



Connecting to success

Technology in Ontario schools



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Data from the survey

Specific research data from the survey can be provided for a fee. Elementary school data have been collected since 1997, and secondary school data have been collected since 2000. For more information, please contact info@peopleforeducation.ca.

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Connecting to success

Quick facts:

- 97% of elementary schools and 100% of secondary schools report teachers using technology to communicate with students.
- 33% of all elementary and 66% of secondary schools encourage students to “bring your own device” (BYOD) every day.
- 85% of elementary schools in high-income neighbourhoods fundraise for technology, compared to 54% of elementary schools in low-income neighbourhoods.
- In 2019, 54% of elementary schools had at least one full or part-time teacher-librarian, compared to 80% in 1998. Teacher-librarians facilitate learning with technology in schools.

Technology in Ontario schools

The use of technology in today’s classrooms has the potential to enable, expand, and accelerate learning in ways previously unimaginable (Fullan & Langworthy, 2014). Whether through interactive whiteboards, tablets, apps, robotic toys, or gamified quizzes, technology is changing the way schools work.

Classrooms immersed in digital learning help students work collaboratively, develop problem solving and critical thinking skills, be motivated to learn, take ownership of their learning, and develop creativity skills (Project Tomorrow, 2015). These competencies are the “new basics” for public education: they allow students to navigate a globalized world, prepare them for careers in a knowledge economy, and help them in both their personal and professional lives (Ontario Ministry of Education, 2016; People for Education, 2018a; Royal Bank of Canada, 2018).

In the next ten years, over one quarter of Canadian jobs will be disrupted by technology (Royal Bank of Canada, 2018), and computer and mathematical jobs will be major drivers of employment (World Economic Forum, 2016). Consequently, technology use in education is becoming increasingly important for student success (Council of Ontario Directors of Education, 2011).

Over the last five years, data from People for Education and the Education Quality and Accountability Office (EQAO) have provided insights into the use of technology in Ontario schools:

- In 2014, almost every school had access to computers. In 80% of elementary schools, principals reported that computers were integrated with student learning beginning in kindergarten (People for Education, 2014).
- In 2018, 68% of grade 3 and 94% of grade 6 teachers reported asking their students to use the internet as part of their language instruction (Education Quality and Accountability Office, 2018).
- In 2019, our data shows that in 97% of elementary schools and 100% of secondary schools, at least some teachers communicate with students using technology (up from approximately 88% of elementary schools in 2014).
- This year, 33% of elementary schools and 66% of secondary schools report that they encourage students to bring their own electronic devices to class every day. In those schools, most of the principals report that teachers create lessons with the “Bring your own device” (BYOD) policy in mind.

According to principals, lack of funding, poor connectivity, and insufficient access to professional development can make it challenging to successfully integrate technology in schools. But when these barriers are overcome, technology has the potential to enhance learning spaces.

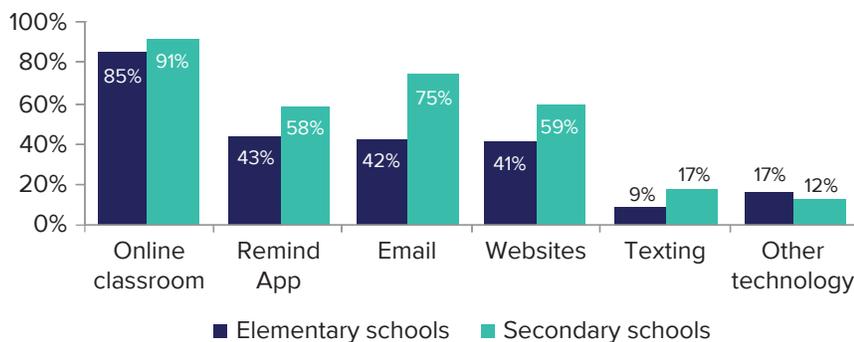
Learning beyond the school walls

In 2014, 88% of elementary schools reported that some teachers communicated online with parents/students. In 2019, 97% of elementary schools and 100% of secondary schools report that some of their teachers use technology to communicate with students.

Teachers use a variety of tools, including email, classroom websites, web applications (e.g. Remind, Seesaw, Class Dojo), and online classrooms (see Figure 1). These tools allow learning to continue beyond the confines of a classroom. Students can email teachers with questions, ask for one-on-one support, watch videos, or read articles related to class learning. The tools also allow teachers to assess student performance in a variety of ways, inform parents about classroom activities, and post classroom announcements.

Figure 1

Teachers' use of digital communication tools



Some principals report that increased access to communication technology poses challenges for teachers—parents/caregivers and students texting each other during class, or expecting an immediate response to questions and problems. Other principals report that using technology to communicate can foster greater home-school connections when appropriate digital use policies are in place.

In Ontario, school boards are required to develop and review policies for acceptable internet use (Council of Ontario Directors of Education, 2011). These policies often include rules regarding respectful communication and bullying, plagiarism and the process for citing content, and guidelines for teachers sharing student work online (e.g. Ottawa Catholic SB, 2017; Thunder Bay CDSB, 2015; York Region DSB, 2018). The Ontario College of Teachers has also released a professional advisory for teachers about appropriate electronic communication and social media use, both at work and home (Ontario College of Teachers, 2017).

“Communication between home and school has increased greatly. Parents enjoy seeing and hearing about the learning in general and what their specific child is doing.”

Elementary school,
Kawartha Pine Ridge DSB

“It is adding a new stress to teachers. Teachers are too accessible. Parents are emailing or texting at all times. Teachers are feeling pressure to respond.”

Elementary school,
Toronto DSB

“Online courses [at the secondary level] makes it possible to increase our offer of courses and thus allow students to take the courses of their choice, and according to their study itinerary.¹”

Secondary school,
Conseil des écoles publiques
de l’Est de l’Ontario

“Students are keen to sign up for e-learning courses, but often struggle with the self-discipline and direction that these courses require.”

Secondary school,
Waterloo Region DSB

e-Learning

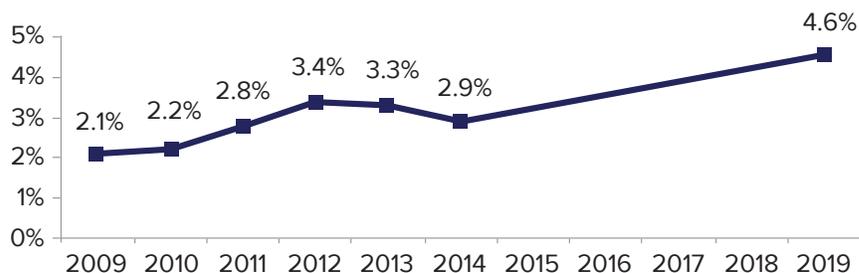
The Provincial e-Learning Strategy was launched in eleven pilot school boards in 2006, and has now grown to include all publicly funded school boards (Ontario Ministry of Education, 2013). E-learning credit courses are offered to students in secondary schools. Until 2019, these courses were primarily for students who could not attend physical classes due to personal or timetabling issues, or for students who wanted to take classes not offered at their home school. E-learning courses range from grade 9 English to grade 12 Earth and Space Science, use the same Ontario curriculum that school-based classes use, and are generally taught by Ontario certified teachers. These courses allow for greater flexibility—students in different locations can enrol in the same e-learning course and access the class during different periods of the day (Ontario Ministry of Education, 2017).

In March 2019, the Ontario government announced that, beginning in September 2020, all secondary students will be required to take at least four e-learning credits during their high school careers (Government of Ontario, 2019). This is equivalent to one credit per year, but exemptions may be available for some students. The government also announced that it will centralize the delivery of e-learning courses (Naylor, 2019). Currently, school boards manage and deliver their own menu of online courses and enrolment criteria, and there is a fee of \$773 (paid by boards) for students taking e-learning courses from other providers, such as TVO or other Ontario school boards (Ontario Ministry of Education, 2018a).

This year’s survey data show that in 87% of high schools, at least some students are enrolled in e-learning. There are over 100 courses available through e-learning, although the availability of courses differs across school boards (Ontario Ministry of Education, 2019). In the schools where students are earning e-learning credits, 5% of students per school, on average, are enrolled in these courses (up from 3% in 2014 and 2% in 2009, see Figure 2). Students in smaller schools are more likely to take e-learning courses, likely because these schools offer fewer course choices and e-learning gives them access to more options.

Figure 2

Average percent of students per school enrolled in e-learning



From 2008-2014, People for Education asked school principals how many students are enrolled in e-learning courses. This question was asked again five years later in 2019.

1. Translated from French. Original comment: “La dotation au secondaire fait en sorte qu’on offre des cours en ligne pour augmenter notre offre de cours et ainsi permettre aux élèves de suivre les cours de leur choix, et selon leur itinéraire d’étude.”

Some principals report a growing demand for e-learning, and not enough courses to meet that demand. They also report that students are keen to sign up for e-learning courses, but at times struggle with the self-discipline these courses require. While it is useful to expose all students to online learning, research has shown that the lowest achieving students consistently perform worse in online courses than in face-to-face classes (Bettinger & Loeb, 2017).

The BYOD phenomenon

The trend of BYOD, or “bring your own device,” is a way for schools to increase access to technology without the cost of purchasing devices for each student.

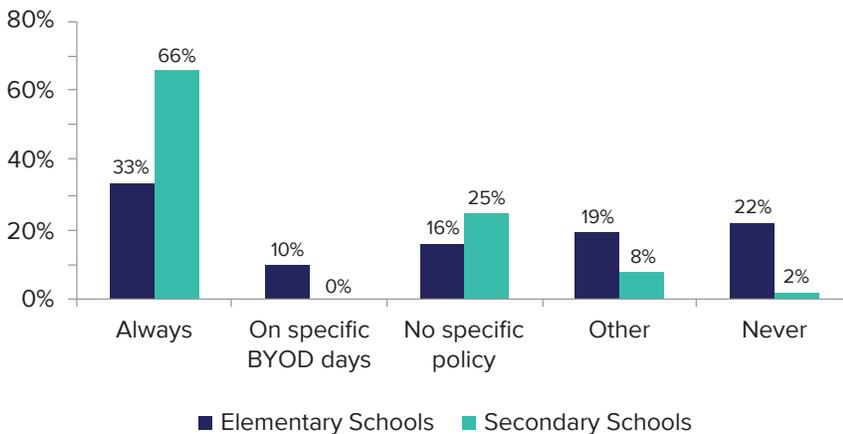
Student devices are used in a variety of ways, such as creating shareable slide presentations, podcasts, interactive maps, or graphic designs; as well to facilitate video conferencing, take notes on lessons, translate materials, and collaborate with peers and teachers. In 2019, People for Education’s data shows that one third of all elementary schools (40% of elementary schools with grades 7 or 8), and two thirds of secondary schools encourage the BYOD policy every day. Overall, 62% of elementary and 74% of secondary schools encourage BYOD in some way, whether it is only for specific grades, on certain days, or for all students without restriction (see Figure 3).

What is BYOD?

BYOD (Bring Your Own Device) is a common practice in many workplaces. Over the last few years, it has also started gaining popularity in education. This practice encourages students to bring their own smartphones, tablets, or laptops to class.

Figure 3

Schools encouraging students to bring their own devices



When students are able to bring their own devices to school, principals report that teachers plan lessons with this policy in mind. Sixty-four percent of elementary schools and 93% of secondary schools with BYOD report at least some of the teachers create lessons with BYOD in mind. Among elementary schools that allow BYOD, 27% of schools start BYOD in grade 4, while 19% start in kindergarten.

“Students and families have been very supportive of using technology at school; students are generally very respectful of non-tech times and of teacher requests to not use technology; students and teachers rarely have problems with one another with regards to respectful and appropriate use of personal and/or school-provided technology.”

Elementary school,
Peel DSB

A big challenge is that not all students have devices, so we try to purchase as many as we can to make up the difference; but we are in a low socio-economic area so it is hard to set high fundraising goals for technology.

**Elementary school,
Hamilton-Wentworth CDSB**

Even the Board partnership for families to purchase refurbished laptops at a very reduced price was not affordable for our families. We need more devices in the school. Our families need access to free internet at home.

**Elementary school,
York Region DSB**

Equity and access to technology

Not all students have access to computers or the internet at home. And, despite its increasing presence, access to technology varies considerably from school to school.

From 2014-2017, the Ministry invested \$150 million in the Technology and Learning Fund (TLF) to help schools acquire digital technology and learning tools (Council of Directors of Education, 2017). However, according to the Elementary Teachers' Federation of Ontario, funding is not sufficient to provide devices for every classroom in the province (Elementary Teachers Federation of Ontario, 2018), and a 2018 report from Ontario's Auditor General found that students do not have equal access to technology such as tablets or laptops (Office of the Auditor General of Ontario, 2018).

In our survey, principals report technology is often purchased through school fundraising. Sixty-eight percent of elementary and 22% of secondary schools specifically fundraise for technology. At the same time, they report challenges with relying on fundraising to purchase and maintain technology, and that it is more difficult to raise these funds in low-income neighbourhoods.

Among schools that encourage BYOD, principals report that less than half of elementary students, and two-thirds of secondary students, participate in the initiative. In their comments, some principals note that BYOD policies are not successful in neighbourhoods where families don't have technology access at home.

Using data from Statistics Canada, we looked at the top and bottom 25% of elementary schools in our sample based on income. In 2019, 85% of elementary schools in high-income neighbourhoods fundraise for technology, compared to 54% of elementary schools in low-income neighbourhoods. Elementary schools in higher-income neighbourhoods are also more likely to have BYOD policies than those in lower-income neighbourhoods.

Peel District School Board, one of the first boards to adopt a BYOD policy, recognizes that not all students can bring a device to school. To address this issue, schools still provide some in-school technology, and teachers plan lessons knowing that not all students will have a device. Peel District School Board has found that even a few extra devices per classroom can make a difference in transforming learning experiences (Peel District School Board, n.d.).

To reduce the inequitable effects of BYOD, many principals report that they purchase laptops, tablets, and other devices that students can use in class or borrow to use at home. One example of this comes from Upper Grand DSB, where the school board purchased Chromebooks to be circulated to students via local public libraries (Campbell & King, 2017). This initiative helped bridge the digital divide for students enrolled in e-learning courses or who needed computer access for other school work, but did not have a computer in their home.

Despite these efforts, some schools report that they are struggling to purchase enough technology to meet the needs of all students. Technology also changes rapidly, and devices need constant system upgrades, replenishing, and repair. Maintaining technology access requires costly investments.

Geographical challenges in broadband access

High-speed internet enables students and educators to access high-quality online courses, and helps students learn competencies necessary in a globally connected world (Ontario Ministry of Education, 2018b).

In 2016, the Canadian Radio-television and Telecommunications Commission (CRTC) established a universal service objective that all Canadians should have access to broadband internet access, and that it would be available in 90% of Canadian premises by the end of 2021 (CRTC, 2016). This mandate seeks to resolve the inequitable access to digital connection between urban and rural centres (e.g. CRTC, 2017).

Despite the national policy, this year's survey results indicate that principals are facing challenges with connectivity and internet speeds in schools. One principal reported, "Bell still has not connected our school to the fibre that is in town. We have been waiting for months to respond and install, all digging was done in the spring. We do not have enough computers for our students to have access for more than 80 minutes (2 periods) a week" (Elementary principal, Bluewater DSB).

To address these issues, the Ministry of Education launched a *Broadband Access for All Students* initiative, and committed to providing high speed internet access in all publicly funded Ontario schools by 2021 (Ontario Ministry of Education, 2018b). Effective September 2017, the province also implemented a Rural and Northern Education Fund (RNEF) to improve education for students in rural communities. One component of the RNEF is targeted at improving access to e-learning and minimum broadband speeds (Paul, 2017). In 2019, the federal government committed \$1.7 billion over the next 13 years to work towards providing high-speed internet throughout Canada, and will work with provinces and the CRTC to coordinate this funding (Morneau, 2019, pp. 96-97).

To be or not to be: Cellphones in schools

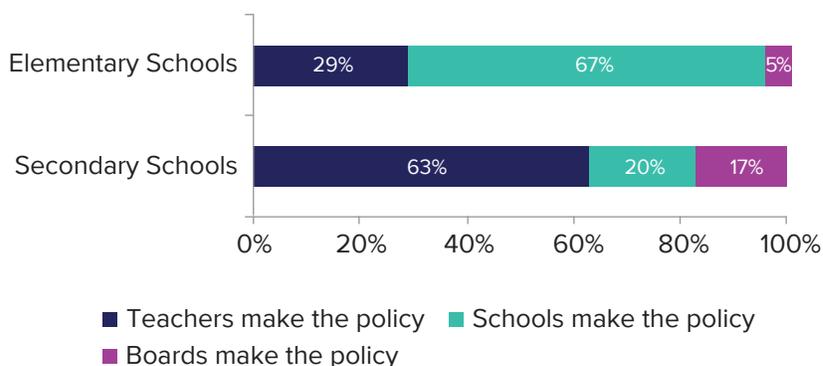
Despite the prevalence of BYOD policies, cellphone use in schools is a contested issue. This year, we asked principals whether their school or board has a policy about cellphone use, or if it is up to teachers' discretion. Rules for cellphone use in elementary schools are mainly determined by teachers (29% of the time) and schools (67% of the time), rather than a board policy (5% of the time). In secondary schools, the decision to allow cellphones sits with individual teachers 63% of the time, schools 20% of the time, and boards 17% of the time (see Figure 4). This allows schools and teachers to make decisions that are relevant for the needs of their community.

“Our biggest challenge in an extremely rural school is bandwidth. Despite upgrades, our internet is very slow and extremely spotty. We lack the infrastructure necessary to support today's technology.”
Elementary school,
Thames Valley DSB

“Our school is in a rural community and there are still challenges for some families to access technology at home.”
Elementary school,
DSB Niagara

Figure 4

Cellphone policies in Ontario



Some principals report challenges in preventing students from using social media or online gaming sites, as well as increasing cyber-bullying issues. Other principals report addressing these challenges through school policies on appropriate digital use, guest presentations about cyber bullying, etc. According to the Elementary Teachers' Federation of Ontario (ETFO), school policies help to establish parameters for appropriate digital use, and allow students to learn how to use cellphones critically, while practicing self-regulation in recognizing when technology is helpful vs. a distraction (ETFO, 2018).

In March 2019, the Ontario government announced a ban on cellphones in classrooms during instructional time, with access permitted at the teacher's discretion, for educational, health, or medical purposes (Government of Ontario, 2019).

The evolving role of school libraries

Teacher librarians can play a vital role in facilitating learning with technology in schools. This year, more schools are transforming their school library into a learning commons that integrates technology with the traditional library. In this way, the library can be a collaborative space, where knowledge is co-created by both teachers and students. Here, classes can access school-wide resources such as robotics kits, specialized software, and computer labs. Students enrolled in e-learning courses also use this common learning space to work independently. The Ontario School Libraries Association explains:

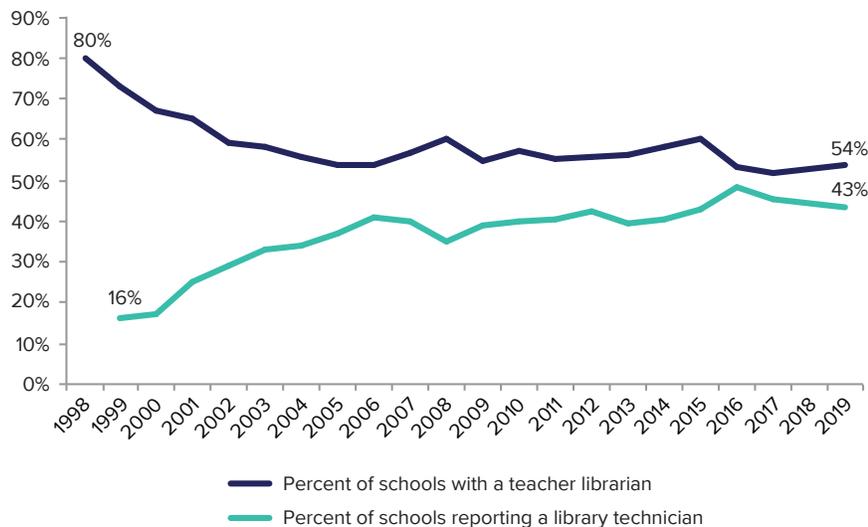
“A Learning Commons is a vibrant, whole-school approach, presenting exciting opportunities for collaboration among teachers, teacher librarians, and students. Within a Learning Commons, new relationships are formed between learners, new technologies are realized and utilized, and both students and educators prepare for the future as they learn new ways to learn...best of all, as a space traditionally and naturally designed to facilitate people working together, a school's library provides the natural dynamics for developing a Learning Commons.”
(Ontario School Libraries Association, 2010, p. 3)

The Learning Commons model has changed the teacher librarian role from gatekeeper of books to facilitator of competencies, research skills, and technical knowledge (Rizk, 2018). However, many principals report that they are unable to keep libraries open and staffed all day long. In 2019, in schools with teacher librarians, the average ratio per elementary school is one teacher librarian for every 805 students. In secondary schools, that ratio increases to 1 to 1,007.

Over the last 20 years, teacher librarians in elementary schools have been steadily declining, while library technicians have been increasing. This year, 54% of elementary schools have at least one full or part-time teacher librarian, compared to 80% in 1998 (see Figure 5). Forty-three percent of elementary schools report having a library technician in 2019, compared to 16% in 1999. This may be a result of salary differences. School boards receive funding from the Ministry for one teacher librarian for every 763 elementary-level students and one for every 909 secondary students, at the rate of \$76,210 (before benefits; Ontario Ministry of Education, 2018c). By contrast, the average annual salary for library technicians ranges from \$30,000 - \$60,000 (Payscale, 2019). Teacher librarians are also salaried staff, while library technicians are typically paid an hourly wage.

Figure 5

Library staff in Ontario schools



Both library technicians and teacher librarians play an important role in maintaining a successful library space. However, they each play a different role. Library technicians are responsible for developing, organizing, and maintaining library resources, while teacher librarians work with classroom teachers in the planning, teaching, and assessment of students. In Canada, library technicians play a supportive role and operate between a clerk and a librarian (Canadian Library Association, 2011), while teacher librarians are Ontario certified teachers with specialist qualifications in librarianship (James, Shamchuk, and Koch, 2015).

“We have had incredible success with our librarian partnering with every classroom for literacy, makerspace and technology. We are going to have our librarian work on math as well during library time.”

Elementary school,
Simcoe County DSB

“Not enough hours to fully utilize it as it is becoming so much more than a library – maker space, learning commons, robotics, etc. Teacher Librarian role is so important, and we do not get enough of her!”

Elementary school,
York Catholic DSB

“We would like our Library to be a Learning commons and HUB for our school. Difficult when we only have a Teacher Librarian for 1/3 of the instructional day.”

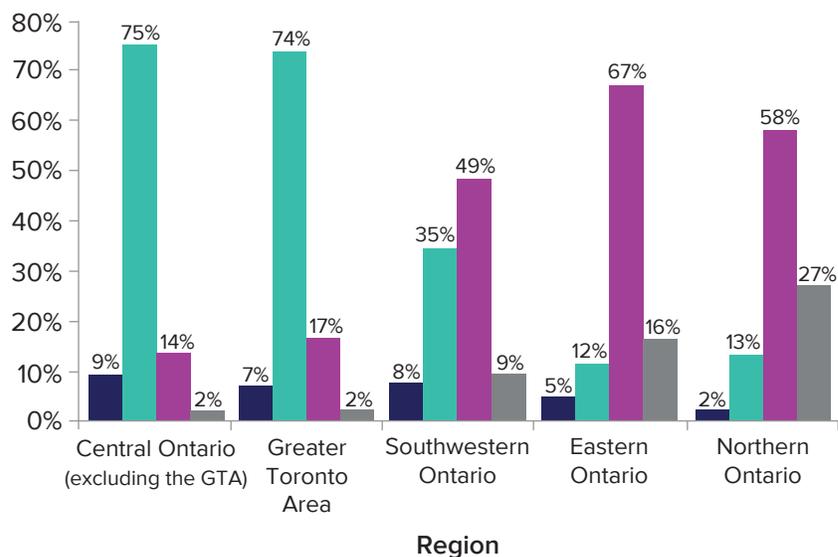
Elementary school,
Halton DSB

School libraries tend to be staffed differently across the province. Elementary schools in Central Ontario and the GTA are more likely to be staffed with only a teacher librarian, while those in Eastern and Northern Ontario are more likely to be staffed with only a library technician (see Figure 6). In Northern Ontario, 27% of schools have neither a library technician nor a teacher librarian.

Differences in library staff also exist along socio-economic lines. Sixty-three percent of schools in high-income neighbourhoods report a teacher librarian, compared to 48% of schools in low-income neighbourhoods.

Figure 6

Library staff in elementary schools across Ontario



- Both teacher librarians and library technicians
- Teacher librarians only
- Library technicians only
- Neither library technicians nor teacher librarians

Keeping up with technology – the role of professional development

Principals report that teachers have varying levels of comfort with technology, and some teachers may need professional development in using technology as an effective teaching tool. To support boards with this, the Ministry of Education funded each school board with a Technology Enabled Learning and Teaching Contact (TELT) in 2018 (Ontario Ministry of Education, 2018c). The TELT supports staff in using various online platforms and virtual environments. However, larger school boards claim that it is challenging to meet the needs of all schools in the board with one TELT. In 2017, the Ministry also announced a \$10 million per year Innovation in Learning Fund (ILF) to support the development of global competencies as a way to build on the TLF (Franz, 2017). However, in December 2018, this fund was discontinued (People for Education, 2018b).

Conclusion

Technological advances are changing the way schools work and the way we interact with each other.

The Canadian economy is transitioning from a “jobs economy” to a “skills economy”, where young people will be expected to exercise digital fluency and navigate between various careers (Royal Bank of Canada, 2018). To prepare students for this, the focus of learning needs to include competencies like creativity, social emotional learning, and citizenship.

Technology in schools can amplify the learning of these core competencies and help students develop the digital fluency they need to succeed in today’s world. While Ontario has acknowledged the importance of technology in schools, students do not have equitable access to the internet or digital tools; and schools do not have equal access to the resources that build staff capacity for teaching with technology.

Technology presents a great potential to transform student learning, but without adequate resources, it also creates new barriers and inequities in education.

“There are varying levels of educator comfort and proficiency with technology for learning. We are working with the Board to facilitate professional learning and to implement technology in the instructional program.”

Elementary school,
Hamilton-Wentworth CDSB

“...the Digital Lead Administrators program and Digital Lead Learner (teachers) roles in our Learning networks is doing a lot of great work to support staff. However, the degree of training and capacity building needed in schools around the effective use of technology is very high...”

Elementary school,
Toronto DSB

Recommendations

- 1. Provide funding for technology upgrades and maintenance.**
To help purchase, maintain, repair, and replenish digital tools, create a consolidated grant for technology within the Grants for Student Needs. This should be funded using a formula that is based on a combination of per pupil and demographic factors to account for the lower access to technology in rural and low socio-economic areas.
- 2. Re-instate the Innovation in Learning Fund.** Digital tools alone are not enough to support student learning (Fullan & Langworthy, 2014). To exercise the full potential of technology in schools, educators need to use methods that foster learning of core competencies. The Innovation in Learning Fund supports educators in developing these competencies among students.
- 3. Continue funding the Broadband Access for All Students Initiative and the Rural and Northern Education (RNEF) Fund.** As per the CRTC mandates, all Canadians should have access to broadband internet with reliable speeds. Lack of internet access or poor internet speed prevents some students from accessing the same quality of educational experiences as students in the rest of the province.
- 4. Consult with school administration, teachers and students before implementing the requirement that students take four e-learning credits over their secondary career.** In 2019, an average of only 5% of students per school are taking e-learning courses. The proposed change represents a significant increase from current student enrolment in e-learning. It is not clear if all students and teachers are equipped with the infrastructure, tools and strategies to learn successfully and teach effectively online.

Methods

Every year, People for Education surveys all of Ontario's publicly funded elementary and secondary schools. This report is based on data from the schools that participated in the 2018/19 Annual Ontario School Survey. Unless cited from other sources, the statistics and quoted material in this report originate from People for Education's Annual Ontario School Survey, the 22nd annual survey of elementary and 19th annual survey of secondary schools in Ontario. Surveys could be completed online via SurveyMonkey in both English and French.

This year, we received 1,254 responses from elementary and secondary schools in 70 of Ontario's 72 publicly funded school boards, representing 26% of the province's publicly funded schools. Survey responses are also disaggregated to examine survey representation across provincial regions. Regional representation in this year's survey corresponds relatively well with the regional distribution of Ontario's schools.

Data collected from the survey was also matched with school-level data provided by Statistics Canada using the school's Forward Sortation Area (i.e. the first three digits of the school's postal code). The data from Statistics Canada included median household income (before tax) in 2015, and the percentage of adults aged 25 to 64 with no high school diploma or equivalency certificate, based on the 2016 census.

Qualitative data analysis was conducted using inductive analysis. Researchers read responses and coded emergent themes in each set of data (i.e. the responses to each of the survey's open-ended questions).

The quantitative analyses in this report are based on descriptive statistics. The chief objective of the descriptive analyses is to present numerical information in an illuminating format that is accessible to a broad public readership. All data were analyzed using SPSS statistical software.

Calculations have been rounded to the nearest whole number and may not amount to 100% in displays of disaggregated categories. All survey responses and data are kept confidential and stored in conjunction with Tri-Council recommendations for the safeguarding of data.

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