

Chapter 15

The State of Environmental and Sustainability Education in Canada

A Review of Past, Current, and Future Directions

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Introduction

Manoeuvring the ‘many currents [that] stir and animate the waters’ of environmental and sustainability education (ESE) across Canada is a formidable task (Russell et al. 2000, 2003). These currents manifest within formal, non-formal (e.g., zoos, museums), and informal (e.g., media) education (CEGN 2006) and are the result of international trends as well as national and sub-national contexts (Hart and Hart 2014, Hopkins 2013).

This chapter particularly focuses on the state of formal ESE in Canada during the timeframe of the Global Action Programme (GAP) on Education for Sustainable Development (ESD), the UN 2030 Agenda, and the ESD for 2030 framework. The five-year GAP programme was launched in 2015 as a continuation of the UNESCO Decade of Education for Sustainable Development (‘DESD’ or ‘the Decade’)

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(UNESCO 2014). Its overarching goal was ‘to generate and scale up action in all levels and areas of education and learning to accelerate progress towards sustainable development’ (UNESCO 2014, 14). Adopters of the 2030 Agenda committed ‘to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030’ by committing to achieving 17 Sustainable Development Goals (SDGs) (UNDP 2021). The ESD for 2030 framework aimed to scale up ESD action following the Decade and GAP on ESD (United Nations General Assembly resolution 74/223 2020).

This chapter reports results from research in Canada by the Sustainability and Education Policy Network (SEPN), as well as other published reports and studies, to provide a partial overview of the state of formal ESE in Canada. SEPN is an international partnership of researchers and leading policy and educational organizations advancing sustainability in education policy and practice. In 2012, SEPN began the first large-scale research collaboration to collect and analyze comparable data across Canada’s formal education system. Between 2012 and 2020, SEPN conducted a series of comparative research projects including research syntheses, document analyses, a national survey, and site analysis case studies. The research examined sustainability uptake in primary (Grades Pre-K-6) and secondary (Grades 7–12) ministries of education, school divisions, schools, and higher education institutions (HEIs) in Canada. Evidence was collected of sustainability uptake in policy and practice, including relationships between the two. This research also examined how sustainability uptake relates to other policy and practice priorities and explored the development and enactment of sustainability in education policy and practice.¹

The sections that follow provide details on Canada’s unique national and sub-national education system, including in relation to historical considerations. The chapter also provides an overview of how ESE is understood and implemented within primary and secondary education as well as higher education across the country, before considering current trends and future directions.

Political, economic, cultural and social contexts and conditions in Canada

Understanding ESE uptake across Canada necessitates understanding its unique socio-political-cultural-economic context. Education in Canada is constitutionally demarcated to provincial jurisdictions, with minimal national level policy directing formal education (CMEC 2012). Ministries or departments of education (hereafter ministries of education) within Canada’s ten provinces and three territories exercise autonomy over educational policy-making, including curriculum development, student assessment, and financial overview (CMEC 2012). Ministries of education are led by ministers who collaborate through their participation in the Council of Ministers of Education Canada (CMEC), discussing matters of shared concern, including sustainability (CMEC 2010). Separate ministries of education exist

¹ For more information about SEPN, see our website (www.sepn.ca).

for primary and secondary education as well as higher education within some jurisdictions (CMEC 2010).

Across primary, secondary, and higher education levels, there are key differences in how the country's education systems operate in relation to access and governance. Regarding access at the primary and secondary level, public education is free for those of a certain age and residency status (Hopkins 2013). Alternatively, students can attend private schools, which governments may subsidize, but student guardians typically pay for tuition (Statistics Canada 2015). Governance across the 13 jurisdictions in relation to school administration, operations, financial accountability, and curriculum implementation, is overseen by 374 regional school divisions or boards (hereafter school divisions) (McKenzie and Aikens 2021).

At the higher education level, Canada has some of the highest student participation levels globally (Jones 2014). Canada's 220 HEIs are relatively autonomous (e.g., setting admissions standards and degree requirements as well as overseeing financial management) (CMEC 2012). That said, regarding teacher education, ministries of education at the primary and secondary level can mandate that certain pre-service requirements align with ministry curriculum, which can influence higher education programming (CMEC 2012). HEIs in Canada include public and private institutions, vocational colleges, and pre-university colleges (Jones 2014). Traditionally, degree-granting privileges were exclusive to universities, but since the 1990s, this status has been extended to the college sector (Jones 2014).

Education systems in Canada at all levels operate within particular geographic, historical, and cultural contexts (Bieler and McKenzie 2017). At almost 10 million square miles, Canada is the second largest country in the world but has one of the lowest population densities at 3.9 people per square kilometre (Statistics Canada 2017). This geographic reality makes providing quality education for urban, rural, and Indigenous communities challenging (Bentham et al. 2019, Hopkins 2013). Adding to this complexity, the Canadian population is highly concentrated around the United States border, with two out of three people living within 100 miles of its southern neighbor (Statistics Canada 2017). For example, the province of Ontario, located in the southeast, resides at one extreme (population: 14.6 million; HEI students: 889,000), while Canada's three far northern territories (combined population: 125,000; combined HEI students: 4,000) reside at the other (Statistics Canada 2021a, Statistics Canada 2021b).

Canada's cultural and historical origins as a settler-colonial nation is reflected in its diverse population of Indigenous peoples, as well as early European settlers (Gebhard 2017). Due to this history, there are regular tensions over policies in Canada related to bilingual, multicultural, and religious concerns (Patrick 2017). For example, though the Canadian constitution guarantees that citizens can receive education in the official colonial languages of English and/or French (Canadian Charter of Rights and Freedoms 1982), a federal plan does not exist to ensure access to Indigenous language instruction (McIvor and Ball 2019). This reality exists, despite Canadian commitments to ensure Indigenous language education through its signing of the UN Declaration on the Rights of Indigenous Peoples, and Canada's Truth and Reconciliation Commission calls to action (Bentham et al. 2019). Policies protecting

Indigenous language education are needed due to early education attempts to ‘civilize’ Indigenous peoples through residential schooling where they endured forced foreign language acquisition and religious conversion as well as abuse from their caretakers (Jones 2014). The residential schools resulted in ‘successive generations with deep wounds from familial separation, cultural and community displacement, shame and sadness’ (McIvor and Ball 2019, 18). The marginalization of Indigenous education continues, in part, because education is legislated provincially, whereas Indigenous services fall under federal jurisdiction (OECD 2020). Additionally, Indigenous-managed schools within Canada are severely under-funded (Bentham et al. 2019).

Global shifts toward a neoliberal political economy have also affected primary, secondary, and higher education systems in Canada (Fisher et al. 2009, Metcalfe 2010, Schuetze et al. 2011, McKenzie et al. 2015, Virone 2016). At the primary and secondary level, several jurisdictions have enacted neoliberal agendas by ‘fostering private schools (‘increasing choice’), introducing a number of market mechanisms into the public school system, imposing standardized testing, enhancing competition between schools, and allowing private companies to advertise their products in schools’ (Schuetze et al. 2011, 62). Parker (2017) notes neoliberal objectives are achieved through a ‘curriculum of accountability’, wherein measurable targets are set to meet provincial standards. Similar trends exist at the higher education level (Fisher et al. 2009, Metcalfe 2010). HEIs operate in competitive atmospheres wherein research is valued for its profitability (Jeppesen and Nazar 2012), and education is valued for its marketability and capability to train students for a global economy (Olssen and Peters 2005). To up the ante, HEIs are called upon to increase rank and reputation amid dwindling provincial funding (Harden 2017).²

Canada’s political economy is also strongly tied to extractive fossil fuel industries (Erickson and Lazarus 2014), which has resulted in varying levels of commitment to reduce overall greenhouse (GHG) gas emissions. For instance, Canada ratified the 1997 Kyoto protocol in 2002 (under the Liberal party) only to withdraw in 2011 (under the Conservative party) (Burch and Harris 2014, Bieler and McKenzie 2017). Shortly after the Liberal party gained power in 2015, Canada adopted the UN 2030 Agenda for Sustainable Development (Government of Canada 2019) and signed the Paris Agreement (Government of Canada 2020).³

Canadians have paid increasing attention to climate change in recent years due, in part, to the 2018 IPCC report, which warned that just 12 years remained to address climate change, as well as increasing frequency of extreme weather events, the Fridays for Futures climate strikes, and other initiatives. In 2019, education systems in Canada largely responded positively to the school climate strikes, with several school divisions (such as Toronto District School Board, Vancouver School Board) and HEIs (such as the University of British Columbia, and Dawson College) not penalizing student strike attendance (CBC News 2019, The Canadian Press 2019).

² In 1982, government funding covered 82.7% of universities’ operating revenue. That number dropped to 54.9% in 2012 (Harden 2017).

³ Signatories to the Paris Agreement committed to limiting global warming below 2°C (UN 2015).

The lasting impact on education policy and practice in Canada of these school climate strikes, as well as documented (e.g., IPCC) and observed (e.g., natural disasters) evidence of climate change remains to be seen.⁴

Historical background/development of ESE in Canada

ESE history in Canada is an expression of the aforementioned national contexts and international movements. ESE programming in Canada has existed since the 1970s (Hopkins 2013), with environmental education (EE) becoming ‘a definite part of the school experience’ during the mid-1980s (Hart 1996, 57). Provincial specialist associations for EE were also established to serve as resources for schools and educators (e.g., EEP SA 2022). The 1987 publication of the Brundtland report marked the beginning of an international movement towards ESD. Canada participated in this movement, in part, through its involvement in Preparatory Committee meetings in advance of the 1992 Earth Summit (Hopkins 2013). Canada’s involvement with ESD continued through participation at the 1992 Earth Summit meeting in Rio de Janeiro and the resulting work programme, Agenda 21 (Russell et al. 2000, Hopkins 2013), as well as through subsequent UN programmes (e.g., the DESD, GAP programme, UN 2030 Agenda). This involvement was partly fueled by increased interest in EE by educators, politicians, and parents in Canada, which began as early as 1990 due to increased awareness of ‘resource scarcity, environmental deterioration, and failed economic policies’ (Hart 1990, 45).

Implementing the Earth Summit goals was met with several challenges in Canada. The first challenge was related to debates regarding acceptance, adaptation, or rejection of ESD (which continue today⁵) (see Jickling 1992, McKenzie and Aikens 2021, Sauvé et al. 2005). Canadian scholars also considered possibilities and potential implications for the ‘interwoven spheres of culture, environment, and education’ (McKenzie et al. 2009, 1), relationships between outdoor education and EE (McClaren 2009), and ethical and cultural motivations for EE (Bai 2009, Fawcett 2009). A second challenge was related to the aforementioned geographic complexities: ESE leaders were dispersed across 6,400 kilometres without a national ESE organizational structure to foster cohesion and direction (Hopkins 2013).

Some have argued, however, that a lack of national education standards facilitated new and creative approaches (Russell et al. 2000). Despite an overall hands-off approach by the national Canadian government in relation to ESE, some national direction was provided early on through the publication of a national ESE framework (Government of Canada 2002) and a range of work by the Council of

⁴ For more on how primary and secondary education systems in Canada can and are responding to climate change (see Hargis and McKenzie 2020).

⁵ Critiques include that the ESD term is: (1) vague and thus susceptible to manipulation, (2) a logically inconsistent oxymoron, and (3) ill-defined such that it is impossible to determine what an educator is educating ‘for’ (Jickling 1992). There are also misgivings about education aiming ‘for’ sustainable development or any other type of behavior, as opposed to empowering individuals to think for themselves (Jickling 1992).

Ministers of Education, Canada (CMEC) (McKenzie and Aikens 2021). A third challenge to implementing the Earth Summit agenda was its co-occurrence with a global recession (Hopkins 2013). Due to financial cutbacks, formal education leaders tended to focus on core subjects, such as mathematics, which often meant exclusion of ESE (Hopkins 2013), with some exceptions (for example, through integrated environmental studies programs) (Russell et al. 2000, Breunig 2013).

Prior to and during the Decade, ESE work was largely led by passionate champions, non-governmental organizations (NGOs), and school-based programming (Russell et al. 2000, Hart and Hart 2014, Hopkins 2013). For instance, the Canadian Network for Environmental Education and Communication (EECOM) and the *Canadian Journal of Environmental Education* were founded (in 1993 and 1996, respectively) to support formal and non-formal ESE education (EECOM 2019, Russell et al. 2000). National and provincial Green School initiatives also led ESE work through school-based eco-certification programs, such as the national SEEDS Foundation's Learners in Action program, which recognizes school participation in environmental activities, as well as the provincial Destination Conservation program (in Alberta and British Columbia), which emphasizes energy and waste auditing (Russell et al. 2000).

With the launching of the Decade in 2005 came several ESE initiatives at national and sub-national levels, which were not always in alignment. For instance, at the national level, the Government of Canada published its objectives for the UNESCO Decade of ESD in 2005. At the same time, CMEC committed to incorporate 'sustainable development themes into formal, non-formal, and informal education and to report on this implementation' (CMEC 2012, 16). CMEC's commitment to ESD was related to its involvement with the United Nations Economic Commission for Europe (UNECE) (CMEC 2012), as well as the influence of ministerial policy actors (in Manitoba) who held high-level national CMEC positions while active in global UNESCO initiatives (McKenzie and Aikens 2021). Within sub-national contexts, there was also adaptation and rejection of national-level commitments to ESD (Hart and Hart 2014, McKenzie and Aikens 2021). For instance, the Manitoba Eco-Globe programme, an eco-certification programme administered by the Manitoba Ministry of Education, remains largely faithfully to ESD conceptualizations, whereas the Ontario EcoSchool programme has maintained alignment with ministerial and divisional commitments to EE (McKenzie and Aikens 2021). During the decade, Regional Centres of Expertise on ESD also provided some coherence for ESE activity through their focus on 'greening' HEI campuses, teacher education, and community initiatives (Hart and Hart 2014).

Significant changes occurred during and beyond the Decade within primary, secondary, and higher education systems in Canada in relation to how ESE is understood and implemented, some of which are summarized in the next section.

The understanding and implementation of ESE in Canada

This section overviews some of the current aspects of ESE implementation at primary, secondary, and higher education levels in Canada based on SEP's comparative research of ESE in formal education between 2012–2020.

Primary and secondary education

At the primary and secondary level, approximately half the ministries of education and school divisions had sustainability-specific policies (Beveridge et al. 2019). Sustainability conceptualizations within the ministry of education policies fell into three clusters (i.e., EE, ESD, and Indigenous Education), each of which had implications for ESE pedagogy and action (Aikens and McKenzie 2021). Other major findings included: climate change education responses were insufficient to meet Canada's Paris Agreement and SDG commitments (Bieler et al. 2018), a whole institution approach was effective but under-utilized (Beveridge et al. 2019, McKenzie and Chopin 2023b) and having a sustainability education policy made a focus on sustainability practice more likely (McKenzie and Aikens 2021). Details related to these findings are provided in the sections below in relation to policy documents and practices on the ground, where possible.

Around half the ministries of education and school divisions have a sustainability policy

A national census of sustainability-specific policies in Canada within primary and secondary education found that only 7 of 13 (54%) ministries of education, and 219 of 374 (59%) school divisions had a sustainability-related policy (Beveridge et al. 2019). Beveridge and colleagues (2019) developed Sustainability Initiative scores based on the presence of three policy initiatives at the school division level: (1) sustainability-related policies, (2) eco-certification programmes, and (3) sustainability staff. The provinces of Ontario and Nova Scotia received the highest scores (see Figure 1). Relationships between these policy initiatives were also analyzed, finding that participation in an eco-certification programme and the presence of sustainability staff were weakly correlated with having a sustainability policy (Beveridge et al. 2019).

Primary and secondary ESE policy in Canada in relation to national and international contexts

SEPN's policy analysis and site visit research highlighted the significance of UN initiatives in influencing how ESE was framed and understood within some Canadian provinces at the primary and secondary level in ways that reflect Canada's unique national context (Beveridge et al. 2019, McKenzie and Aikens 2021). A systematic literature review of ESE policy research across 71 countries, found a global shift in the language framing sustainability within education policies away from 'environment' and towards 'sustainable development' and 'sustainability' (Aikens et al. 2016). This move aligns with global policy initiatives, such as the Decade, the GAP programme, and the ESD for 2030 framework. Despite the primacy of ESD in international policy arenas, ESD has not mobilized uniformly across Canada. SEPN's census of school division policies found that 'environment' was the dominant language used in policy titles in Canada, with exceptions in Manitoba and Québec, where 'sustainable development' or 'développement durable' were common (Beveridge et al. 2019). Nationally, the CMEC adopted language related to ESD, and ESD working groups

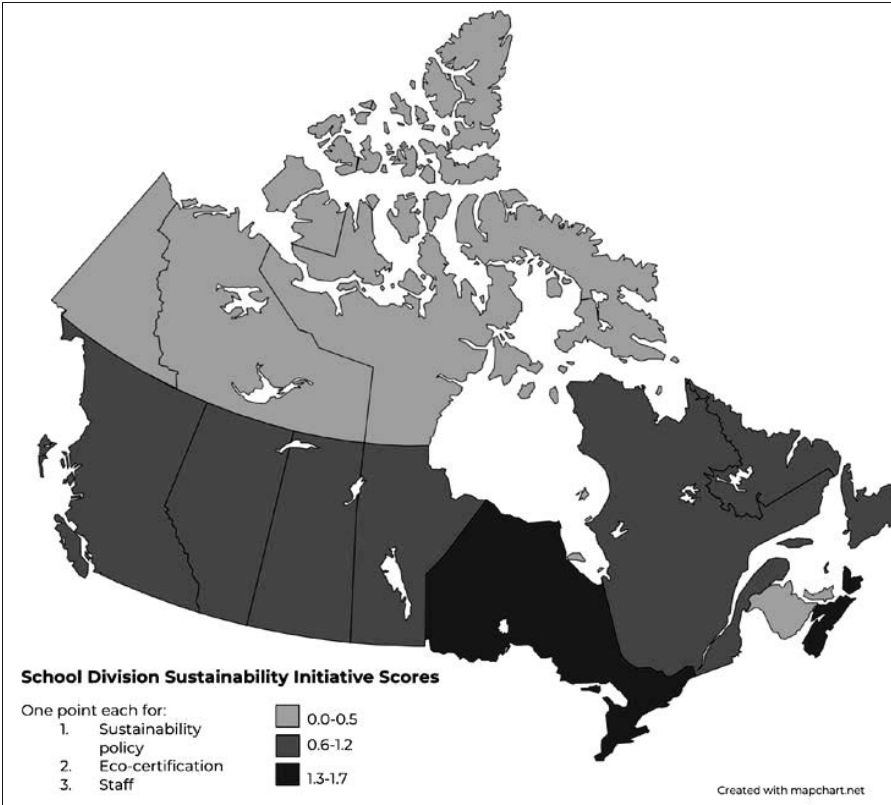


Figure 1. Map of Sustainability Initiative scores across Canadian provinces. Adapted from Beveridge et al. 2019.

were established within the CMEC and across the 13 provinces/territories (CMEC 2012). The language of ESD was particularly taken up within the province of Manitoba (though resistance and adaptation of ESD in some provinces were noted, for example, in British Columbia and Ontario who preferred to use EE) (McKenzie and Aikens 2021).

A content analysis of sustainability-related policy documents from all 13 Canadian provinces and territories found three dominant clusters of ESE understanding in primary and secondary education policy in Canada: Indigenous Education, ESD, and EE (Aikens and McKenzie 2021). Each cluster brought distinct approaches, which shaped the cluster’s orientation, action, and pedagogy (Aikens and McKenzie 2021). For instance, within the Northwest Territories and Nunavut, there was strong alignment between Indigenous knowledge systems and Indigenous education policy, which was likely due to ‘localized, relevant and appropriate policy development’ (Aikens and McKenzie 2021, 69). In Manitoba and Québec, there was strong alignment between global initiatives around ESD, which was likely due to Manitoba’s role in leading Canada’s work in ESD mentioned above (Aikens and McKenzie 2021). Adaptation and rejection of global ESD within policies from

British Columbia and Ontario was also noted, with a focus on EE instead, which was likely due to a longer history of EE in those areas (Aikens and McKenzie 2021). Across all three clusters, an explicit focus on climate change was missing.

Climate change education responses in primary and secondary are insufficient

Within primary and secondary policy documents in Canada, SEPN's research indicated that current climate change approaches lacked sufficient depth to meet Canada's Paris Agreement commitments (McKenzie and Chopin 2023b). A census of sustainability-related policies from all the ministries of education and school divisions found that only 22 (7%) focused on climate change (Beveridge et al. 2019). SEPN also assessed alignment of climate and education policy across all 13 provinces and territories, finding *climate* policies more likely to address climate change education than *education* policies (Bieler et al. 2018). While all 13 provincial climate policies mentioned that education was essential to address climate change, only six included specific targets, which usually focused on operational energy efficiency instead of focusing on actions within other whole institution domains (i.e., governance, curriculum, community outreach, and research) (Bieler et al. 2018).

On the ground, climate change was rarely mentioned when participants were asked open-ended questions about sustainability initiatives at their setting on SEPN's national survey and during site visits (McKenzie and Chopin 2023b). When climate change was mentioned, it was most commonly done so by students and was referenced as a barrier and a driver for sustainability uptake (McKenzie and Chopin 2023b).

A whole institution approach is effective but under-utilized in primary and secondary education

SEPN's analysis of sustainability uptake found that institutions commonly focused on curriculum and operations, with less attention paid to other whole institution domains (governance, community outreach, and research) (Beveridge et al. 2019). The ministries of education usually addressed sustainability in curriculum documents, whereas school divisions usually addressed sustainability in operations-related documents (Beveridge et al. 2019). While all the ministries of education addressed sustainability in some capacity, only five out of 13 had a sustainability-related policy in more than one domain (Beveridge et al. 2019). Of these five, only Manitoba included policy across all five domains, though British Columbia and Ontario also included engagement within several domains (see Figure 2).

SEPN's analysis of policy flows across international, national, and sub-national levels found that policy presence at 'higher' levels made it more likely that policy would exist at 'lower' levels across whole institution domains (McKenzie and Aikens 2021). Within ministries that adopted a whole institution approach (i.e., Manitoba, British Columbia, and Ontario), mutually reinforcing relationships between ministry and school division policy with respect to whole-institution domains were found (McKenzie and Chopin 2023b). Specifically, if sustainability was included in a

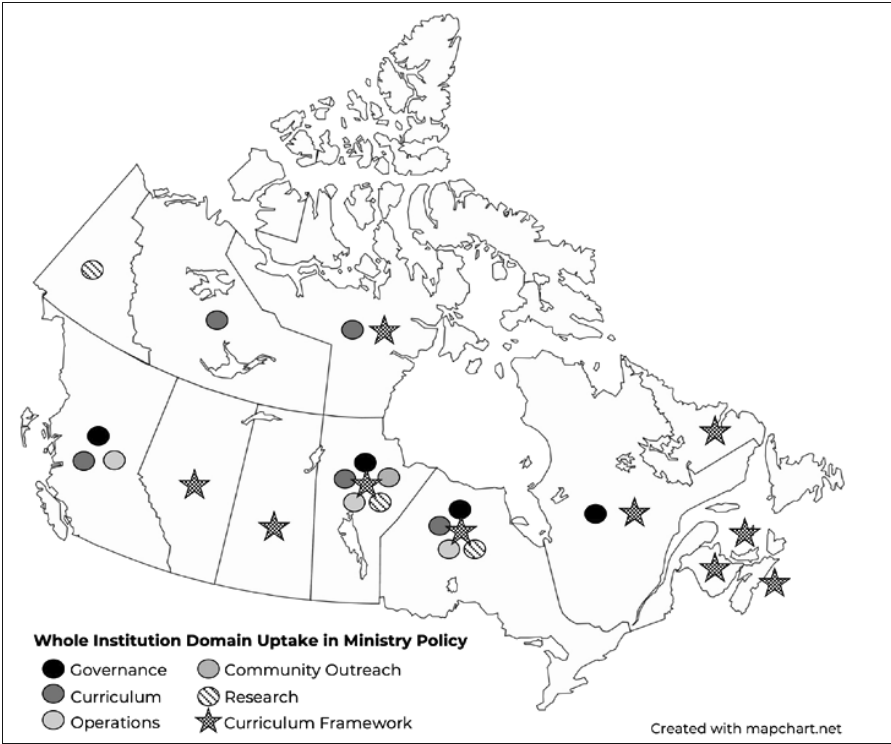


Figure 2. Whole institution domain uptake in ministry of education policy in Canada. Figure created based on data from Beveridge et al. 2019.

particular policy domain at the ministry and school division levels, it was more likely that policy would exist at lower levels (McKenzie and Aikens 2021).

Non-education-related sustainability policy was also found to influence sustainability uptake at the provincial and municipal levels (McKenzie and Aikens 2021). For example, a policy analysis by Beveridge and colleagues (2019) found that provinces with broader government sustainability mandates were more likely to have higher sustainability uptake in education policy (also see McKenzie and Aikens 2021). Site visits also identified cases where broader provincial policy had supportive or reciprocal relationships with policy at the ministry level (McKenzie et al. 2017). Specifically, four of the six provinces visited which had broader environment-specific acts also had higher sustainability policy uptake in their ministry of education and school divisions as indicated by a critical policy analysis (McKenzie et al. 2017).

Whole institution uptake within Indigenous primary and secondary education contexts differed slightly from the findings mentioned above. Within these contexts, there was a strong focus on curriculum and community outreach, with schools viewed by participants as the focal point for community activities (Bentham et al. 2019). Descriptions of sustainability education in these contexts viewed whole institution domains as enmeshed (Bentham et al. 2019). There was a strong focus on language acquisition and cultural revitalization, with participants associating greater

fluency in Indigenous language with higher sustainability engagement in Indigenous communities (Bentham et al. 2019).

High ESE policy presence makes practices more likely in primary and secondary education

Site visits indicated that high policy and high practice contexts tended to co-occur at the primary and secondary levels⁶ (McKenzie and Chopin 2023b). Sustainability Initiative scores were used to categorize site visit school divisions as Sustainability ‘Learners’ (low policy uptake) or ‘Leaders’ (high policy uptake). Participants at Sustainability Leader contexts ranked policy higher than participants at Learner institutions across whole institution domains (see Figure 3). Additionally, participants at Learner (12 of 24) and Leader (12 of 21) institutions felt policy was positively associated with sustainability practice uptake across all domains (McKenzie and Chopin 2023b).

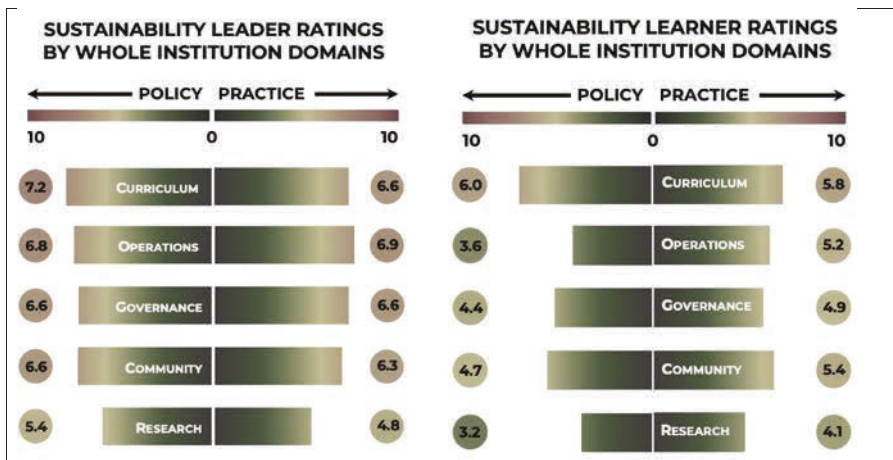


Figure 3. Sustainability Leader and Learner Heat Diagram ratings of sustainability inclusion in policy and practice. Participants rated whole institution domains between 0–10 for policy and practice, higher scores indicate ‘hotter’ domains. Source: McKenzie and Chopin 2023b.

Higher education

Half of the accredited HEIs in Canada were found to have a sustainability policy (Beveridge et al. 2015). Within strategic plans from a representative sample of HEIs, sustainability was most commonly understood and implemented through accommodative (vs. transformative) measures, wherein sustainability is included as one of several policy priorities as opposed to responses that deeply question

⁶ We found one outlier wherein participants indicated two domains were sustainability hotspots despite being in a low sustainability policy context (McKenzie and Chopin 2023b).

the status quo of educational paradigms in relation to sustainability (Bieler and McKenzie 2017). Other major findings include: shallow engagement with climate change (Henderson et al. 2017), unbalanced uptake of a whole institution approach (Vaughter et al. 2016), and policy can drive practice (McKenzie and Chopin 2023a). Additional details are provided below regarding each of these findings in relation to policy and practice.

Half the number of HEIs have a sustainability policy

Beveridge and colleagues (2015) found that 110 out of 220 accredited HEIs in Canada (50%) had a sustainability-related policy (Beveridge et al. 2015). Sustainability Initiative scores were used to analyze whether HEIs had a sustainability-related policy, a sustainability assessment, a sustainability office(r), and/or a sustainability declaration (Beveridge et al. 2015). Only 32 (15%) institutions received a score of four, indicating all four initiatives were present (Beveridge et al. 2015). In contrast, 60 (27%) institutions received a score of zero, indicating they had not undertaken any of the high-level sustainability policy initiatives (Beveridge et al. 2015).

Beveridge and colleagues (2015) also analyzed relationships among the four sustainability initiatives, including in relation to geographic and institutional characteristics, and found strong linkages between three sustainability initiatives: assessment, office(r), and policy. This suggests that the uptake of one might encourage the uptake of others. The existence of sustainability-specific policies in higher education was strongly related to province, with the majority of institutions in Québec (85%) and British Columbia (67%) having policies (Beveridge et al. 2015). In contrast, only 14% of institutions in New Brunswick and 13% in Saskatchewan had policies, and 0% of institutions in the territories had policies (Beveridge et al. 2015).

HEIs primarily understand and implement sustainability in an accommodative manner

Similar to the global terminology trends previously mentioned at the primary and secondary level (Aikens et al. 2016), shifts in the terminology used in higher education policies from ‘environment’ to ‘sustainable development’ and ‘sustainability’ were found (Beveridge et al. 2015). When this terminology was used within higher education strategic plans, it was most commonly done in a shallow way (Bieler and McKenzie 2017).

Bieler and McKenzie (2017) conducted a content analysis of a representative sample of strategic plans from 50 HEIs, including in relation to the five domains of a whole institution approach. The study found that 18% of strategic plans did not discuss sustainability at all, 40% had accommodative responses (addressed sustainability as one of many policy priorities), 16% had reformative responses (institutional priorities were aligned with 3–5 whole institution domains discussed in varying depth), 26% had progressive responses (sustainability addressed in mission, goals, and policy in relation to most whole institution domains), and 0% had transformative responses

(sustainability integrated in a way that supports decarbonization) (see Figure 4). Site visits showed that universities overwhelmingly focused on operational upgrades and other low hanging fruit (for instance, recycling and water bottle refilling stations) as opposed to more transformative, decarbonized approaches, such as, for instance, divestment and social justice (McKenzie and Chopin 2023a).

Transformative sustainability responses require HEIs to re-think existing educational paradigms and re-conceptualize the purpose of higher education to support the transition to decarbonized societies (Bieler and McKenzie 2017). One potential transformative approach is fossil fuel divestment. However, SEPN found widespread resistance to fossil fuel divestment among HEIs, despite increasing pressure from students and faculty (Maina et al. 2020). In 2019, across the 220 accredited universities and colleges in Canada, there were 38 active divestment campaigns, but only six institutions had committed to divesting their financial portfolio to some degree (Maina et al. 2020).

In Canada, transformative sustainability approaches also mean respectfully engaging with Indigenous knowledge to move beyond superficial sustainability integration (Vizina 2018, McKenzie and Wilson 2022). A sample of 10 Indigenous higher education programmes indicated that more work was also needed in this area in relation to policy and practice (Vizina 2018). For instance, participants viewed facilities management at their institutions as also encompassing the type of curriculum offered, and suggested the need for more land-based learning (Vizina 2018).

SEPN found that conducting a sustainability assessment played a significant role in encouraging HEIs to develop more holistic sustainability responses. For example,

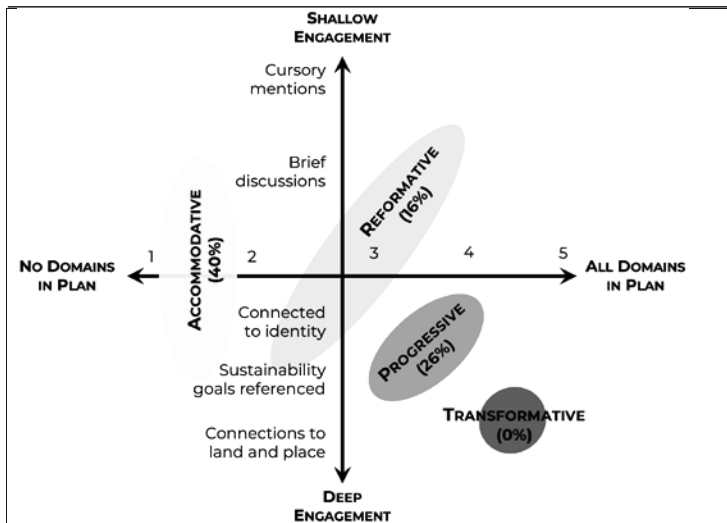


Figure 4. Types of sustainability approaches in higher education strategic plans, ranging from accommodative to transformative responses. Source adapted from Bieler and McKenzie 2017.

an analysis of institutional strategic plans found that institutions rated as STARS⁷ by Association for the Advancement of Sustainability in Higher Education (AASHE) were more likely to have reformative and progressive responses to sustainability in their strategic plans (Bieler and McKenzie 2017). An analysis of AASHE-affiliated institutions also found they were more likely to have sustainability or environmental policies (Lidstone et al. 2015). That is, 67% of ASSHE-affiliated institutions had a sustainability or environmental policy (Lidstone et al. 2015), compared to 50% of the 220 HEIs in Canada (Beveridge et al. 2015). Additionally, SEPN’s analysis of climate-related policy found that over half (63%) of institutions with a climate-focused policy were AASHE members, suggesting that sustainability assessments played a role in supporting climate action in institutions (Henderson et al. 2017). During site visits, it was found that participants rated STARS institutions higher across policy and practice domains relative to those in non-STARS institutions (see Figure 5).

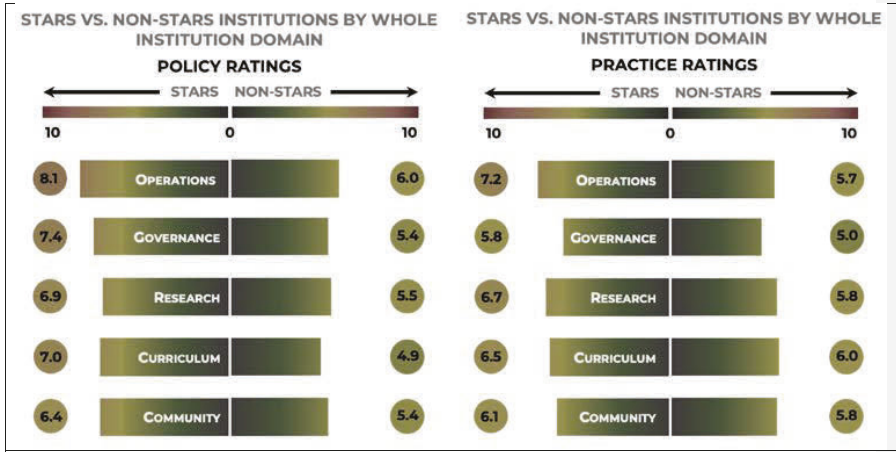


Figure 5. Comparison of Heat Diagram ratings between STARS and non-STARS institutions in relation to sustainability policy and practice uptake across whole institution domains. Source: McKenzie and Chopin 2023a.

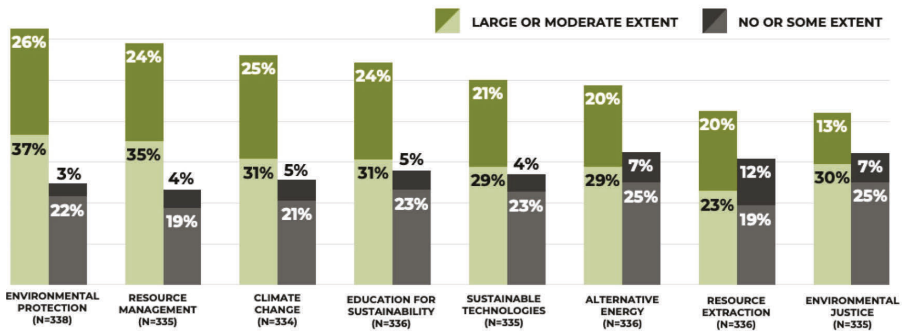
HEIs are lagging in climate action

SEPN found that HEIs can advance climate action more holistically and systematically. A content analysis of climate change-related policies from a representative sample of 50 HEIs in Canada found that only 22 institutions (44%) had climate-specific policies (Henderson et al. 2017). Of those 22, only 11 institutions had official

⁷ AASHE’s STARS program is a self-reporting assessment framework that colleges and universities can use to track their sustainability progress (AASHE n.d.). Institutions report on their activities within the areas of: (1) academics (includes curriculum and research), (2) engagement (includes on and off campus), (3) operations, (4) planning and administration, as well as (5) innovation and leadership (an open-ended category that allows institutions to report on innovative practices not covered in the other domains) (AASHE n.d.).

climate change policies, while the remaining 11 were energy or emissions plans (Henderson et al. 2017). The most common words referenced in the policies were ‘energy’ and ‘building.’ Institutional climate policies were rare, and, when present, disproportionately focused on campus operations (Henderson et al. 2017).

In relation to climate action on the ground, perceptions of institutional engagement were often higher in non-operational domains (McKenzie and Chopin 2023a). For example, fewer than one in five national survey participants indicated they were aware of their institutions tracking institutional carbon footprints or greenhouse gas emissions (McKenzie and Chopin 2023a). SEPN’s national survey also indicated room for improvement regarding institutional prioritization of climate change research. While the participants ranked climate change research third highest of the research topics asked about in the national survey, only 25% of the respondents indicated their institution prioritized climate change research to a large extent (McKenzie and Chopin 2023a). Only 20% of the survey participants indicated that their institutions were prioritizing research related to alternative energy to a large extent, and only 13% of participants indicated that environmental justice was prioritized by their institutions to a large extent (see Figure 6).



*NOTE: 'I DON'T KNOW' RESPONSES NOT INCLUDED IN FIGURE

Figure 6. Prioritization of research topics at HEIs from SEPN survey results. Source: McKenzie and Chopin 2023a.

Unbalanced uptake of a whole institution approach in HEIs

SEPN found that HEIs were consistently engaging more deeply with sustainability in the domains of operations and governance as compared to other sustainability domains, especially in relation to policy (McKenzie and Chopin 2023a). For example, Vaughter and colleagues (2016) analyzed sustainability policies and plans from a representative national sample of 50 HEIs. Of the 40 institutions with a sustainability-related policy and/or plan, all of them referenced operations initiatives and most (32/40) incorporated sustainability into governance (Vaughter et al. 2016). Most policies, however, lacked detail on curriculum, research, and community outreach (Vaughter et al. 2016). An examination of sustainability uptake in relation to Indigenous knowledge in a sample of 10 HEIs also indicated that Indigenous knowledge was not well integrated across sustainability domains (Vizina 2018).

On the other hand, at universities in the northern Canadian provinces, Indigenous knowledge and practice was embedded across the whole institution, leading their campus community to act in more sustainable ways (McKenzie and Chopin 2023a). This integration was facilitated, in part, through practices, such as the integration of Indigenous knowledge in all institutional planning documents, the inclusion of Indigenous content in all courses, and the involvement of a Council of Elders within institutional governance structures (e.g., in Nunavut Arctic College, McKenzie and Wilson 2022).

SEPN also found that many HEIs had an unbalanced whole institution approach on the ground, engaging more with the domains of curriculum and operations depending on institutional size. Site visit participants rated curriculum as the ‘hottest’ practice domain at small institutions on SEPN’s Heat Diagram surveys, whereas participants at large institutions rated operations as the ‘hottest’ practice domain (see Figure 7).

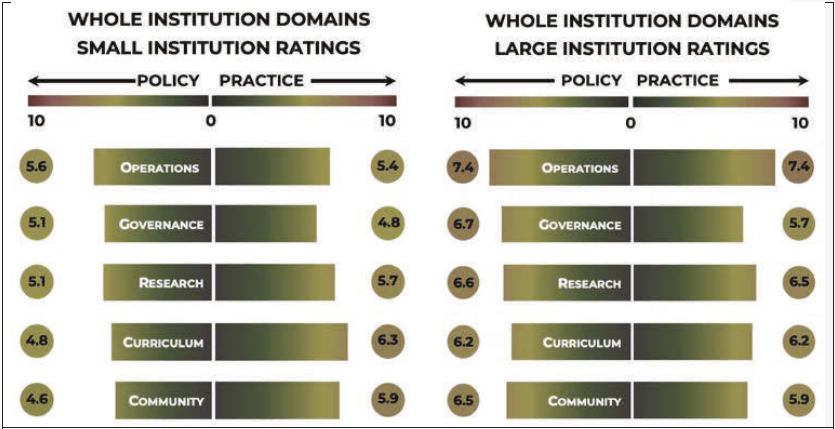


Figure 7. Comparison of sustainability practice and policy Heat Diagram ratings at small and large HEIs. Source: McKenzie and Chopin 2023a.

Policy-practice relationships are supportive, inhibitive, and iterative in HEIs

Participants described policy (or the lack thereof) as both a driver and a barrier to successful sustainability uptake at their institution (McKenzie and Chopin 2023a). During SEPN’s site visits, participants at larger institutions described top-down relationships where sustainability-related policies at their institution drove practice (McKenzie and Chopin 2023a). Participants at these larger institutions often described policy-practice relationships as iterative and mutually supportive, with policy driving practice and vice versa (McKenzie and Chopin 2023a). At one institution, the absence of sustainability-related policy drove the student’s union to take action to develop its own policy (McKenzie and Chopin 2023a). Instances of policy acting as a barrier during site visits were also found; for example, at one institution, supplier contracts blocked attempts to bring local food on campus (McKenzie and Chopin 2023a).

During site visits, municipal, provincial, and federal government policies, as well as cultural policies were found to play important roles in sustainability uptake in some institutions (McKenzie and Chopin 2023a). Several participants mentioned instances of non-education sustainability-related governmental policies trickling down to the institution (McKenzie and Chopin 2023a). An analysis of the drivers of embedding Indigenous knowledge into sustainability education within 10 Indigenous higher education programmes⁸ found that provincial, national, and international policies and declarations supporting Indigenous self-determination were crucial (Vizina 2018). Cultural policies in relation to Indigenous knowledge and worldviews (e.g., oral policies from Elders) were also key to sustainability uptake at HEIs in the northern territories (McKenzie and Wilson 2022).

Emerging trends as well as current and future needs of ESE in Canada

This section discusses several future key priority areas for ESE as well as emerging trends in Canada, including Indigenous engagement and alignment with global metrics such as the SDGs. In relation to future needs, education systems at the primary, secondary, and higher education levels in Canada can do more to meaningfully engage with Indigenous education. A major emerging trend across primary, secondary, and higher education systems is represented through attempts to align with global competencies and goals.

Countries with colonial histories must engage with the settler-colonial contexts in which they are embedded to meaningfully address sustainability (Maina-Okori et al. 2018). In relation to Indigenous education, HEIs in Canada can engage more meaningfully with Indigenous knowledge systems. In some settings, the inclusion of Indigenous knowledge was primarily seen as for Indigenous learners (Vizina 2018). In contexts where Indigenous students, faculty, and staff were in the minority, there was much more resistance to inclusivity, even though broader society and other higher education learners are important to reconciliation efforts (Vizina 2018). On the other hand, participants at Nunavut Arctic College described their policy-practice context as one where policy drove practice, with their comments highlighting how the local Inuit culture guided the development of sustainability-related policies (McKenzie and Wilson 2022).

At the primary and secondary level, Indigenous-managed schools continue to face barriers related to Canada's colonial context (Bentham et al. 2019). An examination of sustainability uptake in Indigenous-managed schools identified severe underfunding, small population sizes, distance from urban centres, lack of community leadership, restricted employment opportunities, and historical contexts all acted as barriers to sustainability uptake (Bentham et al. 2019). Evidence of systemic racism within Indigenous education systems was also found, whereby outside priorities and pedagogies were favoured over locally determined priorities (Bentham et al. 2019). Moreover, several gaps in teacher education programmes

⁸ This included HEIs with an Indigenous focus and HEIs with Indigenous programming.

were described by participants (Bentham et al. 2019). On the other hand, promising practices were found in Nunavut where Indigenous land-based knowledge was central to how sustainability was engaged with in schools (Aikens and McKenzie 2021, McKenzie and Aikens 2021).

At the primary, secondary, and higher education levels in Canada there are efforts to align with global initiatives such as the SDGs. At the primary and secondary level, the Council of Ministers of Education Canada has begun shifting focus away from ESD and towards ‘global competencies’, with sustainability now embedded within one of six, CMEC priorities (CMEC 2016, CMEC 2018). This commitment was illustrated through a recent Pan-Canadian Global Competencies Framework, which was endorsed by all ministers of education (CMEC 2018, UNESCO-IBE 2020).⁹ This shift is, at least in part, driven by broader trends within the Programme for International Student Assessment (PISA) to assess for global citizenship competency (OECD 2018, 4).

At the higher education level, institutions in Canada have particularly taken on commitments to achieve the global SDGs, which is illustrated in international rankings and supported through key publications. In April 2019, the *Times Higher Education* released its inaugural University Impact Ratings, which measures the contribution of HEIs to 11 out of 17 SDGs (Halliday 2019). More than 450 institutions were ranked, with 10 institutions in Canada making the list, most of which were in the top 100, and three of which ranked in the top 10 (THE 2019). These rankings illustrate a general trend to commit to the SDGs within HEIs in Canada. Efforts to move in this direction are also supported by publications, such as the *SDG Toolkit for Canadian Colleges and Institutes* (Colleges and Institutes Canada n.d.).

While the SDGs are notable in that they bring nations together to work towards common goals, they are not without critique. The SDGs come packaged with a number of overlaps and contradictions as well as a long list of targets and indicators, some of which have evaded attempts at measurement (ISC n.d., Swain 2018). The SDGs have also been critiqued for operating within neo-liberal frameworks that prioritise economic growth over achieving justice for all (Struckman 2017). Moreover, the editors of a recent special issue within *Higher Education*, which focused on the uptake of the SDGs within HEIs, noted an alarming focus on the human dimensions of sustainable development within the issue’s submissions, versus also considering environmental aspects, such as climate change (Chankseliani and McCowan 2021). The extent to which the development focus within the SDGs may water down ESE approaches is a question that merits further investigation.

As SEPN conducted its comparative research in Canada, it became clear there is a substantial global need for more and better climate change education across a range of sectors. With only 60% of Canadians believing that climate change is caused mostly by human activities (e.g., Mildemberger et al. 2016), and continuing climate

⁹ SDG 4 (quality education for all) is a key pillar upon which the framework is based (CMEC 2018, UNESCO-IBE 2020). SDG indicator 4.7 focuses on ESD and global citizenship education (United Nations General Assembly resolution 70/1 2015).

change denial, extensive calls for education and action have been made by youth and allies around the world. However, a clear understanding of effective climate change education (its quality), as well as the global benchmarks and targets to support inter-governmental processes to encourage the world's nations to increase climate change education (its quantity) remain missing.

As a result, SEPN began the Monitoring and Evaluating Climate Communication and Education (MECCE) Project in 2020. MECCE is a six-year Partnership Grant largely funded by the Canadian Social Sciences and Humanities Research Council. The MECCE Project involves over 100 leading experts and international agencies, including the IPCC, UNFCCC, UNESCO, and Environment and Climate Change Canada, collaborating to increase the impact of communication and education in addressing the climate crisis.

Conclusion

The findings presented above provide an overview of sustainability-related policies and practices, as well as policy-practice dynamics, in the formal education system in Canada. Approaches to climate change education and whole institution approaches, as engaged within Canada, are also presented. Canada's unique social, political, economic, and historical contexts in relation to global ESE trends are also considered.

In relation to policy presence, it was found that around 50% of the primary and secondary ministries of education and school divisions as well as HEIs have sustainability-specific policies (Beveridge et al. 2015, Beveridge et al. 2019). Across primary, secondary, and higher education levels, shifts away from 'environment' and towards 'sustainable development' and 'sustainability' in policy titles were noted (Beveridge et al. 2015, Aikens et al. 2016). At the primary and secondary level, it was found that conceptualizations of sustainability within ministry of education policies fall into three clusters (i.e., ESD, EE, and Indigenous Education) each of which have implications for ESE pedagogy and action (McKenzie and Aikens 2021). At the higher education level, a lack of transformative approaches within an institution's strategic plans was found (Bieler and McKenzie 2017). Within HEIs, having conducted a sustainability assessment played a significant role in more holistic responses to sustainability (Lidstone et al. 2015, Bieler and McKenzie 2017).

Across primary, secondary, and higher education, sustainability-specific policies rarely focused on climate change. When they did, it was usually in relation to operational energy upgrades (Henderson et al. 2017, Beveridge et al. 2019). At the primary and secondary level, climate policies were more likely to mention the need for climate change education than education policies (Bieler et al. 2018).

The use of a whole institution approach was found to contribute to increases in sustainability uptake but was under-utilized in institutions at primary, secondary, and higher education levels in Canada (Vaughter et al. 2016, Beveridge et al. 2019, McKenzie and Aikens 2021). A whole institution approach in Indigenous contexts differs in that the domains are seen as enmeshed, with schools seen as a focal point for community activities at the primary and secondary level (Bentham et al. 2019). At the higher education level, Indigenous worldviews and practices were seen as embedded across institutions within northern and Indigenous contexts, such as

through institutional governance structures that included a Council of Elders, which oversaw the incorporation of Indigenous knowledge throughout the institution (McKenzie and Chopin 2023a).

In relation to policy-practice relationships at the primary and secondary level, it was found that a high ESE policy presence makes sustainability practices more likely across all levels (McKenzie and Aikens 2021). At the higher education level, evidence of policy-practice relationships that were supportive, inhibitive, and iterative was found (McKenzie and Chopin 2023a). At the primary, secondary, and higher education levels, evidence was found of non-education-related policy influencing sustainability uptake (Vizina 2018, McKenzie and Aikens 2021). At Indigenous HEIs, cultural oral policies and Indigenous knowledge were also key to sustainability uptake (McKenzie and Chopin 2023a).

In relation to future directions, primary, secondary, and higher education continue to deal with challenges associated with Canada's settler-colonial context (Vizina 2018, Bentham et al. 2019). Education systems across all levels in Canada have also signaled a trend to align with global competencies and goals. We are watching these trends with great interest to see what they mean for the future of ESE in Canada and encourage future research in this area.

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References

- Aikens, K., M. McKenzie and P. Vaughter. 2016. Environmental and sustainability policy research: a systematic review of methodological and thematic trends. *Environmental Education Research* 22(3): 333–359.
- Aikens, K. and M. McKenzie. 2021. A comparative analysis of environment and sustainability in policy across subnational education systems. *The Journal of Environmental Education* 52(2): 69–82.
- Association for the Advancement of Sustainability in Higher Education (AASHE). n.d. Getting started with STARS. <https://www.aashe.org/wp-content/uploads/2017/04/Getting-Started-with-STARS.pdf>.
- Bai, H. 2009. Reanimating the universe: Environmental education and philosophical animism. In: McKenzie, M., P. Hart, H. Bai and B. Jickling (eds.). *Fields of Green: Restorying Culture, Environment, and Education*. Hampton Press, New Jersey.

- Bentham, D., A. Wilson, M. McKenzie and L. Bradford. 2019. Sustainability education in First Nations schools: A multi-site study and implications for education policy. *Canadian Journal of Educational Administration and Policy* 191: 22–42.
- Bieler, A. and M. McKenzie. 2017. Strategic planning for sustainability in Canadian higher education, *Sustainability* 9: 161. Doi:10.3390/su9020161.
- Bieler, A., R. Haluza-DeLay, A. Dale and M. McKenzie. 2018. A national overview of climate change education policy: Policy coherence between subnational climate and education policies in Canada (K-12). *Journal of Education for Sustainable Development* 11(2): 63–85. Doi: 10.1177/0973408218754625.
- Beveridge, D., M. McKenzie, P. Vaughter and T. Wright. 2015. Sustainability in Canadian post-secondary institutions: The interrelationships among sustainability initiatives and geographic and institutional characteristics. *International Journal of Sustainability in Higher Education* 16(5): 611–638.
- Beveridge, D., M. McKenzie, K. Aikens and K.M. Strobbe. 2019. A national census of sustainability in K-12 education policy: implications for international monitoring, evaluation, and research. *Canadian Journal of Educational Administration and Policy* 188: 36–52.
- Breunig, M. 2013. Food for thought: An analysis of pro-environmental behaviours and food choices in Ontario environmental studies programmes. *Canadian Journal of Environmental Education* 18: 155–172.
- Burch, S.L. and S.E. Harris. 2014. *Understanding Climate Change: Science, Policy, and Practice*. University of Toronto Press, Toronto.
- Canadian Charter of Rights and Freedoms, s 16, Part 1 of the Constitution Act, 1982, being Schedule B to the Canada Act 1982 (UK), 1982, c 11. Retrieved from <https://laws-lois.justice.gc.ca/eng/Const/page-15.html>.
- CBC News. 2019, September 24. Vancouver School Board will allow students to skip class to attend global climate strikes. Retrieved from <https://www.cbc.ca/news/canada/british-columbia/vsb-climate-strike-vote1.5294962>.
- CEGN. 2006. *Environmental Education in Canada: An Overview for Grant-makers*. CEGN.
- Chankseliani, M. and T. McCowan. 2021. Higher education and the sustainable development goals. *Higher Education* 81: 1–8.
- CMEC. 2010. Report to UNECE and UNESCO on indicators of education for sustainable development: Report for Canada. Council of Ministers of Education, Canada, in collaboration with Environment Canada and The Canadian Commission for UNESCO. CMEC.
- CMEC. 2012. Education for sustainable development in Canadian faculties of education. Council of Ministers of Education, Canada, in collaboration with Manitoba Education, the International Institute for Sustainable Development, and Learning for a Sustainable Future. CMEC.
- CMEC. 2016. Pan-Canadian Systems-level Framework on Global Competencies. Council of Ministers of Education, Canada. CMEC.
- CMEC. 2018. Global Competencies. Retrieved from <https://www.globalcompetencies.cmec.ca/global-competencies>.
- Colleges and Institutes Canada. n.d. SDG toolkit for Canadian colleges and institutes. Retrieved from <https://sdgcicanguide.pressbooks.com/front-matter/introduction/>.
- EEPSA. 2022. History of EEPSA. <https://eepsa.org/history-of-eepsa/>.
- EECOM. 2019. History. Retrieved from <https://eecom.org/about/history/>.
- Erickson, P. and M. Lazarus. 2014. Impact of the Keystone XL Pipeline on global oil markets and greenhouse gas emissions. *Nature Climate Change* 4(9): 778–780.
- Fawcett, L. 2009. Feral sociality and (un)natural histories: On nomadic ethics and embodied learning. *In*: McKenzie, M., P. Hart, H. Bai and B. Jickling (eds.). *Fields of Green: Restorying Culture, Environment, and Education*. Hampton Press, New Jersey.
- Fisher, D., K. Rubenson, G. Jones and T. Shanahan. 2009. The political economy of post-secondary education: a comparison of British Columbia, Ontario and Québec. *Higher Education* 57: 549–566.
- Gebhard, A. 2017. Reconciliation or racialization? Contemporary discourses about residential schools in the Canadian prairies. *Canadian Journal of Education* 40(1): 1–30.
- Government of Canada. 2002. A framework for environmental learning and sustainability in Canada. Retrieved from <http://publications.gc.ca/collections/Collection/En40-664-2002E.pdf>.

- Government of Canada. 2019, July 15. Canada takes action on the 2030 Agenda for Sustainable Development. Retrieved from <https://www.canada.ca/en/employment-social-development/programs/agenda-2030.html>.
- Government of Canada. 2020, April 27. United Nations Framework Convention on Climate Change and the Paris Agreement. Retrieved from <https://www.canada.ca/en/environment-climate-change/corporate/international-affairs/partnerships-organizations/united-nations-framework-climate-change.html>.
- Halliday, M. 2019, April 29. Canadian universities score big in new sustainable development rankings. University Affairs. Retrieved from <https://www.universityaffairs.ca/news/news-article/canadian-universities-score-big-in-new-sustainable-development-rankings/>.
- Harden, J. 2017. The case for renewal in post-secondary education. Canadian Centre for Policy Alternatives. Retrieved from <https://www.policyalternatives.ca/publications/reports/case-renewal-post-secondary-education>.
- Hargis, K. and M. McKenzie 2020. Responding to Climate Change Education: A Primer for K-12 Education. The Sustainability and Education Policy Network, Saskatoon, Canada.
- Hart, P. 1990. Environmental education in Canada: Contemporary issues & future possibilities. *Australian Journal of Environmental Education* 6: 45–65.
- Hart, P. 1996. Problematizing enquiry in environmental education: Issues of method in a study of teacher thinking and practice. *Canadian Journal of Environmental Education* 1: 56–88.
- Hart, P. and C. Hart. 2014. It's not that simple anymore: Engaging the politics of culture and identity within environmental education/education for sustainable development (EE/ESD). *In: Lee, J.C. and R. Efid* (eds.). *School for Sustainable Development Across the Pacific*. Springer, Heidelberg.
- Henderson, J., A. Bieler and M. McKenzie. 2017. Climate change and Canada's higher education system: An institutional policy analysis. *Canadian Journal of Higher Education* 47(1): 1–26.
- Hopkins, C. 2013. Education for sustainable development in formal education in Canada. pp. 23–36. *In: McKeown, R. and V. Nolet* (eds.). *Schooling for Sustainable Development in Canada and the United States*. Springer, London.
- International Science Council (ISC). n.d. A guide to SDG interactions: From science to implementation: Executive summary. Retrieved from <https://council.science/wp-content/uploads/2017/05/SDGs-interactions-executive-summary.pdf>.
- IPCC. 2018. Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor and T. Waterfield (eds.)]. *In Press*.
- Jeppesen, S. and H. Nazar. 2012. Beyond academic freedom: Canadian neoliberal universities in the global context. *Topia*. 28: 87–113.
- Jickling, B. 1992. Why I don't want my children to be educated for sustainable development. *Journal of Environmental Education* 23(4): 5–8.
- Jones, G.A. 2014. An introduction to higher education in Canada. pp. 1–38. *In: Joshi, K.M. and S. Paivandi* (eds.). *Higher Education Across Nations* (vol. 1). B.R. Publishing, Delhi.
- Lidstone, L., T. Wright and K. Sherren. 2015. An analysis of Canadian STARS-rated higher education sustainability policies. *Environment, Development, Sustainability* 17(2): 259–278.
- Maina, N.M., J. Murray and M. McKenzie. 2020. Climate change and the fossil fuel divestment movement in Canadian higher education: The mobilities of actions, actors, and tactics. *Journal of Cleaner Production* 253: 1–10.
- Maina-Okori, N.M., J.R. Koushik and A. Wilson. 2018. Reimagining intersectionality in environmental and sustainability education: A critical literature review. *The Journal of Environmental Education* 49(4): 286–296.
- McClaren, M. 2009. The place of the city in environmental education. *In: McKenzie, M., P. Hart, H. Bai and B. Jickling* (eds.). *Fields of Green: Restorying Culture, Environment, and Education*. Hampton Press, New Jersey.

- McIvor, O. and J. Ball. 2019. Language-in-education policies and Indigenous language revitalization efforts in Canada: considerations for non-dominant language education in the global south. *Fire: Forum for International Research in Education* 5(3): 12–28.
- McKenzie, M., A. Bieler and R. McNeil. 2015. Education policy mobility: Reimagining sustainability in neoliberal times. *Environmental Education Research* 21: 319–337.
- McKenzie, M., K. Aikens and N.S. Chopin. 2017. *Scale Matters in Policy Flows: A Comparative Case Study of Sustainability in K-12 Education*. Sustainability and Education Policy Network, University of Saskatchewan, Saskatoon, Canada.
- McKenzie, M. and K. Aikens. 2021. Global education policy mobilities and subnational policy practice. *Globalisation, Societies and Education* 1–15. Doi: 10.1080/14767724.2020.1821612.
- McKenzie, M. and N. Chopin. 2023a. Sustainability in the Canadian post-secondary education system. Sustainability and Education Policy Network, University of Saskatchewan, Saskatoon, Canada (in press).
- McKenzie, M. and N. Chopin. 2023b. Tracking sustainability in K-12 education: A national comparative study. Sustainability and Education Policy Network, University of Saskatchewan, Saskatoon, Canada (in press).
- McKenzie, M., P. Hart, H. Bai and B. Jickling (eds.). 2009. *Fields of Green: Restorying Culture, Environment, and Education*. Hampton Press, New Jersey.
- McKenzie, M. and A. Wilson. 2022. Sustainability as wild policy: Mobile SDG interventions and land-informed policy in education. *Discourse: Studies in the Cultural Politics of Education* 1–16.
- Metcalf, A.S. 2010. Revisiting academic capitalism in Canada: No longer the exception. *Journal of Higher Education* 81: 489–514.
- Mildenberger, M., P.D. Howe, E. Lachapelle, L.C. Stokes, J.R. Marlon and T. Gravelle. 2016. The distribution of climate change public opinion in Canada. Retrieved from <https://ssrn.com/abstract=2732935>.
- OECD. 2018. *Preparing our youth for an inclusive and sustainable world: The OECD PISA global competence framework*. OECD.
- OECD. 2020. *Linking Indigenous communities with regional development in Canada*, OECD Rural Policy Reviews, OECD Publishing, Paris, <https://doi.org/10.1787/fa0f60c6-en>.
- Olssen, M. and M.A. Peters. 2005. Neoliberalism, higher education and the knowledge economy: From the free market to knowledge capitalism. *Journal of Education Policy* 20: 313–345.
- Parker, L. 2017. Creating a crisis: Selling neoliberal policy through the rebranding of education. *Canadian Journal of Educational Administration and Policy* 183: 44–60.
- Patrick, D. 2017. Language policy and education in Canada. pp. 401–441. *In*: May, S. and N.H. Hornberger (eds.). *Language Policy and Political Issues in Education: Encyclopedia of Language and Education* (Vol. 1). Springer, Cham, Switzerland.
- Russell, C.L., A.C. Bell and L. Fawcett. 2000. Navigating the waters of Canadian environmental education. pp. 196–216. *In*: Goldstein, T. and D. Selby (eds.). *Weaving Connections: Education for Peace, Social and Environmental Justice*. Sumach Press, Toronto.
- Sauvé, L., R. Brunelle and T. Berryman. 2005. Influence of the globalized and globalizing sustainable development framework on national policies related to environmental education. *Policy Futures in Education* 3(3): 271–283.
- Schuetze, H.G., L. Kuehn, A. Davidson-Harden, D. Schugurensky and N. Weber. 2011. Globalization, neoliberalism and schools: The Canadian story. pp. 62–84. *In*: Olmos, L., C.A. Torres and R.V. Heetun (eds.). *Educating the Global Citizen in the Shadow of Neoliberalism: Thirty Years of Educational Reform in North America*. Bentham eBooks.
- Statistics Canada. 2015, November 27. Academic outcomes of public and private high school students: What lies behind the differences? Retrieved from <https://www150.statcan.gc.ca/n1/pub/11f0019m/11f0019m2015367-eng.htm>.
- Statistics Canada. 2017, March 30. Population size and growth in Canada: Key results from the 2016 Census. Retrieved from <https://www150.statcan.gc.ca/n1/daily-quotidien/170208/dq170208a-eng.htm>.
- Statistics Canada. 2021a, February 1. Table 17-10-0009-01. Population estimates, quarterly. <https://doi.org/10.25318/1710000901-eng>.

- Statistics Canada. 2021b, February 1. Table 37-10-0011-01. Post-secondary enrolments, by field of study, registration status, program type, credential type and gender. <https://doi.org/10.25318/3710001101-eng>.
- Struckmann, C. 2017. A Post-colonial Feminist Critique of the 2030 Agenda for Sustainable Development: A South African Application (Master's thesis, Stellenbosch University).
- Swain, R.B. 2018. A critical analysis of the Sustainable Development Goals. pp. 341–356. *In*: Filho, W.L. (ed.). *Handbook of Sustainability Science and Research*. Springer International Publishing, Cham, Switzerland.
- The Canadian Press. 2019, September 18. Some Canadian schools, colleges move to accommodate climate strikes. Retrieved from <https://www.cbc.ca/news/canada/toronto/schools-climate-rally-1.5288179>.
- Times Higher Education (THE). 2019. Impact Ratings 2019. Retrieved from https://www.timeshighereducation.com/rankings/impact/2019/overall#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/undefined.
- UN. 2015. Paris Agreement. Retrieved from https://unfccc.int/sites/default/files/english_paris_agreement.pdf.
- UNDP. 2021. What are the Sustainable Development Goals? Retrieved from [https://www.undp.org/content/undp/en/home/sustainable-development-goals.html#:~:text=The%20Sustainable%20Development%20Goals%20\(SDGs,peace%20and%20prosperity%20by%202030](https://www.undp.org/content/undp/en/home/sustainable-development-goals.html#:~:text=The%20Sustainable%20Development%20Goals%20(SDGs,peace%20and%20prosperity%20by%202030).
- UNESCO. 2014. UNESCO roadmap for implementing the Global Action Programme on Education for Sustainable Development. UNESCO.
- UNESCO-IBE. 2020, February 27. Canada establishes a pan-Canadian global competencies framework for education. Retrieved from <http://www.ibe.unesco.org/en/news/canada-establishes-pan-canadian-global-competencies-framework-education>.
- United Nations General Assembly resolution 70/1. 21 October 2015. Transforming Our World: The 2030 Agenda for Sustainable Development, A/RES/70/1.
- United Nations General Assembly resolution 74/223. 24 January 2020. Sustainable development: Education for sustainable development, A/RES/74/223.
- Vaughter, P., M. McKenzie, L. Lidstone and T. Wright. 2016. Campus sustainability governance in Canada: A content analysis of post-secondary institutions' sustainability policies. *International Journal of Sustainability in Higher Education* 17(1): 16–39.
- Virone, R. 2016. Neoliberalism and the current educational climate: The effect on school culture and at-risk students. Master's thesis, Concordia University. Retrieved from <https://spectrum.library.concordia.ca/981017/>.
- Vizina, Y.N. 2018. Indigenous Knowledge and Sustainability in Post-secondary Education (Doctoral dissertation, University of Saskatchewan).
- Zhao, Y. 2020. Two decades of havoc: A synthesis of criticism against PISA. *Journal of Educational Change* 21: 2450266.