

Chapter 4

Canada (Ontario): A Unifying Theme for Canadian Education Is Equity



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Abstract Canada has one of the most successful education systems in the world, as evidenced by continuous high performance on various international assessments. Within Canada, Ontario has produced major improvements in the last 20 years in Elementary school literacy and in Secondary school graduation rates. These improvements extend across a large, diverse and complex education system. This chapter provides a brief description of the Canadian and Ontario school systems, outlining

Evelyn Wilson passed away in 2021.

A note from the editors

The Province of Ontario in Canada is one of the most successful examples of transforming education with a focus on key competencies. Back in the 1990s, a deep and progressive philosophy of learning outcomes was born here, developed in the works of the Ontario Institute of Studies in Education (OISE) at the University of Toronto, and, above all, in the works of the outstanding scholar Michael Fullan [14]. This culture of reform has come in handy in the last decade for the implementation of a framework of key competences and new literacies in the province. The chapter was written by OISE scholars and practitioners.

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some of the main strategies used. It describes the approach Ontario is taking toward defining, developing, implementing, monitoring, assessing and extending global competencies and skills. The Ontario effort is serious and multi-faceted, involving many aspects of the system: curriculum, pedagogy, leadership, technology, assessment and community engagement. Moving to twenty-first century skills and competencies makes the transitions complicated, contextual, and contingent. For sustainable improvement to occur, many instances must happen in a mutually reinforcing manner, which can be challenging to implement in a large system. We continue to benefit from and contribute to the steady development of international knowledge about effective schools and school change. Accordingly, this chapter is presented with a mixture of pride, optimism, curiosity, caution and realism.

Keywords Twenty-first century skills · Key competences · Critical thinking · Creativity · Cognitive skills · Social skills · Entrepreneurial attitudes · Multiculturalism · Global citizenship · Sustainability commitment · Stakeholder engagement · Learning to learn · Measuring and assessing twenty-first century competences · Teacher professional learning

Highlights

- The Ontario effort is serious and multifaceted, involving many aspects of the system: curriculum, pedagogy, leadership, technology, assessment, and community engagement.
- Canada's frameworks of key competences demonstrate a distinctive emphasis on social traits and attitudes: multiculturalism, global responsibility, sustainability commitment—the Canadian society feels an urgent need for these qualities in the form of both knowledge and skills.
- Along with creativity, entrepreneurial attitudes are emphasized in the frameworks.
- The competences/skills spiral through the K-12 curriculum. Literacy training is integrated into various subjects of the curriculum.
- Involving cognitive and social skills, as well as personality traits, competences help students achieve deeper disciplinary understanding, grip interdisciplinary concepts, and apply knowledge in new situations.
- Ontario: teachers and education leaders continually learn from each other.
- Ontario: stakeholder engagement has been a source of strength and support. Parents are essential partners.
- Tests and data are to be used to support improvement, not to make judgments.
- Effective change requires three to seven years of intentional implementation, targeted and intentional support, and monitoring.
- Experience in Canada and elsewhere has clearly shown that systems that try to be too directive create greater alienation and resistance at the local level, and in the end, achieve less effective implementation. A combination of intelligent pressure and ongoing job-embedded professional support is applied.

4.1 Introduction

Canada has one of the most successful education systems in the world, as evidenced by continuous high performance on the recent Programme for International Student Assessment (PISA) and other international assessments. Within Canada, Ontario has produced major improvements in the last 10–15 years in elementary school literacy and secondary school graduation rates. These improvements extend across a large, diverse, and complex education system.

This chapter provides a brief description of the Canadian and Ontario school systems, outlining some of the main strategies used. It describes the approach Ontario is taking toward defining, developing, implementing, monitoring, assessing, and extending twenty-first-century competences and skills. The Ontario effort is serious and multifaceted, involving many aspects of the system: curriculum, pedagogy, leadership, technology, assessment, and community engagement.

4.2 State of Education in Canada

Canada has been identified as one of seven nations/economies where 90% of 15-year-olds master the baseline proficiency in science, reading, and mathematics as measured by PISA.¹ Based on PISA analysis, Canadian students are considered “high performers in science” [35, p. 34]. On PISA 2015, “only three countries achieved higher results than Canada in science, one in reading, and six in mathematics” ([4], p. 13). Students’ financial literacy knowledge and skills formed the basis of PISA’s 2015 assessment of the financial literacy component.² Eighty-seven percent of Canadian students met the baseline for financial literacy, as compared to 78% for the Organisation for Economic Co-operation and Development (OECD) average. Twenty-two percent of students scored at level 5 or high achievement, as compared to 12% for the OECD. Canada remained a top performer among the participating jurisdictions. Within Canada, Ontario remains a high-performing jurisdiction balancing excellence and equity [3]. Canada is one of a very few countries where students born outside the country do as well, on average, as students born in the country.

Intentional policies, programs, and interventions support positive academic outcomes for underserved and traditionally underperforming learners, based on the economic, social, and cultural status (ESCS)³ index. Ontario promotes “inclusive and equitable quality education” as described in Sustainable Development Goal (SDG)

¹ According to PISA 2015, 510,000 students completed the assessment representing 29 million 15-year-olds in 72 participating countries/economies.

² In 2015, 15 countries and economies involving 137,000 students participated representing 11 million students. Ontario was one of the seven participating provinces.

³ Students in the bottom quarter of the index are classified as disadvantaged in terms of learners and schools.

4. To prepare students for increasing complex challenges, school systems are being asked to implement twenty-first-century skills and competences within their formal and informal curricula.

There is no national structure for education across Canada. Education falls within the jurisdictional responsibilities of the individual departments/ministries of education for each of the provinces and territories. The exceptions are for First Nations Peoples living on reserves and the children of employees of the Armed Forces, which remain under federal jurisdiction. Additionally, the federal government provides funding for minority languages⁴ and some aspects of research, training, and higher education. The OECD has described the role of the federal government in education as “limited and sometimes non-existent;” however, its academic outcomes, as measured by international assessments, remain stellar [8].

4.3 How Does Canadian Education Work?

Canada comprises ten provinces and three territories in a federated structure and is a member of the British Commonwealth of Nations. Canada is the second-largest country by area in the world (9,984,670 km²) with a population of approximately 37 million. The country’s population density is less than four people per square kilometer. The small population given the large land mass affects education in rural and remote areas.

Most Canadians live in urban areas and 45% of the population lives in six metropolitan areas. Ontario is Canada’s most populous province at 13.9 million, with 38.5% of the country’s total population [59].

Canada is the only nation in the developed world without a national education policy or ministry/department of education. Canada’s 1867 Constitution Act⁵ mandated that “for each province the legislature may exclusively make Laws in relation to Education.”⁶ The federal government plays a minor role in education, acting through voluntary collaboration. When describing educational transitions, for Canada the process is collaborative, because each jurisdiction sets its own parameters. Ontario’s context is presented in Sect. 4.3.

The various departments/ministers of education across Canada cooperate with the Council of Ministers of Education, Canada (CMEC), which is the intergovernmental organization for education, founded in 1967. The CMEC:⁷

- Provides leadership on education at national and international levels;
- Serves as a national forum for policy and education-related issues;
- Offers a mechanism to direct research;

⁴ English in Quebec and French in the other jurisdictions.

⁵ Originally the British North America Act—<http://laws-lois.justice.gc.ca/eng/Const/>.

⁶ Constitutional Act, 1867, <http://laws-lois.justice.gc.ca/eng/Const/page-1.html>.

⁷ CMEC website: www.cmec.ca.

- Supports recognition and portability of educational and occupational qualifications; and
- Administers the official language programs for French and English.

In 2017, CMEC launched a multiyear strategic plan promoting pan-Canadian excellence and equity in education to maintain its “world-class” results. The plan for change was negotiated within the national frame for education based on research and provincial/territorial student achievement data. Key components of the plan for more effective K-12 education include

- Promoting more effective transitions from secondary school through post-secondary;
- Supporting approaches in indigenizing education, ensuring cultural responsive opportunities for First Nation, Metis, and Inuit (FNMI) learners;
- Ensuring students are equipped for the digital world by integrating technology and developing twenty-first-century skills;
- Improving mathematical skills, knowledge, practices, and opportunities so that Canadian learners acquire CMEC’s six global competences: critical thinking and problem solving; innovation; creativity and entrepreneurship; learning to learn; collaboration, communication, and global citizenship; and sustainability; and
- Supporting student well-being.

The provinces/territories act as agents for transitioning educational change, in terms of policies, processes, focus, and resources, including implementing CMEC’s six global competences.

An elected member of the provincial/territorial legislature, who is appointed to the education portfolio, acts as the Minister for Education. This person heads the department/ministry, which may represent elementary/secondary and/or post-secondary education. Despite provincial/territorial jurisdictions, there is equity in education across Canada.⁸

Local governance is in the purview of school boards, divisions, districts, or district education councils. Locally elected (three- to four-year terms) in most provinces, they provide local governance, hire teachers and administrators, allocate programs to schools, budget for individual schools, and own and operate school buildings. Almost all provinces/territories fund schools/systems; local contributions through local property taxes are now minor or nonexistent. This provides more centralized control. Administrative structures vary across the country with an appointed superintendent and/or director of education leading K-12 school systems.⁹ They select a variety of system- and school-based staff, depending on the size of the school system.¹⁰ A principal leads a school, and in the case of larger schools, vice/assistant principals are appointed to meet specific qualifications and requirements. The trustees or members of the board that govern local education are elected by public ballot.

⁸ Quebec has only 11 years of school instead of 12 in the other provinces and a 2-year college system that provides academic programs for university and/or technical training.

⁹ These individuals are required to have teaching qualifications.

¹⁰ Range from 3,000,000 pupils in Toronto to less than 1,000 in rural/remote parts of the country.

Canada spends 8% of the gross domestic product on education. Education funding with centralized control is more equitable. Curriculum is established by the individual province/territory. Teachers and administrators are required to meet specific qualifications, and all provinces administer some degree of accountability through assessments. Teachers and most support staff members are unionized and bargaining may be at the district and/or provincial/territorial level. Most schools have a form of mandated parent/community council that provides local advice to the school/district.

Canada focuses on maintaining the excellence and equity inherent in the system. Provinces and territories offer different curricula, prerequisites, and qualifications.¹¹

- All jurisdictions offer a form of noncompulsory, **pre-Grade 1 schooling**, such as kindergarten and/or preschool education. The impact of effective early years' education is increasingly refocusing governmental agendas on improving the quality of the programming. On a pan-Canadian level, 95% of five-year-olds and over 40% of four-year-olds attend school. Programs vary from half days to all day, every day (Ontario).
- There are approximately 5 million students enrolled in over 15,000 public **elementary and secondary schools** across Canada. Public education is provided free of charge to all Canadians who meet various age and residency requirements.
- The age of compulsory Grade 1 education varies across jurisdictions. Most students begin at age six, and some at age five. Elementary education covers Grade 1 to Grade 8. Over 98% of students go on to attend secondary school (Grades 9 through 12). Compulsory schooling lasts through secondary school between 16 and 18 years of age.
- Students enroll in public education or private/independent/faith-based schools, which are regulated by the relevant jurisdiction. According to the Fraser Institute, 6.8% of Canadian students attend private schools. Some provinces and territories provide partial private school tuition, but Ontario, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland/Labrador do not. In Ontario, due to historic constitutional factors, Catholic education is fully subsidized from kindergarten through Grade 12.
- Most students attend their local school; however, there is some choice built into the system for Francophone (French as a first language) schools, magnet programs,¹² and providing specialized services and programs to students with special needs. Integration of students with special needs is the placement of choice.
- Canada is officially bilingual (French and English). Eighty-five percent of French first-language Canadians reside in Quebec, which has language laws in education to promote and protect French as the first official language of the province. French first-language students living outside of Quebec have their language rights and access to French first-language education, as protected by the Canadian Charter of Rights and Freedoms.¹³

¹¹ Further information regarding each province/territory's education system can be found at <https://www.cicic.ca/1301/Ministries-Departments-responsible-for-education-in-Canada/index.canada>.

¹² Arts, sports, and gifted programming.

¹³ Canadian Charter of Rights and Freedoms: <http://laws-lois.justice.gc.ca/eng/Const/page-15.html>.

- 400,000 are enrolled in French immersion programs, which is the fastest-growing education program across Canada.
- Canada has the highest percentage of adults holding tertiary qualifications among OECD countries. Twenty-five percent of Canadians ages 25–64 have a college diploma¹⁴ as their highest level of education, a proportion higher than any OECD country.

4.3.1 Diversity

Canada, except for the FNMI peoples, is a land of immigrants. All immigrants add to the rich diversity of Canada and Ontario. Canada and Ontario welcome newcomers; according to [60], 22% of the total population are immigrants. Close to 30% of Ontario’s population is foreign-born and more than 30% of young adults are from families where both parents immigrated to Canada from other countries. PISA 2015 provides evidence of Canada’s consistent performance on equity in terms of narrowing educational outcomes due to the impact of social background, between advantaged and disadvantaged students. Canadian and Ontario students demonstrate more resilience overall.¹⁵ In Canada, the SECS gap was 9% compared with over 20% for the OECD. Canada’s immigrant students perform better than most OECD economies/nations, even when social factors are excluded. Closing this academic gap has shown improvement since 2006. A unifying theme for Canadian education, according to the OECD, is equity (OECD, Canada Country Overview, 2015). Canadians honor a sense of fairness and equal access for all students.

Creating culturally responsive and supportive structures to increase educational outcomes is a focus of Canada’s educational systems. Diversity has been reported to add to economic prosperity: “viewed across all sectors, one percent increase in ethno-cultural diversity was associated with an average 2.4% increase in revenue and a 0.5% increase in workplace productivity” [30, p. 1]. Diverse peoples wish to live in diverse cities that reflect their backgrounds and shared experiences. This cultural responsiveness extends to schools and the workplace, where “cultural fluency” is being nurtured [30, p. 15].

A recent British Broadcasting Corporation (BBC) article applauded Canada’s ability to lower the achievement gap between immigrant and advantaged students, ensuring more equitable outcomes [8]. Although Canada currently performs well on the OECD’s index of well-being, the country is committed to providing targeted opportunities for growth and inclusivity, through education and retraining to prepare for the twenty-first-century workplace [36–38].

¹⁴ College refers to both colleges and polytechnics.

¹⁵ Students who perform well on PISA despite disadvantaged backgrounds.

4.4 State of Education in Ontario

Ontario's education system is internationally recognized as a high-achieving, equitable, and continuously improving education system [2, 31]. Education in Ontario is continuing its improvement journey, focused on deeper learning, additional twenty-first-century skill development, and wellness. Ontario is preparing its students to be personally successful, economically productive, and engaged citizens of the world, which, it believes, will in turn provide for the province's success in the decades to come.

It is one of the most diverse provinces, with 2.1 million students in four different publicly funded school systems (English Public, English Catholic, French Public, and French Catholic). Currently, 20.7% of Ontario students have a first language other than English or French. There are approximately 73,700 elementary school teachers and 41,300 secondary school teachers, represented by four different teacher unions. Education is delivered in almost 4,000 elementary schools and 900 secondary schools, each under the jurisdiction of a district school board. There are 60 English language and 12 French language school districts that range in size, from a few hundred students in rural areas to 250,000 students in the Toronto District School Board (one of the largest urban districts in North America). Approximately 95% of all students in the province attend publicly funded schools. The remaining students are homeschooled or attend private schools or federally funded First Nations schools. While indigenous pupils living on reserves generally attend federally operated schools, over 70% of First Nations students attend provincially operated schools in Ontario.

Formal education in Ontario begins at age four with all-day, everyday junior and senior kindergarten (two years). While attendance in kindergarten is optional, over 90% of Ontario's four- and five-year-olds are enrolled. Compulsory enrolment begins in Grade 1 at age six and students are legally required to remain in school until age 18 or graduation from secondary school. Kindergarten to Grade 8 classes are traditionally offered in elementary schools, while Grades 9 to 12 are found in secondary schools.

4.4.1 Educational Improvement Processes

In 2003, concern was raised over student performance results based on annual province-wide curriculum-based assessments of literacy and numeracy in Grades 3 and 6.¹⁶ The newly elected provincial government announced that educational improvement is its top priority.

¹⁶ The Education Quality and Accountability Office (EQAO) designs, administers, and reports on the provincial assessments for Grades 3, 6, 9 and 10 <http://www.eqao.com/en>.

The government established three goals:

- (a) To raise the bar for student achievement, specifically to increase the percentage of children in Grades 3 and 6 who met or exceeded the province’s literacy and numeracy standards from 54% in 2003 to 75%, and to increase the rate of secondary school graduation from 68 to 85%¹⁷
- (b) To narrow the gap for students who have historically faced challenges to their success in school
- (c) To build public confidence in publicly funded education

By the 2015–2016 school year, these critical foundational measurements of students’ readiness to succeed had improved to 72 and 86.5%, respectively. Ontario also significantly narrowed the achievement gap for students experiencing challenges to their learning. For example, the performance gap on the Grade 6 writing test for students learning English as a second language narrowed from 30% in 2003 to 3% in 2015. The performance on the same test by students with special needs rose from 12 to 46% (integration of students with special needs into regular classes is the preferred approach across the province). The province also saw dramatic reductions in the numbers of low-performing elementary schools (usually schools in areas of poverty and/or high immigration), from over 700 in 2003 to less than 70 in 2015–2016.¹⁸

This transformation was achieved through a partnership between the government and the school districts’ leaders and teachers. Progress was made through eight overall strategies and conditions identified to support system-wide change:

- (a) A small number of ambitious goals
- (b) A guiding coalition of leadership
- (c) High standards and expectations
- (d) Investment in leadership and capacity building related to pedagogy (professional learning)
- (e) Mobilizing data and effective practices as a strategy for improvement
- (f) Intervention in a nonpunitive manner
- (g) Being vigilant about distractors
- (h) Being transparent, relentless, and increasingly challenging

4.4.2 Provincial Standards for Improving Student Skills

Provincial standards set very high expectations for students. Higher-order thinking skills, critical thinking, problem solving and analysis, and collaboration and communications skills are all part of Ontario’s curriculum. Students must demonstrate these skills to meet the provincial standards. To assist teachers in improving instruction to

¹⁷ The rate is established for all students entering Grade 9 who complete their secondary school studies within 5 years.

¹⁸ These results were tracked and supported by the Ministry’s Literacy and Numeracy Secretariat.

meet these ambitious standards, the ministry produced two reports that describe high-quality literacy instruction: *The Early Reading Strategy in 2003* and the *Expert Panel on Literacy in Grades 4 to 6 in Ontario in 2004*. The government established curricular expectations for the content that students were to learn and shared research-informed teaching strategies that had proven to be successful. Teachers selected their pedagogical approaches after learning together about the range of teaching approaches that can be most effective for different contexts.

The 2004 literacy report defined literacy as:

...the ability to use language and images in rich and varied forms to read, write, listen, speak, view, represent, and think critically about ideas. It enables us to share information, to interact with others, and to make meaning. Literacy is a complex process that involves building on prior knowledge, culture, and experiences in order to develop new knowledge and deeper understanding. It connects individuals and communities, and is an essential tool for personal growth and active participation in a democratic society ([45], p. 5).

This report, and other documents by the ministry, established effective instruction as

- The use of assessment to guide instruction;
- Differentiating instruction to address student needs;
- A gradual release of responsibility for learning from teacher to student; and
- Integrating literacy instruction across various curriculum areas.

Support in literacy, mathematics, and secondary school improvement was also provided through a new division of the ministry: the Student Achievement Division.¹⁹ It was staffed by a combination of ministry staff members and educators seconded from the school system to lead the initiative to improve student learning. Districts and schools were expected to produce improved student learning outcomes and were provided increasing support to realize success. They submitted improvement plans²⁰ with measurable targets and strategies/actions on how to meet their targets. This holds school boards/districts accountable for their student achievement results.

Having seen the efficacy of these approaches in improving learning in measurable ways, the same philosophy and approaches are informing Ontario's commitment to additional twenty-first-century skills. In 2014, over 50% of school boards had independently identified twenty-first-century competences as a focus for their systems; currently all 72 have incorporated some form of twenty-first-century skills/competences [46–52].

Successful change occurs through knowledgeable leadership and relationship development, knowledge building and innovation, and transparent accountability throughout the system. Educators in Ontario understand their power to improve learning for all students. They are now involved in collaborative inquiry and action research in their classrooms, as well as working together to increase learning outcomes for students and staff.

¹⁹ Ministry of Education staff: <http://edu.gov.on.ca/eng/about/whoweare.html>.

²⁰ Board Improvement Plans for Student Achievement (BIPSA) and schools submitted to the school system School Improvement Plans (SIPs).

4.5 Twenty-First Century Competences

4.5.1 *Pan-Canadian Competency Frame*

In 2016, the CMEC adapted a pan-Canadian frame for global competences, including definitions and detailed descriptors of what students are to know, understand, and demonstrate to prepare them for the rapid socially, technologically, economically, and culturally changing world. Previous research and discussion resources from the Conference Board of Canada, C21, and OECD informed the CMEC's six global competences:

- Critical thinking and problem solving
- Innovation, creativity, and entrepreneurship
- Learning to learn/self-awareness and self-direction
- Collaboration
- Communication
- Global citizenship and sustainability

These six components were developed to meet the 2030 SDG4 on the education of the United Nations Educational, Scientific, and Cultural Organization (UNESCO), promoting global citizenship and sustainable development. They were refined with input from business and the corporate sectors to ensure that they align with changing workforce demands. A brief synopsis is depicted in Table 4.1.

Awareness of financial literacy is another component for informed citizens operating in the twenty-first century and is implied, although not directly addressed, within the CMEC model. **Financial literacy**, according to Canada's Task Force on Financial Literacy (2010), is having the knowledge, skills, and confidence to make responsible decisions.

Within this framework, each province and territory will decide how best to embed the six CMEC competences in their curricula and resources to teach and measure students' ability to master the competences required to become informed and productive citizens.

The CMEC recognizes that educational policy direction regarding twenty-first-century skills/competences comes from provincial/territorial governments and may include any or all of the following:

- Changes in official curricula
- Guidance to school districts on how to conduct various activities
- Changes in time allocations for the school day or year
- Professional development for school leaders and teachers
- Pilot projects or resources of various kinds for use by schools and teachers
- Public education intended to inform parents and others about changing ideas about schooling

Table 4.1 Pan-Canadian frame of competences

Component	Definition	Descriptors
Critical thinking and problem-solving	Acquiring, processing, analyzing, and interpreting information to make informed judgments and decisions	Solve meaningful, real-life, complex problems, engage in inquiry, see patterns
Innovation, creativity, and entrepreneurship	Ability to move from idea to action to meet community needs, enhance, improve concepts, ideas, products	Formulate and express insightful questions and opinions, contribute solutions to complex, economic, social, and environmental problems
Learning to learn/self-awareness and self-direction	Becoming aware, demonstrating agency, development of motivation, perseverance, resilience and self-regulation, growth mindset	Use metacognition, goal setting, independence, self-regulate to be lifelong learners
Collaboration	Interplay of cognitive, interpersonal, and intrapersonal competences	Develop positive and respectful relationships, learn from and contribute to others
Communication	Receiving and expressing meaning, understanding local and global perspectives, positive digital literacy	Communicate effectively in oral and written form using appropriate tools
Global citizenship and sustainability	Acquisition of skills for engaged citizenship, local and global, appreciation for diversity	Understand diverse and interconnected forces, discrimination, engage, and contribute positively

Once such guidance is given, school districts normally have a reasonable degree of flexibility in how they adopt such measures, depending on local priorities. Even when provinces provide clear policy direction, they are generally reluctant to supervise too closely or intervene too forcefully, preferring to allow local districts to guide changes. Similarly, districts may give individual schools a fair amount of autonomy in deciding how to follow or interpret various policy guidance. While this decentralized system may seem “soft” in terms of implementing new approaches, experience in Canada and elsewhere has clearly shown that systems that try to be too directive create greater alienation and resistance at the local level, and in the end, achieve less effective implementation. A combination of intelligent pressure and ongoing job-embedded professional support is applied.

Table 4.2 Ontario C model

Character	Citizenship	Collaboration	Communication	Creativity and Imagination	Critical thinking
Honesty, self-regulation, empathy, perseverance	Global knowledge, sensitivity and respect for others, active involvement	Working in teams, social networking, learn from and contribute to others	Communicate effectively—oral, writing, in a variety of forms—use digital tools, active listening	Economic and social entrepreneurship, leadership for action pursue novel ideas	Thinking critically, solve problems, effective decision making

4.5.2 Ontario 6C Model

Ontario similar to other provinces is attempting to prepare students, “for success in a dynamic, technologically intensive and increasingly connected 21st-century world” [46–52] with the goal of becoming “world leaders in higher-order skills such as critical thinking and problem solving, which will allow Ontario to thrive in the increasingly competitive marketplace” by 2025 [46, p. 9].

The 6Cs or six competences are described in Table 4.2. These became the agenda for Ontario’s focus on transitioning to twenty-first-century learning and deepening students’ learning. The aim was to operationalize the competences and assess for them.

In the fall of 2013, individuals and organizations across the province consulted on a renewed vision for education. Embedded into the four goals of “Achieving Excellence: A Renewed Vision for Education in Ontario”²¹ were recommendations for twenty-first century/global competences, and previous models informed their design. Ontario’s frame for twenty-first-century/global competences aligns with the pan-Canadian vision, reflects Ontario’s unique context, and is evidence informed.

The province explored the implications for policy and practice. The six competences allow Ontario’s students to go deeper, involve cognitive, interpersonal, and intrapersonal learning domains, and transfer/apply these to new and challenging experiences. The twenty-first-century competences support learning in and across the discipline areas in Ontario’s K-12 education system (Table 4.3).

These components reflect Ontario’s emphasis on equity and diversity, as well as the focus on achieving excellence for all. The twenty-first-century/global competences are woven within teaching and learning, indigenous education, education for sustainable development, early education and development, wellness and mental health, experiential learning, and assessment. The aim is to create global citizens prepared to live and thrive in the twenty-first century.²²

²¹ Achieving Excellence, Ensuring Equity, Promoting Well-Being, Enhancing Public Confidence.

²² About 21st Century Learning in Ontario: http://www.edugains.ca/newsite/21stCenturyLearning/about_learning_in_ontario.html.

Table 4.3 Ontario's twenty-first-century global competences/skills

Component	Descriptors
Critical thinking and problem-solving	Solves meaningful, real-life complex problems; takes concrete steps to address issues; designs and manages projects; acquires, processes, interprets, and analyzes information to make informed decisions; engages in inquiry; makes connections; transfers learning
Innovation, creativity, and entrepreneurship	Contributes to complex problems; enhances a concept, idea, or product; takes risks in thinking and creating; makes discoveries through inquiry research; pursues new ideas; leads and motivates with an ethical entrepreneurial spirit
Learning to learn/self-aware and self-directed learning	Learns the process of learning, believes in a grow mind-set, perseveres and overcomes challenges to reach a goal, self-regulates, reflects on learning, cultivates emotional intelligence, adapts to change, manages various aspects of life
Collaboration	Participates in teams; establishes positive relationships; learns from and contributes to others' learning; co-constructs knowledge, meaning, and content; assumes a variety of roles within a team; manages conflict; networks; respects a diversity of perspectives
Communication	Communicates effectively in different contexts in oral and written form in English and/or French, asks effective questions, communicates using a variety of media, selects appropriate digital tools, listens to understand, gains knowledge about a variety of languages, voices opinions, and advocates for ideas
Global citizenship	Contributes to society and the culture of the local, global, and digital community in a responsible, accountable, and ethical manner, engages in local and global initiatives, learns from and with a diverse people, interacts safely and responsibly within a variety of communities, creates a positive digital footprint, relates to the environment, and is mindful of the importance of all living things

4.6 Competences Applied

The competences/skills spiral through the K-12 curriculum. There is a “21st Century Learning Unit” in the Ontario Ministry of Education’s Curriculum and Assessment Policy Branch. As curriculum documents and policies are revised, these twenty-first-century skills are included in the updates and revisions.²³

For instance, the 2016 Kindergarten Program begins with a preface entitled “Elementary Schools for the Twenty-First Century,” “today and in the future, children need to be critically literate in order to synthesize information, make informed decisions, communicate effectively and thrive in an ever-changing global community” ([51], p. 4).

This message repeats in the revisions to all curriculum policy documents from kindergarten through Grade 12. The Ministry of Education’s student achievement officers and school board educators participated in 45 experimental learning projects to apply experiential learning and create video pedagogical documentation of innovative practices ([47], p. 27).

4.6.1 Competences in Kindergarten and Elementary Schools

The kindergarten curriculum is included as part of the elementary listings. The optional kindergarten, two-year, play-based learning program uses targeted strategies and inquiry to begin to close academic gaps for traditionally underachieving students, including those from backgrounds of generational poverty, new immigrants, and refugees.

The elementary curriculum policy documents are listed both by grade and by subject area. The most recent curriculum revisions are in Health and Physical Education (2015), Social Sciences (2013), and French as a Second Language (2013). The older documents such as Language (2006) and Mathematics (2005) contain fewer references to global competences and critical and creative thinking. The new Health and Physical Education Curriculum document²⁴ includes references to the challenges for positive, lifelong physical and mental health, as well as personal and collective wellness.²⁵

²³ The Ontario Early Years program is operating a 6-week school readiness preparation program for students entering kindergarten. The program “School’s Cool” is targeted at children from low income or vulnerable communities. In Ontario, kindergarten is voluntary; however, students may begin the September they will turn 4 if before January 1 or if eligible will begin at 3 years and 9 months.

²⁴ Health and Physical Education Curriculum Document: <http://edu.gov.on.ca/eng/curriculum/elementary/health1to8.pdf>.

²⁵ “A variety of factors, known as the “determinants of health” have been shown to affect a person’s overall state of well-being. Some of these are income, education and literacy, gender and culture, physical and social environment, personal health practices and coping skills, and availability of health services” (Health and Physical Education Document 2015, 4).

Pedagogy in the elementary grades focuses on inquiry and creating opportunities for students to collaboratively and creatively solve problems. A K-12 career-planning resource document, “Creating Pathways to Success,” was developed in 2013 to “ensure that students develop the knowledge and skills they need to make informed education and career/life choices through the effective application of a four-step inquiry process” (p. 3).

In 2016, the ministry released a resource document on financial literacy for Grades 4–8: “the goal is to help students acquire the knowledge and skills that will enable them to understand and respond to complex issues regarding their personal finances, as well as to develop an understanding of local and global effects of world economic forces and the social, environmental, and ethical implications of their own choices as consumers” (2016, p. 3).

In 2017, a resource document on environmental education²⁶ was developed. The directions and messages from these more recent revisions to curriculum resource documents and policy align with the global competences and enable implementation within the learning process. It is a model of how global competences can be infused across the curriculum as educators identify subject-specific expectations that can be paired with global competences in engaging ways. This is an example of how emerging trends and needs are identified and then aligned to competency development.

4.6.2 Competences in Secondary Schools

As is the case with elementary education, the curriculum policy documents for secondary education are accessible by subject and grade. The pattern of curricular revisions mirrors the elementary revisions. The achievement charts used for gathering evidence of learning assess evidence of knowledge and understanding, thinking, communication, and application in each of the subject-specific areas.²⁷

Relevance and deeper understanding to build global competences are integrated aims. The following is an example from the “Canada and World Studies” curriculum document (2013): “examining current events helps students analyze controversial issues, understand diverse perspectives, develop informed opinions, and build a deeper understanding of the world in which they live” (p. 40). As mathematics and science curricula are updated through revisions, these skills will be included throughout the grades and subjects.

The Grade 9 and 10 Canadian and World Studies curriculum, particularly in the compulsory “Civics and Citizenship” course in Grade 10, provides students with

²⁶ Environmental Education: Scope and Sequence of Expectations. The Ontario Curriculum, Grades 1–8, and the Kindergarten Program. 2017 Edition. http://www.edu.gov.on.ca/eng/curriculum/elementary/environmental_ed_kto8_eng.pdf.

²⁷ An example of a secondary school achievement chart is found on pages 36–37 of the [5]: <http://edu.gov.on.ca/eng/curriculum/secondary/canworld910curr2013.pdf>.

opportunities to learn about what it means to be a responsible, active citizen in the community of the classroom and the diverse communities to which they belong within and outside of school. It is important for students to understand that they belong to many communities and that, ultimately, they are all citizens of the global community. The “Framework for Citizenship Education” (p. 10) is published in the Grade 9 and 10 Canadian and World Studies curriculum (2013) and demonstrates how the global competences are seamlessly integrated into the curriculum.

Additionally, the revisions updating the various curriculum policy documents added a section on twenty-first-century skills/competences for program considerations. This section contains common and key messaging in terms of education for

- Instructional programming;
- Students with special needs;
- Students whose maternal languages are other than English/French and are English language learners (ELLs);
- Equity;
- Financial literacy;
- Mathematical and language literacy;
- Inquiry skills within mathematics and language literacy;
- Critical thinking and critical literacy; and
- Information and communications technology.

Box 4.1

Two examples from common messages demonstrate how these are fundamental to building and applying global competences within the curriculum:

- (a) “The Ontario equity and inclusive education strategy focuses on respecting diversity, promoting inclusive education, and identifying and eliminating discriminatory biases, systemic barriers, and power dynamics that limit the ability of students to learn, grow, and contribute to society ... Diversity is valued, and all members of the school community feel safe, comfortable, and accepted.” (2013, p. 49)
- (b) Information Literacy and Research Skills, students will:
 - “access, select, gather, process, critically evaluate, create, and communicate information;
 - use the information obtained to explore and investigate issues, solve problems, make decisions, build knowledge, create personal meaning, and enrich their lives;
 - communicate their findings to different audiences, using a variety of formats and technologies; and

- use information and research with understanding, responsibility, and imagination.” (2013, p. 54)

Global skills/competences are also embedded explicitly in all careers and guidance courses in Grades 9–12, where students focus on the development of the nine essential skills that have been identified by the Government of Canada and other national and international agencies as necessary for success in any occupation. The nine essential skills for career and guidance courses are as follows:

- Reading text
- Document use
- Writing
- Numeracy
- Oral communication
- Thinking skills
- Working with others
- Computer use
- Continuous learning

Students learn about the importance and transferability of the essential skills and become actively involved in developing and applying them in preparation for future work.

4.6.3 Specialist High Skills Major (Grades 11 and 12)

Ontario emphasized increased graduation rates as one of its priorities. One of the strategies that allows the application of global competences and alternative pathways is the Specialist High Skills Major (SHSM) program,²⁸ which allows senior students to focus on a career path while fulfilling the requirements for their high school diploma. The pathways encompass the workplace, apprenticeship, college, and university, and the SHSM program allows students to explore career options and gain important workplace skills, sector certification, and global competences.

The SHSM programs preparing students for the twenty-first-century workplace are available in a variety of sectors, from agriculture and manufacturing to nonprofit and environment.

Innovation is embedded in the Grade 9–12 courses, including technological education, science, and computer studies and linked to every SHSM program. A clear example found in the Ontario curriculum is the “13 Fundamental Technological Education” concepts aligned throughout the Grade 9–12 curriculum for technological education (2009), including transportation technology, construction, manufacturing,

²⁸ Specialist High Skills Major Program: <http://www.edu.gov.on.ca/morestudentsuccess/SHSM.html>.

design technology, health care, green industries, and communications technology. “Innovation” is listed as its own stand-alone fundamental concept.

Similar to the elementary curriculum, there is a range of policy and other resource documents that support and enhance students’ learning²⁹ including “First Nations, Metis and Inuit Connections Perspectives” (2016), “Financial Literacy” (2016), and “Growing Success” (2010). These reflect Ontario’s continued commitment to excellence and equity. To support the implementation of twenty-first-century competences/skills, the ministry established an Innovation Learning Fund, managed through the Council of Ontario Directors of Education.³⁰

4.6.4 Informal Education

In terms of informal education, schools and school systems are encouraged to develop student leadership and voice as outlined in the “School Effectiveness Framework” (2013). The Student Achievement Division³¹ addresses issues ranging from student success, leadership, program implementation, and professional development among others. Schools and school districts organize a variety of cocurricular opportunities including teams, clubs, and events (arts, athletics, and IT) for students where they can collaborate and practice global competences. In terms of leadership roles, students are elected by other students to school councils. At a system level, they provide input as student trustees on the Board of Education.

4.6.5 Special Education

Special education is included within the ministry’s Equity and Inclusion Strategy. Students who require support beyond those ordinarily received due to behavioral, communicational, intellectual, and physical or multiple exceptionalities may be identified as students with special needs through an Individual Education Plan (IEP).

An inclusionary placement in a regular classroom is the placement of first choice. Depending on the severity of the exceptionality and impact on learning needs, students may be placed in a small class setting with dedicated programming and services as outlined by an Identification, Placement, and Review Committee (IPRC). Approximately 12–15% of all Ontario students are identified with special needs. The most frequent exceptionality designated are learning disabilities. The Education Act

²⁹ Ontario Secondary Policy and Resource Documents: <http://edu.gov.on.ca/eng/curriculum/secondary/commenttwo.html>.

³⁰ Invitation for the 21st Century Teaching and Learning Roundtable Event: http://www.edu.gov.on.ca/eng/policyfunding/memos/jan2016/2016round_table.pdf.

³¹ Ministry of Education Organizational Chart: http://edu.gov.on.ca/eng/general/edu_chart.html.

mandates programs and services for identified students, including the use of assistive technology.³² More detailed information is contained in the ministry’s Special Education Update.³³

For students with special needs, the global competences are critical in ensuring that students develop the necessary skills and abilities to navigate life successfully. The global competences are easily adapted to support individualized learning plans and differentiated instruction to support the unique learning needs of every student and provide an inclusive framework that can be used to assist students in the acquisition of skills on a developmental continuum.

4.7 Measuring and Assessing Twenty-First Century Competences

Ontario’s framework for twenty-first-century/global competences provides six specific, evidence-based competences that have the capacity to transform both teaching and learning in schools. The competences, when embedded into the K-12 curriculum, provide a coherent framework and context to develop and prepare students to thrive as global citizens. “The research shows that whatever is measured matters” [2, p. 20].

For the twenty-first-century skills to be embedded and assessed in Ontario schools, Ontario educators require a formal structure for measuring and assessing the impact on student learning. This strategic planning process needs clear, focused, and purposeful direction on the use of the framework by both system and school leaders [29]. To establish a structure for success, a strategic execution process that outlines the implementation and monitoring process must be developed, including metrics that assess evidence of impact.

The tools to secure accountability are provided by the Education Quality and Accountability Office (EQAO) provincial assessments, the School Effectiveness Framework K-12 (2013), District Reviews, School Self-Assessment (SSA), and ongoing system/school leadership.

4.7.1 *Education Quality and Accountability Office*

In Ontario, the provincial agency tasked with assessment is the EQAO. The EQAO was established to design and deliver large-scale assessments and to measure Ontario’s students’ performance in reading, writing, and mathematics in Grades

³² Assistive Technology Tools: http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/WW_TechnologyTools.pdf.

³³ Ministry of Education Special Education Update: http://www.edu.gov.on.ca/eng/general/ele/msec/speced/special_ed_update.html.

3, 6, 9, and 10.³⁴ The provincial assessments are developed by Ontario educators and aligned to the provincial curriculum.

The EQAO provides schools and school districts with detailed information about students' achievement on the provincial assessments as well as contextual, attitudinal, and behavioral information from questionnaires. The data are used to inform school planning and interventions. The school and district results are publicly available, which encourages education members and systems to be accountable and enhances public confidence as part of the Achieving Excellence mandate.

The EQAO conducts research into educational practices and administers and reports on the pan-Canadian and international assessments³⁵ including PISA. Participation in the national and international assessments is another form of measuring; a framework is being developed for PISA 2018 to measure students' knowledge and understanding of global skills/competences.

As the EQAO assesses the provincial curriculum, it also assesses twenty-first-century skills as a component of its mandate. In 2014, the EQAO identified four skill categories that align to the provincial assessments: communication, numeracy, critical thinking and problem-solving, and the "learning to learn" as outlined in Ontario's global competences. These are measured through assessment tasks, item analysis, and questionnaires. The results have been referenced in the international assessment results of Canadian students, such as the financial literacy component of PISA. The EQAO has plans to convert the assessments into an electronic format mirroring the PISA initiatives.

Table 4.4 outlines two of the twenty-first-century skills assessed by the EQAO.

A detailed discussion of how Ontario students perform on components of twenty-first-century skills across the EQAO and the pan-Canadian and international assessments can be found in the background papers on 21st Century Skills for Elementary and for Secondary Students referenced at the end of this chapter.

For example, Ontario students show a progression toward acquiring important skills such as applying a variety of thinking skills, demonstrating a systematic approach to solving problems, and analyzing information to make judgments and draw conclusions. While the EQAO confirms that Ontario's students are progressing in their acquisition of twenty-first-century skills, there are areas requiring consolidation and mastery for all students. These include

- Using critical-thinking skills to solve problems;
- Communicating ideas clearly, coherently, and effectively; and
- Making real-world connections to literacy and numeracy skills.

³⁴ Grade 10 Assessment: Ontario Secondary School Literacy Test (OSSLT).

³⁵ Pan-Canadian Assessment Program (PCAP), PISA, Trends in International Mathematics and Science Study (TIMSS), Progress in International Reading Literacy Study (PIRLS). The results are on the EQAO's web site www.eqao.com.

Table 4.4 Examples of twenty-first-century skills assessed by the EQAO

twenty-first-century skills	EQAO
<i>Communication</i>	
<ul style="list-style-type: none"> • Communicate clearly and correctly in written form • Respond to written text in a manner that will ensure effective communication • Read and understand information presented in a variety of forms 	<ul style="list-style-type: none"> • In the writing components for Grades 3 and 6, and OSSLT, students respond to multiple-choice questions and prompts, write responses expressing opinions, finding evidence from the text, communicate ideas and information clearly and coherently, interact with narrative, informational, and graphic selections to construct an understanding, and make connections between the text and their personal knowledge and expertise
<i>Critical thinking and problem solving</i>	
<ul style="list-style-type: none"> • Apply a systematic approach to solve problems • Use a variety of thinking skills to solve problems • Analyze ideas and information to draw conclusions and make judgments 	<ul style="list-style-type: none"> • Students are expected to solve problems by selecting and applying a variety of problem-solving strategies. They have to make a plan and carry it out. Students identify the most important elements of the problem, understand relationships between elements, and draw appropriate conclusions. Students provide relevant supporting evidence from the text • Students analyze ideas and information presented in reading selections and respond to questions that require justification of interpretations from the text

4.7.2 *Implementation of Provincial Directives in Schools and School Systems*

In terms of monitoring school systems and schools’ implementation of provincial directives such as Ontario’s framework for twenty-first-century/global competences, the provincial government mandated that every school board should create and submit the BIPSA to the ministry. These plans contain measurable goals, increasingly including twenty-first-century global skills, and evidence/data of the intended changes as a measure of accountability. Additionally, each school in the district must create and submit their SIP. There is a mandated provincial process for school and school system reviews to measure and assess defined metrics in terms of learning, including twenty-first-century/global competences.

In other Canadian provinces, school reviews are used to assess and monitor change and can be a tool for transformative change [13]. These reviews include the improvement plans and student achievement data described within the “School Effectiveness Framework K-12” (2013).³⁶

The “School Effectiveness Framework K-12” (2013) is a self-assessment tool for schools. “It serves to:

- Help educators identify areas of strength, areas requiring improvement, and next steps;
- Act as a catalyst for shared instructional leadership through collaborative conversations focused on high levels of student learning and achievement;
- Promote inquiry focused on student learning, achievement, and well-being that informs goals and effective teaching and learning practices/strategies;
- Support educators in determining explicit, intentional, and precise improvement planning decisions which inform monitoring and feedback for continuous improvement and future planning in relation to enhanced student learning, achievement, and well-being;
- Maintain communication with stakeholders to foster increased public confidence about school effectiveness; and
- Build coherence in and across schools and districts” (SEF 2013, p. 3).

As Ontario’s system/school leaders and teachers build their capacity at full and sustainable integration of the global competences, the future of educational innovation becomes more engaging and fluid. Creating dynamic teaching and learning environments that embrace the global competences and are integrated into a culturally responsive, inclusive curriculum provides a formula for innovative twenty-first-century education.

The best outcome of the development of twenty-first-century skills/competences is that it provides clearly defined expectations to ensure equitable and inclusive learning spaces for all students. It transcends all grades and creates a responsive education approach for focusing Canadian students, teachers, and leaders. The EQAO and the “School Effectiveness Framework K-12” (2013) provide mechanisms to assess how effectively Ontario’s students will respond to the changing world and workplace.

However, the successful adoption and implementation of a change initiative also requires a formal structure, a strategic planning process, and the implementation of action plans at a system level and in all of Ontario’s schools. This requires clear, focused, and purposeful direction on the use of the framework by both system and school leaders [62]. At the heart of leading a successful change is the ability to monitor the implementation process and its effectiveness on a shift in instructional practice and an improvement in the academic success of students. This strategy focuses on intentionally building professional capacity, establishing plans, operationalizing implementation, and monitoring.

³⁶ School Effectiveness Framework K-12 (2013): <http://www.edu.gov.on.ca/eng/literacynumeracy/SEF2013.pdf>.

The “School Effectiveness Framework K-12” (2013) provides a focused structure for monitoring school improvement, staff instructional strategies, and student achievement success by implementing the SSA monitoring process three times a year. The SSA process brings school leaders together with their school staff and board staff to formally review the SIP and to assess data and evidence of impact. Three times a year, school teams meet to review data and conduct school learning walks to observe visible learning and engage student voices. Input from parent surveys and the School Community Council is often included to incorporate attitudinal/perceptual data into the assessment and analysis. This process will be discussed further in Sect. 4.8.

In Ontario, supervision of school leaders and schools is the responsibility of superintendents and directors³⁷ of the 72 Boards of Education. Superintendents of schools play an integral role in developing and supporting principals as instructional leaders and learners within the change process. The emphasis is on improvement and excellence for senior leaders.

The school teams, with superintendent support, complete an analysis report of the SSA and adjust goals and outcomes in the school plan. As school teams are becoming more proficient in using the SSA process, it is proving to be an effective assessment tool for monitoring; it shifts accountability and ownership to school staff in assessing their impact on school improvement and student achievement and success. The superintendent’s leadership in monitoring is an essential component of ensuring monitoring at all levels; this process has purpose and structure to support overall system accountability. Superintendents visit their “Family of Schools” at least three times a year to meet with the school administrators and school staff. Together, data are analyzed and learning walks are completed to demonstrate the implementation of key strategies and instructional practices, as outlined in the School Plan. Superintendents provide formal, written, and descriptive feedback and set targets with school teams.

A clearly defined strategic execution process, with formal and informal monitoring, is necessary to achieve sustained change in practice and adoption. The following guidelines build on research adapted from [32]:

- Establishing a sense of urgency with shared leadership and accountability
- Creating a team of key individuals to lead, guide the work, and collaborate
- Developing a vision, which includes success criteria, indicators, and measurable goals
- Creating an implementation plan with incremental steps and defined timelines
- Communicating the vision and change process
- Empowering leaders and teachers to implement change (resource allocation and ongoing, relevant professional development) that reflects twenty-first-century classrooms
- Developing an accountability framework that outlines each individual’s responsibility in monitoring, including intentional visibility
- Establishing the metrics based on success criteria and report on the results

³⁷ Council of Ontario Directors of Education (CODE): <http://www.ontariodirectors.ca/>.

- Gathering and analyzing data from a variety of sources to inform the next steps
- Monitoring the results regularly for impact and adjustment
- Achieving sustainability

School monitoring is a critical process for ensuring high expectations and ongoing school, staff, and student improvement. The most effective monitoring systems include formal processes for both internal and external accountability. The EQAO provides an external monitoring process that includes a critical lens on data. Internal monitoring by school administrators, school leadership teams, and superintendents creates a process for internal accountability and responsibility, which has the power to yield incredible results as our schools take ownership for improvement [18].

4.8 Teacher Development and the Role of Leaders: Teachers and Leaders Continually Learn from Each Other

As Ontario strives to prepare students for success in a changing, technology-reliant world, collective efforts continue to address the inevitable implications for the ways in which students learn, teachers teach, and leaders lead. The focus on creating system coherence indicates the success of Ontario, as it has, in a relatively short time frame, learned the required conditions to improve outcomes for students [16].

“Achieving Excellence: A Renewed Vision for Education in Ontario” (2014) articulates a commitment to define and measure twenty-first-century competences. The commitment is highlighted in the budget statement that “by 2025... Ontario will be a world leader in higher-order skills, such as critical thinking and problem solving, which will allow Ontario to thrive in the increasingly competitive global marketplace” ([58], p. 9).

“Achieving Excellence” also acknowledges a renewed focus on leadership, indicating that “Ontario will cultivate and continuously develop a high-quality teaching profession and strong leadership at all levels of the system” ([46], p. 1).

4.8.1 Professional Learning for Teachers: The Idea Is for Schools to Recognize that “Learning Is Voluntary but Inevitable”

Teacher professional learning and leadership capacity building have long been a focus in Ontario. The success of Ontario’s improvement strategy has hinged on supporting the growth of an innovative culture of learning, encouraging risk taking, and promoting continuous learning, collaboration, and capacity building. The Ministry of Education’s Phase 1 document “21st Century Competences” (2016)

notes that these approaches “are key to transformations in pedagogical practice, new learning partnerships, enhanced use of digital tools and resources and strategic design of learning spaces required for the development of 21st-century competencies” ([47], p. 48).

Both pre- and in-service teacher development programming have been continuously evolving to keep up with Ontario’s direction and the changing global context. There is renewed focus on revising approaches to teacher training, including a newly mandated two-year preservice teaching program.³⁸ The expanded program was designed to ensure that teacher candidates are able to develop pedagogical strategies that offer opportunities to promote deep learning and twenty-first-century skills/competences. Pellegrino et al. [55] note that “novice and experienced teachers need time to develop new understandings of the subjects they teach as well as the understanding of how to assess 21st-century competences in these subjects, making ongoing professional learning opportunities a central facet of every teacher’s job.”

“Engaging in problem solving and critical and creative thinking has been central to learning and innovation” ([55], p. 50). Providing opportunities for teachers to learn from each other through the implementation process has been key to the transformation of school cultures. Our changing times require heightened attention to the process of teaching and learning to ensure that these competences are explicit and intentional, not only within the curriculum, but also in the necessary shift in classroom and leadership practice [28]. As Fullan notes, the idea is for schools to recognize that “learning is voluntary but inevitable” ([14], p. 42). To this end, the Ontario Ministry of Education has collaborated with teacher federations in developing professional learning opportunities and resources.³⁹

4.8.2 Evidence-Based Developments in Teaching and Learning Approaches

Ever since 2011, school districts in Ontario have been learning more about the manner in which technology-enabled teaching and learning has affected the demonstration of these competences [46–52]. The ministry offers a variety of grants to assist teachers and leaders in working together on projects, such as the Teacher Learning and Leadership Program (TLLP).⁴⁰ These projects are also included in the body of evidence of effective practices and approaches. This selection of research provides important, Ontario-based evidence to inform future work in defining and measuring twenty-first-century competences. Evidence demonstrates that teaching strategies and the

³⁸ Teacher candidates have an undergraduate degree and then a two-year teaching program at a Faculty of Education: <http://edu.gov.on.ca/eng/general/list/faculty.html>.

³⁹ One example is the Elementary Teachers Federation of Ontario (ETFO): <http://www.etfo.ca/Pages/Home.aspx>.

⁴⁰ 2017–2018 TLLP: <http://edu.gov.on.ca/eng/teacher/tllp.html>.

provision of “rich learning tasks” [21] have continued to broaden as teachers build on their repertoire of pedagogical approaches to support this deep-learning emphasis.

Hattie’s comprehensive meta-analysis of the research outlines that teaching approaches are shown to have positive impacts in schools [23]. Fullan and Langworthy ([15], p. 20) note that these may range from “project-based learning through direct instruction to an inquiry-based model where the teacher uses strategies based on student needs.” Arising from these deepening approaches to teaching and learning has been a renewed consideration of assessment: “If there is value in promoting new pedagogical models that make it possible for students to apply their learning to real-world problems with authentic audiences, then assessments need to be adapted to widen the range of skills and knowledge being observed” ([2], p. 20). This requires ongoing professional development to ensure that assessment skills align with the broader goals for student learning.

4.8.3 The Role of Leaders: Leadership Has Made an “Undeniable” Difference in Ontario

Effective leadership is a key supporting condition for achieving the province’s core education priorities [27]. The Ontario Leadership Framework, which defines effective leadership practice, was last revised in 2013. Fullan [17] has noted that leadership has made an “undeniable” difference in Ontario.

Since 2013, the Ontario Ministry of Education has introduced its “Well-Being Strategy for Education” (2016) and a heightened focus on its “Equity and Inclusive Education Strategy” (2009). The challenge falls upon leaders to ensure that these strategies, together with Ontario’s twenty-first-century global competences, are firmly grounded in the work of schools as they focus on improving student achievement and well-being. The proposed global competences together with the well-being and equity strategies point to deepening the knowledge and skills necessary to support the work of teachers, schools, and leaders. Many district school boards have now moved to include these in their strategic plans [15].

Teacher and leader communication and collaboration processes have long been of interest to those engaged in professional learning. Dede [11] acknowledges that collaborative inquiry is “tough to do well” in practice. At the school and district levels, collaborative inquiry involves teams of educators working together as co-learners to study student learning. Dweck [12] explains that as a professional learning strategy, collaborative inquiry encourages all educators to “fulfill their potential” to help students “fulfill their potential.”

Leithwood [28] has described leadership as “the exercise of influence.” Much of the focus on capacity building in the current context addresses how leaders work with their teams to improve student achievement and well-being. Leaders across Ontario have also appreciated the capacity building and resource supports provided by the Ontario ministry. One example is the professional learning series titled “Capacity

Building Series” (Ontario Ministry of Education),⁴¹ which supports leadership and instructional effectiveness in Ontario’s schools.

In recent years, interest has been generated in the power of professional networked approaches to teaching and learning. The process provides opportunities for education leaders and practitioners to develop a shared understanding of high-quality instruction and how schools and districts can collectively support this effort [6]. The process of teaching and learning is observed in practice and a collaborative learning culture is nurtured.

4.8.4 Collaborative Efforts Between Teachers and Leaders

In 2016, aligned with its efforts in reaching the goals outlined in “Achieving Excellence” (2014), the province introduced Policy/Program Memorandum (PPM 159) on Collaborative Professionalism [46–52]. This policy builds on Ontario’s solid foundation of achievement promoting “the establishment of trusting relationships that value the voices of all encourage reflection and support professional growth” [46–52]. Specifically, the core priority of the PPM 159 addresses the building of a shared commitment to working together to improve student achievement and the well-being of both staff and students. It also addresses the need to “transform culture and optimize conditions for learning, working and leading at all levels of the education sector” [46–52].

Leaders across Ontario are exploring a variety of successful processes. One that shows promise is The Learning Conversations Protocol (2016).⁴² Katz and Dack [26] designed the protocol to enable focused learning discussions among educators. The seven steps of the protocol must be followed carefully enabling collaborative groups to structure their learning conversations as a central part of their professional learning efforts.

4.9 Community and Stakeholder Engagement: Stakeholder Engagement Has Been a Source of Strength and Support

For over two decades, Ontario has been experiencing a transition to an education system based on clearly articulated twenty-first-century competences. Community and stakeholder engagement has been an important factor in shaping this change. The engagement has included public consultations leading to policy development

⁴¹ Capacity Building Series: <http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/capacityBuilding.html>.

⁴² The Learning Conversations Protocol (2016): http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/learning_conversations.pdf.

or program change; encouragement for active involvement by parents and citizens in projects, committees, and councils; emphasis on communication and welcoming environments for parents; and initiatives of citizen organizations to supplement and support the directions of public education.

Throughout this transition, parents, teachers, education organizations, teacher unions, the business community, and other education-focused citizen groups have been engaged to contribute ideas and express concerns. As the system has moved toward its goals of excellence, stakeholder engagement has been a source of strength and support.

4.9.1 Public Engagement Efforts

A seminal event involving extensive engagement occurred in the mid-1990s. During this event, a ministry-appointed Royal Commission, a high-level panel of five education experts and academics, conducted broad consultation among citizens and educators.⁴³ The commissioners began by acknowledging widespread concern over a publicly funded education system that seemed insufficiently responsible to the public and set out to hear from as many people as possible. They listened to presentations from 1,396 groups and individuals in 27 cities and received written, voicemail, or email messages and submissions from 3,350 other individuals.⁴⁴

Because of the interest generated by its comprehensive process, the commission's report was widely read and deeply influential. It provided "a blueprint for changing Ontario's schools to equip all students for the challenges of the twenty-first century" [44]. The cochair of the commission stated its goal that all students would become "literate, knowledgeable, creative and committed young men and women ... able to solve problems, and think logically and critically" [44]. She added that "they will be able to communicate articulately, work cooperatively, and most importantly, will have learned how to learn" [44].⁴⁵

The report also emphasized technological literacy and school-community councils to foster connections with parents and community members. The commission's engagement of stakeholders was more far-reaching than any consultation previously undertaken, and the goals that resulted were the precursors of Ontario's twenty-first-century competencies and skills.⁴⁶

⁴³ Royal Commission on Learning Report: <http://www.edu.gov.on.ca/eng/general/abcs/rcom/short/short.html>.

⁴⁴ For the Love Of Learning: Report of the Royal Commission on Learning (1994): <http://www.edu.gov.on.ca/eng/general/abcs/rcom/full/volume1/volume1.html>.

⁴⁵ Royal Commission on Learning Press Release (1995): <http://www.edu.gov.on.ca/eng/general/abcs/rcom/news.html>.

⁴⁶ 21st Century Competencies: Foundation Document for Ontario (2016): http://www.edugains.ca/resources21CL/About21stCentury/21CL_21stCenturyCompetencies.pdf.

Despite the success of this major exercise in public engagement, no one claimed that all views could be harmonized and included. The report acknowledges a fundamental truth that “it was not easy to find common themes or concerns among all these interested citizens, and certainly there was consensus about precious little.”⁴⁷ The lesson communicated was that public engagement yields a range of material. There are immediately useful ideas, interesting but currently impractical thoughts, and complaints that are often passionate and highly personal. The Royal Commission’s report could not include everything that everyone expressed, but its consultation had a key merit: it was an open-minded search for ideas and opinions. It was definitely not a case of education authorities looking for evidence of public support for what they had already decided to implement.

4.9.2 Establishing the EQAO: Tests Would Be Fair and Data Would Be Used to Support Improvement, not Make Judgments

Between 1997 and 2001, Ontario acted on a number of recommendations by the commission, including the creation of an agency to assess the learning of every student and provide publicly accessible data from these assessments.⁴⁸ The implementation of this province-wide testing was controversial. Parents were generally in favor of the initiative, but most teachers saw tests as an unfair attempt to judge their pedagogical performance.

The new agency, the EQAO, embarked on several forms of engagement to convince its constituencies that tests would be fair and data would be used to support improvement, not make judgments:

- An advisory committee was established with members from all levels of education, from the business community to unions. The committee made key recommendations about the need for tests firmly based on the newly developed provincial curriculum.
- EQAO leaders, including members of a citizen board, traveled the province speaking to district officials and teachers about the tests. They spent long hours with teachers and representatives of the various unions, discussing improvement as the goal of the assessment. Initial engagement with these core groups lessened opposition, although it did not create enthusiastic support.
- EQAO engagement also included meetings with leaders of groups with specific interests such as learning disabilities or parent participation and with representatives of educational associations. These organizations provided ideas to improve

⁴⁷ Royal Commission on Learning: <http://www.edu.gov.on.ca/eng/general/abcs/rcom/short/short.html>.

⁴⁸ For the Love Of Learning: Report of the Royal Commission (1994), Chapter 11: Evaluating Achievement: <http://www.edu.gov.on.ca/eng/general/abcs/rcom/recommen.html>.

assessment tools as well as offer support based on a clearer understanding of assessment goals.

In 2016, after 15 years of implementing tests for Grades 3, 6, 9, and 10, many educators agreed that intensive stakeholder engagement to support and improve provincial assessments was an important factor in the program's success. Furthermore, they agreed that improvements in Ontario education (as reflected in PISA results) were linked to effective curriculum-based assessment that incorporated twenty-first-century competences.

4.9.3 Engaging with Parents: Parents Are Essential Partners

In 2010, the Ministry of Education released “Parents in Partnership: A Parent Engagement Policy” (2010).⁴⁹ This document formalized expectations that had been developing over the past decade, as the benefits of parent involvement in education became very clear. The four foundations of engagement identified in the policy were

- (a) A welcoming environment;
- (b) Clear communication of opportunities to participate;
- (c) Ongoing dialogue; and
- (d) A flow of information relevant to parent support of children.

The policy emphasized new ways to engage parents, such as using twenty-first-century technology to allow them to view, hear, or read materials related to their children's schools. The policy also acknowledged the need for global awareness in twenty-first-century Canada, where an appreciation for diversity is essential. Districts were encouraged to provide key messages and information in several languages to avoid excluding parents whose language or cultural background left them feeling remote from schools. Schools and districts were also reminded that including parents of diverse backgrounds on councils and committees would enrich the learning environment and that providing community outreach workers would help hesitant parents to become involved. By planning for complementary approaches by schools, districts, and the province, the education system can send a powerful message that parents are essential partners.

Parent Reaching Out Grants⁵⁰ are another example of ministry engagement. This grant program invites participation by school-based parent councils, district parent involvement committees, and not-for-profit organizations. Groups are asked to define projects that address important issues in their school communities and then apply for funding to implement their plans. Grants are awarded for a wide variety of activities, for example, learning events for families where parents attend and participate alongside their children in activities that emphasize twenty-first-century competences such

⁴⁹ Parents in Partnership (2010): www.edu.gov.on.ca/eng/parents/involvement/pe_policy2010.pdf.

⁵⁰ Ontario Ministry of Education Parent Reaching Out Grants: www.edu.gov.on.ca/eng/parents/reaching.html.

as problem-solving and critical thinking. Over 19,500 projects have been funded by these grants since 2005, and the program has contributed to lasting engagement in thousands of communities.

4.9.4 *Citizen Groups*

The examples presented earlier are associated with the ministry's initiatives. However, citizen groups committed to public education initiate some stakeholder engagement independently. One such group is **The Learning Partnership (TLP)**, founded by Ontario business leaders to build bridges between the education and business communities.⁵¹

Among other activities, TLP develops programs for students. Included in its student programs are "Entrepreneurial Adventure" that emphasizes twenty-first-century skills such as marketing, planning, team building, and social responsibility and "Investigate! Invent! Innovate!" that integrates science, technology, engineering, and math (STEM) skills and twenty-first-century competences such as critical thinking, creativity, collaboration, and communication.

Another citizen organization with different purposes is **People for Education**.⁵² This organization is devoted to research, policy recommendations, and public dialogue. It produces an annual report on publicly funded schools designed to engage the community in thoughtful conversation about system improvement. Although its 2017 report⁵³ is not specifically focused on twenty-first-century competences, one section does comment on Ontario's "strategy to help the province's current and future workforce adapt to the demands of a technology-driven knowledge economy" ([56], p. 30).

TLP and People for Education are examples of the citizen groups that engage productively with Ontario's evolving education programs.

4.9.5 *Achieving Excellence Report*

In 2014, "Achieving Excellence: A Renewed Vision for Education in Ontario"⁵⁴ was released by the ministry after a comprehensive engagement of stakeholders. Its premise was that Ontario had taken great strides in the previous decade but needed to move from great to excellent. The emphasis on "renewed" in the title of this document

⁵¹ The Learning Partnership: <http://www.thelearningpartnership.ca/>.

⁵² People for Education: <http://www.peopleforeducation.ca/>.

⁵³ People for Education [56] Annual Report: <http://www.peopleforeducation.ca/research/annual-report/>.

⁵⁴ Achieving Excellence: A Renewed Vision for Education in Ontario (2014): <http://www.edu.gov.on.ca/eng/about/renewedVision.pdf>.

reminds us that periodic consultation should be an important part of an evolutionary process.

Consultation for “Achieving Excellence” (2014) included input sessions for provincial organizations, regional meetings for local groups, and digital-only opportunities for individuals and groups not otherwise included. Participants in the consultation were asked to respond to seven questions developed by a committee of stakeholders. These questions invited input on graduation outcomes, student well-being, achieving equity, lifelong learning, use of technology, and partnerships. The report reflects input that supported twenty-first-century competences as it envisages students who will “become personally successful, economically productive and actively engaged citizens” and also “motivated innovators, community builders, creative talent, skilled workers, [and] entrepreneurs” [46, p. 1].

To some extent, the outcomes of this and other consultations are dependent on who is likely to have participated most effectively. Often groups that are well-organized and well-funded have the best chance of expressing their views in a forceful manner. They are more likely to have research data and speak in professional terms familiar to policy makers. It is always useful to ask whether the “average person” is adequately represented when the majority of input is from professional groups. A report such as “Achieving Excellence” (2014) must find a fair balance among the voices heard.

4.10 Twenty-First-Century Skills and Industry Needs

In Canada over the last 10 years, 40% of labor growth has been due to migration. The Canadian and Ontario economies have continued to improve since the 2008/2009 global downturn and the economic projections are hopeful due to impacts from NAFTA, European Union, and pan-Asian trade opportunities. To meet the challenges, Ontario and Canada require a highly skilled (including skilled trades) and educated workforce.

4.10.1 Twenty-First Century Skills for the Changing Workplace

The Conference Board of Canada identifies employability skills for 2000 and beyond including fundamental skills, personal management skills, and teamwork skills requiring the ability to

- Communicate;
- Manage information;
- Use numbers;
- Think and solve problems;
- Demonstrate positive attitudes and behaviors;

- Be responsible;
- Be adaptable;
- Learn continuously;
- Work safely;
- Work with others; and
- Participate in projects and tasks.

In Ontario, the Premier’s Highly Skilled Workforce Expert Panel’s task was to develop an integrated strategy to inform policy and direction regarding the development of a highly skilled workforce to meet Ontario’s demands of technology, knowledge economy, and the shifting labor market realities. The panel’s aim was to develop approaches, responses, and resources to, “bridge the worlds of skills development, education, and training” ([33–35], p. 2). The panel and government understand the need for a highly skilled workforce and view the training as a shared responsibility to plan, train, and reskill. Ontario’s workforce is diverse and “recognized as well credentialed.”

Overall, the Canadian labor force is considered well educated. The percentage of Ontario students graduating from high school after five years is above 85%. In 2014, the OECD ([33–35], p. 5) reported that 66% of Ontario adults had a post-secondary degree or diploma—more than any OECD member nation. Supporting a highly educated workforce, Canada at 55% has the highest proportion of working-age adults with degrees/diplomas/accreditation from post-secondary institutions, as compared to the OECD average of 35% [8].

4.10.2 Implications for Education

According to Statistics Canada, 70% of new jobs will require a high school diploma and some degree of post-secondary education. Immigration will be increasingly important as birth rates decline. More than 50% of immigrants have a university degree, twice that of the Canadian-born population. The government wants to develop an integrated learner-focused adult education system focused on reskilling and retraining through incentivizing lifelong learning.

Grose [22] challenges the existing expectations noting that, “as students grow to become digitally literate citizens and leaders in our connected world, multi-faceted thinking skills are needed to navigate digital, multimodal text and media laden environments to interpret large volumes of new information, to use oral, listening and written language to communicate persuasively and to promote and advance ideas; and to think critically and ethically in contexts to collaborate, communicate, create and succeed in learning and life.” Jenkins ([25], p. 4) explains that a changing workplace, “participatory culture shifts the focus of literacy from one of individual expression to community involvement.” The twenty-first-century skills/competences are transitioning from workplace demands into the written and taught K-12 curriculum in response to this changing reality.

4.11 Twenty-First Century Competences Implementation Best Practices

This section considers best practices in pedagogical implementation, describing the influence of these factors in our shift from teaching organizations to learning organizations and in the adoption of learner-centric pedagogies aided by technology to support deeper learning [9, 19, 15, 22, 55, 61].

Responding to a changing world and workplace, the emerging learning-focused paradigm requires an explicit and intentional transition from what is known as objectivist⁵⁵ to that of interdisciplinary, inquiry-based learner-centric approaches. These types of pedagogical practices provide students with opportunities to lead their own learning, collaborate with each other as well as experts to solve authentic and complex problems, explore their own questions, and address real-world challenges [46–52]. Learner-centric practices foster student agency by embedding student choice and voice in the learning process itself. This includes, but is not limited to, the choice regarding the ways in which they demonstrate their learning and the type of technology they use to support their learning.

The process by which students learn rich core content in innovative ways and are able to transfer and apply that learning to new situations requires new pedagogies accelerated by technology [19]. The following supports the development of twenty-first-century skills/competences:

- Implementing pedagogical practices that include inquiry-learning, project-based learning, experiential learning, internships, and physical and virtual connections with the wider community. As the World Economic Forum’s “The Future of Jobs Report” [63] indicates, the global economy is expected to gain 2 million jobs in STEM-related fields in less than five years. These pedagogies should include formal and informal STEM-related experiences in computer, environmental, health and data science, engineering, gaming, and digital media production through technology-supported and hands-on experience in coding, hackathon challenges, computer programming, and robotics to spark interest in STEM-related careers. These are of particular importance to female students.
- Creating knowledge-building communities [57] that collaboratively explore and share new knowledge, expose students to a diversity of thought, and broaden perspectives, thereby enhancing critical and ethical thinking and deepening understandings
- Encouraging students to creatively use different types of tools, styles, formats, and digital media to participate in global conversations and to collaborate with multiple audiences to analyze data and solve real-world problems
- Providing broader participatory face-to-face, blended, and online environments where students engage in dialogue, collaboration, and inquiry and where they feel their voice matters, thereby empowering ownership in the learning process

⁵⁵ More traditional, teacher-focused methodologies.

- Ensuring there is shared ownership for learning by providing authentic opportunities for students to learn from and with each other, and for educators to learn from and with students
- **Focusing explicit and intentional learning opportunities** regarding digital leadership and the rights and responsibilities of respectful participation

Educators are striving to implement deeper learning and ensure learning is personalized, flexible, and supported by a culturally relevant and globally contextualized curriculum. Students, then, have opportunities to develop the cognitive, interpersonal, and intrapersonal competences needed to lead, learn, and work more collaboratively with all cultures in both physical and online environments.

Opportunities are provided for students to direct and construct their own learning; their own professional learning models must also evolve to support teacher agency. This requires a shift from a traditional top-down professional learning model to more authentic learning ecosystems that support collaborative professionalism, de-privatization of practice, knowledge construction, and ongoing growth. Opportunities for professional learning and growth are collaboratively constructed and reflect the “4Rs” of authentic learning summarized in the Ontario Ministry of Education’s 2017 “Mentoring for All eBook” (see Table 4.5).

Table 4.5 4Rs of authentic professional learning

Relational	Recursive
<ul style="list-style-type: none"> • Relational trust creates an inclusive learning space with all partners in the learning process listening to each other (students, educators, parents, and school community) • All learners collaboratively construct communities of practice that build upon their strengths, attributes, and experiences 	<ul style="list-style-type: none"> • Rich learning tasks reflect embedded beliefs that learning itself is a messy, iterative, recursive process • Protocols for application of learning, follow-up, and evaluation of impact are embedded into the learning process
Responsive	Real World
<ul style="list-style-type: none"> • Learners are listened to and their individual and collective voices directly inform learning designs • The “how” and “what” of the learning designs employed are based on authentic learning goals identified by the participants • Learning “makes sense” to the learners and involves authentic collaboration, choice, voice, and agency 	<ul style="list-style-type: none"> • Learners construct learning together that is relevant and has authentic real-world connections and applications • Learning designs that leverage peer-to-peer networks for deep learning and foster the intentional sharing of knowledge and practice are utilized • A direct connection to student learning and well-being is evident (that is, students are at the center of the learning)

4.11.1 New Roles in Learning

Co-constructing empowers student ownership, collaboration, creativity, and innovation, resulting in teaching and learning that is more inclusive, instructionally precise, attributes based, and culturally responsive. As teachers shift their traditional roles, emerging as facilitators of learning-centered environments, students become authentic sources of learning for both the teacher and their peers. Teachers utilize a combination of modeling, coaching, and scaffolding to direct and guide instruction facilitating deep-learning tasks. The teacher is also a learner alongside their students.

In the context of these types of learner-centric environments in classrooms that are flexible and connected locally and globally 24/7, a more fluid and adaptive participatory learning culture emerges for all learners [22] where:

- Critical thinkers and problem solvers use “evidence and data, analyze, think critically and manage projects, solve problems and make informed decisions using digital tools and resources”
- Collaborators work together both face-to-face and virtually, to support personalized learning and contribute to the learning of others;
- Communicators make and share meaning and their point of view using a variety of digital tools with real and online audiences; and
- Creators and innovators “demonstrate creative thinking, construct knowledge and develop innovative products and processes using technology” [10], p. 7.

4.11.2 The Role of Technology: Digital Spaces for Educators

There are two innovative and collaborative digital spaces to assist all educators in Ontario with knowledge building, accessing research and evidence, and sharing of best practices in action. The first is TVO’s award-winning TeachOntario.⁵⁶ TeachOntario was created by TVO, in partnership with the Ontario Teachers’ Federation (OTF) and its affiliates, the Ministry of Education and in consultation with elementary and secondary teachers from a variety of districts across the province. TeachOntario offers tremendous opportunity to support professional learning, to foster educator leadership, and to facilitate the sharing of exemplary practices with others, both locally and globally. TeachOntario is a unique destination created “for Ontario’s educators, by Ontario’s educators.”

The second digital space is the Ontario Ministry of Education’s Learning Exchange, created by the Ministry of Education’s Student Achievement Division.⁵⁷ The Learning Exchange supports the goal of achieving excellence in education for early learning, K-12, and adult education.

⁵⁶ TeachOntario: www.tvo.org/teachontario.

⁵⁷ Ministry of Education’s Learning Exchange: <http://thelearningexchange.ca/>.

4.12 Twenty-First Century Competences Implementation Challenges

Inherent challenges for effective implementation involve “will and skill” [16]. Learning to collaborate, communicate effectively, and use creativity, critical thinking, and problem-solving skills is challenging to implement coherently and deeply across Ontario’s classrooms and 5,000 schools. Section 4.11 of this chapter examines (a) how twenty-first-century competences are applied in Ontario, (b) what challenges schools and school systems face in this type of large-scale implementation, and how educators and policy makers know if the intended change is occurring and if it is affecting student learning.

We know that it is difficult to effectively implement complex policies in education and to sustain the implementation. Policy makers and educators struggle with the challenges of moving to scale and having a new practice actually taking place, roughly as intended, in all or almost all schools and classrooms. Freedman and Di Cecco ([13], p. 3) examine “how to decrease variability among and between schools and classrooms.” Coburn [7] argued that moving to scale involved issues of sustainability, spread of norms and beliefs involved with the change, and a shift in ownership to a shared model, so the reform becomes self-generative. This means to scale up and embed an initiative such as implementing twenty-first-century competences, the design and planning needs to account for depth and breadth across the system, province, and nation.

For education, depth means substantive change in teaching and learning. Fullan and Quinn ([16], p. 3) argue that implementing change coherently involves “a set of right drivers that are effective: capacity building, collaboration, pedagogy, and systemness (coordinated policies).” These drivers also comprise the challenges to implementation. Educators tend to be risk-adverse. The change, therefore, must be clearly articulated and implemented gradually. Intentional and thoughtful action planning, including time lines, resources, professional learning, designated champions, and measures/indicators of success, provides road maps for the desired change. There are implications for policy and practice.

4.12.1 Policies and Funding

The Ministry of Education released its foundational document “21st Century Competences (2016)”, referenced in Sect. 4.5 of this chapter. The document had a focus on “developing these competences in explicit and intentional ways through deliberate changes in curriculum design and pedagogical practice” [1, p. 6]. The challenge is “to prepare students to solve messy, complex problems—including problems we don’t yet know about—associated in living in a competitive globally connected, technologically intensive world” [47, p. 3]. This is part of the shift from schools of teaching to schools of learning and thinking.

The initiatives are going to be effective in raising academic bars and closing gaps. The initiatives are aligned to avoid fragmentation and educators feeling overwhelmed with the scope of the change. Increasingly, educators want policies and strategies that are evidence informed [23, 24]. Effective change does not happen within a single school term or even year. It requires three to seven years of intentional implementation, targeted and intentional support, and monitoring.

4.12.2 *Range of Learners*

In addition to embedding twenty-first-century competences/skills in the curriculum, instructional time and pedagogical practices must be adapted to develop these skills in Ontario's students. Another issue in implementation is a recognition of support required to increase student engagement and achievement. These accommodations are required by a range of learners. While Ontario supports both excellence and equity and has made significant gains in closing achievement gaps, complex issues remain. There are still gaps in learning experienced by indigenous students, youth in care and custody, learners with mental health issues, and students identified with special education needs. The curriculum policy documents and resources include these students as learners within the system. There are specialized supports and services provided, and the Ministry of Education works with its partners to deliver inclusive, culturally relevant education for all learners.

4.12.3 *Human Resources*

Effective implementation of twenty-first-century competences/skills can occur with trained and confident staff members who understand professional pedagogy and the use of digital technology. Fullan and Langworthy [15] caution about the challenges to implementing new pedagogies accelerated by technology. Teachers need to acquire the growth mind-set that twenty-first-century skills can and will affect student outcomes [1]. Dede ([9], p. 9) notes that “teachers will find it hard to provide deep learning opportunities without employing learning opportunities,” however, many teachers lack the skill and confidence to make this happen.

On the Grade 9 EQAO mathematics assessment, only 40% of math teachers reported solving open-ended problems, less than 30% conducted math investigations, and 35% asked students to use computer software in mathematics classrooms. In the 2017 mathematics assessments, Ontario students in Grades 3 and 6 experienced challenges in responding to thinking problems and multistep, open-ended mathematical problems.⁵⁸

⁵⁸ Retrieved from: <https://ca.yahoo.com/news/math-scores-flat-falling-among-143409293.html>.

Increasing professional learning and expertise of teachers and leaders remains an ongoing challenge for implementation:

- Designing and delivering preservice training that incorporates knowledge and evidence-informed pedagogies on implementing twenty-first-century competences/skills
- Building the skills and knowledge of school leaders to lead collaborative deep change
- Providing funding and release time for ongoing professional learning
- Sustaining productive and impactful collaborative professional learning inquiries and sharing leadership and accountability for collectively implementing twenty-first-century skills/competences
- Developing incentives for teachers to voluntarily enroll in Additional Qualifications (AQs), where teachers take ministry-approved courses such as “Integration of Information and Computer Technology in Instruction and Assistive Technology”
- Developing outreach partnerships with community agencies and business to offer students authentic learning experiences
- Providing frameworks and tools for knowledge sharing and mobilization
- Working with the teacher federations/unions as partners in the change process. The unions represent Catholic teachers, elementary teachers (public), secondary teachers (public), and French first-language teachers.

An equity issue involving implementation is that teachers and administrators do not reflect the student diversity that exists in Ontario’s classrooms. There are challenges in developing responsive methodologies and pedagogies that allow Ontario’s diverse student body to see themselves reflected in the curriculum:

- Multilingual resources and/or translated resources including braille and other accessible formats and modalities;
- Using examples and ensuring that names that are reflective of the students as twenty-first-century skills are integrated;
- Changing assessment practices to provide evidence of twenty-first-century skills/competences;
- Learner-centric materials and active student involvement in terms of voice and choice;
- Providing intentional interventions to close existing academic gaps.

4.12.4 Learning Environment

In times of fiscal restraint, change implementation needs to be cost-effective and efficient. There are inequities existing within the system, as wealthier communities

can supplement ministry/board funding and provide extra technology and opportunities to local schools.⁵⁹ Schools in urban areas have access to reliable high-speed Internet. This may not be the case in Ontario’s rural/remote communities. The cost of updating equipment is very challenging. Additionally, there are challenges in terms of

- Access to current, well-maintained technology;
- Awareness of digital tools and their effective use;
- Teachers’ competency with digital tools and integrating them into their practice;
- Integration of technology into the learning environment;
- Providing flexible seating for collaboration and constructivist learning; and
- Transforming school libraries into learning centers or hubs of learning.

4.13 Conclusion. Ontario Education: Where to Next?

The Ontario Ministry of Education [47, p. 45] states that “transformations in pedagogical practice, new learning partnerships, enhanced use of digital tools and resources, physical and virtual spaces designed to support learning are required to ensure students’ development of 21st-century competencies.”

In that spirit, on September 6, 2017, Premier Wynne and the Minister of Education announced a plan to modernize the curriculum and improve assessment and reporting to parents and the public. To keep Ontario schools competitive and world-class, “Ontario’s updated school curriculum will be developed through the public consultations with the goal of improving student achievement in core skills such as math and increasing emphasis on transferable life skills that can help students of all ages meet the changing demands of today and tomorrow. Communication, problem-solving, critical thinking, creativity, and global citizenship are skills that will help Ontario students thrive as they grow up in a changing, interconnected world. Beginning next school year, new report cards will better track a young person’s development of these essential and transferable life skills” [39–43, 53, 54].

Where to next is becoming now.

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⁵⁹ The top 5% of fundraising schools in affluent areas can raise as much funds as the bottom 83% combined: <http://www.peopleforeducation.ca/wp-content/uploads/2017/06/P4E-annual-report-2017.pdf>.

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