

Education for Sustainable Development in Ontario and Norwegian Schools and Society: An Analysis of Curriculum and Practice

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Nord University & The CANOPY Project
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An essay submitted to the Faculty of Education and Arts at Nord University
in conformity with the requirements for the
Queen's University International Alternative Practicum (IAP) credit

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Contents

Abstract	3
Keywords	4
Introduction	4
Introduction to Sustainable Development	5
Environmental Education vs Education for Sustainable Development	7
EE and ESD within the Ontario school system and curriculum	8
EE and ESD within the Norwegian school system and curriculum	10
Factors that Influence the Integration of ESD	13
Social and Economic Factors in Ontario	13
Social and Economic Factors in Norway	15
Methods	18
Participants	18
Design	19
Procedure	20
Results	20
Discussion	26
The current Ontario curriculum: in support or a hindrance to ESD.	26
The current Norwegian curriculum: in support or a hindrance to ESD.	27
Teaching practices that currently exist and are popularized in Ontario schools.	29
Teaching practices that currently exist and are popularized in Norwegian schools.	31
Conclusion	33
Acknowledgements	37
Bibliography	37
Appendix	43
Appendix I. CANOPY Information Brochure	43
Appendix II. Results from Interviews and Surveys	45

Abstract

As our society continues to advance in its ways of living, we often forget the implications we have on our planet. In any case, understanding what sustainable development entails is important for the sustainability of our environment and community. As such, this addition to the CANOPY project will look into the development of Education for Sustainable Development (ESD) in both Ontario and Norway while also delving into place-based education (PBE). Thanks to the collaboration between Queen's University in Canada and Nord University in Norway, a comparative study will be done on the past and current education systems of both countries in relation to sustainability and sustainable development. In order to further understand the difference and the presence of ESD in both regions of this study, the following question will be answered: "What does Education for Sustainable Development look like in Canadian and Norwegian education society?"

To gain a full understanding of what this research encompasses, exploration will be done on the difference between sustainability, Environmental Education (EE), and Education for Sustainable Development (ESD). In addition, there will be further inquiry into EE and ESD within the Ontario and Norwegian school systems and curricula, factors that influenced the integration of ESD, and teaching practices that currently exist and are popularized in both geographic regions. Through the use of qualitative data (e.g., interviews and surveys), further research has been done on the various perspectives that teachers in Ontario and Norway hold when it comes to their knowledge and experience of ESD.

In summation, Ontario and Norway differ when it comes to implementing ESD in their respective educational systems and curricula. Through various research papers and interviews used to support this research, Norway in particular puts emphasis on ESD and EE due to cultural, political and

social factors that dictate the importance of taking care of the local environment. However in Ontario, ESD is still an emerging concept for both schools and educators within the Ontario education system. That being said, incorporating ESD within Ontario curricula has become increasingly popular over the years amongst educators and students alike. Throughout this work, similarities and differences of incorporating ESD within Ontario and Norwegian school systems and curricula will be further discussed in conjunction with experienced and new teachers' perspectives on ESD.

Keywords

Sustainability; Environmental Education (EE); Education for Sustainable Development (ESD); Teachers' perspectives; Ontario teaching; Norway teaching; Place-based education (PBE)

Introduction

The CANOPY Project (**C**anada-**N**orway **P**edagogy Partnership for Innovation and Inclusion in Education) is a program built from the partnership between the Norwegian Agency for International Cooperation and Quality Enhancement in Higher Education (DIKU), the Faculty of Education and Arts at Nord University in Norway, and the Faculty of Education at Queen's University in Canada, as shown in [Appendix I](#). Thanks to the support of schools situated in Nordland, Trøndelag and across Ontario, educators can gain a better insight to our current education system from a “holistic and international perspective” (CANOPY, 2021). By partaking in this major project, popularized topics and issues within the world of education are further examined. As such, the focus of this study will be on the development of Education for Sustainable Development (ESD) in both Ontario and Norway while also delving into place-based education (PBE). More specifically, answering the question: “What does Education for Sustainable Development look like in Canadian and Norwegian education society?”.

For this study, it is imperative to gain a better understanding of both the Ontario and Norwegian school systems. In Ontario, the public school system is essentially divided into two main stages: elementary school for those ages 4 to 13 (i.e., kindergarten to grade 8), and secondary school for those ages 13 to 18 (i.e., grade 9 to grade 12). Within an Ontario elementary school, students only have one teacher who teaches all subjects required by the Ministry of Education. Then once students attend secondary school, they take classes based on subjects in which individual teachers specialize. Unlike Ontario, the public education system in Norway is divided into three main stages: primary school known as *Barneskole* (for those ages 6 to 13), lower secondary school known as *Ungdomsskole* (for those ages 13 to 16), and upper secondary school known as *Videregående skole* (for those ages 16 to 19) (Study in Norway, n.d.). The primary and lower secondary schools utilise the same curriculum, whereas the upper secondary schools have “vocational subjects and specializations” similar to Ontario (Study in Norway, n.d.). With this basic information in mind, ESD within the Ontario and Norwegian education system will be better understood.

Introduction to Sustainable Development

Based on various articles, it has been indicated that there is a notable difference between the words ‘sustainability’ and ‘sustainable development’. However, we often see the two words being used interchangeably. According to a UNESCO webpage on sustainable development: “Sustainability is often thought of as a long-term goal (i.e., a more sustainable world), while sustainable development refers to the many processes and pathways to achieve it (e.g., sustainable agriculture and forestry, sustainable production and consumption, good government, etc.)” (UNESCO, 2015). An additional defining feature of sustainable development includes the fact that it intertwines four specific dimensions of our current world: the society, the environment, the culture, and the

economy. For the purpose of this study, both sustainability and sustainable development will be examined; however, emphasis will be put on Education for Sustainable Development (ESD).

The concept of sustainable development was initially introduced and popularized during the United Nations (UN) conference held in Rio in 1992 with the help of the World Commission on Environment and Development, also known as WCED (Sætre, 2016, p. 66; Sauvé, 1996, p. 9). Since then, there has been an increased awareness of implementing sustainable development into current teaching practices in both Ontario and Norwegian schools. The UN even declared 2005 as the start of the “decade for Education for Sustainable Development”, also known as the “decade of action” (Nayar, 2013; United Nations, n.d.). In support of this motion, the UN created and implemented the Sustainable Development Agenda which includes seventeen sustainable development goals that will help the world “achieve a better and more sustainable future for all” (United Nations, n.d.). To gain a better sense of what each of the seventeen goals are, an illustration has been included below (see Figure 1).



Figure 1. *United Nations' 17 Sustainable Development Goals from "Sustainable Development Goals" by the UN, 2015. Copyright [2015] by the United Nations.*

In reality, there has been a growth in the presence of sustainable development; mainly in the hopes that countries will work together to solve issues that not only affect the environment but our wellbeing as well. By finding solutions to the overconsumption of food and water, to the over-extraction of materials, to the pollution occurring on land and in water, to poverty, to gender equality, and many others, it will be possible to make our world sustainable. According to an article on the *Importance of Education for Sustainable Development* written by Ajita Nayar (2013), who is a project manager for the Education for Sustainable Development (ESD) program at the World Wildlife Fund (WWF), ESD helps integrate “key environmental challenges like climate change into core subjects like math, science and art”. With this in mind, sustainable development is a pressing topic that should be increasingly addressed in schools, especially when everything at its core begins with education.

Environmental Education vs Education for Sustainable Development

With the popularization of sustainable development, there has been an increased presence of teaching about the environment and sustainability in schools across Ontario and Norway. Reading through various articles, two forms of education were prominent in the field of teaching environment and sustainability: Environmental Education (EE) and Education for Sustainable Development (ESD). According to the Ontario elementary curriculum for Environmental Education, EE is described as “education about the environment, for the environment, and in the environment by learning about the earth’s physical and biological systems, the dependency of our social/economic systems on natural systems, environmental issues, and positive/negative consequences on the environment created by humans” (OME, 2017, p. 2). Whereas ESD is referred to as “the integration of key sustainability issues into teaching and learning to provide opportunities for young people to acquire first-hand experience in addressing the socio-ecological challenges faced by their communities” by UNESCO (2017, p. 10).

In line with the definitions, EE and ESD have several key differences between them. For one, EE includes a broad spectrum of topics related only to the natural systems found in our world as well as the environmental issues caused by humans. As such, EE focuses on the “what”, “where” and “why” but not exactly on the “how” (i.e., how can we change our ways, how can we help the environment, and how can we change people’s minds and/or perspectives). Furthermore, EE is an older concept that is slowly being replaced by ESD. As indicated by Sauvé (1996, p. 9), an associate professor for the Faculty of Education at University of Quebec in Montreal (UQAM), “the United Nations Educational Scientific and Cultural Organization even proposed sustainable development as the ultimate goal”, therefore suggesting environmental education to be “reoriented or reshaped”. The shift from EE to ESD comes from the fact that ESD focuses on the current issues that are affecting our communities and finding solutions to create a sustainable world (environmentally, socially, culturally, and economically). So, not only does ESD delve into the “what”, “where” and “why” of environmental issues and sustainability, but also the “how”. Independently, ESD can be viewed as an educational approach that was created for the earth’s and future generations’ well-being. For this reason, it is paramount for ESD to be incorporated into Ontario and Norwegian school systems and curricula.

EE and ESD within the Ontario school system and curriculum

Since the UN conference in Rio in 1992, the education system in Ontario has been slowly implementing EE and/or ESD into their curricula. For elementary schools, a resource guide titled *Environmental Education* was published by the Ministry of Education (UDIR, 2017). Based on grade levels, the document gives suggestions on ways in which EE could be incorporated into all subjects, including: drama, music, visual arts, French (core and immersion), physical education, language, math, native languages, science and technology, and social studies. When it comes to secondary school, students are mainly exposed to EE and sustainability in the mandatory Grade 9

geography course (course code: CGC1P/CGC1D). However, geography teachers are only required to teach sustainability during two strands of the course: during strand C when students look at managing Canadian resources and industries, and during strand E when students look at liveable communities in Canada (OME, 2018, p. 78-84). Additionally, there is an optional course that upper year students can take, titled “Living in a Sustainable World” (course code: CGR4E). The goal of this course is to examine the impact of human activity on our natural environment while also being aware of what can be done at home, at school, and in public to mitigate human’s impact on the environment (OME, 2015, p. 279). To give a general idea of what the course entails, some of the topics include: human impacts on ecosystems, sustainability of natural resources, and community action.

Even though a small presence of EE and sustainability exist within Ontario curricula, it is ultimately up to teachers to decide how much of EE and sustainability they would like to incorporate in their lesson plans. Based on the description of CGC1P/CGC1D, this mandatory geography course focuses on the physical and human geography of Canada and answers the question “what is where, why there and why care”, but misses the “how” (i.e., how can we change our ways, how can we help the environment, and how can we change people’s minds and/or perspectives). However, an examination of whether or not the current Ontario school system supports ESD will be further discussed later on. In addition, it is important to note that courses such as CGR4E are extremely rare. This is due to the fact that upper-level geography courses are all optional and can only occur if and only if there are enough students who are interested and if there are teachers who are willing to teach the courses.

Lastly, there are a number of key institutional elements that contribute to and have a role in implementing EE in Ontario. For instance, the existence of the Ministry of Education, which helps administer provincial law and policy that help with the growth of EE. In addition, policy activists such as Environmental Education Ontario (EEON), the Canadian Network for Environmental Education and Communication, the Council of Outdoor Educators of Ontario (COEO), the Ontario Association for Geographic and Environmental Education (OAGEE), and the Ontario Society for Environmental Education, all helped produce the most change in integrating EE in schools (Bardecki & McCarthy, 2020, p. 118). Of course, there are also school boards and trustees which have made progress in incorporating environmentally sustainable practices at the board-level such as EcoSchools and Energy W.I.S.E (Bardecki & McCarthy, 2020, p. 119). With the support of these institutions and organizations, EE and ESD can have a larger presence within the Ontario school system and curricula.

EE and ESD within the Norwegian school system and curriculum.

Unlike Ontario curricula, primary and lower secondary schools in Norway utilize a core curriculum that includes core values and fundamental approaches for all grades and levels. Upon analyzing the curriculum, it was noted that there is an emphasis on providing hands-on learning experiences to the students. In addition, when it comes to core values and principles related to the environment and sustainability, there are three: (1.4) “the joys of creating, engaging and the exploring”; (1.5) “having respect for nature and environmental awareness”; and (2.5) “including interdisciplinary topics such as sustainable development in various disciplines besides natural and social sciences” (UDIR, 2020). Moreover, according to Sætre (2016), the Norwegian school system used to have three levels of approach to EE. The first and lowest level being “EE limited to learning about scientific knowledge”, the second approach being “EE based on learning about scientific knowledge but with specific goals to help develop environmentally friendly values and attitudes”,

and the last approach being how our society causes environmental problems and knowing what to do to resolve conflicts surrounding sustainability (i.e., ESD) (Sætre, 2016, p. 68). By integrating these three levels of approaches to EE, teachers in Norway had the chance to cover topics that pertained to ESD. However, was there and is there still a large presence of EE and ESD in Norwegian school systems and curricula?

Before the Rio conference, primary schools merged social studies and sciences together to create a course called “Orientation” for grades 1 to 3. Once students were in grades 4 to 9, geography was a separate subject included within the social studies discipline alongside history and social sciences (Sætre, 2016, p. 70). After the Rio conference, social studies was then split into three different syllabi: geography, history, and social sciences. One of the main goals for the new geography syllabus related to EE, which included topics such as environmental balance between human and nature, pollution, recycling, poverty, and many others. In terms of incorporating EE and ESD in Norwegian primary school systems, there was a study done on Flaktveit School, a primary school located within the Municipality of Bergen. This particular school is known for its focus on ESD and ensuring that all their students are aware of the importance of sustainability. Additionally, Flaktveit collaborates with external sources to create immersive opportunities for their students. Some of the companies the school worked with included: BIR, a waste management company in Bergen; IKEA, where students learned about a large company’s role in solving environmental issues; and UNICEF, where students worked together to increase bike usage or find alternatives for local waste disposals (OECD, n.d., p. 4). Thanks to schools such as Flaktveit, other educational institutions throughout Norway are doing similar programs and collaborations due to the emerging importance of ESD.

Similar to the Ontario secondary school system, geography is a one-year compulsory course for students in upper secondary schools in Norway. Alongside geography, upper secondary students are required to take a natural science course for a year. In this course the environmental perspective is primarily ESD focused, with the intensity varying depending on the student's subject focus (UDIR, 2020). Before the Rio conference, the curriculum created in 1976 “was the first general core curricula to state the importance of EE” (Sætre, 2016, p. 70). As a result, the geography curriculum was divided into two parts: cultural geography and physical geography. Unfortunately, environment and sustainability still did not have a prominent place within the course; however, they were covered in cultural geography through various topics related to environmental protection, community development and industrialization. Once the conference in Rio took place, changes were made to the main objectives in the geography curriculum. Instead of focusing purely on cultural and physical geography, it was crucial for the new curriculum to include environmental issues and sustainable development as one of the main goals for teaching geography. As a result, the newly revised geography curriculum for upper secondary schools included four goals: landscape and climate, cultural landscape, resource and industry, and population and settlement (Sætre, 2016, p. 73).

Topics related to EE and ESD tend to be more prominent within Norwegian curricula compared to ones used in Ontario. However, support for integrating ESD within school systems in Norway does not stop there. A program called “The Sustainable Backpack” has been implemented in approximately 600 primary, lower secondary and upper secondary schools in Norway. This initiative allows schools to gain the financial aid they need to implement EE and ESD within their school community, which includes and is not limited to: teacher training, curriculum planning, school projects, and external collaborations (One Planet, 2018). Due to their efforts, “The

Sustainable Backpack” ended up producing “more environmentally conscious students” (One Planet, 2018). With ESD becoming increasingly relevant, the program plans on improving their approach to educating teachers about ESD in hopes that “all teachers will be able to participate in sustainable development courses” in the near future (One Planet, 2018). Based on the given information, EE had a prominent place within Norwegian curricula before being slowly replaced by ESD. With the revision of the geography curriculum (to one that emphasizes the importance of sustainable development) and the rise of support initiatives like “The Sustainable Backpack” program, Norway has demonstrated the incentive needed to implement ESD in their school systems and curricula. Even so, exactly what factors come into play when it comes to integrating ESD in both Ontario and Norway?

Factors that Influence the Integration of ESD

Social and Economic Factors in Ontario.

When considering the implementation of ESD into Ontario and Norwegian curricula, exploring the social and economic factors of each country are necessary in understanding how environmentalism and sustainability has and is being integrated, and why. Social factors influence groups by dictating what is the norm, and affect the individual lifestyles of peoples in a given population. Combined with economic factors, ESD is determined by the social values of the population, and the economic factors that affect local environment and sustainability. One major social factor of a population is identity. Canadian identity is vastly built on the diversity of the land and of the people. Borris Vormann and Christian Lammert (2014, p. 308) argue that “regionalism” has historically been a key feature of Canadian civic nationalism, and exists in Canada because of a “lack of a national civic religion, inspirational leaders and ideologists through history” that has failed to create a unified national identity. The vastness of Canadian geography and the different ethno-cultural groups that have historically settled and lived in these different geographic locations has caused

regionalism to be “a main cultural and socio-economic fact of Canadian life” (Ibid., p.308). As a result, modern Canadian identity reflects a mosaic, where minority and disparate cultural and ethnic groups are celebrated and Canadians pride themselves on a culture of inclusiveness and diversity (Taub, 2017). The cultural mosaic and the inherently inclusive perspective of the population reflects a politically liberalistic perspective, but the regionalistic influence has created a diverse political spectrum that varies across the left-right dimensions.

Implementation of environmental policy and ESD in schools has been made complicated because of this varied political spectrum. Canada is a major contributor in global greenhouse gas (GHG) emissions. Based on data provided by the International Energy Agency, the Union of Concerned Scientists ranks Canada 11th overall for the top 20 countries that emitted the most carbon dioxide in 2018, at 0.56 metric gigatons. Per capita, that places the country 5th overall at 15.32 metric tons (Union of Concerned Scientists, 2018). In 2015, Canada agreed to join the United Nations 2030 Agenda for Sustainable Development, which presented a set of 17 global goals and 169 associated targets. Canada presented a *Voluntary Review* (2018) for the 2030 Agenda, where the country states its determination to reduce GHG emissions by 30% by 2030, and discusses the *Pan-Canadian Framework on Clean Growth and Climate Change* (2016) implemented under the Liberal federal government. As the first climate change plan in Canada’s history to include collective and individual commitments of federal, provincial and territorial governments, it includes 50+ concrete measures to reduce carbon pollution, build resilience to the impacts of climate change, foster cleantech solutions and create good jobs that contribute to a strong economy.

The country’s largely liberalist identity reflects the importance placed on sustainability and environment on a global scale, but the implementation of sustainable development goals on a

national level is challenged by the opposing Liberal and Conservative political parties. On a federal level, the Liberal government prioritizes climate policy through setting net-zero emissions goals, green investments, and a national carbon tax. The Conservatives on the other hand do not believe in policies that impact climate change, and instead rely on tax incentives to support technological development that back energy efficiency (McCarthy & Walsh, 2019). The differing approaches to environmental sustainability and combating climate change make it difficult for one method to remain consistent over years and different federal governments. If the Liberal party implements policies, the Conservatives will revoke it and focus on tax incentives. The cycle goes on, and an accepted consensus is hardly achieved. This is also reflected at a provincial level, as importance on different educational philosophies changes based on who sits in the Premier's office. The Conservative government tends to focus on traditional practical skills, reflected in the recent importance placed on literacy and numeracy. Environmentalism and sustainable practices are not seen as important, thus why the curriculum lacks a solid base or framework for ESD. Frameworks in curricula reflect citizenship and democratic practices instead of ESD, and teaching environmentalism and climate policy is placed primarily in the hands of teachers willing to take it on in practice.

Social and Economic Factors in Norway.

Identity in Norway is based on the idea of *friluftsliv*, which loosely translates to “outdoor life”. Termed by a Norwegian playwright in the 19th century, *friluftsliv* describes a broadly recognized and valued concept that has historically valued spending time outdoors across the Norwegic region (Vegsund, 2018). Brooks and Dahl (Vegsund, 2018 p. 17) define it as “nature-life traditions” that “resemble oral tradition, kept alive by repetition and subtle improvisation in response to the patterns and variations in nature, encountered along well-known paths”. This in part is due to the geographic makeup of Norway, since only 1% of the country consists of urbanized areas. As a

vastly rural population, “individuals have always used the environmental areas around them extensively; fjords, valleys, woods, hills, lakes and mountains for fishing, agriculture, forestry and mining” (Andersen & Wennevold, 1997, p. 157). Acknowledging this, it is easy to understand why place-based education and sustainable teaching is implemented as interdisciplinary practice. With such a high value and respect placed on the local environment, teaching outdoors and using geographic locations as a playground for learning is highly valued and practiced traditionally in Norwegian education.

Unlike Canada’s regional makeup, Norwegian identity is nationally based. This unified national identity is reflected in the country’s political environment as a primarily centralist and social state. With a smaller landmass and overall population, the political system does not have a separate regionalistic system to enforce policy like Canada does. This makes it easier for the country to make changes to curriculum and education, as responsibility over education is not divided among different governing systems. Ranked by the Economist Intelligence Unit in 2017 as the best democracy in the world for 6 years running, Norway’s political system focuses more on the collaboration between parties to implement policies and procedures (as cited in Smith & Adams, 2017). The two main oppositions, Arbeiderpartiet (labour party with a liberal perspective) and Høyre (liberal-conservative) have traditionally gained the majority seats in the latest elections (Nikel, 2020). In 2019, climate change topped Norway’s annual list of important political issues of the populace for the first time ever. Gaute Eiterjord, leader of the environmental organization Natur og Ungdom (Berglund, 2019) stated that “I think this amounts to a clear message to all involved with climate issues, to sharpen up”. While the Greens Party supports environmental action the most, the Socialist Left Party looks to develop a center-left platform, and the Center Party will only cooperate with the Arbeiderpartiet. The Greens and the Center strongly disagree on most green

issues, and the Center continues to face ongoing criticism that their actions are not “green enough” (Ibid., 2019).

Economically, Norway ranks quite low in developed countries for GHG emissions on a global scale. In 2019, the country’s global cumulative CO₂ emissions only accounted for 0.16% annually (Ritchie & Roser, 2020). With the high importance put on outdoor life and the environment of the nation, Norway actively participates in many initiatives to reduce GHG emissions globally. Like Canada, Norway is participating in the 2030 Agenda for Sustainable Development, and previously signed the Kyoto and Paris Agreements. On the 2030 Agenda, Norway is committed to reducing emissions by at least 40% by 2030, compared to their 1990 levels. In their progress report on the 2030 Agenda titled “One Year Closer” (Norwegian Ministry of Finance, 2019, p. 6), Prime Minister Solberg states that “at a time when we need more, not less, global cooperation, the 2030 Agenda for Sustainable Development is the roadmap that ensures everyone wins, even at the national level”. Implementation of environment and sustainable politics at the national scale continues to be better, as contesting parties work together to improve on the country’s environmental impact. Making changes of ESD within the education system is much easier, as the core curriculum elements in writing support any efforts schools and teachers make towards experiential outdoor learning and practices of sustainable teaching and learning. While economic policy and agendas concerning environmentalism and sustainability are still contested domestically, the general population’s recent importance put on climate change combined with a historically naturalistic identity allows Norway to socially and economically be a leading country in ESD teaching and environmental action and policy.

Methods

In conjunction to the information about EE and ESD within Ontario and Norwegian school systems and curricula, social and economic factors that influenced and is still influencing the integration of ESD, and modern-day teaching practices that currently exist and are popularized in both geographic regions, a brief study was done to accompany all that has been discussed. For this section of the study, focus was put on the perspectives of teacher candidates and teachers in Ontario and Norway. By interviewing and surveying teachers of various teaching specialities and experiences, further insight into teachers' current knowledge about ESD, how ESD is being implemented into their schools and classrooms, and any limitations that currently exist were explored.

Participants

In total, 8 individuals have participated in our study. Unfortunately, due to the strict time constraint of having three weeks to finish this project, it was a challenge to find participants under short notice. In addition, permission was also granted from all contributors to incorporate their first name in this study. The following table below shows basic information about the individuals who were involved in this project (see Table 1).

Name or Pseudonym	Current Occupation	Experience (in years)	Sex	Nationality
Abby	Teacher candidate	>2	F	Canadian
Allison	Teacher candidate	>2	F	Canadian
Nicole A	Teacher candidate	>2	F	Canadian
Nicole B	Secondary school teacher (Grades 9 to 12)	10+	F	Canadian
Annveig	Primary school teacher (Grades 3 & 4)	10+	F	Norwegian
Elin	Primary/Lower secondary school headmaster	15+	F	Norwegian
John	Primary school teacher (Grade 1)	10+	M	Norwegian
Nikolai	Lower secondary school teacher (Grades 8 & 10)	4	M	Norwegian

Table 1. *Basic information about each participant.*

The Norwegian participants were chosen thanks to the help of Dr. Sørmo and her connections, whereas the Ontario participants were chosen based on their relations to the authors of this paper. In addition, it is important to note that the Ontario teacher candidates and certified teachers who participated in this study have experience in teaching either geography or the sciences; therefore, being more informed about the meaning of sustainability and sustainable development compared to those who may have had less or minimal exposure to ESD.

Design

For simplicity and efficiency, interviews and surveys were conducted for this study. As such, participants were provided either an interview or a Word document survey, or just a Google Forms survey depending on the medium that seemed to best fit their comfort and schedule. In terms of the contents of the interviews and surveys, the same questions were asked to all participants, as can be seen in the table below (see Table 2).

1	Could you tell us what you currently know about sustainability and Education for Sustainable Development?
2	When going through “Teacher Education”, how much emphasis do they put on teaching sustainability or sustainable development? If any at all.
3	Based on a teacher’s perspective, how important is teaching sustainable development? a) What sorts of topics do teachers tend to focus on? (e.g., environmental sustainability, resource sustainability, etc.)
4	According to the new curriculum [in Norway], ESD is supposed to be interdisciplinary. Could you tell us what the term “interdisciplinary” means to you as a teacher? a) Do you think there should be a bigger presence of teaching sustainable development in schools? Or even in other subjects besides social science and natural science?
5	Climate change is an emerging topic of concern in teaching sustainability. Do you think climate change is being adequately addressed in your school and classrooms?
6	Do you think your students are gaining valuable insight on their individual roles within their environment and creating positive sustainable change and action?
7	If teaching sustainable development needs improvement, in your opinion, what do you think limitations are for you as an educator? What could be done or implemented to overcome these obstacles?

Table 2. *Questions asked during interviews and surveys.*

Procedure

Within the second week of this project, teacher candidates, teachers, and headmasters were contacted in Ontario and Norway to see if they were willing to participate in the study. As aforementioned, due to time constraints, two main methods of data collection were constructed in order to gather qualitative data: an in-person interview through Zoom/Teams and a self-paced Word document/Google Forms survey. Before the creation of the online Google Forms survey, Norwegian candidates were provided a Word document with the questions from *table 2* so that they were able to prepare ahead of time. In addition, teachers in Norway had the choice to either discuss with us via a video-conferencing platform or fill out the Word document that was sent to them earlier in the week. At the same time, participants in Ontario were strictly sent a Google Forms survey for easier data collection and organization. As a result, three interviews were conducted, one Word document was acquired, and four submissions were received from the survey. The data was then collected and organized into tables for easier analysis, which can be found in [Appendix II](#).

Results

The responses gathered from the interviewees and survey participants demonstrate that Norwegian and Ontario teachers largely understand what ESD and EE are and recognize it as a relevant and important practice in teaching. The results also display that teachers in both Norway and Canada identify gaps in curricula to support ESD and EE, as well as in varied practices of implementation based on individual interpretation of need as well as classroom, school, and regional environment.

Here is the summation of the following data gathered from each interview question:

1. Could you tell us what you currently know about sustainability and Education for Sustainable Development (ESD)?

All interviewee's responses highlight interacting with the environment as a key variable, as well as the impact of individuals on the environment. There was a focus on the lens of 21st century teaching, and the long lasting impact of individual actions today on the earth's environment. John and Nicole B. both made a connection to ESD and the United Nations own initiative, discussing ESD as defined by the organization. The Norwegian educators also focused more deeply on the interaction between humans and the natural world, whereas this is demonstrated by the Ontario teachers as well, but Allison explicitly defined teaching sustainability as focusing on Indigenous ways of interacting with the environment. Elin indicates that the new 2020 Norwegian curriculum and it's focus on sustainability reflects a national plan with key targets on renewable resources such as the ocean and food. In their response to this question, Nikolai also mentions the double moral of Norway's economic prosperity and social value placed on sustainability, which can be connected back to the social and economic factors of Norway above. When asked this first question, all teachers were able to recognize and understand the term sustainability, some referring to the United Nations' ESD initiative.

2. When going through "Teacher Education", how much emphasis do they put on teaching sustainability or sustainable development? If any at all.

The Ontario educators indicated having less exposure to learning about teaching sustainability and sustainable development in comparison to the Norwegian teachers. The exception would be Abby, who indicated there was an emphasis, and Allison, who indicated that their Biology and Chemistry teaching subjects for Intermediate/Senior qualifications has included significant exposure towards ESD and EE. All Norwegian educators mention sustainable practices taught in their teacher

education program due to increased curriculum focus in schools. John indicates that while there was some, and that teaching sustainability and sustainable development was focused primarily in Geography and History, as well as included in the teaching of the culture of Norway's Indigenous Sami people. Interviewees' responses demonstrate that teachers who specialized in teaching the Sciences have had more exposure to sustainability and environmentalism as compared to those who specialized in Geography or Arts. When it comes to teaching geography specifically in Ontario, focus is put on the physical and human aspect of Canadian geography rather than environmental education (although there is still a small presence of EE and ESD within the Ontario geography curriculum). Elin states something similar, indicating that was not as it is now and there was not enough focus in Arts and Languages.

3. Based on a teacher's perspective, how important is teaching sustainable development?

a. What sorts of topics do teachers tend to focus on? (e.g., environmental sustainability, resource sustainability, etc.)

All interviewees' responses agreed that teaching Sustainable Development is important. The Ontario educators indicated that environmental sustainability/climate action, resource sustainability, and clean energy are topics of focus. Allison again mentions Indigenous Education, and Nicole A. highlighted poverty as an additional topic of importance. Norwegian educators mentioned recycling, resource management, climate action, and environmental sustainability/nature preservation. Annveig identifies social sustainability as a key focus topic, and Nikolai mentions community infrastructure as another focus in their teaching. Nikolai also indicates in their response that Norwegian teachers have a lot of flexibility in focus topics, as long as it fits into the new core curriculum. While positive, Nikolai explains how lack of resources and outdated textbooks make teaching sustainable development a harder task. Both John and Nikolai

indicate that the recent and frequent curriculum revisions have created challenges for teachers new and old and made it difficult to keep up practices and resources with current curriculum standards.

4. According to the new curriculum [in Norway], ESD is supposed to be interdisciplinary.

Could you tell us what the term “interdisciplinary” means to you as a teacher?

- a. Do you think there should be a bigger presence of teaching sustainable development in schools? Or even in other subjects besides social science and natural science?**

All interviewees understand interdisciplinary as teaching different topics and curriculum goals across multiple subject fields. Both Ontario and Norwegian educators believe there should be a larger presence of teaching sustainable development within their respective regions, and agree ESD should be incorporated into more subjects. Specifically in Ontario, the lack of ESD in the curricula could account for the need for a larger presence of ESD. Whereas in Norway, the need for ESD can be linked back to national identity which is heavily influenced by environmental and outdoor life as well as traditions. In fact, John mentions the importance of analysing social and cultural traditions and integrating this into teaching, and describes teaching subjects more as being integrated into “themes”, that of which the subjects can be fit into. Elin indicates that pupils seem to be learning better with interdisciplinary teaching, and that it incorporates the unique interests and skills of students better. Nicole B. explains that there is a lack of depth in teaching ESD cross-curricularly in Ontario schools, and maintains that ESD is not fully interdisciplinary across all subjects, and that it is especially not taught in compulsory courses. Alternatively, Nicole B. does mention the extra-curricular programs, teams and clubs that exist outside of the classroom where students do get the chance to participate in ESD. Regardless of the country, ESD is heavily reliant on teacher and school initiative. The curriculum cannot force teachers to implement ESD into their

lessons. As such, teachers must work together to integrate ESD and have the desire to achieve a successful outcome.

5. Climate change is an emerging topic of concern in teaching sustainability. Do you think climate change is being adequately addressed in your school and classrooms?

Ontario educators are mixed as to whether they believe climate change is being adequately addressed in the classroom. Abby believes it is, while Allison agrees somewhat, but recognizes she only has experience from the Science subjects. Nicole A. and Nicole B. both agree that it is not being adequately addressed. Elin, Annveig, John and Nikolai agree that climate change is being addressed in schools, but John and Nikolai both conclude that there is still not enough awareness and that it can still be taught more as one of the biggest issues of our future. All educators recognize climate change as a large issue and agree that it is important to address in all classrooms and schools.

6. Do you think your students are gaining valuable insight on their individual roles within their environment and creating positive sustainable change and action?

Interviewees provide mixed responses to this question. The general consensus is that teaching students their individual roles within climate action is important, but there are different ideas on how well students understand their responsibilities as individuals. This largely depends on the subject and grade level that the educator is teaching. Abby believes students do, Allison mentions that they do try to incorporate as much information on student roles as they can, while Nicole A. says that they are not motivated and do not have the proper education to make change. Nicole states that students recognize their impact, but as a result of the teachers personal interest in these topics. Elin indicates that they hope students do. John says it is hard to tell at their age, but Annveig and

Nikolai both agree that students do seem to understand their actions and impact on climate change. Annveig, like Nicole A. agrees that there can be problems with motivation, doubting that students are willing to reduce their living standards in order to make a change. In addition, Nikolai states that creating positive sustainable change is one of the main goals of the Norwegian education system. Thus, there has been an increase in implementing ESD related topics so that students are aware of their environmental presence. Unlike in Norway, it is mainly up to educators to introduce ESD related topics to their students. In doing so, the students themselves have the necessary knowledge and tools to reduce their ecological footprint on their own terms.

7. If teaching sustainable development needs improvement, in your opinion, what do you think limitations are for you as an educator? What could be done or implemented to overcome these obstacles?

All interviewees recognize limitations in implementing ESD into schools in both Norway and Ontario. Teachers in Ontario describe limitations such as a lack of resources, open-endedness of the curriculum, lack of direction for educators, and lack of time. Norwegian educators indicate that limitations exist in lack of knowledge and community coherency (ability for educators to work together to create content and lessons), funding, school management initiatives, lack of interdisciplinary knowledge regarding ESD teaching, and again lack of time. Some educators have a difficult time answering what can be done to overcome these obstacles and recognize it as a complex issue. Interviewees mention possible solutions of providing more and better resources, funding, increased salary for educators, providing realistic problems to students/better assignments, increasing teacher's knowledge, and increased action through principals, schools boards and governments.

Discussion

The current Ontario curriculum: in support or a hindrance to ESD.

The Ontario curriculum documents lack a lot in detail when addressing ESD. As mentioned and identified by interviewees, what is included in the curriculum regarding EE and ESD is minimal, and fails to guide teachers in how to implement these ideas into practice. The Ontario Ministry of Education (OME) formed the Working Group on Environmental Education who released *Shaping Our Schools, Shaping Our Future* in 2007 (The Bonder Report) which detailed the existence of EE and ESD in Ontario curricula. The report concluded that only a small proportion of curricula at the secondary level have content related to EE expectations, and the material that is there is optional. When looking at courses such as CGC1P/CGC1D that are mandatory for all students, that missing aspects of “how” is where EE and ESD would be. Bardecki and McCarthy (2020) outline how ESD contests traditional pedagogical practices and curriculum expectations, which makes it harder to implement it in the education system. Stevenson (Bardecki & McCarthy, 2020, p. 120) states that EE and ESD “stresses cooperative and collaborative strategies with an emphasis on creative and critical thinking”, where education right now is focused on content-based learning, and therefore individual progress and achievement. Traditional schooling also focuses on “high-status” knowledge, or largely rational and technically based learning. EE and ESD goes against that traditional knowledge set, as it accommodates other knowledges and encourages new ways of pedagogical practice in Ontario curricula.

ESD is also fundamentally interdisciplinary, which the Ontario curriculum is not. It demands a “whole school approach” where every member of the school community, from the students to the administrative staff, must work together to implement environmental practices into teaching and learning (Ibid., p.120). Teaching is not an independent profession, rather a job where educators

work together to teach curricula. This works well for ESD especially at the elementary level and within departments at the secondary level, since teachers must work collaboratively in teaching specific subjects. Where EE and ESD meet obstacles in Ontario curriculum is in the interdisciplinary aspect that demands teachers to work together across subjects and teaching practices. At the secondary level especially, lack of collaboration between departments required for the successful implementation of EE and ESD is seen as the major issue by many educational experts (Ibid., 2020). The Bonder Report paved the way for the document released by the OME in 2009 called the *Acting Today, Shaping Tomorrow* which outlined a policy framework for EE in Ontario schools. The document echoes the Bonder Report's statement that Ontario's education system should be preparing students with the "knowledge, skills, perspectives, and practices they need to be environmentally responsible citizens" and stresses the education system's responsibility in ensuring students understand their environmental responsibility and the connection they have between all living things (OME, 2009, p. 6). Despite this recognition, the actions the OME promises to complete to reach their strategies do not go deep enough to create meaningful change. Today this lack of longstanding action still reflects minimal expectations in curricula, absence of EE electives offered in schools, and continued focus on traditional, single subject-based teaching. This demonstrates how the Ontario curriculum continues to hold ESD back from student learning and engagement in the public school system.

The current Norwegian curriculum: in support or a hindrance to ESD.

In comparison to the Ontario curriculum, Norway's implementation of EE and ESD is addressed to a much higher degree and level of competency. The recently revised and implemented core curriculum introduced in August 2020 has 3 main elements, and in element #2 "principles for education and all-round development", sustainable development has its own subsection under the interdisciplinary topics expected to be taught across grades 1 through 10 (UDIR, 2020). ESD is

implemented directly into the schools through this, as teachers are responsible to use the expectations of the core curriculum and these interdisciplinary themes across all subjects. As the curriculum states, “sustainable development is about protecting life on earth and taking care of the needs of people living today, without destroying the ability of future generations to meet their needs” (Ibid., section 2.5.3). The goal of this interdisciplinary subject is for students to develop the necessary skills to make conscious environmental decisions with the understanding that their actions will have a continuous, future impact on the environment and the world. The importance placed on ESD in the new curriculum is effectively possible because of the larger interdisciplinary nature of Norwegian teaching practices, as recognized by interviewees, as well as the high importance and value placed on the environment and outdoor traditions that have existed culturally in the society’s identity for generations. As stated by the United Nations on Partnership for Change: Education (n.d.), environmental studies in schools has traditionally been a compulsory part of education in Norway. Through EE, students are given the opportunity to obtain the “knowledge, attitudes and skills” required for them to properly contribute towards further goals of sustainable development (United Nations, n.d.).

While the curriculum today demonstrates considerable attention paid to ESD and EE, it has not always been this way. In 2005, the Environmental Education in the North (Witoszek, 2018) completed research where they found that sustainability as a topic in schools was still seen as controversial to teach. As EE and ESD is a newer addition to standardized curricula across the country, resources and the essential teaching practices needed to fully implement it into teaching are not yet there. Nina Witoszek (2018) outlines how the Norwegian curriculum reflects a high degree of importance placed on EE and ESD, while at the same time there is a cultivated cognitive dissonance accepting the country as a ‘virtuous’ oil economy. This tension between ESD and the

economic reality of Norway makes for a paradoxical relationship where cognitive recognition is needed for Norwegians to understand their current place and impact on environmental issues and change. Popularized textbooks used in schools fail to identify Norway as both an environmentally conscious country as well as a prosperous oil economy. They tend to address either the social or economic aspects of environmentalism, sustainability and the Norwegian economy, but often fail to make the ESD connection to pull the social and economic together. In the textbook *Natural Science Level 8-10* from the popular Tellus series (2007, 2015), Norway's extraction of oil and gas is framed in largely positive terms' (Ibid., 2018). While this textbook discusses the process of oil extraction as a largely positive action, it briefly touches on the negative environmental impact, but fails to thoroughly address the dichotomy between the oil sector and its negative impacts on the environment and what students can do as active citizens to address these issues. The new core curriculum provides the framework for educators to work with ESD and creates opportunities for students to be agents of change, but resources are few and far between because this cognitive recognition and the core curriculum expectations are both so new. As teachers work together over the next few years to rework Norwegian classrooms to fit the new curriculum, the implementation of ESD will only improve over time.

Teaching practices that currently exist and are popularized in Ontario schools.

Placed-based education (PBE), also commonly known as place-based learning (PBL), has gained traction in schools across Canada, including Ontario. Essentially, PBE is a “student-centered form of learning that heavily emphasizes inquiry into topics of importance in the community and “often occurs when performing exploration of the environment” (Loveless, 2021). In Canada, PBE is a method of practice that has no direct correlation to Ontario curricula. As such, implementing PBE in schools and classrooms ultimately depends on school boards, principles, and/or teachers, but it is not strictly restricted to a classroom setting; educational practices such as PBE can also be

adopted as a whole-school approach. An example of this is the Teton Science Schools (TSS) located in Wyoming and Idaho, United States of America. These particular schools provide authentic, meaningful and engaging lessons for all students based on the geographic location of the school. As a result, the Teton Science Schools focus on three major factors: the environment, the local community, and the culture, in hopes that students will build various skills, value contribution and develop appreciation to the local environment. Schools such as the TSS demonstrate that it is possible to fully integrate ESD and PBE within a school system.

When it comes to the specifics of PBE, the pedagogical approach includes providing students a voice in what they are learning, how they are learning the materials and where they want to learn. Tailored learning ensures that all students' needs and abilities are met, while also providing an equitable foundation where students can build up their current level of knowledge. In practice, PBE is known for its interdisciplinary nature and focus on sustainability of life (Promise of Place, n.d.). Moreover, students within a PBE system end up developing their comprehension and reflection skills since they are required to think critically and reflectively on various pressing topics from different perspectives. Through the skill development approach that comes with PBE, schools contribute to citizenship education across the curriculum. For example, teaching students to read, write and communicate through numerous forms; including civic projects where students engage in civic writing and speaking, ultimately developing students' values and attitudes towards various issues in our world (People for Education, 2014).

Specifically to Ontario, teachers have developed substantial teaching and learning opportunities across the province that incorporate EE and/or ESD. However, there are many obstacles that comes with its incorporation, many of which interviewees identified, such as: overcrowded curriculum,

time constraints, preference on literacy and numeracy, coherence across leadership on EE and ESD development, and level of expertise and comfort among teachers in their abilities to integrate EE and ESD in course curricula (Bardecki & McCarthy, 2020, p. 121). In fact, Bardecki and McCarthy (2020, p. 121) noted that with the absence of EE as a recognized teaching subject, very few teachers identify as “environmental educators”, outside of those who are involved in Specialist High Skills Major programs related to the environment. Even though time for teachers to develop resources and practices is limited, there are various resources and institutions available for teachers, such as: Ontario EcoSchools, Learning for a Sustainable Future, Ontario Institute for Studies in Education, The Environmental Literacy Council, Green Teacher, local conservation authorities, the Ontario Society for Environmental Education, Ducks Unlimited, Evergreen, and WWF-Canada. In addition, there are online resources pertaining to place-based education that teachers can easily access in order to gain better insight into how PBE works in an environmental context. An example is Edutopia’s webpage on “Place-Based Learning”, which includes the following articles: “7 Tips for Moving Learning Outside”, “Bringing Core Content to Life with Outdoor Education”, “Moving from the Comfort Zone to the Challenging Zone”, “Simple Ways to Bring Learning Outside”, and many others (Edutopia, 2021). With the recognition of EE and ESD comes the popularization of PBE in Ontario. Although changing current teaching practices is not an easy feat by any means, through the implementation of additional teaching practices connected to ESD, both teachers and students will be able to obtain valuable information and skills needed to become sustainable citizens.

Teaching practices that currently exist and are popularized in Norwegian schools.

PBE is a major aspect of the education system when discussing current practices of teaching in Norway. Similar to Canadian teaching practices in that it is highly popularized, Norway’s

education system integrates PBE more effectively across curriculum documents. PBE is highly valued in practice because of the importance put on outdoor play and learning. Britt Vegsund (2018, p. 7) says that the outdoor environment in Norwegian education is “both designed to encourage physically active play and used by educators as an arena for physically active play and learning”. For example, the curriculum demands that a specific amount of hours have to be dedicated to outdoor education and physical activity. Outdoor activity and PBE practices are naturally a huge part of the Norwegian education system, and contribute to the overall high importance put on EE and ESD. The interdisciplinary nature of the new core curriculum also demonstrates a high importance of PBE practice placed in education. In section 2.3 (UDIR, 2020) the curriculum outlines the 5 basic skills of reading, writing, arithmetic, oral skills and digital skills and stresses that teachers must make connections to these 5 basic skills across subject curricula. These skills are notably regarded as “important for the development of students’ identity and social relationships, and for being able to participate in education, work, and community life” (Ibid., 2020). Since the curriculum is so broad, it is up to individual schools and teachers to decide how they want to meet the given expectations. The broadness in the curriculum and the subsequent social value placed on being outdoors has resulted in a larger influence of EE on teaching over time, as interviewees have stated. In the Framework Plan for Kindergartens (2017, p. 52), it emphasizes how “Kindergartens shall enable the children to appreciate nature and have outdoor experiences that teach them to move around and spend time outdoors during the different seasons”. Regardless of the class or the subject, spending time outdoors is socially and culturally valued. It is because of this that EE and PBL occur simultaneously in the Norwegian curriculum.

Across the country, some of Norway’s top stakeholders and groups for sustainable development and environmental consciousness have created a variety of resources for educators to use. The

Sustainable Backpack program is one that has already been mentioned, but there exists still a wide variety of additional digital tools for teachers to use as packages for lessons or even entire units that incorporate PBE practice in teaching EE and ESD. Many schools set aside their own funding for EE and ESD learning opportunities, as well as municipalities and the Norwegian government contribute to funding these teaching practices. Funding provided by external sources allows schools and teachers to partake in a variety of EE and ESD based programs that are currently running across the country. Natufag.no (2020) is a website developed by the National Center for Science in Education, and provides Norwegian teachers with a variety of EE and ESD resources for students at the primary level. These resources not only include activities and lessons, but opportunities for teachers to work on professional development and learn about different practices and methods of teaching EE and ESD. Another popular resource is Miljolare (n.d.), a website launched by the Environmental Education Network in Norway which works as a tool for training teachers and students in sustainable development. It offers an extensive list of activities to be carried out in schools' local environments where observation and data collection can be shared and compared. However, many resources available to teachers only focus on the environmental side of sustainability, and do not necessarily connect to the other strands of ESD that look at individual responsibility in the community in ways that touch on subjects like poverty and inequality. This and the continued work of teachers and educational stakeholders required to restructure the school system with the new curricula demonstrates popularized use of PBE and EE practices, and a growing focus on ESD in Norwegian schools and classrooms.

Conclusion

This comparative research project has revealed many parallels as well as distinctive differences between the Ontario and Norwegian education systems. Globally, society is in a period of rapid

change, increasingly so concerning the environmental status of the Earth. Living in the age of the Anthropocene, individuals now are forced to consider their environmental impact not only on a micro scale, but also from a globally minded perspective. Understanding what sustainable development is is integral to contextualizing the human impact on the environment and the Earth's climate, as well as individual and group impacts on society, environment, culture, and economy. The United Nations effort to focus on Education for Sustainable Development, as well as other emphasis put on environmental education and place-based education in both Norwegian and Ontario school demonstrates an increasing demand and need for students living in the twenty-first century world to fully comprehend the current geological epoch, and be able to take effective action to alter the current course for the betterment of future generations to come.

The need and recognition of the importance of ESD, EE AND PBE is represented both in the Ontario and Norwegian curricula, but to different degrees of urgency. In Ontario, the resource guide *Environmental Education* outlines how topics of EE and sustainability should be incorporated into subject curricula, and even provides a few tips and tricks into how teachers should be going about doing it. The main issue with the Ontario curriculum is that there is an enormous lack of EE and ESD teaching implemented into the text and expectations. Grade 9 Geography (CGC1P/1D) is the only mandatory Intermediate level course that provides students with exposure. There are an additional few elective courses that focus on topics of EE and touch on topics of ESD, but the actuality of schools running these courses is extremely rare. There just are not the teachers who feel comfortable enough or trained well enough to take on these heavily focused ESD courses. In Norway, there is a completely different amount of emphasis placed on ESD teaching. The newly revised 2020 core curriculum includes sustainable development as one of the main pillars. Additionally, the curriculum is designed with interdisciplinary teaching as a main focus. With ESD

being a broadly interdisciplinary topic, the Norwegian curriculum is set up to support instead of hinder ESD teaching. The lack of interdisciplinary focus is where Ontario curricula lags behind in this aspect. Additionally, in comparison to Ontario's grade 9 compulsory grade 9 Geography course, the Norwegian upper secondary level Geography includes 4 main ESD based goals: landscape and climate, cultural landscape, resource and industry, and population and settlement. In the case of curricula, Norway far outmatches the goals of ESD education and curricula that Ontario is only just beginning to touch on.

Concerning popularized teaching practice, both Norwegian and Ontario educators understand the importance of and have a goal to include more ESD topics and teachings into their individual classroom environments, regardless of the classroom or course subject. With ESD being fundamentally interdisciplinary, Ontario teachers -especially Intermediate/Senior educators- have a difficult time implementing it into their teaching when the curriculum is not. Various resources for the classroom as well as school environments exist to support teachers in implementing ESD, but the curriculum is already overcrowded as it is. There are several constraints put on and felt by educators, and the large precedent given to numeracy and literacy skills overshadows any efforts to include much else. Therefore ESD education more often than not occurs outside the classroom and within the larger school setting, in specialized programs, clubs, activities and extracurriculars shepherded by teachers on their own time. In Norway, teachers are given more of an opportunity to work with ESD in the broader curriculum with a much heavier focus on interdisciplinary practice. Many classes at various grade levels spend significant time learning outdoors, but it is always ultimately up to each individual teacher's own initiatives and abilities to fully engage with ESD teaching practice. Like in Ontario, various resources exist for teachers to engage with more ESD material and teaching practices. The challenge lies for Norwegian teachers in keeping up with

the changing core curriculum, and finding new ways to adapt their teaching and find resources to be able to fully engage with the ESD topics present in the revised curriculum today.

Various economic and social factors in both Ontario and Norway affect the ways in which ESD is implemented into curriculum and practice. From research, interesting findings between the countries' relationships with their own climate impact and their education system and philosophies unveils an interesting dichotomy that exists between society and the increased importance of ESD content and practice. The continued lack of ESD in Ontario schools can be accredited to a divided regionalistic identity, the multitude of involvement of different political entities, and an economic sphere with a massive impact on the world's GHG emissions. Norway's own GHG emissions and reliance on an oil-based economy would potentially indicate a similar situation as in Ontario, but the larger national identity of *friluftsliv* and high importance placed on outdoor life creates a realm of increased need of ESD, EE and climate saving practices within society and government. While these various factors, the state of curricula and teaching practice in both countries, and the accounts given by interviewees provide a better understanding of the differences between Ontario and Norwegian public educational emphasis placed on ESD, it also reveals a parallel between both countries across the Atlantic. ESD is important, and understanding the definition and purpose of sustainability is essential for students to know. There may be various limiting factors that make it difficult for educators to focus on these topics of the environment, but educators are doing the best that they can with what they've got to make informed choices, teach students topics of ESD, and provide them with opportunities to take action and better understand their individual responsibilities as people of a global world. It is a changing world, and like always, teachers continue to develop professionally, adapt, and overcome to do what is best for generations to come.

Acknowledgements

This research project was possible thanks to organizations and individuals who have provided us assistance throughout the last several weeks. We would like to give sincere thanks to our project supervisor, Wenche Sørmo, and her colleagues, Karin Stoll and Mette Gårdvik, for guiding us on this journey. Thanks to our supervisors from Nord University, we were able to learn more about sustainability and ESD in Norway, were able to interview Norwegian teachers, and were able to receive the guidance needed to write a formal research paper. We also thank our survey participants for taking the time out of their busy schedule to answer questions for our research: Abby, Allison, Annveig, John, Nicole, Nicole, Elin and Nikolai. With the short notice that they had, their insight was highly valuable to us and we could not have finished our research without them. Lastly, many thanks to the CANOPY team, Nord University Faculty of Education and Arts, and Queen's University Faculty of Education for allowing us to take on this project for our alternative practicum at Queen's University. Without our FOCI course professor, Dr. Chin, and her course assistant, Raquel, we would not have been aware of this opportunity. The help that we received from everyone throughout this process has been and still is greatly appreciated and without them, our final product would not have been possible.

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Appendix

Appendix I. CANOPY Information Brochure



Online International Alternative Practicum in Norway

Spring semester 2021

Eight available spots • Application deadline: 11 January 2021

Are you interested in exploring some of the most pressing topics in the field of education alongside leading experts from Norway? This IAP-online-program offers a unique opportunity to pursue an exciting project at the international level.

PROGRAM AND PLACEMENT

Description

Eight students from Queen's University will be divided into four pairs. Each group will be assigned a supervisor from the Faculty of Education and Arts at Nord University in Norway. These pairs, under the guidance of their supervisor, will complete a major IAP-project on a topic of their choice. Some possible topics include (but are not limited to):

- educational technology
- innovation in education
- inclusive teaching and social justice
- teaching the environment and climate responsibility
- indigenizing education
- deep learning
- intercultural learning and citizenship education
- curricular values
- student life
- teacher training
- arts or literature in the classroom
- crisis management
- evaluation modes and models
- school leadership
- experiential or outdoor education
- multilingualism and linguistic diversity

Together, the two students and their supervisor will develop and focus the project field from a broader topic to a specific subject area and set of questions to lead their comparative study of education in Norway and Canada. After meetings, research, and development activities, the student pair will deliver a final product; the format of this output can vary. Students, in consultation with their supervisor, may select from a variety of options, ranging from an advanced research essay to more creative, multimodal opportunities, such as a video documentary or a lesson portfolio.



Additional Opportunities

Depending on the nature of the project and the type of data collection necessitated, Nord University is able to arrange for IAP students to interview online other teacher education students, researchers, practicing teachers, and/or principals from Norway.

Students will have an opportunity to feature their project and their experience of the IAP-process on the CANOPY Project website after the conclusion of their placement.

Eligibility and Requirements

- Students must be enrolled the final year of the Queen's Bachelor of Education
- Selected students must each complete 90 hours towards their alternative practicum



THE CANOPY PROJECT

The Canada-Norway Partnership

This online international alternative practicum opportunity is made possible by a DIKU-funded partnership between Queen's University and Nord University, entitled CANOPY (The Canada-Norway Pedagogy Partnership for Innovation and Inclusion in Education). This partnership aims to address, from a holistic and international perspective, the most pressing issues currently facing the education sector to better prepare the next generation of teachers. Connecting educational research, classroom experience, student mobility, and institutional management, CANOPY will develop global competencies in pedagogy, research, and training through international collaboration. Innovation and Inclusion are the guiding principles of CANOPY, and the initiatives of each year of the project will focus on a different priority area comprehended by these principles:

2020/21: Educational Leadership

2022: Digital Innovation and Educational Technology

2023: Indigenous Studies, Diversity, and Inclusion

2024: Exceptional Learners

Through the IAP component of CANOPY, the project endeavours to offer teacher-candidates the opportunity to immerse themselves in the educational environment of the partner region and to acquire an international perspective on teaching and learning that extends beyond their typical experience within local provincial guidelines and curricula. Practicum placements, in particular, will help teacher-candidates cultivate intercultural awareness, craft self-reflexive pedagogy, and assemble a broader network of colleagues and mentors. At the institutional level, such arrangements will ultimately improve International Practicum programs, which are an increasingly influential aspect

Application Process

To apply, write a letter of motivation (a maximum of 300 words) explaining why you would like to participate in a digital IAP placement in Norway. You are free to formulate the letter as your wish, but you must address the following two questions:

- What do you expect to gain and/or learn from participating?
- What topics or issues do you hope to investigate through a comparative study of education in Norway and Canada? Why are you concerned with these topics?

If you would like to partner with another Queen's teacher candidate for your project, please identify this student on your application form, in the Notes section. Submit your completed application by email to Nadya Allen nadya.allen@queensu.ca no later than 9:00 AM on 11 January 2021.

of teacher training worldwide. Retrospective reflection with practicum exchange students, along with ongoing logistical planning between international practicum coordinators, will assist Faculties with refining programme parameters, establishing evaluation equivalences, and identifying innovative pathways.

Nord University and the Faculty of Education and Arts

Global challenges demand new insight, innovative solutions and local legitimacy. Nord University is a young university with strong regional ties and a global perspective. We are committed to delivering relevant educational programmes and research, with a focus on blue & green growth, innovation & entrepreneurship, as well as welfare, health & education. Nord University has 11,000 students and 1,300 employees at nine study locations in central and northern Norway. It receives 200 students annually on exchange, with its biggest international student body based in Bodø campus.

The Faculty of Education and Arts (FLU) educates tomorrow's teachers from preschool to upper secondary school, and with specializations ranging from sports to the fine arts. Our candidates play a vital role in the knowledge-based development of society. Our research emphasizes the teaching profession and professional teaching practices. The Faculty offers a doctoral program (PhD) in the study of professional praxis. FLU has 3500 students as well as 350 academic and administrative staff.

More Information

- Nord University: <https://www.nord.no/en>
- CANOPY: <https://blogg.nord.no/canopy>



Appendix I. These images show the information brochure received from Queen's University and the CANOPY project team. Through this brochure, we were able to go through the application process in order to be selected for the project.

Appendix II. Results from Interviews and Surveys

Could you tell us what you currently know about sustainability and Education for Sustainable Development (ESD)?	
Abby	I don't know much about it
Allison	Teaching sustainability has a great focus on indigenous ways of interacting with the environment. Sustainable education can also be paired with environmental education, outdoor education and many different curriculum subjects.
Nicole (Teacher Candidate)	I know about the 17 goals for sustainable development.
Nicole	ESD is teaching students the importance of sustainability. To do this, I teach students about climate change (the causes, effects and impacts), then we look at renewable energy and investigate ways to reduce ecological footprint.
Annveig	I think our new curriculum sums it up very well. (quoted sustainable development curriculum)
Elin	I am the headmaster now, but I know that in the national plans for primary and lower secondary, there is more focus now from 2020 on sustainability. There is support in this national plan for taking care of the environment and our society. There is a lot of focus on the sea, ocean, and food. And that is a national topic, so it's for all schools in Norway to take care of these sustainability and environmental focuses.
John	To me sustainability is similar to the cycle of life, [for example] what we should continue doing to sustain the richness of species. Sustainability is also how we should live with nature and how we should value cultures (which is important for a sustainable way of living), not how we should live against nature. It's also about reversing the damage that we have done. I don't know much about Education for Sustainable Development but I do know about the UN action plan.
Nikolai	Sustainability is a big word that means a lot. It is about not destroying the options for the next generation, so it is a big question. It is about making it possible for the next generation to come and do the same. In Norway, we talk about sustainability a lot -it is huge. The whole education system is built off 3 big subjects, and sustainability is one. Personally, I think it's a bit of a double moral, because they say we want to be sustainable, but our economic growth continues to increase every year. (In regards to ESD): The Norwegian system is built upon the core curriculum, which is the values and principles for education in Norway from 1st to 10th grade -the principles and values that everything will be built upon. #2.5.3 is sustainable development, so everything they do has to be connected to this somehow when they teach. It is a big subject, you cannot do it alone, and you must have approaches to achieve it. Not one teacher's responsibility, it's all teachers in Norwegian schools.

When going through “Teacher Education”, how much emphasis do they put on teaching sustainability or sustainable development? If any at all.

Abby	Yes they do
Allison	My focus is environmental education and subjects of biology and chemistry so I have heard a lot about sustainability and environmentalism
Nicole (TC)	None
Nicole	None
Annveig	I studied at Nord University before the new curriculum came into force. It was only the science department that had a strong focus on ESD, the other departments I had subjects at did not focus on EDS at all. Since I started in my job as a teacher I really have missed more competence in how to teach ESD interdisciplinary.
Elin	It was not like it is now, as it is more across the subjects, but we had it in geography and in natural science. Not in art and languages, and not enough. Only in natural science.
John	It depended on what subject I was studying. In the arts, [we had to] use previous knowledge to be able to redesign and recycle [for certain projects]. We had to know how we could use materials that were already there, where the materials were from, how they were used, and how we could use them. I had a course called “food and culture” (which doesn’t exist anymore) and [it taught us] a lot about traditions, why traditions were there, and how we reuse and value [these traditions]. We had a lot of [sustainability/sustainable development topics] in geography and history, which focused on how people lived years ago and how they lived in a sustainable world. But in the basic subjects, there weren’t a lot of [sustainability/sustainable development talk]. But, we learned about the Sami people. During my Master’s degree, there were none (sustainability/sustainable development topics and courses). But we learned about how we interact with each other (i.e., the cultural and community aspect of it), we learned how the action of one man could have large consequences on the environment, but we didn’t really learn about the environmental perspective.
Nikolai	I took some time of my teacher’s education in Denmark, where I took nature science so sustainability was talked about a little more. When I took pedagogy and sport in Norway I did not hear about it at all. Denmark is a little different, in how you organize subjects. In Norway, the chemistry and nature subjects are combined and therefore only touch the surface, but in Denmark students have to complete 30 study marks in chemistry, in biology, etc. but in Norway it’s only 7 in biology, etc. So it’s built up completely different. After 10th grade, age 16 to 18, then they can choose what they will take for the rest of their lives. For example, students can choose to do health care studies specialization, where they will then take specific subjects like biology and chemistry.

Based on a teacher’s perspective, how important is teaching sustainable development? a) What sorts of topics do teachers tend to focus on? (e.g., environmental sustainability, resource sustainability, etc.)	
Abby	Very important a) Sustainability and climate change
Allison	Very important because we need to get students in the mindset to think about the earth,

	<p>in order to prevent any worsening of climate change.</p> <p>a) indigeneous education, climate action, resource sustainability. (In my practicum I discuss how economics and capitalism plays a role)</p>
Nicole (TC)	<p>Important</p> <p>a) Poverty, climate action, clean energy</p>
Nicole	<p>I think it is extremely important as we need today's youth to not only prevent and reduce the damaging effects of climate change and ecological footprints, but to come up with solutions to repair and prevent further damage. We need students to be aware of the negative impact we are having on the planet.</p> <p>a) I teach geography so I focus on resource sustainability, resource management, climate action and clean energy. We look at issues from a geographic perspective taking into account the social, political, economic and environmental viewpoints of sustainability, from clothing manufacturing, to agriculture, access to clean water, and mining.</p>
Annveig	<p>My personal opinion is that it is very important that the school focus on sustainable development.</p> <p>My experience from school is that the main focus in primary school is environmental sustainability. Gradually as the students get older, the focus expands to also deal with social, climatic and technological sustainability.</p>
Elin	<p>I think it is very important because we know that all these things, the youth will have to take care of and understand, because I think our generation hasn't been that good at taking care of. We live in a country that has an enormous expansion of oil. When the oil came, we didn't have to take care of the environment because we had the money and were over consuming and wasting. We had food, and we threw away things, and spent money like drunken sailors. It was a problem, and now we understand this is wrong. We need to find normality again, and we need to combat the earth again. This oil phenomenon has made us blind.</p> <p>a) A mix/blend of topics here. More on the environment, but more and more about resources and how to take care of what we have in food, clothing, furniture, home.</p>
John	<p>In the curriculum in Norway, sustainability has its own chapter. As a teacher, sustainability is the basics of all that we do. The children of today need to know more about sustainability and [be able] to think ahead for tomorrow, because the next generation needs to have answers or we can't sustain the way of life [we have now] in any parts of the world. So everything that we do [should connect back] to sustainability. I think that the way to enlighten the next generation is to give them the knowledge necessary to keep their curiosity and to keep their eagerness and hunger for knowledge. So, the most important thing I do is inspire others for this knowledge. (Mentioned John Dewey) Knowing isn't something that we can just pass on, but it's something we also need to experience.</p> <p>a) Right now it's recycling and how to preserve nature (e.g., how to have a reusable mindset). But what is missing is society's perspective. In Norway, we don't have a uniform curriculum. [Instead] we have a guide that the department of education changes every 10 years. It's quite frustrating. I think the new one (curriculum) is much better. I've been teaching from the one in 2016 and it was a lot of pouring knowledge into the heads of children instead of discovering [for themselves] like the curriculum now. It's not "here's what we're going to</p>

	<p>teach”, it’s now “here are the things we’re going to teach, you figure out how” (John mentioned how some teachers who’ve been teaching for 50+ years find it difficult to adapt to this new method of teaching). The new curriculum isn’t about the subject itself, but it’s about personal growth [of the students]. The Norwegian have what we call “life handling” (livshåndtering?) to represent this.</p>
Nikolai	<p>I think it is super important, if you don't have it in your mind, you end up destroying something you cannot get back. So it is super important to understand sustainability and have it on your mind when you are going to do big projects, like building roads for example, and everything you do later in life as a community member.</p> <p>a) In Norway, you have “teacher’s right” which is that teachers can do what they want as long as you can fit what you are teaching into the core curriculum. As long as you can connect it to what stands there -because it is super big and doesn't say how you have to work with it- teachers can choose how they want to pursue it.</p> <p>Right now it is super challenging, in subject revision. Everything is changing in Norwegian society for education, like how to attack subjects. So, there are not as many good teaching arrangements out, so you have to find all your resources by yourself right now because it is currently being developed. It is challenging, but when we get where we want to be, it will be okay. The textbooks we use right now do not fit in the curriculum, so currently we do not have good textbooks for the new subjects or strategies on how to attack these new subjects. But, it is coming, it will just take some time of adjustment.</p>

<p>According to the new curriculum [in Norway], ESD is supposed to be interdisciplinary. Could you tell us what the term “interdisciplinary” means to you as a teacher?</p> <p>a) Do you think there should be a bigger presence of teaching sustainable development in schools? Or even in other subjects besides social science and natural science?</p>	
Abby	<p>I think it means related to more than one branch of knowledge</p> <p>a) Yes it should be taught in all subjects</p>
Allison	<p>Interdisciplinary means that a topic should span across many different curriculum subjects (teachables) and many different focuses. It should reach diverse groups of students. Not just science/biology/ecology.</p> <p>a) Yes. There are many ways to incorporate sustainability into different subjects. Short stories, plays, novels can be used for the arts. Climate fiction (film) can be used as a media study. Sustainable use of resources can be studied in history. Creating a fundraiser performance for music students.</p>
Nicole (TC)	<p>Interdisciplinary means that a topic or idea is weaved through multiple subjects.</p> <p>a) Yes I do.</p>
Nicole	<p>Interdisciplinary means that the topic should be taught through all subjects. This is not something that is currently being done when it comes to ESD, especially as it is not even in any mandatory courses. ESD is undoubtedly a topic that should be taught cross-curricular as it is such a vital issue facing humanity today.</p> <p>a) 100% - I think ESD is being taught subtly from a young age - for example elementary students are taught to recycle, or to bring a litter-less lunch to school. Various programs push to be deemed an "Eco School" and there are school level teams and clubs that work toward environmental goals (green team,</p>

	<p>social justice, etc.). However, there definitely needs to be a more direct focus on ESD in social science and natural science based courses, but also through other subjects, such as religion and humanities that focus on social justice issues.</p>
Annveig	<p>My understanding of interdisciplinary is teaching where curriculum goals from several subjects can be worked towards. I believe that it is naturally that mathematics, Norwegian, science and social studies all are parts in interdisciplinary projects. Outdoor school(primary school) and gymnastics can also be included in some projects. I think it is important that the schools have annual ESD projects. But it is equally important that sustainable development has a place in the everyday life in school.</p>
Elin	<p>It is a nice way to learn, and to have this opportunity to see the connection between the subjects. I see that we are finding that the pupils are learning better by making the lessons in more interdisciplinary ways. Some of them like the technical side of the project, some of them like the history and the art, so if we have this mix we reach the students better.</p> <p>a) Yes, I hope so, but i know that it is difficult and there is a long way to go. But I think we are in the change now, and I hope that all these national and international projects surrounding the environment also make the plans for the Norwegian schools, highschool system, and cause the universities to think more about this issue.</p>
John	<p>I look at education and experience-based knowledge like renal fungus (?). Every part of the fungus has a network to other fungus, so everything is interconnected. So, we don't only use mathematics in the subject of mathematics. There's no more borders - and I think that's the new curriculum in Norway. There's not supposed to be any borders between subjects now. [Instead] it's more like themes. For example "life by the seaside": we can use language, science, math, etc. So, we can use all these subjects as learning [tools]. When students are about 10 (5th grade), there's a lot of subject dividing. I think we have the same guideline throughout the country, but it really depends on the teachers. Some teachers are subject-based. We do have a guideline on how many hours we have to do certain subjects like Norwegian. It depends on how we utilize our time with the kids. For me, the experience is important. However, a lot of teachers are more subject-based in order to reach the [minimum subject time requirement]. But at my school, we have a lot more freedom.</p> <p>a) Yeah absolutely. I think we need to have a better understanding of sustainability of our environment and our culture and with how we interact with our environment and the world. For example, traditions. Why do we decide to destroy land to get Christmas trees? In Norwegian nature, we've worked on our land and nature for many years. It's important to find ways [to help nature]. How did [people in the past] live sustainability, why did it work, how did people and nature coexist, why were there no conflicts?</p>
Nikolai	<p>It means having good interaction between teachers -time to sit, plan and interact, and make good plans on how to attack specific subjects. It is all about interacting with different teachers, to have different inputs on how to teach subjects.</p> <p>a) Yes, I think so. I personally want it to be better in teaching resources, that there is complete content that is put together, and teachers have completed lessons and assignments that you can use and have all the things you need to give a good education to the kids. We miss a little bit of that in Norway, but they are building it right now.</p>

	<p>b) Of course. For example in mathematics, it [sustainability] should be there too where you can draw charts to show how it actually works, and when you get higher up in high school, students who chose to take economics should learn about green economics; understanding that economies cannot grow without taking resources.</p> <p>c) Something I am maybe thinking about for the future, I just haven't had the time to think about it yet. We have 5 basic skills in Norway that we have to look at and make sure students can do across all subjects, like math, reading and writing, etc. so that means you can take mathematics into talking about sustainable development, and sustainability into democracy for example</p>
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Climate change is an emerging topic of concern in teaching sustainability. Do you think climate change is being adequately addressed in your school and classrooms?	
Abby	Yes I do
Allison	Somewhat. I only get the science perspective and it is discussed often there.
Nicole (TC)	No, I feel that it could be addressed more.
Nicole	Not at all. I am not overly familiar with the curriculum outside of the course I teach, but to my knowledge it isn't being addressed. I implement it into the Gr. 9 Geography course because I feel it is important for students to learn and be aware. I implement ESD throughout all the units in the course I teach.
Annveig	Yes; in middle school this is a big topic.
Elin	<p>Yes, I think there is good focus on climate change. I think that the teachers are aware of it, and try to connect it to us. And I also think that the parents are also in a way changing, and are also aware of the change in that way. The pupils also get it.</p> <p>J: Do you know how parents are also teaching about climate change and sustainability?</p> <p>I cannot say for sure, this is a small village, it's smaller than a village. We live on an island on the west coast of Norway, so we know the parents. We know that there is a lot of focus on not throwing away food, and there is a lot of focus on the ocean. Of course this plastic problem too, as we have fishermen here and they see this trouble. The pupils have good help from their parents.</p>
John	<p>Climate change is a real thing and it's been in our curriculum. [What was different is] how we taught it because a lot of it has been fear tactics. Instead of having the children take initiative. This fall we couldn't go on our weekly trip so one of the kids suggested going recycling. So we had sorting bins and collected plastic, waste and food. The kids already knew about recycling from primary care. So, we need to focus [more] on it (sustainability/sustainable development). I've taught teenagers why we redesign and we discussed why. I remember 4 years ago every girl in that class wanted to protest, so they agreed and banned certain clothing stores. It was very interesting! But each year there's also an organization for awareness for the teenagers. Last year was a clean water organization for the entire world. This climate change group is now taking on environmental cases and what's going to happen to people in the future. [In essence] there's not enough awareness, but it's there (when it comes to addressing climate change in schools).</p>

Nikolai	It is being addressed very much in the Norwegian school system, but we could probably do more because it's one of the biggest issues of the future. [Climate change] is being addressed in different subjects, like nature science, art crafts, design and redesign -which looks at how to take something broken and turn it into something useful, as a way to take care of the environment and learn how to do it in many different ways.
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Do you think your students are gaining valuable insight on their individual roles within their environment and creating positive sustainable change and action?	
Abby	Yes
Allison	I would say I try to incorporate as much information on student roles in climate action as possible. I always include a mini lesson on environmental activism - discussing the importance of protests, how you can do your part and how money plays a part in climate change (and why does it affect them as individuals)
Nicole (TC)	No, I do not feel that they are. They don't necessarily have the motivation or proper education to make change.
Nicole	I think my students in particular have had the ability to recognize the impact they are having on the environment - they've completed tasks that look at their ecological footprint and then have come up with simple and complex tasks to improve their footprint. They also look at the impact of mining for materials needed to bring a smartphone/technology into their lives. Students also investigate food sustainability as well as access to clean water. Students learn about the commodity chain of bringing their favourite foods to their table and the importance of choosing local. However, my students are exposed to these topics because I find them important and interesting, not because they are dictated by the curriculum.
Annveig	Yes, I sincerely believe so. Young people of today have many great attitudes and are often much more environmentally conscious than those found among many in the adult generations. I am not as optimistic when it comes to their attitudes about poverty reductions. They see the challenges poor countries face, but I doubt they are willing to go down in living standard themselves to achieve a more sustainable and equitable distribution of the earth's resources
Elin	Yeah, I hope so. I hope that they feel that they are a part of it.
John	Thinking about the children I'm working with now, it's hard to answer the question because they're still new to this world. Still very young. But I think most of them know why we pick up our garbage, why we don't hurt animals, why we don't leave trash in the forest, and why it's important to tell someone about what's going on/bring awareness. I can already see that, but there's too little focus on it. They need to know WHY we're doing this and why this is important to them. I've been following Wenche's garbage project. It's not about recycling or garbage picking, it's about expressing what you can find and what you do with it. If in 20 years they can't find garbage and instead use rocks and twigs, THAT'S GREAT!
Nikolai	Yeah, that's one of the big goals. Because one of the big goals of the Norwegian school system is to give students a certain set of principles and values, sustainability is one. It

	teaches students how to make good ethical choices that are in the best interest of the environment. So, it is one of the big goals -how to make a conscious human that is resourceful for it's society.
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If teaching sustainable development needs improvement, in your opinion, what do you think limitations are for you as an educator? What could be done or implemented to overcome these obstacles?	
Abby	More environmental ed field trips
Allison	Teachers outside of science aren't provided with resources to connect their content with sustainability. They don't know where to start. It's also a lot more work to create new lessons for new media rather than sticking with media that they have used for many years. Maybe creating a package for a form of media highlighting sustainability for one subject is a good start.
Nicole (TC)	I think that limitations in resources is a problem in many schools. Students learn about these issues but don't have the resources to actually make a change. By actually giving students bigger more realistic problems that they can actually do, it may change their attitudes about sustainable development.
Nicole	Limitations are the open-endedness of the curriculum. The curriculum is a guide and can be interpreted based on the knowledge and experiences of the teacher. Time is always a limitation for teachers - there is always a push to get through a number of concepts rather than to dig deep into a few. Lack of direction can be a limitation as well - there are so many resources out there, it can be difficult to narrow it down and to come up with meaningful lessons, activities, and assessments.
Annveig	I think it is important that the school management focus on increasing the teacher's knowledge of the topic ESD. And how to teach interdisciplinary about ESD, regardless of which subjects they usually work with.
Elin	I don't know how to answer that, because this is a huge topic. I think that we need to continue where we are now, because I think we're in the middle of a change. Some teachers in my school are also afraid, and we don't want the children to be afraid that we are damaging the earth, so we need to have a normal approach to this. Of course, it's important that the society around us does the right things, and then it will drop on us, but I don't know how to do it even better because I think we need to make small steps. We have children who are afraid and who are scared of damaging their future, so we need to walk with it and not against it.
John	The limits are collective mindsets, the knowledge, and the need. I see people go collect their paycheck but not invest in their workplace every day. I see people who sit 14 hours a day to have the perfect teaching day the next day. Everyone needs a living and if we can have a period of 10 years to make [new] traditions, a culture, and hunger for knowledge about sustainability, not only will we be thinking about my life time but we'd also be thinking about my children's lifetime. For basic education in school, if we could crack the code (of teaching sustainability) within the next 50 years, [the consequences] won't be as bad. But I think it stops with the government [which affects] our knowledge and ignorance. I think there's a lot of factors that go against it, but I think there's a lot of people that could fight against [the negative] changes [we make in

	<p>our world]. Funding is also very important. Norwegian teachers are mad. This is the 4th year without any form of salary raise. We're at the bottom of development in our earnings compared to other occupations in Norway. We're only 40,000 teachers in Norway. How hard could it be? It's not that hard. I think the biggest with secondary schools is that the schools are small. There aren't any schools with thousands of people. (In essence, the schools are small so it should be easy enough to enact change and implement more education for sustainable development and also give more funding to schools and teachers.)</p>
Nikolai	<p>One of the biggest ones is time. When I do not have my class with me, for example when other teachers are with them or they are in a different classroom, there is not enough time to get to speak to them, tell them that maybe next week we are going to work with sustainability. Not having enough time to teach, give good assignments, and also not having enough time for teachers to have the possibility to get together and work together is one of the biggest limitations.</p> <p>There are probably many other limitations, like also about teachers' individual understanding of subjects. These are big questions, so your own lack of knowledge can also be a limitation.</p> <p>I don't know how you could beat the issue of lack of time. It's all about how you can put together teams to work together, and organize this. It is the principal's role to determine how to attack these sorts of problems.</p>

Appendix II. *The same questions were asked to all participants in both Ontario and Norway, collected from either an in-person interview or from an online Google Form survey. For easier analysis and comparison, these tables were organized in such a way that each individual response is under the same question.*