate all that apply)
1. Ecology/Environmental science
2. Environmental studies
3. Environmental education
4. Education
5. Life sciences
6. Physical/Earth sciences
7. Social sciences (e.g. geography, history)
8. Humanities
9. Fine Arts
10. Other _____

Appendix D: French language survey.

SONDAGE EECOM SUR L'ÉDUCATION À L'ENVIRONNEMENT VERS UN DÉVELOPPEMENT DURABLE AUPRÉS DES ENSEIGNANTS EN FORMATION DANS LES FACULTÉS D'ÉDUCATION CANADIENNES

La Commission permanente sur l'éducation à l'environnement vers un développement durable dans la formation des futurs enseignants (Standing Committee on Environmental & Sustainability Education in Teacher Education – ESE-TE)*, du Réseau canadien d'éducation et de communication relatives à l'environnement (Canadian Network for Environmental Education and Communication – EECOM), mène un sondage pour évaluer l'état de l'Éducation à l'environnement vers un développement durable (EEDD) et d'autres domaines associés dans les facultés d'éducation canadiennes.

Nous vous invitons à participer à ce sondage, qui nous aidera à dresser un portrait actuel du niveau d'éducation des enseignants en formation au Canada en ce qui concerne l'EEDD , et nous permettra de formuler des recommandations visant à en faire avancer les programmes, les politiques et les pratiques.

Veuillez répondre aux questions du sondage en les appliquant au contexte de la dernière année universitaire, soit 2017-2018.

Bien que le sondage utilise généralement l'expression Éducation à l'environnement vers un développement durable (ou son acronyme EEDD), nous faisons en fait référence à une gamme d'approches qui inclut, entre autres, l'éducation environnementale, l'éducation au développement durable, l'éducation en faveur de la viabilité, l'éducation pour un développement durable, l'éducation et la formation en matière d'énergies renouvelables, l'enseignement en plein air et l'éducation axée sur les lieux.

Vos réponses resteront anonymes. Ce sondage ne recueille aucune donnée identificatrice à l'exception de l'établissement auquel vous appartenez et votre rang ou statut au sein de celui-ci. Toutefois, ces informations pourraient permettre de vous identifier, c'est pourquoi il est recommandé d'en tenir compte avant d'accepter de participer au sondage. Dans les rapports et les présentations issus du sondage, les données seront regroupées et présentées de façon à réduire au minimum la possibilité d'identifier les participants. Aucun lien ne sera établi entre votre consentement à participer et vos réponses aux questions.

Les données recueillies seront conservées sur un serveur canadien et ne feront l'objet d'aucune vérification en vertu de la loi sur l'antiterrorisme du gouvernement américain (US Patriot Act).

Le fait de participer au sondage ne comporte aucun risque prévisible, mais il est possible que les sujets abordés provoquent chez vous un certain niveau de stress émotionnel.

Si vous ne voulez pas participer au sondage, veuillez NE PAS cliquer sur le bouton « ENVOYER » à la fin du sondage; vous n'avez aucune obligation d'envoyer votre sondage une fois celui-ci rempli.

Le fait d'envoyer votre sondage rempli indique que vous avez lu les informations pertinentes et que vous consentez explicitement à participer au projet. Une fois le sondage envoyé, il ne vous sera pas possible de le retrouver ni d'annuler votre envoi. Les données brutes seront archivées et serviront à de futures études comparatives.

Si vous n'avez pas assez de temps pour répondre à toutes les questions en une seule séance, vous pouvez y revenir plus tard en cliquant de nouveau sur le lien-invitation que vous avez reçu par courriel. Le sondage complet demande environ 30 minutes, et comprend des réponses ouvertes.

Après avoir cliqué sur le bouton « ENVOYER », il ne vous sera plus possible de rouvrir le sondage.

Le projet a été vérifié et a obtenu l'approbation éthique de chacun des établissements participants, conformément aux exigences de ceuxci. Les résultats de la recherche seront divulgués aux participants et à d'autres personnes intéressées.

Nous vous remercions de votre participation volontaire à ce projet de recherche.

Pour commencer, veuillez cliquer sur le bouton « SUIVANT » ci-dessous.

* Les membres du groupe de recherche ESE-TE sont (en ordre alphabétique) : Maurice DiGiuseppe (University of Ontario Institute of Technology), Paul Elliott, (Trent University), Patrick Howard (Cape Breton University), Douglas Karrow (Brock University), Richard Kool (Royal Roads University), Emily Lin (University of Nevada-Las Vegas), Janet McVittee (University of Saskatchewan), Laura Sims (Université de Saint-Boniface), Rob vanWynsberghe (University of British Columbia).

J'accepte de participer à cette enquête

_____

Quel est votre rang ou statut actuel dans votre établissement d'appartenance ?
    Membre du personnel enseignant à temps partiel ou contractuel
    Membre du personnel-enseignant à temps plein
    Directeur de département
    Administrateur de faculté (p. ex. vice-doyen)

_____

À votre avis, en matière de contenus actuellement requis dans la formation des futurs enseignants de votre faculté, vous:

	Priorité élevée		Priorité moyenne		Priorité peu élevée
accordez le niveau de priorité suivant à l'éducation à l'environnement vers un développement durable (EEDD)	☐	☐	☐	☐	☐
devriez accorder le niveau de priorité suivant à EEDD	☐	☐	☐	☐	☐

_____

Quels sont les types de cours liés à l'EEDD offerts par votre faculté ou votre programme ? Choisissez tous les types qui s'appliquent.
1. Cours de d'enquêtes générales
2. Cours de formation sur le terrain
3. Cours de méthodes
4. Cours fondés sur des données scientifiques (par exemple l'écologie, le développement durable, l'histoire naturelle)
5. Cours fondés sur les sciences humaines (par exemple la philosophie environnementale, les arts environnementaux)
6. Cours fondés sur les sciences sociales (par exemple la psychologie environnementale)
7. Aucun
8. Commentaires / Autres

_____

Lucie Sauvé (2005) a identifié des « courants », ou cadres théoriques, qui influencent la pédagogie environnementale (voir « Currents in Environmental Education: Mapping a complex and evolving pedagogical field ». Canadian Journal of Environmental Education, 10, 11-37).
Comment ces courants, décrits brièvement ci-dessous, sont-ils présentés dans les cours et programmes de formation en EEDD à l'intention des futurs enseignants (ESE-TE)?

	Pas du tout	2	3	4	Courant »

	(1)				principal (5)
Le courant biorégionaliste / axé sur les lieux : «[...] conduit à voir un lieu du point de vue des systèmes naturels et sociaux, dont les relations dynamiques contribuent à créer un sentiment de "lieu vivant" enraciné aussi bien dans l'histoire naturelle que	❏	❏	❏	❏	❏
Le courant conservationniste / ressourciste: est « [...] centré sur la conservation des ressources »; « la préoccupation pour la "gestion" environnementale est un thème récurrent de ce courant. »	❏	❏	❏	❏	❏
Le courant éco-éducateur: « [...] axé principalement sur des préoccupations éducatives plutôt qu'environnementales. On ne vise pas la résolution pratique de problèmes ni la "gestion" de l'environnement, mais on cherche à maximiser notre relation avec l'environnement et à favoriser le développement personnel comme fondement d'une action significative et responsable. »	❏	❏	❏	❏	❏
Le courant ethnographique : « [...] propose non seulement que la pédagogie soit adaptée aux différentes réalités culturelles, mais aussi que nous nous inspirions de la pédagogie de ces différentes cultures, qui ont un autre type de relation avec l'environnement. »	❏	❏	❏	❏	❏
Le courant féministe : « [...] fait la lumière sur les relations entre la domination des femmes et la domination de la nature [...] »	❏	❏	❏	❏	❏
Le courant holistique : « […] développe les multiples dimensions qui entrent en jeu lorsque la personne interagit avec tous les aspects de l'environnement [...] et développe une compréhension "bioécologique" du monde, ainsi qu'une action participative dans, et avec, l'environnement. »	❏	❏	❏	❏	❏
Le courant humaniste : «« [...] met l'accent sur la dimension humaine de l'environnement, point de rencontre de la nature et de la culture. »	❏	❏	❏	❏	❏
L Le courant autochtone : « [...] relie activement les savoirs autochtones et traditionnels en matière de liens entre les humains et en matière de participation humaine au monde naturel. »	❏	❏	❏	❏	❏
Le courant naturaliste : est « [...] centré sur les relations des êtres humains avec la nature. »	❏	❏	❏	❏	❏
Le courant praxique : « [...] met l'accent sur l'apprentissage en action, par l'action, et pour le perfectionnement continu de l'action. »	❏	❏	❏	❏	❏
Le courant de la résolution de problèmes : soutient que « l'environnement est avant tout considéré comme un ensemble de problèmes ».	❏	❏	❏	❏	❏
Le courant scientifique : « [...] aborde les réalités et les problèmes environnementaux de façon rigoureuse, pour mieux les comprendre et mieux en identifier les liens spécifiques de cause à effet. »	❏	❏	❏	❏	❏
Le courant de la critique sociale : « [...] vise à promouvoir l'analyse des dynamiques sociales qui sous-tendent les questions et les problèmes environnementaux [...]»	❏	❏	❏	❏	❏

Le courant du développement durable / de la viabilité : considère que « le développement économique est à la base du développement humain, et [...] reconnaît qu'une économie "durable" est étroitement liée à la conservation des ressources naturelles et au partage équitable des ressources [...] »	❏	❏	❏	❏	❏
Courant systémique : « L'analyse systémique permet de définir les diverses composantes d'une situation ou d'un problème environnemental, ainsi que de dégager des relations qui existe entre celles-ci, y compris les relations entre les éléments biophysiques et sociaux. . »	❏	❏	❏	❏	❏
Le courant centré sur les valeurs : affirme que «le fondement de notre relation avec l'environnement est moral ou éthique par nature ».	❏	❏	❏	❏	❏

Parmi les « courants » auxquels vous avez accordé la cote 4 ou 5, veuillez indiquer, en ordre d'importance, les cinq courants qui, à votre avis, sont actuellement les plus importants dans votre faculté (1 étant le plus important).

- Le courant biorégionaliste / axé sur les lieux : «[...] conduit à voir un lieu du point de vue des systèmes naturels et sociaux, dont les relations dynamiques contribuent à créer un sentiment de "lieu vivant" enraciné aussi bien dans l'histoire naturelle que dans l'histoire culturelle.»
- Le courant conservationniste / ressourciste: est « [...] centré sur la conservation des ressources »; « la préoccupation pour la "gestion" environnementale est un thème récurrent de ce courant. »
- Le courant éco-éducateur: « [...] axé principalement sur des préoccupations éducatives plutôt qu'environnementales. On ne vise pas la résolution pratique de problèmes ni la "gestion" de l'environnement, mais on cherche à maximiser notre relation avec l'environnement et à favoriser le développement personnel comme fondement d'une action significative et responsable. »
- Le courant ethnographique : « [...] propose non seulement que la pédagogie soit adaptée aux différentes réalités culturelles, mais aussi que nous nous inspirions de la pédagogie de ces différentes cultures, qui ont un autre type de relation avec l'environnement. »
- Le courant féministe : « [...] fait la lumière sur les relations entre la domination des femmes et la domination de la nature [...] »
- Le courant holistique : « […] développe les multiples dimensions qui entrent en jeu lorsque la personne interagit avec tous les aspects de l'environnement [...] et développe une compréhension "bioécologique" du monde, ainsi qu'une action participative dans, et avec, l'environnement. »
- Le courant humaniste : «« [...] met l'accent sur la dimension humaine de l'environnement, point de rencontre de la nature et de la culture. »
- Le courant autochtone : « [...] relie activement les savoirs autochtones et traditionnels en matière de liens entre les humains et en matière de participation humaine au monde naturel. »
- Le courant naturaliste : est « [...] centré sur les relations des êtres humains avec la nature. »
- Le courant praxique : « [...] met l'accent sur l'apprentissage en action, par l'action, et pour le perfectionnement continu de l'action. »
- Le courant de la résolution de problèmes : soutient que « l'environnement est avant tout considéré comme un ensemble de problèmes ».
- Le courant scientifique : « [...] aborde les réalités et les problèmes environnementaux de façon rigoureuse, pour mieux les comprendre et mieux en identifier les liens spécifiques de cause à effet. »
- Le courant de la critique sociale : « [...] vise à promouvoir l'analyse des dynamiques sociales qui sous-tendent les questions et les problèmes environnementaux [...]»
- Le courant du développement durable / de la viabilité : considère que « le développement économique est à la base du développement humain, et [...] reconnaît qu'une économie "durable" est étroitement liée à la conservation des ressources naturelles et au partage équitable des ressources [...] »
- Courant systémique : « L'analyse systémique permet de définir les diverses composantes d'une situation ou d'un problème environnemental, ainsi que de dégager des relations qui existe entre celles-ci, y compris les relations entre les élémentsbiophysiques et sociaux. . »
- Le courant centré sur les valeurs : affirme que «le fondement de notre relation avec l'environnement est

moral ou éthique par nature ».

Veuillez classer, en ordre d'importance pour votre programme ou faculté, certains arguments qui sont souvent cités pour favoriser et faire avancer l'EEDD dans la formation des futurs enseignants (choisir tous les arguments qui s'appliquent).

- Préparer les étudiants en éducation à développer leur capacité d'intégrer l'EEDD dans leurs futures pratiques d'enseignement
- Préparer les étudiants en éducation à développer leur engagement à intégrer l'EEDD dans leurs futures pratiques d'enseignement
- Répondre aux priorités des politiques éducatives internationales
- Défier les approches néolibérales contemporaines, axées sur les marchés, en education

---

Voici certains problèmes ou certains obstacles couramment signalés lorsqu'il est question de l'enseignement de l'EEDD dans les programmes de formation des enseignants. Dans votre programme de formation des maîtres, quelle est l'importance de ces problèmes ou obstacles fréquemment cités?

	Sans importance (1)	2	3	4	Très important (5)
Manque de soutien de la part de la haute administration pour l'EEDD dans ma faculté d'éducation	❏	❏	❏	❏	❏
Accès insuffisant aux ressources en ligne en EEDD	❏	❏	❏	❏	❏
Manque de communication parmi les formateurs en EEDD	❏	❏	❏	❏	❏
Ressources financières insuffisantes pour les expériences sur le terrain	❏	❏	❏	❏	❏
Matériel et outils pédagogiques insuffisants	❏	❏	❏	❏	❏
L Manque de travaux de recherche sur l'enseignement efficace de l'EEDD	❏	❏	❏	❏	❏
Manque de soutien de l'EEDD de la part de mes collègues de la faculté	❏	❏	❏	❏	❏
Trop de concurrence avec d'autres cours de formation des enseignants	❏	❏	❏	❏	❏
Manque de temps dans l'horaire établi par ma faculté d'éducation	❏	❏	❏	❏	❏
Manque de contenus canadiens dans le matériel d'apprentissage	❏	❏	❏	❏	❏
Contenus EEDD peu conformes au curriculum du primaire et du secondaire dans les écoles	❏	❏	❏	❏	❏
Non-reconnaissance, de la part de l'Ordre des enseignantes et des enseignants (ou de ses équivalents), de l'EEDD en tant que matière d'enseignement légitime	❏	❏	❏	❏	❏
Outils d'évaluation de l'EEDD inadéquats pour les étudiants du primaire et du secondaire	❏	❏	❏	❏	❏

Parmi les problèmes ou obstacles auxquels vous avez donné la cote 4 ou 5, veuillez donner en ordre d'importance les cinq qui, à votre avis, sont les plus urgents dans votre faculté (1 étant le plus urgent).

- Manque de soutien de la part de la haute administration pour l'EEDD dans ma faculté d'éducation
- Accès insuffisant aux ressources en ligne en EEDD
- Manque de communication parmi les formateurs en EEDD
- Ressources financières insuffisantes pour les expériences sur le terrain

- Matériel et outils pédagogiques insuffisants
- Manque de travaux de recherche sur l'enseignement efficace de l'EEDD
- Manque de soutien de l'EEDD de la part de mes collègues de la faculté
- Trop de concurrence avec d'autres cours de formation des enseignants
- Manque de temps dans l'horaire établi par ma faculté d'éducation
- Manque de contenus canadiens dans le matériel d'apprentissage
- Contenus EEDD peu conformes au curriculum du primaire et du secondaire dans les écoles
- Non-reconnaissance, de la part de l'Ordre des enseignantes et des enseignants (ou de ses équivalents), de l'EEDD en tant que matière d'enseignement légitime
- Outils d'évaluation de l'EEDD inadéquats pour les étudiants du primaire et du secondaire

---

Avez-vous l'intention de mettre sur pied un cours ou un programme d'EEDD dans votre faculté ?

1. Oui, nous avons l'intention de mettre sur pied des cours ou un programme d'EEDD

2. Non, nous n'avons pas l'intention de mettre sur pied des cours ou un programme d'EEDD

S'il y a dans votre établissement d'autres contraintes ou d'autres problèmes auxquels les enseignants en éducation sont confrontés lorsqu'ils souhaitent intégrer l'EEDD dans leurs cours de formation des maîtres, veuillez les exprimer/expliquer ici:

Veuillez expliquer ce que votre programme de formation des maîtres a l'intention de faire afin d'intégrer l'EEDD.

Qu'est-ce qui, à votre avis, serait le plus utile pour commencer un programme ou un cours en EEDD dans votre faculté? Veuillez indiquer, en ordre d'importance, les cinq initiatives qui à votre avis seraient les plus utiles (1 étant la plus utile).

- Développer des savoirs et des connaissances de base en EEDD, et mieux comprendre le rôle du didacticien/de l'éducateur en formation des maîtres
- Explorer différentes façons d'intégrer l'EEDD dans les programmes actuels de formation des enseignants
- Poursuivre des démarches de perfectionnement avec les formateurs afin de développer la confiance professionnelle par l'entremise de pratiques critiques et réflectives
- Créer des partenariats et des réseaux d'institutions de formation des enseignants dans le but de développer, grâce à la collaboration, les compétences en EEDD des éducateurs en formation des maîtres
- Développer des curriculums et des ressources novatrices en EEDD
- Mettre au point des stratégies de vérification et d'évaluation, ainsi que des outils de contrôle de la qualité, pour évaluer les programmes
- Obtenir la reconnaissance, de la part des conseils provinciaux, du fait que l'EEDD constitue une matière qu'il est possible d'enseigner

---

Voici certains problèmes ou obstacles couramment signalés lorsqu'il est question de l'enseignement de l'EEDD dans les programmes de formation des enseignants. Dans votre programme de formation des maîtres, quelle est l'importance de ces problèmes ou obstacles fréquemment cités?

	Sans importance (1)	2	3	4	Très important (5)
Manque de soutien de la part de la haute administration pour l'EEDD dans ma faculté d'éducation	❑	❑	❑	❑	❑
Accès insuffisant aux ressources en ligne en EEDD	❑	❑	❑	❑	❑
Manque de communication parmi les formateurs en EEDD	❑	❑	❑	❑	❑

Ressources financières insuffisantes pour les expériences sur le terrain	❑	❑	❑	❑	❑
Matériel et outils pédagogiques insuffisants	❑	❑	❑	❑	❑
L Manque de travaux de recherche sur l'enseignement efficace de l'EEDD	❑	❑	❑	❑	❑
Manque de soutien de l'EEDD de la part de mes collègues de la faculté	❑	❑	❑	❑	❑
Trop de concurrence avec d'autres cours de formation des enseignants	❑	❑	❑	❑	❑
Manque de temps dans l'horaire établi par ma faculté d'éducation	❑	❑	❑	❑	❑
Manque de contenus canadiens dans le matériel d'apprentissage	❑	❑	❑	❑	❑
Contenus EEDD peu conformes au curriculum du primaire et du secondaire dans les écoles	❑	❑	❑	❑	❑
Non-reconnaissance, de la part de l'Ordre des enseignantes et des enseignants (ou de ses équivalents), de l'EEDD en tant que matière d'enseignement légitime	❑	❑	❑	❑	❑
Outils d'évaluation de l'EEDD inadéquats pour les étudiants du primaire et du secondaire	❑	❑	❑	❑	❑

Parmi les problèmes ou obstacles auxquels vous avez attribué la cote 4 ou 5, veuillez indiquer en ordre d'importance, les cinq problèmes qui à votre avis sont les plus urgents dans votre faculté (1 étant le plus urgent).
- Manque de soutien de la part de la haute administration pour l'EEDD dans ma faculté d'éducation
- Accès insuffisant aux ressources en ligne en EEDD
- Manque de communication parmi les formateurs en EEDD
- Ressources financières insuffisantes pour les expériences sur le terrain
- Matériel et outils pédagogiques insuffisants
- Manque de travaux de recherche sur l'enseignement efficace de l'EEDD
- Manque de soutien de l'EEDD de la part de mes collègues de la faculté
- Trop de concurrence avec d'autres cours de formation des enseignants
- Manque de temps dans l'horaire établi par ma faculté d'éducation
- Manque de contenus canadiens dans le matériel d'apprentissage
- Contenus EEDD peu conformes au curriculum du primaire et du secondaire dans les écoles
- Non-reconnaissance, de la part de l'Ordre des enseignantes et des enseignants (ou de ses équivalents), de l'EEDD en tant que matière d'enseignement légitime
- Outils d'évaluation de l'EEDD inadéquats pour les étudiants du primaire et du secondaire
_____

Au cours de l'année universitaire 2017-2018, le programme de formation des futurs enseignants incluait-il un cours en EEDD obligatoire que tous les étudiants en didactique étaient tenus de suivre?
- Oui
- Non
- Commentaires
_____

Puisque le programme de formation des futurs enseignants incluait un cours en EEDD obligatoire pour tous les étudiants en didactique en 2017-2018, donnez quelques informations au sujet de ces cours:

	Nom du cours	Primaire (P) ou secondaire (S)?	Durée (heures)	Total des inscriptions 2017- 2018	Une attestation est-elle conférée à la fin du cours

					(p. ex. un certificat)?
Cours 1	❑	❑	❑	❑	❑
Cours 2	❑	❑	❑	❑	❑
Cours 3	❑	❑	❑	❑	❑
Cours 4	❑	❑	❑	❑	❑
Cours 5	❑	❑	❑	❑	❑

_____

Au cours de l'année universitaire 2017-2018, le programme de formation des futurs enseignants comportait-il des cours obligatoires dont au moins une partie des contenus relevait de l'EEDD?
- Oui
- Non
- Commentaires

_____

Puisque, au cours de l'année universitaire 2017-2018, le programme de formation des futurs enseignants comportait des cours obligatoires dont au moins une partie des contenus relevait de l'EEDD, veuillez fournir quelques informations sur ces cours en particulier :

	Nom du cours	Primaire (P) ou secondaire (S)?	Durée (heures)	Total des inscriptions 2017- 2018	Une attestation est-elle conférée à la fin du cours (p. ex. un certificat)?
Cours 1	❑	❑	❑	❑	❑
Cours 2	❑	❑	❑	❑	❑
Cours 3	❑	❑	❑	❑	❑
Cours 4	❑	❑	❑	❑	❑
Cours 5	❑	❑	❑	❑	❑

_____

Au cours de l'année universitaire 2017-2018, le programme de formation des futurs enseignants offrait-il des cours non obligatoires (par exemples des cours à option ou des cours au choix) dont les objectifs principaux relevaient des méthodes d'enseignement de contenus en EEDD?
- Oui
- Non
- Commentaires

_____

Puisque, au cours de l'année universitaire 2017-2018, le programme de formation des futurs enseignants comportait des cours non obligatoires (par exemples des cours à option ou des cours au choix) dont les objectifs principaux relevaient des méthodes d'enseignement de contenus en EEDD, veuillez fournir quelques informations sur ces cours:

	Nom du cours	Primaire (P) ou secondaire (S)?	Durée (heures)	Total des inscriptions 2017- 2018	Une attestation est-elle conférée à la fin du cours (p. ex. un certificat)?
Cours 1	❏	❏	❏	❏	❏
Cours 2	❏	❏	❏	❏	❏
Cours 3	❏	❏	❏	❏	❏
Cours 4	❏	❏	❏	❏	❏
Cours 5	❏	❏	❏	❏	❏

_____

Au cours de l'année universitaire 2017-2018, le programme de formation des futurs enseignants offrait-il des cours non obligatoires (par exemples des cours à option ou des cours au choix) dont les contenus étaient centrés sur l'ESE?
- Oui
- Non
- Commentaires

Puisque, au cours de l'année universitaire 2017-2018, le programme de formation des futurs enseignants comportait des cours non obligatoires (par exemples des cours à option ou des cours au choix) dont les contenus étaient centrés sur l'EEDD, veuillez fournir quelques informations sur ces cours:

	Nom du cours	Primaire (P) ou secondaire (S)?	Durée (heures)	Total des inscriptions 2017- 2018	Une attestation est-elle conférée à la fin du cours (p. ex. un certificat)?
Cours 1	❏	❏	❏	❏	❏
Cours 2	❏	❏	❏	❏	❏
Cours 3	❏	❏	❏	❏	❏
Cours 4	❏	❏	❏	❏	❏
Cours 5	❏	❏	❏	❏	❏

Au cours de l'année universitaire 2017-2018, les étudiants qui suivaient le programme de formation des futurs enseignants devaient-ils payer des frais supplémentaires (par exemple des frais afférents) pour des cours liés à l'EEDD?
- Oui
- Non
- Je ne sais pas

_____

Au cours de l'année universitaire 2017-2018, selon vous, quelle proportion des étudiants diplômés du programme de formation des enseignants de votre faculté a reçu une préparation adéquate en EEDD?

	0 à 10%	11 à 30%	31 à 50%	51 à 70%	71 à 90%	91 à 100%
Futurs enseignants au primaire (de la première à la cinquième année)	❏	❏	❏	❏	❏	❏
Futurs enseignants au premier cycle du secondaire (de la sixième à la huitième année)	❏	❏	❏	❏	❏	❏
Futurs enseignants au deuxième cycle du secondaire (de la neuvième à la douzième année)	❏	❏	❏	❏	❏	❏

Si les étudiants qui suivaient le programme de formation des futurs enseignants devaient payer des frais supplémentaires pour des cours liés à l'EEDD, veuillez indiquer le total approximatif de ces frais par cours.

_____

Au cours de l'année universitaire 2017-2018, le programme de formation des futurs enseignants a-t-il offert des concentrations, une majeure ou une mineure, en EEDD?
- Majeure
- Mineure
- Les deux
- Aucune des deux
- Je ne sais pas
- Commentaires (veuillez décrire votre majeure ou votre mineure)

_____

Voici quelques approches pédagogiques communément utilisées en EEDD. Compte tenu des options suivantes, veuillez classer les cinq approches qui, selon vous, sont les plus efficaces pour traites des EEDD dans un programme de formation des futurs enseignants (1 étant selon vous le plus efficace).
- L'apprentissage actif, par l'expérience
- L'apprentissage en milieu communautaire
- L'apprentissage par le service communautaire
- La pédagogie critique
- L'apprentissage basé sur l'intégration transdisciplinaire
- Les expériences sur le terrain
- L'apprentissage fondé sur les enquêtes et la recherche
- L'apprentissage transdisciplinaire
- L'apprentissage en plein air, centré sur la nature
- L'apprentissage par projet

_____

Vous ou vos collègues de la faculté participez-vous à des projets subventionnés qui ne sont pas liés à la recherche en EEDD (par exemple le développement de ressources d'apprentissage ou de programmes)?
- Oui
- Non

_____

Vous ou vos collègues de la faculté participez-vous à des projets de recherche subventionnés en EEDD?
- Oui
- Non

_____

Vous ou vos collègues de la faculté participez-vous à des projets de recherche non subventionnés en EEDD?
- Oui
- Non

_____

Quelles formes de reconnaissance, d'encouragement ou de motivation (s'il y a lieu) sont offertes aux professeurs de didactique qui souhaitent intégrer l'EEDD dans leur enseignement au sein de votre institution?

_____

Si vous ou vos collègues de la faculté participez à des projets subventionnés qui ne sont pas liés à la recherche en EEDD (par exemple le développement de ressources d'apprentissage ou de programmes), veuillez donner le titre du ou des projets et en fournir une brève description.

_____

Si vous ou vos collègues de la faculté participez à des projets de recherche subventionnés en EEDD, veuillez donner le titre du ou des projets auxquels vous participez et en fournir une brève description.

_____

Selon vous, au cours de l'année universitaire 2017-2018, quel pourcentage de vos candidats en enseignement primaire (jusqu'à la cinquième année) ont participé à des travaux ou à des projets en EEDD au cours de leur stage de formation pratique, et ce, pour les disciplines indiquées (s'il y a lieu)? (Si vous n'avez pas d'opinion ou qu'aucun de vos étudiants n'étudie ces disciplines, veuillez passer à la question suivante.)

	0 à 10%	11 à 30%	31 à 50%	51 à 70%	71 à 90%	91 à 100%
Sciences	❏	❏	❏	❏	❏	❏
Langues	❏	❏	❏	❏	❏	❏
Mathématiques	❏	❏	❏	❏	❏	❏
Sciences sociales	❏	❏	❏	❏	❏	❏
Éducation physique	❏	❏	❏	❏	❏	❏
Enseignement des technologies	❏	❏	❏	❏	❏	❏
Arts plastiques	❏	❏	❏	❏	❏	❏

_____

Selon vous, au cours de l'année universitaire 2017-2018, quelles catégories (s'il y a lieu) de vos candidats à l'enseignement au premier cycle du secondaire (de la sixième à la huitième année) ont participé à des travaux à des projets en EEDD au cours de leur stage de formation pratique ? (Si vous n'avez pas d'opinion ou qu'aucun de vos étudiants n'étudie ces disciplines, veuillez passer à la question suivante.)

	0 à 10%	11 à 30%	31 à 50%	51 à 70%	71 à 90%	91 à 100%
Sciences	❏	❏	❏	❏	❏	❏
Langues	❏	❏	❏	❏	❏	❏
Mathématiques	❏	❏	❏	❏	❏	❏
Sciences sociales	❏	❏	❏	❏	❏	❏
Éducation physique	❏	❏	❏	❏	❏	❏
Enseignement des technologies	❏	❏	❏	❏	❏	❏
Arts plastiques	❏	❏	❏	❏	❏	❏

_____

Selon vous, au cours de l'année universitaire 2017-2018, quel pourcentage (s'il y a lieu) de vos candidats à l'enseignement au deuxième cycle du secondaire (de la neuvième à la douzième année) ont participé à des travaux ou

projets en EEDD au cours de leur stage de formation pratique ? (Si vous n'avez pas d'opinion ou qu'aucun de ces candidatsn'étudie ces disciplines, veuillez

	0 à 10%	11 à 30%	31 à 50%	51 à 70%	71 à 90%	91 à 100%
Sciences	☐	☐	☐	☐	☐	☐
Langues	☐	☐	☐	☐	☐	☐
Mathématiques	☐	☐	☐	☐	☐	☐
Sciences sociales	☐	☐	☐	☐	☐	☐
Éducation physique	☐	☐	☐	☐	☐	☐
Enseignement des technologies	☐	☐	☐	☐	☐	☐
Arts plastiques	☐	☐	☐	☐	☐	☐

Si votre programme de formation des futurs enseignants offre des cours liés à l'EEDD, vous attendez-vous à ce que les candidats qui suivent ces cours intègrent des contenus de type EEDD dans leur enseignement au cours de leur stage de formation pratique?
- Oui
- Non
- Je ne sais pas
- Ne s'applique pas
- Commentaires

Si les candidats à l'enseignement intègrent des contenus de type EEDD dans leur enseignement au cours de leur stage de formation pratique, cet enseignement fait-il l'objet de reconnaissance, de félicitations ou d'une évaluation?
- Oui
- Non

Les candidats à l'enseignement qui sont particulièrement intéressés par l'EEDD ont-ils la possibilité de participer à (cochez toutes les réponses qui s'appliquent)
- Des stages de formation pratique dans le système scolaire public qui soutiennent l'intérêt des candidats pour l'EEDD
- Des stages de formation pratique dans le système scolaire privé qui soutiennent l'intérêt des candidats pour l'EEDD
- Des expériences parascolaires (par exemple dans des centres scientifiques, des centres d'interprétation de la nature, des camps) qui soutiennent l'intérêt des candidats pour l'EEDD
- Aucune de ces options

Si votre programme offre des expériences parascolaires, veuillez indiquer les contextes dans lesquels ces activités se déroulent (cocher tous les contextes qui s'appliquent):
- Fermes pédagogiques
- ONG écologiques
- Musées
- Centres d'interprétation de la nature
- Fermes agricoles
- Centres scientifiques
- ONG oeuvrant pour la justice sociale
- Jardins zoologiques

- Aucune de ces réponses
- Autre

_____

Veuillez fournir le nom de l'établissement auquel vous faites référence dans vos réponses à ce questionnaire.
_____

Quelle est votre formation universitaire? (Veuillez cocher toutes celles qui s'appliquent)
- Écologie/sciences de l'environnement
- Études environnementales
- Éducation à l'environnement
- Éducation/Didactique
- Sciences de la vie
- Sciences physiques/Sciences de la nature
- Sciences sociales (géographie, histoire, etc.)
- Sciences humaines
- Arts plastiques
- Autre

Appendix E: Numerical data

Figure 4. Rationales for Supporting or Advancing ESE-PTE

Analysis of "Please rank according to importance to your program or Faculty, some rationales commonly cited as supporting and advancing ESE in preservice teacher education (select all that apply)."

	Preparing student teachers to develop the capacity to embed ESE into their teaching practices	Preparing student teachers to develop the commitment to embed ESE into their teaching practices	Responding to international educational policy priorities	Challenging contemporary neo-liberal and market-oriented approaches to education
1=	14	9	0	3
2=	10	12	2	2
3=	1	5	9	10
4=	1	0	12	10
1=%	54%	35%	0%	12%
2=%	38%	46%	9%	8%
3=%	4%	19%	39%	40%
4=%	4%	0%	52%	40%

Figure 5. Competition with other PTE courses

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	10%	3	
2	0%	0	
3	3%	1	
4	20%	5	1
Very important (5)	67%	18	2
Total	100%	27	3

Figure 6. Lack of time in the PTE program timetable

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	23%	6	1
2	7%	2	
3	3%	1	
4	10%	3	
Very important (5)	57%	15	2
Total	100%	27	3

Figure 7. Lack of senior administrator support for ESE-PTE

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	13%	4	
2	10%	3	
3	10%	3	
4	23%	5	2
Very important (5)	43%	12	1
Total	100%	27	3

Figure 8. Lack of faculty colleague support for ESE

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	10%	3	
2	10%	2	1
3	13%	3	1
4	27%	7	1
Very important (5)	40%	12	
Total	100%	27	3

Figure 9. Lack of professional governing body leadership

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	17%	4	1
2	13%	3	1
3	3%	1	
4	20%	6	
Very important (5)	47%	13	1
Total	100%	27	3

Figure 10. Lack of fit, or alignment, between ESE in PTE programs and ESE in K-12 Curriculum.

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	37%	10	1
2	13%	4	
3	3%	1	
4	40%	11	1
Very important (5)	7%	1	1
Total	100%	27	3

Figure 11. Lack of communication among ESE educators

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	27%	6	2
2	27%	7	1
3	20%	6	
4	17%	5	
Very important (5)	10%	3	
Total	100%	27	3

Figure 12. Lack of research in effective ESE teaching

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	40%	10	2
2	27%	7	1
3	20%	6	
4	7%	2	
Very important (5)	7%	2	
Total	100%	27	3

Figure 13. Inadequate teaching materials and equipment

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	43%	11	2
2	27%	7	1
3	10%	3	
4	17%	5	
Very important (5)	3%	1	

Total	100%	27	3

Figure 14. Lack of Canadian content in learning materials

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	50%	13	2
2	27%	7	1
3	13%	4	
4	7%	2	
Very important (5)	3%	1	
Total	100%	27	3

Figure 15. Inadequate access to online ESE resources

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	73%	20	2
2	13%	3	1
3	10%	3	
4	3%	1	
Very important (5)	0%	0	
Total	100%	27	3

Figure 16. Inadequate tools for assessing ESE in K-12 students in schools

Answer	percentage(%)	English(N)	French(N)
Unimportant (1)	37%	11	
2	17%	3	2
3	17%	4	1
4	17%	5	
Very important (5)	13%	4	
Total	100%	27	3

Figure 17. Expectation that preservice teachers taking ESE-oriented courses will engage in ESE practice during school-based practica

Answer	percentage(%)	English(N)	French(N)
Yes	38%	9	1
No	35%	9	
Not sure	0%	0	
Not applicable	27%	6	1
Total	100%	24	2

Figure 18. Types of Practica

Answer	percentage(%)	English(N)	French(N)
Non-school based experiences	36%	15	
Public school-based practica	36%	15	
Private school-based practica	14%	6	
None of the above	14%	4	2

Figure 19. Settings in which non-school-based ESE-oriented practicum experiences occur

Answer	percentage(%)	English(N)
Museums	19%	4
Outdoor education centres	19%	4
Science centres	19%	4

Zoos	14%	3
Other	10%	2
City farms	5%	1
Environmental NGOs	5%	1
Rural farms	5%	1
Social justice NGOs	5%	1
Total	100%	21

Figure 20. Degree to which preservice teachers specializing in various school divisions and curricular areas were able to engage in ESE-oriented practicum activities.

Elementary Science

Answer	%	N
0-10%	0%	0
11-30%	46%	6
31-50%	15%	2
51-70%	15%	2
71-90%	15%	2
91-100%	8%	1
Total	100%	13
Mean	3.23	

Elementary Language Arts

Answer	%	N
0-10%	44%	4
11-30%	44%	4
31-50%	0%	0
51-70%	11%	1
71-90%	0%	0
91-100%	0%	0
Total	100%	9
Mean	1.78	

Elementary Maths

Answer	%	N
0-10%	70%	7
11-30%	20%	2
31-50%	0%	0
51-70%	10%	1
71-90%	0%	0
91-100%	0%	0
Total	100%	10
Mean	1.50	

Elementary Social Studies

Answer	%	N
0-10%	44%	4
11-30%	11%	1
31-50%	33%	3
51-70%	0%	0
71-90%	11%	1
91-100%	0%	0
Total	100%	9
Mean	2.22	

Elementary Physical Education

Answer	%	N
0-10%	78%	7
11-30%	0%	0
31-50%	0%	0
51-70%	0%	0
71-90%	11%	1
91-100%	11%	1
Total	100%	9
Mean	2.00	

Elementary Technology Education

Answer	%	N
0-10%	89%	8
11-30%	0%	0
31-50%	0%	0
51-70%	0%	0
71-90%	0%	0
91-100%	11%	1
Total	100%	9
Mean	1.56	

Elementary Arts

Answer	%	N
0-10%	33%	3
11-30%	56%	5
31-50%	0%	0
51-70%	11%	1
71-90%	0%	0
91-100%	0%	0
Total	100%	9
Mean	1.89	

Middle-school Sciences

Answer	%	N
0-10%	0%	0
11-30%	36%	5
31-50%	21%	3
51-70%	29%	4
71-90%	7%	1
91-100%	7%	1
Total	100%	14
Mean	3.29	

Middle-school Language Arts

Answer	%	N
0-10%	44%	4
11-30%	22%	2
31-50%	22%	2
51-70%	0%	0
71-90%	11%	1
91-100%	0%	0
Total	100%	9
Mean	2.11	

Middle-school Maths

Answer	%	N
0-10%	70%	7
11-30%	20%	2
31-50%	0%	0
51-70%	10%	1
71-90%	0%	0
91-100%	0%	0
Total	100%	10
Mean	1.50	

Middle-school Social Studies

Answer	%	N
0-10%	33%	3
11-30%	11%	1
31-50%	22%	2
51-70%	22%	2
71-90%	11%	1
91-100%	0%	0
Total	100%	9
Mean	2.67	

Middle-school Physical Education

Answer	%	N
0-10%	44%	4
11-30%	33%	3
31-50%	0%	0
51-70%	22%	2
71-90%	0%	0
91-100%	0%	0
Total	100%	9
Mean	2.00	

Middle-school Technology Education

Answer	%	N
0-10%	78%	7
11-30%	11%	1
31-50%	0%	0
51-70%	11%	1
71-90%	0%	0
91-100%	0%	0
Total	100%	9
Mean	1.44	

Middle-school Arts

Answer	%	N
0-10%	44%	4
11-30%	44%	4
31-50%	0%	0
51-70%	11%	1
71-90%	0%	0
91-100%	0%	0
Total	100%	9
Mean	1.78	

Secondary Sciences

Answer	%	N
0-10%	11%	1
11-30%	33%	3
31-50%	22%	2
51-70%	22%	2
71-90%	0%	0
91-100%	11%	1
Total	100%	9
Mean	3.00	

Secondary Language Arts

Answer	%	N
0-10%	57%	4
11-30%	43%	3
31-50%	0%	0
51-70%	0%	0
71-90%	0%	0
91-100%	0%	0
Total	100%	7
Mean	1.43	

Secondary Maths

Answer	%	N
0-10%	86%	6
11-30%	14%	1
31-50%	0%	0
51-70%	0%	0
71-90%	0%	0
91-100%	0%	0
Total	100%	7
Mean	1.14	

Secondary Social Studies

Answer	%	N
0-10%	43%	3
11-30%	29%	2
31-50%	14%	1
51-70%	14%	1
71-90%	0%	0
91-100%	0%	0
Total	100%	7
Mean	2.00	

Secondary Physical Education

Answer	%	N
0-10%	57%	4
11-30%	43%	3
31-50%	0%	0
51-70%	0%	0
71-90%	0%	0
91-100%	0%	0
Total	100%	7
Mean	1.43	

Secondary Technology Education

Answer	%	N
0-10%	83%	5
11-30%	17%	1
31-50%	0%	0
51-70%	0%	0
71-90%	0%	0
91-100%	0%	0
Total	100%	6
Mean	1.17	

Secondary Arts

Answer	%	N
0-10%	57%	4
11-30%	14%	1
31-50%	29%	2
51-70%	0%	0
71-90%	0%	0
91-100%	0%	0
Total	100%	7
Mean	1.71	

Figure 21. Recognition for engaging in ESE-oriented activities in practicum

Answer	percentage(%)	English(N)	French(N)(N)
Yes	33%	6	2
No	67%	16	
Total	100%	22	2

Figure 22. Adequacy of preparation in ESE-related teaching

	Elementary		Middle		Secondary	
Answer	percentage(%)	English(N)	percentage(%)	English(N)	percentage(%)	English(N)
0-10%	31%	8	44%	11	45%	10
11-30%	42%	11	32%	8	27%	6
31-50%	12%	3	12%	3	9%	2
51-70%	4%	1	4%	1	0%	0
71-90%	0%	0	0%	0	0%	0
91-100%	12%	3	8%	2	18%	4
n=		26		25		22

Figure 23. Presence of Sauvé's (2005) ESE currents in PTE programs.

Bioregionalist/Place-based Current

Answer	percentage(%)	English(N)
Not at all (1)	3%	1
2	14%	4
3	24%	7
4	14%	4
A principal 'current' (5)	45%	13
Total	100%	29
Mean	3.83	

Conservationist/resourcist Current

Answer	percentage(%)	English(N)
Not at all (1)	25%	7
2	32%	9
3	39%	11
4	4%	1
A principal 'current' (5)	0%	0
Total	100%	28
Mean	2.21	

Eco-Education Current

Answer	percentage(%)	English(N)
Not at all (1)	7%	2
2	17%	5
3	21%	6
4	34%	10
A principal 'current' (5)	21%	6
Total	100%	29
Mean	3.45	

Ethnographic Current

Answer	percentage(%)	English(N)
Not at all (1)	4%	1
2	11%	3
3	32%	9
4	29%	8
A principal 'current' (5)	25%	7
Total	100%	28
Mean	3.61	

Feminist Current

Answer	percentage(%)	English(N)
Not at all (1)	46%	13
2	25%	7
3	11%	3
4	11%	3
A principal 'current' (5)	7%	2
Total	100%	28
Mean	2.07	

Holistic Current:

Answer	percentage(%)	English(N)
Not at all (1)	4%	1
2	38%	10
3	15%	4
4	23%	6
A principal 'current' (5)	19%	5
Total	100%	26
Mean	3.15	

Humanist Current

Answer	percentage(%)	English(N)
Not at all (1)	7%	2
2	26%	7
3	37%	10
4	19%	5
A principal 'current' (5)	11%	3
Total	100%	27
Mean	3.00	

Indigenous Current

Answer	percentage(%)	English(N)
Not at all (1)	0%	0
2	10%	3
3	10%	3
4	34%	10
A principal 'current' (5)	45%	13
Total	100%	29
Mean	4.14	

Naturalist Current

Answer	percentage(%)	English(N)
Not at all (1)	4%	1
2	18%	5
3	25%	7
4	25%	7
A principal 'current' (5)	29%	8

	percentage(%)	English(N)
Total	100%	28
Mean	3.57	

Praxic Current

Answer	percentage(%)	English(N)
Not at all (1)	7%	2
2	11%	3
3	19%	5
4	22%	6
A principal 'current' (5)	41%	11
Total	100%	27
Mean	3.78	

Problem-Solving Current

Answer	percentage(%)	English(N)
Not at all (1)	11%	3
2	29%	8
3	32%	9
4	25%	7
A principal 'current' (5)	4%	1
Total	100%	28
Mean	2.82	

Scientific Current

Answer	percentage(%)	English(N)
Not at all (1)	7%	2
2	24%	7
3	38%	11
4	17%	5
A principal 'current' (5)	14%	4
Total	100%	29
Mean	3.07	

Socially Critical Current

Answer	percentage(%)	English(N)
Not at all (1)	0%	0
2	11%	3
3	43%	12
4	21%	6
A principal 'current' (5)	25%	7
Total	100%	28
Mean	3.61	

Sustainable Development/ Sustainability Current

Answer	percentage(%)	English(N)
Not at all (1)	14%	4
2	25%	7
3	36%	10
4	21%	6
A principal 'current' (5)	4%	1
Total	100%	28
Mean	2.75	

Systems/systemic Current

Answer	percentage(%)	English(N)
Not at all (1)	11%	3
2	29%	8
3	29%	8

	percentage(%)	English(N)
4	14%	4
A principal 'current' (5)	18%	5
Total	100%	28
Mean	3.00	

Value-centered Current

Answer	percentage(%)	English(N)
Not at all (1)	0%	0
2	25%	7
3	29%	8
4	11%	3
A principal 'current' (5)	36%	10
Total	100%	28
Mean	3.57	