CHAPTER 3

A Whole Institution Approach to Climate Change Education

Preparing School Systems to Be Climate Proactive

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Abstract

Few studies have investigated a "whole institution" approach in relation to climate change education (CCE), despite its importance in achieving a culture of sustainability and climate action. Responding to this imperative, UNESCO launched a "Getting Climate-Ready" pilot project across 25 countries through their Associated Schools Project Network (ASPnet). This pilot project integrated climate action into the domains of teaching and learning, facilities and operations, community partnerships, and school governance. In Canada, 10 primary and secondary schools participated under the direction of the Canadian Commission for UNESCO. The Sustainability and Education Policy Network (SEPN) evaluated CCE engagement in these 10 pilot schools as well as in 17 non-pilot ASPnet schools across Canada. This chapter documents the promising climate action practices identified through this evaluation. Insights for increased climate action at school, school division, and ministry of education levels are also included from a recently developed CCE primer. The chapter provides entry points for transforming education systems through a cross-site comparative analysis of a whole institution approach to CCE across Canada.

Keywords

climate change education – whole institution – comparative case-study – whole school approach

1 Introduction

At the time of writing, the world is facing a pandemic that has infected millions of people and claimed more than a million lives (WHO, 2020). Connected to this global health crisis is a climate catastrophe the likes of which

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is comparable to that of the dinosaur extinction (Glikson, 2016). As the climate warms, the potential for future virus outbreaks also increases (Costello et al., 2009; Watts et al., 2018; WHO, n.d.), with some arguing we are entering a "pandemic era" due in part to human-caused climatic alterations (Jandu, 2020; Morens & Fauci, 2020). Addressing climate change is essential not only to reduce the likelihood of future health disasters, but also for the survival of humanity, and time is of the essence (IPCC, 2018).

In October 2018, the Intergovernmental Panel on Climate Change (IPCC) released a landmark *Special Report on Climate Change*, warning that 12 years remained to prevent climate catastrophe. Their unprecedented message beseeched nations to increase climate change education (CCE) to "accelerate the wide scale behaviour changes consistent with adapting to and limiting global warming" (IPCC, 2018, p. 22). The IPCC's imperative joins international calls for CCE, dating back to 1992, when the United Nations Framework Convention on Climate Change (UNFCCC) ratified Article 6, encouraging governments to educate all stakeholders on climate change. More recently, the importance of CCE was acknowledged in Article 12 of the Paris Agreement (UNFCCC, 2015) and in the UNFCCC launching of the Action for Climate Empowerment guidelines in collaboration with UNESCO (UNESCO & UNFCCC, 2016). Calls for CCE were further strengthened when the United Nations developed the 2030 Agenda for Sustainable Development in 2015, which includes 17 Sustainable Development Goals (SDGs) for achieving sustainability and tackling climate change. Goal 13, in particular, encourages nations to "improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning" (SDSN, 2015). Goal 4 (inclusive and quality education for all) also encompasses CCE through Indicator 4.7, which specifies that all learners should acquire the knowledge and skills needed to promote sustainable development by 2030 (SDSN, 2015).

Without doubt, educational potential exists to engender the large-scale transformation required to address sustainable development and climate change, a fact long recognized by UNESCO. Indeed, in 1953 UNESCO established what would later become known as the Associated Schools Project Network (ASPnet) to link educational institutions around a common goal: promoting quality education in pursuit of peace and sustainable development (UNESCO, 2018). Currently more than 11,000 schools in 182 countries have joined ASPnet (UNESCO, 2018). Schools usually join ASPnet to have the chance to join a global initiative and to receive the legitimation offered through association with UNESCO (Shultz & Guimares-Iosif, 2012; Shultz et al., 2009). ASPnet is recognized by UNESCO as an effective mechanism for contributing to SDG 4 to achieve Target 4.7 on Global Citizenship Education (GCED) and Education for Sustainable Development (ESD), as well as Target 13.3 on climate action.

In 2016, UNESCO launched the Getting Climate-Ready pilot project within their ASPnet schools across 25 countries to help them engage in climate actions to limit climate change and adapt to its effects. Worldwide, the project reached approximately 200,000 students and 12,000 teachers (UNESCO, 2016). Within Canada, 10 primary and secondary schools participated under the direction of the Canadian Commission for UNESCO. The aim of the project was for schools to implement a "whole institution" approach to CCE. A whole institution approach seeks to develop a school culture of sustainability, in which all aspects of school life support and advance climate action (Henderson & Tilbury, 2004; UNESCO, 2016).

As part of the pilot project, UNESCO widely distributed the Getting Climate-Ready guide as well as a list of climate change teaching and learning resources (UNESCO, 2016). The Getting Climate-Ready guide provides a step-by-step framework to help schools become more climate friendly (UNESCO, 2016). Its development was informed by scholarly literature, national and international guidelines, and program websites, as well as a survey of climate action projects already happening in 55 ASPnet schools in 12 countries (UNESCO, 2016). Pilot ASPnet schools were provided with in-person training. Non-pilot ASPnet schools were sent a link to the Getting Climate-Ready guide through the ASPnet newsletter but did not receive in-person training. In 2016, to aid project completion UNESCO also launched the ASPnet online tool (OTA), a new participatory hub on the whole institution approach to ESD.

The Sustainability and Education Policy Network (SEPN) evaluated the project's success in pilot and non-pilot schools across Canada. SEPN collected information from 10 Canadian ASPnet schools that participated in the Getting Climate-Ready pilot project, as well as data from an additional 17 Canadian ASPnet schools not participating in the pilot. The evaluation goal was to identify good practices of climate action in Canadian UNESCO ASPnet schools, using a whole institution approach as a lens. The evaluation resulted in data-driven (Chopin et al., 2018) and story-based (Hargis et al., 2018) reports, which provide the basis for the contributions in this chapter.

SEPN used the Getting Climate-Ready guide to identify variables related to a whole institution approach, as well as the scholarly literature on "good" CCE to evaluate the success of the project in the pilot and non-pilot ASPnet schools. The scholarly literature upon which SEPN drew is reviewed in the next section.

2 What Is "Good" Climate Change Education?

While the field of CCE is still emerging, research suggests that "good" CCE should involve all areas of institutional activity (Bieler et al., 2018; Henderson &

Tilbury, 2004; UNESCO, 2016). A "whole institution" or "whole school" approach to climate change involves engagement within and across the areas of school governance, teaching and learning, facilities and operations, and community partnerships (Bieler et al., 2018; UNESCO, 2016; see Figure 3.1).[1]

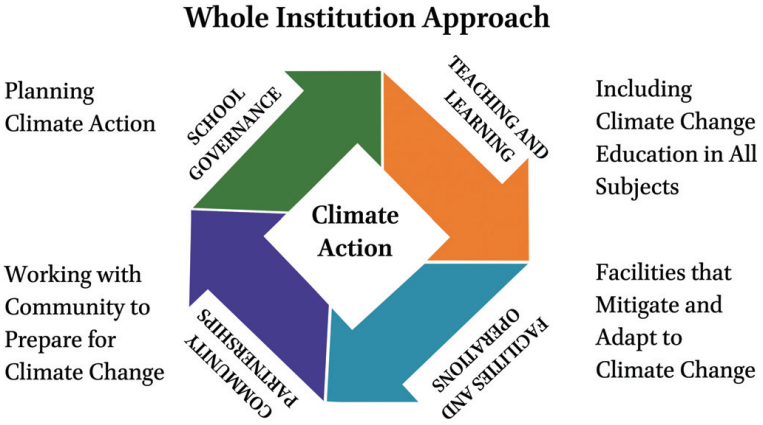

FIGURE 3.1 Overview of a whole institution approach to CCE (Chopin et al., 2018)

A whole institution approach pivots focus from *individuals* to school communities working toward climate actions *together*. Indeed, "The key to successfully implementing the whole school approach is to involve students, teachers, principals, school staff at all levels, and the wider school community – such as families and community members – in reflecting and acting on climate change" (CCUNESCO, 2020, p. 26). The active involvement of all educational stakeholders, both inside and outside the school, is a crucial component of this approach (UNESCO, 2016). Some key climate actions recommended in a whole institution approach and by the Getting Climate-Ready guide are summarized in Figure 3.2 (UNESCO, 2016; also see Hargis & McKenzie, 2020). While listed separately in Figure 3.2, in practice, the domains often interact with one another, with climate action initiatives often linked to more than one domain.

While all domains of institutional activity are important when using a whole institution approach, schools are often most explicitly focused on the area of teaching and learning. Most CCE to date within this whole-school area has focused on learning facts about climate change, assuming that increased scientific literacy will lead to changed beliefs and behaviors (Brownlee et al., 2013; González-Gaudiano & Meira-Cartea, 2010; UNESCO, 2019a; Wibeck, 2014). Evidence suggests, however, that higher levels of scientific knowledge do not automatically change minds or mobilize feet, and that even belief in climate change only moderately affects actions (Callison, 2014; CRED, 2009; Hornsey et al., 2016; Kahan et al., 2012; Lee et al., 2015).

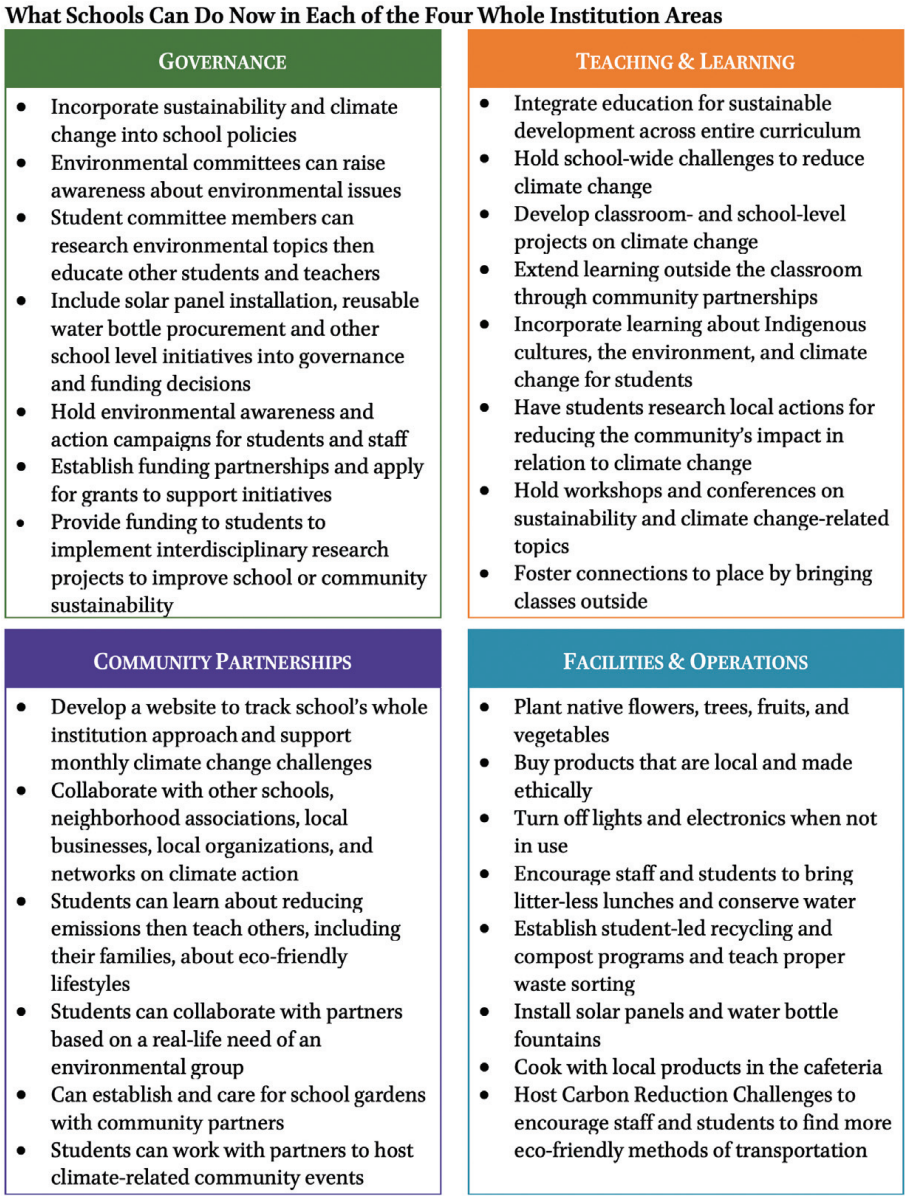

FIGURE 3.2 Examples of climate action in each whole institution domain identified from the Getting Climate-Ready guide (UNESCO, 2016) and SEPN's evaluation (Chopin et al., 2018; Hargis et al., 2018; Hargis & McKenzie, 2020)

The research suggests that "good" CCE should focus on the cognitive, socio-emotional, and behavioral ("action") dimensions of learning and should also be oriented toward the social justice concerns of climate change (González-Gaudiano & Meira-Cartea, 2010; UNESCO, 2015, 2019b; also see Figure 3.3). The cognitive domain emphasizes acquiring accurate information that fosters critical thinking and media literacy skills (UNESCO, 2015). The focus on criticality is essential because of media trends suggesting there are two "sides" to

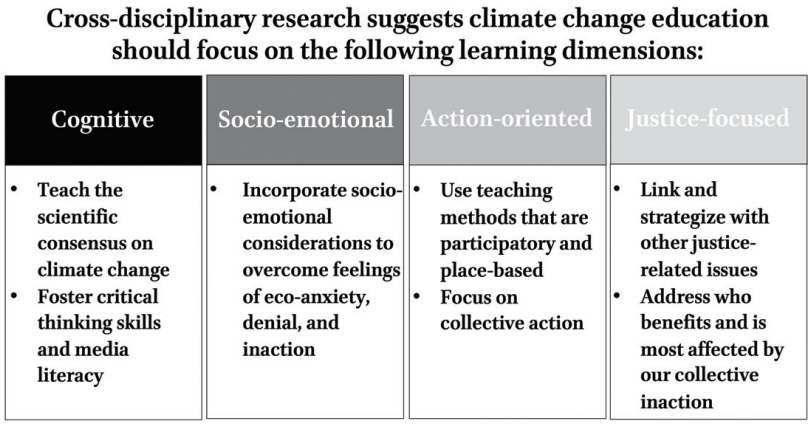

FIGURE 3.3 Key elements of "good" CCE, which include cognitive, socio-emotional, behavioral ("action"), and justice-oriented components (from Hargis & McKenzie, 2020). (The literature that informed the creation of this figure is: Amel et al., 2017; Brownlee et al., 2013; CRED, 2009; Hornsey et al., 2016; Kahan et al., 2012; Monroe et al., 2017; Plutzer et al., 2016; Tuck & McKenzie, 2015; UNESCO, 2010, 2020; Wibeck, 2014)

climate science, which can contribute to student confusion at best and mistrust of science at worst (Doherty & Clayton, 2011; González-Gaudiano & Meira-Cartea, 2010). Educational approaches such as critical media literacy can teach students how to sort fact from fiction (UNESCO, n.d.). Additionally, misinformation in the classroom could further confuse students. Recent research analyzing Canadian science curricula and textbooks found they focused on human-caused warming as a debate, not on the scientific consensus, with one province (Manitoba) recommending reading materials from the climate denier organization Friends of Science within its supplementary curriculum materials (Wynes & Nicholas, 2019). To prevent climate confusion, CCE must include accurate information and encourage critical thought (Plutzer et al., 2016).

As students' knowledge about climate change grows, they may develop eco-anxiety, illustrating the importance of including socio-emotional components within CCE (Doherty & Clayton, 2011; Norgaard, 2011; Randall, 2009; see Figure 3.3). While small doses of concern can spur action, feeling anxious can result in passivity and hopelessness (Clayton et al., 2017). In light of growing reports of youth experiencing eco-anxiety (Elks, 2019; Johnson, 2007; Lawrynuik, 2019), educational approaches must bolster students' agency and empower them to feel that they, and society, can and are taking meaningful climate action (Threadgold, 2012; UNESCO, 2010).

Socio-emotional components of CCE also include cultural and political considerations (Callison, 2014). Indeed, evidence suggests that the greatest predictors of climate belief and action are cultural and political affiliation (Callison, 2014). A recent study found, for instance, that teachers' political views, as

opposed to their content knowledge, more accurately predicted how CCE was taught (Plutzer et al., 2016). The importance of considering political and cultural associations is also illustrated in a range of interdisciplinary work emphasizing the role of language and framing in making climate change matter in relation to the priorities of different communities to overcome prior doubt and inaction (Kahan et al., 2012; Lee et al., 2015; Rowling, 2019).

Related to political considerations are those of climate justice, as those who suffer the worst consequences of climate change have often contributed the least to creating the problem (United Nations, 2019; Kanbur, 2015). Climate justice also intersects with other social and ecological justice issues, such as colonization, racism, sexism, classism, ableism, and xenophobia (Godfrey, 2012; Godfrey & Torres, 2016). Failure to address underlying and systemic issues not only "maintains, and even strengthens the status quo … [but it also] keeps us in an endless cycle of ineffective band-aids while domination, extraction, and oppression persist" (Godfrey & Torres, 2016, p. xxv).

As students engage with climate justice and climate change, there is also growing urgency for educators to aid students in overcoming feelings of climate confusion, pessimism, and hopelessness through action (Li & Monroe, 2017; Ojala, 2017; Stevenson & Peterson, 2016; see Figure 3.3). Action-oriented responses are crucial, as students may disengage with climate change issues if they are perceived as unsolvable (Amel et al., 2017; Monroe et al., 2017; Rowling, 2019). For example, schools and school boards can establish policies preventing penalization of student participation in the Global Climate Strikes (see CBC, 2019b). In addition, social learning and place-based pedagogies are critical in moving beyond climate and environmental awareness to empowerment and action (CRED, 2009). Inclusion of local problems *and* solutions demonstrates that climate change issues are local and actionable. Thus, how CCE is taught is just as important as the content (Orr, 2011). To move beyond cognitive learning to socio-emotional, action, and justice-oriented engagement on climate change, CCE must occur across all subject areas. If CCE occurs only in science classrooms, students may think that climate change has only scientific or technical solutions, rather than understanding that it also requires social and political analysis and action (Hornsey et al., 2016).

To summarize, a whole institution approach encourages CCE within and across all domains of school life (Bieler et al., 2018; UNESCO, 2016). In the area schools are most focused on, teaching and learning, the scholarly literature indicates that climate change should be taught across all subjects and should incorporate cognitive, socio-emotional, action, and justice-oriented, components. These considerations were key for SEPN's evaluation. The next section gives an overview of the methods SEPN used.

3 Evaluation Methods

Data were collected from 10 pilot project participants through a pre-interview survey, as well as semi-structured telephone interviews (for more details see Chopin et al., 2018). An additional 17 non-pilot schools responded to the survey to collect comparative data on current climate action practices happening at ASPnet schools without the support of the Getting Climate-Ready pilot project (i.e., non-pilot ASPnet schools, which did not receive in-person training in relation to the Getting Climate-Ready guide; they only received the guide via the ASPnet newsletter).

This chapter focuses on the climate action stories collected and analyzed qualitatively (for details on the quantitative analysis and results see Chopin et al., 2018). Qualitative data analysis involved inductive thematic analysis of stories and open-ended responses collected via the survey and interviews to identify good practices, as well as factors associated with successes and challenges as identified by the participants. Key emergent themes were developed in consideration to the Getting Climate-Ready guide and the scholarly literature, wherein "good" practices are those that incorporate climate action within and across whole institution domains and that integrate cognitive, socio-emotional, action, and justice-oriented components.

4 Promising Practices and Next Steps

The following discussion of promising practices and next steps highlights emergent themes across pilot and non-pilot schools and provides suggestions for future direction and action, incorporating insights from a recently developed CCE primer (a practical guide based in part on SEPN's CCUNESCO evaluation) and prior SEPN research. Where possible, we also give suggestions for application of the school-level findings to inform action at the levels of school divisions (known elsewhere as school districts) and ministries of education. Together, the results and discussion provide entry points for transforming education systems into institutions focused on climate action.

4.1 *Collaborative Networks*

Throughout our analysis of Canadian ASPnet schools, it was very apparent how much the schools learn from each other (through such avenues as climate change challenges, Carbon Neutral Days, and participation in a program called Bourse Carbone Scol'ÈRE). Two ASPnet schools, for instance, utilized climate change challenges. In Lion's Head, Ontario, as part of Bruce Peninsula District

School's Simply Living Simply program, the entire K–12 school completed 10 monthly challenges focused on climate action (e.g., Go Local, Get Smart, and Get Moving). Each elementary class was responsible for a monthly climate change theme, wherein they developed three action-oriented challenges for the school and local community, which were communicated at monthly assemblies and on websites. Académie des Sacrés-Coeurs (in Saint-Bruno-de-Montarville, Quebec) was inspired by Bruce Peninsula District School to create 10 climate themed challenges that teachers could choose from to create projects. Similarly, Collège Regina Assumpta (in Montreal, Quebec) held a pre-Covid-19 Carbon Neutral Day after being inspired by the Carbon Neutral day held by Collège Sainte-Anne (in Lachine, Quebec), wherein the entire school community worked from home. Académie des Sacrés-Coeurs and École des Amis-du-Monde (in Côte Saint-Luc, Quebec) both participated in the Bourse Carbone Scol'ÈRE program, in which students first learn about reducing emissions, then teach others, including their families, about eco-friendly lifestyles. These examples illustrate the power of networking for climate action.

This key finding was incorporated into a subsequent CCE primer SEPN created in response to a partnership with a local school division, Saskatoon Public Schools, which was instigated by student action related to the Global Climate Strikes. Collaboration between Saskatoon Public Schools and SEPN resulted in a formal Memorandum of Understanding with activities including the formation of a cross-subject and cross-grades teacher network on environmental issues and climate change, professional development with school division leadership, and research collaboration. While this network is an example of local action that resulted in part from key findings from SEPN's evaluation, school divisions in other areas could facilitate the establishment of similar networks and professional development opportunities related to CCE.

Several networks exist that schools can join internationally (e.g., UNESCO ASPnet and the EcoSchools program) and within and across nations (e.g., SEEDS Green Schools in Canada, and the North American Association for Environmental Education). Such networks and associations often provide online platforms to share ideas, problems, and resources.

4.2 *Actions Occurred in Both Pilot and Non-Pilot Schools*

Related to the previous finding about the power of networks, major differences between pilot and non-pilot ASPnet schools were not identified. There are several potential explanations for this finding. First, it is likely that the non-pilot schools that chose to respond to the survey were already engaged in climate action projects (17 out of 77 non-pilot schools responded to the survey). Additionally, both pilot and non-pilot ASPnet schools were already well positioned

to offer transformative education prior to the Getting Climate-Ready project. A previous study on ASPnet schools in Alberta and Manitoba revealed that

> ASPnet schools are unique in their willingness to cross the traditional boundaries between school and community, curriculum and subject area, age and grade, ability and disability, local focus and global concern. Such a willingness to move beyond accepted thinking gives ASPnet schools the potential to transform students into actively engaged citizens. (Shultz et al., 2009, p. 2)

All schools joining the ASPnet network also make a commitment to support UNESCO's ideals through four pillars of learning, which align with the Delors Report (Delors et al., 1996) as well as four themes of study that span these pillars (UNESCO & CCUNESCO, n.d.; see Table 3.1).

TABLE 3.1 The four pillars of learning from the Delors Report (1996) and the four themes of study for UNESCO ASPnet schools

Pillars of learning	Themes of study
Learning to live together	Intercultural Learning
Learning to be	Global Citizenship Education (GCED)
Learning to do	Education for Sustainable Development (ESD)
Learning to know	UNESCO and UN Priorities

That the pillars of learning and themes of study were pre-established likely eased implementation of the Getting Climate-Ready project (for pilot schools) and aligned with practices already occurring (especially in non-pilot schools). The pillars of learning align with the elements of "good" CCE mentioned above (namely, cognitive with "learning to know", socio-emotional with "learning to be", behavioral with "learning to do", and justice-oriented with "learning to live together"), which likely further aided implementation. Prior work at the pilot and non-pilot schools in relation to the pillars of learning and themes of study likely meant that many schools were already undertaking climate action projects before the Getting Climate-Ready project commenced.

4.3 *Integrated Climate Action within and across Domains*

An important element of a whole institution approach is incorporating climate action within and across as many domains of institutional activity as possible.

The more domains included, the stronger and more established the culture of sustainability at the school (UNESCO, 2016). Across pilot and non-pilot ASPnet schools, almost all the climate actions identified were integrated into more than one domain. At École Francophone d'Airdrie in Airdrie, Alberta, for example, a three-year school plan (domain: school governance) led to the creation of a mini-UNESCO conference, at which students learn from each other and the community about an annual theme (domains: teaching and learning; community partnerships). The theme in 2018 was climate change. Bairdmore School, in Winnipeg, Manitoba, has established a funding partnership with the school's advisory council to apply for grants (domains: school governance; community partnerships) to support an outdoor classroom, which encourages outdoor play and sustainable actions, such as growing vegetables and plants (domains: teaching and learning; facilities and operations).

Of the four whole institution areas, schools are typically focused on teaching and learning as their core mandate. Within this area, the emphasis is on incorporating CCE into all subjects in line with curricular outcomes (UNESCO, 2016). Several ASPnet schools were taking up the challenge to include CCE across all subjects, a practice that not only strengthens the culture of climate action at the school but also encourages students to understand climate change from a variety of perspectives. In Edmonton, Alberta, Queen Elizabeth High School incorporates ESD and climate action across all subjects and classes. CCE is also integrated across subjects at Bruce Peninsula District School in Ontario (see Figure 3.4).

Subject	Activities
The Arts	Art installations, Protest art, Posters, Energy plays
English	Speeches, Monthly assembly presentations, Reflections
Agriculture	School garden, Orchard, Indigenous tree planting
Biology	Biological adaptation related to climate change
Citizenship	Shoreline and roadside cleanup, Tree planting volunteers
Geography	Carbon footprint around the world
Health	Outdoor classrooms, Forest walks
History	History of resource extraction to present day extraction
Science	Inquiry based climate change projects
Math	Climate change math-related problems
Vocation	Tech class create raised beds for school garden

FIGURE 3.4 Sample of cross-curricular inclusion of climate change topics at Bruce Peninsula District School (from Bruce Peninsula District School, 2020)

While climate actions were incorporated across multiple domains within the ASPnet schools, many were oriented toward facilities and operations. This approach often relies on individuals' changing their own behaviors (for

example, turning off lights). In the future, students could utilize critical thinking skills to determine the source of problems contributing to climate change. Schools could also adopt a climate action approach aimed at broader systemic social structures that support climate inaction. For example, students could engage with representatives in municipal, provincial, and federal government to advocate for broader governmental and policy change.

4.4 *Diverse Actors Engaged in Climate Action*

A whole institution approach was supported by interpersonal relationships led by diverse members of the school community, such as students of all ages, teachers, and members of the administrations. For example, at Collège Durocher Saint-Lambert in Saint-Lambert, Quebec, students research environmental topics and then visit other classes to educate students and teachers. Students at several schools also lead recycling programs (for example, École Beausejour in Plamondon, Alberta, and Hafford Central School in Hafford, Saskatchewan). At École La Source in Cornwallis, Manitoba, a school garden is cared for by teachers and students in collaboration with a community partner. A sustainable development policy established by school management at Collège Sainte-Anne led to their Carbon Neutral Day, which was held twice a year for three years. Engaging the entire school community develops a sense of agency and makes an integrated, whole institution approach possible.

While the ASPnet schools engaged individuals with different roles in climate action, the inclusion of a focus on other forms of diversity and climate justice represents an area for future growth. This issue is especially relevant in the international and Canadian context of Black Lives Matter protests. Indeed, calls for increased racial justice are inextricably linked to calls for climate justice by Indigenous peoples and other people of color (Lakhani & Watts, 2020; Mersha, 2017).

Diversifying the type of knowledge within CCE may also strengthen future climate action projects. Indigenous knowledge, for example, is deeply embedded in caring for the land for future generations and often includes crucial locally relevant mitigation and adaptation strategies (Hosen et al., 2020; Nalau et al., 2018). Meaningful engagement with Indigenous communities can also make CCE more relevant to students through local connections to place, which benefit everyone, not just Indigenous learners, and which can become a catalyst for action (Restoule & Chaw-win-is, 2017).

4.5 *The Role of Ministries of Education*

While the above sections mostly focus on emerging themes and suggested school-level actions from SEPN's CCUNESCO ASPnet schools evaluation, this

section applies a whole institution approach to provincial (or state) ministries and regional school divisions.

Ministries of education can particularly support whole institution climate action through curricular frameworks and other policy initiatives. Prior SEPN research suggests that each level of education policy is important in ensuring that sustainability policies and practices are strong at local levels (McKenzie & Aikens, 2020). A recent census of sustainability-specific policies within Canadian ministries of education found that 54% of provinces and territories had such policies, usually in relation to curriculum (Beveridge et al., 2019). For example, in the province of Saskatchewan, sustainability was addressed at the policy level only in relation to curriculum, indicating an opportunity for broader inclusion (Beveridge et al., 2019). While all 13 Canadian provinces and territories mention education in their *climate* policies, only 46% of provinces specifically mention climate change in their *education* policies (Bieler et al., 2018). When climate change is included, it is often only in relation to reducing school greenhouse gas emissions, representing a missed opportunity to include other whole institution areas (Bieler et al., 2018). Ministries of education can also meaningfully engage with policy actors at school and division levels to ensure broad support for policies developed, and to encourage school division level and school level policy (Chopin et al., 2017).

Another way ministries of education can address climate change is to include it within subject and grade specific curricula. When climate change is only rarely included in the curriculum, the indirect message sent to students is that it does not matter (Lawrynuik, 2019). Within Canada, including climate change in curricula also aligns with other ministry commitments, such as a 2016 agreement by all ministers of education to integrate six global competencies into curricula, including one on global citizenship and sustainability (CMEC, 2018). By choosing to mandate CCE in curriculum, ministries of education join similar initiatives in other nations (e.g., Italy, New Zealand) and cities (e.g., Islamabad) (Graham-McLay, 2020; Jones, 2019; Tunio, 2019).

Ministries of education can also implement or support provincial eco-certification programs for schools (Strobbe et al., 2014). Environmental certification programs provide environmental, educational, and economic benefits to schools and divisions (see Figure 3.5) by promoting the value of environmental education (and increasingly CCE), supporting schools and divisions to make environmentally friendly decisions, and rewarding schools that meet benchmarks along the way (Freake, 2015; Goodchild et al., 2017; Strobbe et al., 2014). While eco-certification programs are created by a range of groups from provincial governments to non-profit organizations, research suggests that the largest and perhaps most successful eco-certification programs are supported by

Environmental Benefits	• Community strengthening through joint initiatives such as vegetable gardens or waste free lunch programs • Enhanced biodiversity from green school grounds • Increased school aesthetics • Reduction of school's ecological footprint
Educational Benefits	• Healthier students – socially, mentally, and behaviorally • Increase in student and teacher awareness of environmental issues and stewardship • Richer curriculum • Process of certification can lead to a new, collaborative vision for the school • Professional development and leadership opportunities for students and teachers • Whole-school participation and community ownership
Economic Benefits	• Savings due to reduced water and energy consumption due to various activities • Savings from reduced amount of waste due to recycling initiatives

FIGURE 3.5 Environmental, educational, and economic benefits of eco-certification in K–12 schools (from Strobbe et al., 2014)

ministries of education (e.g., in Canada, British Columbia's Green Schools and Manitoba's EcoGlobe Program; Strobbe et al., 2014).

4.6 *The Role of School Divisions*

As mentioned above, each level of education policy is important in ensuring sustainability uptake at subsequent levels, which includes sustainability and climate change policy in school divisions (Bieler et al., 2018). SEPN's research found that 59% of Canadian regional school divisions have sustainability-specific policy of some type, usually focused on operations (Beveridge et al., 2019; see Figure 3.6). An opportunity exists for school divisions to add

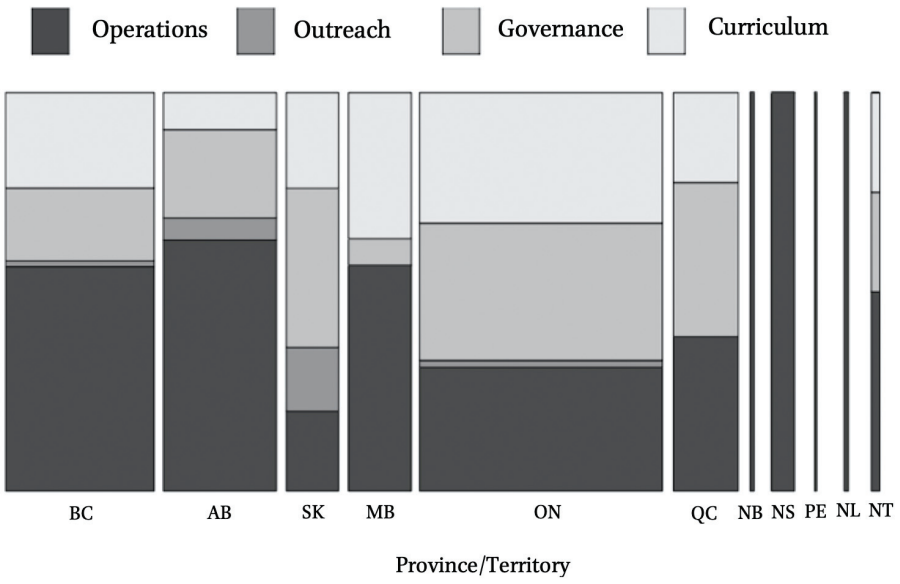

FIGURE 3.6 Whole institution areas covered by school division areas, by province (from Beveridge et al., 2019)

climate-specific targets into these policy documents as well as to develop policies in areas beyond operations, such as curricular and pedagogical support, or community outreach.

School divisions have also responded to the climate crisis in other creative ways, including professional development for teachers and administrators, declaring climate emergencies, supporting climate strike participation, passing climate action resolutions, policies and plans, encouraging schools to include CCE at all grade levels, and developing monthly environmental challenges for staff and students (CBC, 2019a; Colorado Association of School Boards, 2019; Israelson, 2019; Rahim, 2019; Rainbow District School Board, 2019; Schools for Climate Action, n.d; CBC, 2019a; Toronto District School Board, 2010). Eco-certification program support is also growing in popularity among school divisions, with SEPN finding 43% of school divisions participating in this programming (McKenzie & Aikens, 2020). Some suggestions for future and continued action are provided in Figure 3.7.

In Saskatchewan, Canada, Saskatoon Public Schools and Greater Saskatoon Catholic Schools are collaborating on the Student Action for a Sustainable Future program (Saskatchewan Environmental Society, 2019). The program is an inquiry and action project for Grade 5 to 8 classrooms. Each year 12 classes are chosen to participate in the program, which is coordinated by the City of Saskatoon. Co-partners also include the Saskatchewan Environmental Society, Saskatoon Light and Power, and the Sustainability Education Research Institute. Supported by these partners and with the goal of reducing greenhouse gas emissions in Saskatoon and around Saskatchewan, students develop action projects in the areas of waste, water, energy, food, biodiversity, and transportation (Saskatchewan Environmental Society, 2019).

School boards are responding to the climate crisis in unique ways across whole institution domains. Future actions could include expanding sustainability policies beyond an operations focus, as well as partnering more closely with students (e.g., inviting students to develop input concerning their municipality's emissions reduction plan and presenting their results to the city).

5 Conclusion

K–12 education systems in Canada and elsewhere are taking significant steps to mitigate climate change. The many exciting climate action initiatives taking place provide an inspiring reminder of the power and promise of collective action in addressing climate change. While much more research is needed to determine what counts as "good" CCE, a whole institution approach is increasingly recommended to enable education systems to achieve collaborative

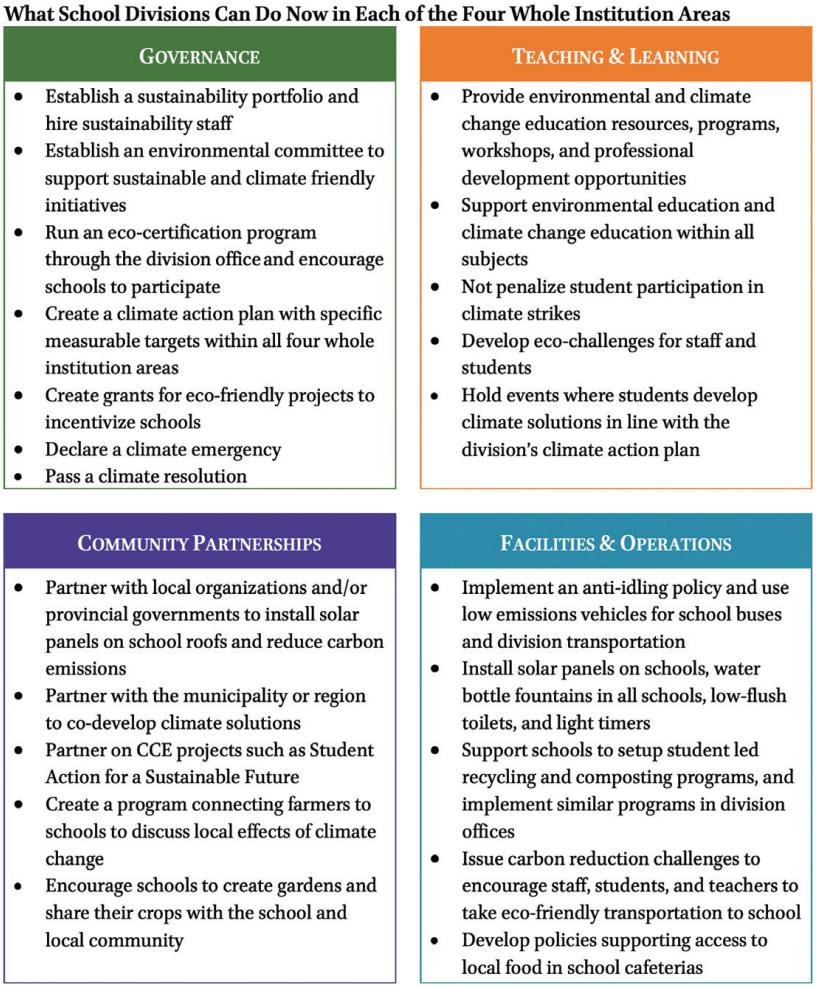

FIGURE 3.7 Actions school divisions can take within each of the whole institution domains (from Hargis & McKenzie, 2020). (The literature that informed the creation of this figure: Beveridge et al., 2019; CBC, 2019b; Chopin et al., 2018; Colorado Association of School Boards, 2019; Greater Victoria School District, 2018; Hargis et al., 2018; Israelson, 2019; Pearson, 2014; Portland Public Schools, 2016; Rainbow District School Board, 2019; Saskatchewan Environmental Society, 2019; Schools for Climate Action, n.d.; CBC, 2019a; Thomson, 2016; Toronto School District Board, 2014)

action that moves away from individualistic climate change responses (Bieler et al., 2018; Henderson & Tilbury, 2004; UNESCO, 2016).

The implementation of the UNESCO Getting Climate-Ready project within Canadian ASPnet schools resulted in examples of climate action in each of the whole institution areas. Recommendations for future and continued action in schools include: (1) establishing connections with local, national, or international networks and associations; (2) integrating climate action within and across domains; and (3) involving diverse peoples, knowledges, and perspectives in local action.

Ministries of education can particularly support climate action through policies, curriculum frameworks, and subject-specific curricula (McKenzie & Aikens, 2020). Many ministries are already responding to the climate crisis in unique ways. Specific recommendations for future action include: (1) expanding beyond curriculum in education policies; (2) incorporating climate change in educational policies, not just climate change policies; (3) including climate change in all subject curricula; and (4) supporting eco-certification programs.

Many school divisions are also incorporating climate action in each whole institution area. Recommendations for future action include: (1) expanding beyond an operations focus; (2) supporting eco-certification programs; and (3) partnering with other organizations and research institutes to deliver climate change related programming for students. Such partnerships with researchers, organizations, schools, and school divisions, can allow for unique opportunities for research to support climate action.

In the face of an enormous health crisis lies an immense opportunity to respond to UN Secretary-General António Guterres' call to "build back better" (Giannini, 2020; also see CCUNESCO & UNESCO, 2020). As governments around the world restructure education systems to respond to Covid-19, we have "a once in a generation opportunity to improve education, alongside economies, to fight the climate crisis" (Giannini, 2020). Such a response should incorporate climate justice perspectives that challenge the intersecting inequities bolstered by capitalism (Godfrey & Torres, 2016). As student and Canadian Indigenous water activist Autumn Peltier reminded us, "We can't eat money or drink oil" (CBC, 2019c). Climate change education provides an opportunity to engage students, teachers, and whole institutions in addressing climate change. We hope Canada, and others, take up the challenge to build back better in the years to come.

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Note

1 In some of SEPN's research a fifth domain of research is also included (see Beveridge et al., 2019).

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