Digital technology at school: uses, impacts, and the workload

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Preface

The survey and the report would not have been possible without the participation of the researchers and assistant researchers at the Canada Research Chair on Technologies in Education and the Centre de recherche interuniversitaire sur la formation et la profession enseignante / Interuniversity Centre for Research on Teacher Training and the Teaching Profession (CRIFPE). We would particularly like to thank Julien Bugmann, postdoctoral intern, and Stéphanie Simard for their invaluable work. We are also grateful to Simon Parent and Ariane Dupuis for their contribution to the data analysis.
Summary

This study was conducted by the team at the Canada Research Chair on Technologies in Education in partnership with the Fédération du personnel de l’enseignement privé (Québec federation of private educational institution employees) under the Centrale des syndicats du Québec (Québec House of Labour) (FPEP-CSQ). The overall aim was to gain a deeper understanding of how technology tools are used in education and the impacts on the workloads of educational employees at private schools in the province of Québec, Canada. The results of a survey questionnaire administered to 439 educational employees reveal that although technology integration at school has many advantages, it also poses certain challenges. For example, although digital integration saves time in the short and medium term, it appears to increase teachers’ workloads in the end. Teachers reported their main needs as more time and training. The findings suggest that the question we should be asking at this point is not whether or not technology impacts learning, but instead: what are the conditions and technologies that are most liable to positively influence students’ engagement and academic performance? In addition, in order to realize the full potential of new technologies, they need to be constantly updated. Regardless of their potential, however, we believe that the effectiveness of technologies for teaching and learning depends on how teachers use them and get their students to use them. The challenge that lies before us is to use technology thoughtfully and appropriately in order to harness its full educational potential. To achieve this, the inescapable conclusion is that teachers must be given suitable training as well as the time they need to apply their newly acquired skills.
1. Introduction

At the World Summit on the Information Society in 2005, former United Nations Secretary Kofi Annan delivered a prescient message.¹ He called for us to push beyond the rapid spread of information and communication technologies (ICTs) to use them in new ways that will benefit everyone. His vision for the information society was “one in which human capacity is expanded, built up, nourished and liberated, by giving people access to the tools and technologies they need, with the education and training to use them effectively.” Technologies are exerting a growing influence on how economies, education systems, and societies evolve. In the space of a few short years, classrooms across the province of Québec have been transformed: students have their own laptops or tablets as a matter of course, especially in member schools of the Fédération des établissements d’enseignement privé (Québec federation of private school teachers) under the Centrale des syndicats du Québec (Québec House of Labour) (FPEP-CSQ).

An oft-cited justification for this massive digital inundation is that technologies foster academic success via improved teaching practices, diversified teaching resources (e.g., graphics, video, audio), and more interactive teaching and learning modes.

The overall aim of this study conducted by the Canada Research Chair on Technologies in Education, in partnership with the Fédération du personnel de l’enseignement privé (Québec federation of private educational institution employees) under the Centrale des syndicats du Québec (Québec House of Labour) (FPEP-CSQ), was to gain a deeper understanding of how technology tools are used in education and the impacts on the workloads of educational employees at private schools in the province of Québec.

The survey was emailed to all members of the unions affiliated with the FPEP, including all personnel categories.

This report is organized into six sections. After the introduction (Section I), an overview of the research on digital integration and the teaching workload is presented (Section 2). This is followed by the research methodology (Section 3) and a presentation of the main results (Section 4). The report ends with a conclusion (Section 5) and a list of main recommendations (Section 6).
2. Technology and the teaching workload: what the research says

We searched all the specialized education databases (ERIC, CAIRN, and FRANCIS) and Google Scholar for studies on digital integration in education and the impacts on teaching workloads.

The findings reveal that practicing teachers are particularly concerned about how digital integration impacts their workload. But this is hardly news. The issue was raised as far back as 2004, in a research report commissioned by the U.K.’s former Department for Education and Skills (DfES), called *Using ICT in Schools: Addressing Teacher Workload Issues* (Bailey et al., 2004). The conclusion was that ICT can “help address workload if its use is well planned and supported.” However, some teachers “felt that ICT has increased their workload, with certain tasks taking longer to complete using ICT.” This shortcoming was associated across the board with lack of specific skills, training, resources (including networks), technical support, and confidence. The recommendations at the time were to improve schools’ ICT capacity in terms of strategic planning, procurement, deployment, and support. This capacity should be complemented with effective ICT leadership, networks, and training. In light of these recommendations, and as digital technology continues to revolutionize learning spaces (Devauchelle, 2012), how far have we come in the integration and use of ICT in the classroom?

The TALIS 2013 Results, An International Perspective on Teaching and Learning (OECD, 2013) is a survey that explored teachers’ needs for initial and ongoing training, among other issues. It reports
that over 50% of teachers felt that training in “ICT skills for teaching” had a positive impact on their teaching practice (p. 106). It is noteworthy that almost one in five (19%) teachers wanted more training in these skills, and almost the same number (18%) wanted training in “new technologies in the workplace” (p. 109). These were the second- and third-ranked needs on the list, following on the heels of “teaching students with special needs.” Cited in the report, Drent and Meelissen (2008) justify these needs based on the fact that technologies are constantly evolving and improving, such that teachers will probably not be sufficiently trained to use them at school. According to Brigitte Denis at the Université de Liège (Belgium), teacher training in ICT should be a priority, and especially for future teachers (Denis, 2016).

France has developed a digital work environment (DWE) in the aim of facilitating resource management, school–family relationships, and teaching work. It has received harsh criticism for the heavier workload it imposes on teachers (Prieur & Steck, 2011). It has also been attacked for the amount of errors made and the general lack of the requisite digital skills among teachers. A further complaint is that technology training programs should be provided to all the school staff, not just the teachers (Coen & Schumacher, 2006).

Australia included studies in digital technologies in its recently released curriculum. To accompany this, in the aim of developing “teacher readiness” to understand and implement the curriculum, it initiated a project to address classroom implementation issues for teachers (Reynolds & Chambers, 2014).

A study on the effectiveness of collaborative problem solving and observation using virtual worlds (Cho & Lim, 2017) revealed that, compared to teacher-directed instruction, the collaborative learning mode fostered intrinsic motivation and group performance in geography class.
Philipp and Kunter (2013) explored how ICT can offset high teacher workloads according to the principles of selection, optimisation, and compensation (SOC). These authors refer to Huberman et al.’s (1993) model of teacher career stages, which says that teachers will initially struggle to get used to job demands, and once established, they may begin to experiment with new materials and strategies. Hammond (2014) offers a critical perspective on the introduction of ICT in schools, arguing that teachers need “support and sustained critical feedback” if they are to use technology effectively in class.

Many change drivers of the 21st century, including technology-enabled teaching methods, have proven challenging for teachers (Rock et al., 2016). These authors urge teachers to embrace the new teaching models, such as the U.S. Department of Educations’ 2016 National Education Technology Plan called *Future Ready Learning: Reimagining the Role of Technology in Education* (Thomas, 2016). This report calls on American education systems to provide pre-service teachers with plenty of opportunities to familiarize themselves with educational technology so they can use it in meaningful and transformative ways. The ultimate aim is to ensure that students acquire college- and career-ready learning standards.

Now that armies of robots have stormed classrooms, teachers will have to adjust to yet another new reality. Reich-Stiebert and Eyssel (2016) suggest that robots can help teach science, technology, engineering, and math (STEM subjects), but caution that teachers find them difficult to use: although they can lighten the workload, they have also been known to disrupt the teaching process.

A one-year study by Sahin, Top, and Delen (2016) showed that using Chromebooks in class can be advantageous in some ways, but teachers complained about inadequate training and tech support. Having received only one hour of training on Chromebook techniques, the teachers had barely grasped the basics, let alone the potential. The conclusion was that proper, hands-on training is a must-have. Teachers play a key role in technology integration at school, and their attitudes affect their teaching quality. Therefore, they need subject-specific technology training that targets their needs and builds confidence in their ability to use technology effectively (Atkins & Vasu, 2000).
Of course, technology covers so much more ground than just computers and tablets. For instance, Elfeky and Masadeh (2016) found a strongly significant effect of mobile learning on academic achievement and conversational skills in English language specialty students at Najran University (Saudi Arabia). Accordingly, the faculty were advised to use mobile learning in their courses.

In a qualitative study, Preston et al. (2015) interviewed 11 education leaders from the Department of Education of Prince Edward Island on the benefits and challenges of technology use in high school. The interviewees described positive effects on student motivation as well as challenges such as inappropriate texting, declining literacy skills, policy issues, and heavier workloads thanks to more communications with parents.

Focusing on Web 2.0, Kale and Goh (2014) argue that teachers’ general tech-savvy has raised expectations for them to integrate technology into their teaching practices. Heavy workloads and the dictum to adhere to a standardized curriculum have somewhat tarnished the appeal of using Web 2.0 for teaching. Suggestions to reverse this attitudinal malaise include improved infrastructures, workload adjustments, and more opportunities to observe, discuss, and practice Web 2.0 technologies for specific school subjects.

Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, and Sendurur (2012) found that a variety of external barriers hindered teachers from using technology in ways that aligned with their beliefs about classroom practices, their beliefs about the relevance of technology for teaching, and their own technology knowledge and skills. The authors propose refocusing professional development toward strategies that could help change teachers’ attitudes and beliefs. It is important to mention that this research trend is not reflected in the results of the present study.
University teaching assistants (TAs) have also been dismayed to find that ICT use increased their workloads. In a survey study, Osterlund and Robson (2009) found that TAs felt overburdened by too much emailing with their students. Their workloads increased to the point that most preferred not to use emails anymore, if possible, especially those in the arts and social sciences. Evans (2008) showed that undergraduates felt that mobile learning (m-learning) using podcasting was a more effective revision tool than textbooks and notes: it gave them more time to revise and it widened the learning scope. The problem here is that these practices have to be developed. In other words, teachers have to know how to introduce new technology tools to their students and get them to use them in ways that unleash their full potential.
3. Method

The objective of this study was to better understand the use of technology tools in education and their impacts on the workloads of educational employees of private schools in Québec. This section presents the research methods. As recommended by the Publication Manual of the American Psychological Association, 6th Edition (APA, 2013), the following subsections are presented: Participants (3.1), Data collection instruments (3.2), Data treatment and analysis (3.3), and Methodological strengths and limitations (3.4).
3.1 Participants

The study participants comprised 439 survey respondents (329 women, 110 men). Figure 1 shows that teachers make up the largest proportion of respondents (78.1%), followed by professional staff (7.3%), administrative support staff (5.9%), technical support staff (5.9%), and surveillance and other staff (2.7%).

The most representative age groups were 35 to 49 years (50%), 50 to 64 years (27.5%), and 25 to 34 years (19.5%). Of the respondents, 83% were permanently employed and 82% held regular full-time positions. Among the remaining 18%, 9% held regular part-time positions, 5% were full-time replacement workers, 2% were part-time replacement workers, and 2% were casual workers.
Years of experience in the education sector ranged from 1 to 35 years. The largest group of respondents (8.5%) had 10 years of seniority, followed by those with 15 or 14 years (6%). Years of accumulated experience also ranged from 1 to 35 years, including years spent at the current school, where the most representative groups for length of experience were less than 1 year (9%), 3 years (6%), 10 or 15 years (5.5%), 2, 8, or 14 years (5%), and 4, 5, 7, 9, or 12 years (4%).

3.2 Data collection instruments

Data were collected from 439 educational employees of private schools in Québec. The data collection was performed entirely online. Candidates received up to three email invitations from their union representative to respond to a questionnaire. The questionnaire contained 14 questions: 12 closed and 2 open. Participants responded to the closed questions on a 4- or 5-point Likert scale. The questionnaire took about 20 minutes to complete. In addition, online survey interviews were conducted with individual participants and groups of participants using Skype.

The preliminary survey results were presented to a number of FPEP-CSQ members in two stages: first to a small group of 20 and subsequently to a larger group of 75. Their feedback was included in this report.

3.3 Data treatment and analysis
Because the questionnaire data included responses to Likert scales and open questions, a mixed analysis was used. The quantitative analysis comprised the online survey tool SurveyMonkey\(^2\) and descriptive statistics using SPSS 23.\(^3\) The quantitative results were complemented and enhanced by a qualitative analysis of the responses to the open questions using QDA Miner,\(^4\) which is widely used in qualitative research (Karsenti et al., 2011).

In this step, a content analysis (see L’Écuyer, 1990; Miles & Huberman, 2003) was applied, with semi-open coding of participants’ responses in relation to the main research objectives (technology uses and the impacts on workloads).

The individual and group interviews were also subjected to a content analysis (L’Écuyer, 1990; Miles & Huberman, 2003) using QDA Miner.

\(^2\) http://www.surveymonkey.com/
\(^3\) http://www-01.ibm.com/software/analytics/spss/
\(^4\) http://provalisresearch.com/fr/produits/logiciel-d-analyse-qualitative/
3.4 Methodological strengths and limitations

One of the main strengths of this study lies in the research methodology. Combining closed Likert and open questions in a survey questionnaire with individual and group interviews allows enriching and triangulating the results. This methodological choice comes with certain limitations, however. Most importantly, the results are based on the participants’ perceptions. We attempted to offset this limitation by collecting data from a large sample of 439 participants.

Another limitation is that, given that the aim was not to obtain a representative sub-set of the target population, the sample was not randomly selected. The rationale for this methodological choice is that in the considered context it would be difficult, if not impossible, to randomly select the participants. It is hard to imagine how we could have obliged the educational employees to participate in the survey and interviews. Instead, we used a convenience or non-probabilistic sample that did not aspire to be representative. We included only respondents who were available, accessible, and willing to participate. Nonetheless, it is noteworthy that although the respondents were working in 33 different FPEP-CSQ member schools, the overall sample representativeness was moderate.
4. Main results

This report presents the main results in relation to the overall research objective and according to the questionnaire and interview results, grouped under the following themes:

4.1 Main technology tools used for work
4.2 Main impacts of technology use on the workload
4.3 Main positive impacts of technology use on teaching and learning
4.4 Main negative impacts of technology use on teaching and learning
4.5 Main technology tools that educational employees appreciated using
4.6 Main technology tools that were imposed on educational employees
4.7 When do educational employees use technology for work?
4.8 When do educational employees spend time learning how to use new technologies?
4.9 Main needs of educational employees in terms of digital knowledge and skills
4.10 General comments by the respondents.
4.1 Main technology tools used for work

Figure 2 shows that most respondents used a computer (97.7%), the school portal (92.3%), or email outside of the school portal (77.1%). Almost half used a tablet (47.9%) or the school’s website or Facebook page (47.7%), and less than one-third (31.5%) used an interactive whiteboard (IWB).

Figure 2: Main technology tools used by the respondents.
4.2 Main impacts of technology use on the workload

One of the objectives of this study was to better understand the impacts of technology use on the workload. The responses to the question, “Does your use of technology impact your workload?” are mixed (Figure 3). Only a few respondents (6.1%) felt that technology use had no impact on their workload, whereas 33.8% said that it saved time and 59.1% said that it took up more time.

It was surprising that some respondents claimed that technology use had no impact whatsoever on their workload, and even more surprising that almost one-third of the respondents reported that they saved time with technology. The latter case might reflect an unawareness of the time that they had formerly spent, combined with optimistic expectations that the new technologies would save time.
Figure 3: Impacts of technology use on the workload.
4.3 Main positive impacts of technology use on teaching and learning

To assess the real impacts of technology use on workloads, the respondents were asked to appraise the benefits of using technology tools. In sum, the results of the content analysis of their responses and comments indicate that the positive generally outweighed the negative.

The positive impacts of technology use on the workload are grouped into eight categories in descending order of magnitude (Figure 4). Heading the list (43.2%) is increased student motivation. Students found the technology tools more hands-on and exciting. The tools sparked students’ interest, made it easier to monitor their progress, and enabled more interactive projects. The visual supports, which made the activities more fun and appealing, were said to be particularly effective. A further source of motivation was that students found it easy to save all their information and to produce impressive documents and presentations. When teachers used technology for teaching and learning, they noticed that their students were more attentive and concentrated, assimilated material more rapidly, and carried out absorbing projects that were connected to real life. In addition, some of the most engaging technology tools allowed creating more interactive lessons.

Improved communication came in second place (29.1%). Many respondents said that technology made it far easier to communicate with parents, students, colleagues, and the school administration. Data management was noticeably faster. Importantly, teachers could communicate and share information more efficiently, give students rapid feedback, plan their activities quickly, and collaborate at a distance instantaneously.
Time saving earned the number three spot (28.5%). Generally speaking, the respondents found that technology made their tasks easier. For example, automated exams were fast and easy to correct. Materials could be easily updated for re-use in subsequent terms. Employees found it easier to work collaboratively and to share materials and documents with their colleagues. Some of the tools, sites, and applications were time savers in other ways: they were useful for completing online forms, preparing and correcting online exams, answering students’ questions online, correcting schoolwork and assignments, preparing reports, and so on. In all, 28.5% of the respondents said that technology helped them manage their time.

Number four on the list (24.9%) was task variation. Technology opened up enormous new vistas for teaching approaches and activity planning. Many teachers said that technology helped them improve their teaching. It enabled more rapid and efficient teaching, livelier classrooms, and more effective differentiated instruction. They especially appreciated using videos and classroom presentations of individual students’ work. Teachers also found it easier to diversify and organize their teaching approaches and learning tasks. They used technology to create visual teaching supports, prepare course summaries, give feedback on students’ computer-written work, make rapid information searches, prepare schoolwork and exams, and correct homework efficiently. Technology was also used to compile and manage data more rapidly and accurately, manage classrooms more efficiently,
make ongoing changes efficiently, and so forth. In short, almost everything that used to be done by hand could be done easier, faster, and more systematically with technology.

Almost one-fifth (18.3%) of the respondents underscored the fact that technology helped them manage their teaching work. Almost the same proportion (17.4%) said that it helped their students learn, and 16.8% said that it made teaching easier.

A non-negligible proportion (11.2%) of the respondents noted that technology improved their ability to share resources with others. They explained that they shared all kinds of resources with their students and with other teachers, both at school and at home. Technology provided practically endless sharing potential: direct classroom access to content and documents, inexhaustible online resources for course creation, professional tasking via the school portal, access to countless reference materials, and an immediate window on the world, including all the latest news and knowledge.

![Figure 4: Positive impacts of technology on teaching and learning.](image-url)
4.4 Main negative impacts of technology use on teaching and learning

Against these positive impacts of technology use on teaching and learning, the respondents brought up some negative impacts as well, notably heavier workloads and problems with the tools themselves. These impacts are grouped into eight categories in descending order of magnitude (Figure 5). Topping the list is time: the majority (81.9%) of respondents said that the technologies demanded more of their time. This does not contradict the above reports that technology saved time. Instead, the respondents pointed out that the main challenge was that it takes time to understand and integrate new technologies.
Technical problems ranked second (75.3%) on the list. Many respondents felt that the avalanche of new tools and applications combined with a lack of technical and technopedagogical support meant that it usually took more time and effort to complete their tasks: preparing course content, creating presentations and videos, finding information, and so on. Many also said that their tasks had become more complicated by all the technical problems they had to deal with: frequent malfunctions and breakdowns, outdated and incompatible devices, slow, unreliable, or faulty Wi-Fi connections (so that teachers had to plan two lessons ahead or prepare a plan B), computer viruses on outdated websites, hyperlink glitches, weak computer batteries, obsolete and incompatible software, over-abundance of platforms (e.g., Google Drive, Moodle, social networks, Pluriportail), and hordes of emails to handle. In addition, information and communications were often confusing or difficult to synchronize across the different tools and accounts (e.g., personal, portal, professional, and Google emails). Consequently, much time was spent on learning how to use all the different platforms and applications.

Lack of training was the third most often (39.9%) mentioned challenge. Respondents felt that they were insufficiently trained to use the technology tools at their disposal. And these tools required time to master. It took them a lot of time to organize and adapt teaching resources with these tools, often spilling over into their free time. Activity planning was rated as the worst offender in terms of increasing the workload, and a major energy drain. In order to profit from the time-saving benefits of technology, a certain familiarity is required. Many respondents said that they didn’t know how to use their technology tools, and a few found the tablet and its applications particularly byzantine. Some respondents said that they didn’t
save time with their devices because they didn’t have the training they needed to do so. Moreover, although they thought that the training sessions in the new applications were rather lengthy, once they had completed the training, they felt that it was essential. Many respondents were learning by hit and miss, and they were spending plenty of time doing so. Technology training programs can compensate for the absence of a digital curriculum and help prepare teachers to make the best use of technology in class. Here again, time is a factor. The teachers needed the time to understand the technologies and to learn how to use them to adapt and produce materials and then present them. They also needed time to roll with the ongoing changes, which, as a rule, the school administrations did not consider as regular working hours. So they had to solve these kinds of problems after hours, resulting in a heavier workload for most respondents. At the same time, they weren’t getting enough technical support.

Using technology for course and lesson planning could actually complicate the process, and this vexed 34.1% of the respondents. One-fourth (25.7%) of the respondents found it challenging to keep abreast of the relentless advances in technology tools. In line with the technical issues mentioned above, many teachers had had trouble dealing with the seemingly endless changes and updates.

Excessive emails were the fifth greatest challenge for teachers (22.4%). Teachers felt that they had to remain in constant touch with the school, their students, the principal, and other school actors. Although emails were seen as a plus, almost one-fourth of the respondents also found them annoying.

Classroom management and student management was the seventh irritant (14.6 %). The use of technology in class appeared to have a number of negative impacts in this sense. Certain tools, such as tablets, iPads, and cell phones, made it harder to manage the class. As soon as
the teacher wasn’t looking, students took the teacher’s picture, spent time on Facebook and other social platforms, or played online games.

According to some respondents, it was practically impossible to be alert to everything that the students were doing with their devices. The younger students appeared to rely on some devices too much, which discouraged them from using their own judgement. Many students used less reflection when answering questions because they could always find the answers or ask the teacher online. The youngest students needed a lot of explanations simply to connect to their account and use the tools.

Some respondents had trouble explaining, controlling, and monitoring how the students used their tools in class to ensure they were using them effectively. They felt that they had to constantly check the students’ work and make sure that they were using the tools properly. Even though they were right there in the classroom, they found it hard to make the students stick to their assignments, especially when the students were too dependent on the technology. To this we may add that computers were sometimes forgotten at home, batteries
might be too weak to handle the work, batteries were run down, students had different technology skill levels, and so on. Consequently, thanks to a great deal of extra management in terms of students’ technology use, many respondents found themselves saddled with a heavier workload.

Rounding out the list of significant annoyances was external pressure (7.6%). Some teachers felt that the expectations placed on them to become tech savvy were a heavy burden to bear.

Figure 5: Negative impacts of technology use for teaching and learning.
4.5 Main technology tools that education employees appreciated using

The respondents gave their views on the technology tools that they most appreciated, at work and at home (Figure 6). Overall, the results show that they particularly appreciated using digital tools for work, where most of the tools were believed to elicit students’ interest. The computer earned the best reviews (99.3%), followed closely by the school portal (97.9%), the tablet (95.1%), the interactive whiteboard (94.2%), the school website or Facebook page (92.8%), and emails (92.7%). It appears that, despite the above-mentioned annoyances, the vast majority of respondents were open to the idea of using digital tools for work.
Figure 6: Digital tools that educational employees appreciated using for work.
4.6 Main technology tools that were imposed on educational employees

The respondents were asked, “Which technology tools did your school administration obligate you to use?” The results (Figure 7) show that most (82.5%) respondents named the school portal first, followed by the computer (59.8%) and emails outside of the school portal (50.9%). Lower proportions of respondents mentioned the tablet (27.4%), the interactive whiteboard (13.6%), and the school website or Facebook page (12.4%). Only 7% said that no technology tools were required as part of their work.

Figure 7: Technology tools that were imposed on educational employees.
4.7 When do educational employees use technology for work?

We wanted to gain insights into when educational employees use technology for work. In descending order, the main times reported were during regular working hours (98.8%), on pedagogical days (96.3%), in the morning before work days (91.1%), during breaks (88.1%), in the evening (86.7%), and on weekends (82.9%). Somewhat alarmingly, many teachers said that they used technology for work on sick days (81.1%) and even when on vacation (78.3%). These results indicate almost constant use of technology, both during and outside of regular working hours.

![Figure 8: When do educational employees use technology for work?](image)

4.8 When do educational employees spend time learning how to use new technology tools?

We also wanted to know when educational employees spent time learning how to master new technology tools. The results pattern was similar to that for technology use for work, but at slightly lower proportions.
We asked the respondents how many hours a week outside of their regular working hours they spent learning how to use new technology tools (Figure 10). One result is somewhat surprising: 17.2% said that they actually saved time by learning how to use the tools. Perhaps they neglected to factor in the time they had invested to achieve this proficiency. Overall, most respondents said that it took time to integrate technology for educational purposes. The majority (61.8%) spent from 1 to 5 hours a week on this. A smaller proportion (10.0%) spent from 6 to 10 hours a week, and only 2.3% spent more than 10 hours a week.
Figure 10: Nombre d’heures par semaine en dehors du temps de travail régulier passées à apprendre à utiliser les outils de technologie.

- 11,0% : Je gagne du temps
- 18,8% : 1 à 5 heures par semaine
- 67,7% : 6 à 10 heures par semaine
- 2,5% : Plus de 10 heures par semaine
4.9 Main needs of educational employees in terms of digital knowledge and skills

In terms of digital knowledge and skills, the main need was time (97.9%), which is in line with the above-presented results. Training came second (96.3%), followed by pedagogical support (89.3%), technical support (74.7%), and access to technology tools at work (71.2%) and outside of school (68.4%). It appears that schools do not necessarily provide their teachers with all the technologies they need, for example, iPads. Other respondents complained that they were not allowed to take their devices home. In addition, 61.2% of respondents said that they would like more professional autonomy, and that they needed their pedagogical choices to be respected.

![Main needs of educational employees](image)

Figure 11: Main needs of educational employees.

We asked them what measures the schools had put in place to meet their needs. Overall, and except for the time issue, the schools appeared to have applied various measures to address the needs: technical support (99.3%), access to technology tools at school (98.8%) and outside of school (91.4%), training (98.6%), and pedagogical support (94.4%). However, none of the 439 respondents said that they had been given the extra time they needed, as such, although extra time may have been included within the diverse measures (such as training).
In any case, the measures that the schools had put in place did not fully meet the respondents’ needs.

Figure 12: Schools’ responses to the needs of educational employees.
4.10 General comments by the respondents

To supplement the survey and interviews, we asked the respondents for their comments about their use of technology tools in education.

Generally speaking, their comments converge on one central issue: teachers need more time and training. On the other hand, despite the inherent challenges, the respondents noted many advantages of using technology in education.

The respondents’ comments fall into two main categories: some felt that technology lightened their workload, and on the contrary, others felt that technology actually made their workload heavier.

That said, the respondents generally appreciated the use of technology tools in education. Many believed that technology tools were here to stay, and that they had to live with them from now on. When all was said and done, they admitted that technology did make their work tasks easier (preparation, organization, and planning), enabled more effective and meaningful teaching, facilitated communication, saved time, cut down on paper, enabled a variety of teaching approaches, and motivated students. With that said, some educational employees were more comfortable, adept, and rapid with the tools than their peers, who found them more puzzling. Still, without exception, everyone had to spend time at the beginning in order to master the new tools.

It follows that, given that workloads get heavier each year as technologies keep on evolving, many respondents wanted more time and training. They also wanted to be kept better informed about regular technology updates so they could use make optimal use of their technologies and save time on their daily tasks. Furthermore, while many respondents were on board with the idea that technology plays a major role in education, they felt that
technologies should only be imposed when they are available, fully understood, mastered, and suitable for their individual needs.

A good number of the respondents believed that technology tools were useful as support for teaching and learning, but should not replace the human touch, including in-the-flesh teachers, handwriting, mathematical logic, and other academic mainstays. However, they emphasized that technology tools can be highly useful for differentiated instruction and for motivating students. In addition, they enable rapid access to a variety of information, case study presentations, and rapid feedback to students.

Many respondents were aware that technology tools (e.g., tablets, smart phones, computers) made them available at all times to students, parents, colleagues, and administrators, and they wanted this issue to be addressed.

Many argued that they should be consulted before the school made technology decisions and policies.

In addition, some respondents found that everyday use of technology was quite challenging. Some said they felt pressured to integrate technology into their work, such that their work day had ballooned. At the same time, this was considered restrictive, because it erased the boundaries between the workplace and private life. There was a substantial consensus that technology should be at the service of teaching and learning, and not an end in itself. Technology was viewed as a classroom convenience that comes at a price, and it is the teacher who pays that price. As one
respondent explained, so much is asked of teachers, and without saying that technology is useless, the situation could be much better.

A good number of respondents felt that daily technology use made classroom management more difficult. As a rule, technology use in class required constant management to prevent abuses by students. Lack of time to train students in proper technology use was another problem. These problems were exacerbated by an assortment of technical issues, such as lack or failure of network access, slow or unreliable Internet connections, outdated software, missing applications, and poor management of technology tools. All these factors were impediments to effective technology use. These classroom management issues made many respondents feel that technology was adding extra hours to their workload, making it very heavy or even unbearable. They found the swarms of emails particularly burdensome. Finally, many educational employees thought that students needed to be made (even) more accountable in their use of digital tools for learning.
5. Conclusion

In a position paper called The Future of Education and Skills: Education 2030 (OECD, 2018), it is stated that, “Schools are facing increasing demands to prepare students […] for jobs that have not yet been created, for technologies that have not yet been invented.” Technology represents the very future of education. Moreover, given the pervasiveness of technology across the globe and its breathtaking advances made to date, technology skillsets will become the sine qua non for social and professional success. In order to play a meaningful part in our ever-mutating knowledge society, 21st-century citizens will have to know how to use technology to self-learn, self-inform, and communicate. Therefore, a key competency for teachers would be the facility to use technologies for teaching and learning in ways that help students succeed in their education, and in a broader sense, in the fellowship of the future.

The aim of this study by the team at the Canada Research Chair on Technologies in Education, in partnership with the Fédération du personnel de l’enseignement privé and the Centrale des syndicats du Québec (FPEP-CSQ), was to better understand the use of technology tools in education and their impacts on the workloads of educational personnel employed by private schools in the province of Québec.

The results, obtained from 439 educational employees working at 33 different schools, clearly indicate that digital integration significantly impacts teachers’ workloads, even though digital tools may save time in the short term and medium term.

Far from calling into question the critical need to integrate technologies into education, these findings underscore the fact that, despite all the advantages that technology can provide, the integration process is not necessarily a smooth ride. However, the educational employees that we surveyed were generally enthusiastic about technology use, with the caveat that the right conditions must be in place for it to work. The teachers in particular needed more time and training to get the most out of their tools. In addition, to preserve their sense of
pedagogical autonomy, they wanted to be consulted before the schools made technology choices and adopted digital policies.

In this light, and in parallel with the exponential growth of digital learning, it appears essential to provide teachers with adequate technical and pedagogical support that meets their needs.

We no longer have to ask whether or not technology itself has impacts on education. Instead, the question at issue is: under which conditions is technology liable to have a positive impact on student engagement and academic performance? Furthermore, in order to unleash the full potential of technology for teaching and learning, updating is essential. In addition, we have seen that the effective use of technologies for education, regardless of the inherent potential, depends mainly on how teachers use them and get their students to use them. Teachers can realize the full potential of technologies by using them in an informed and reflective manner that is appropriate for the subject matter and for their students’ needs. The inescapable conclusion is that teachers need proper training as well as the time required to integrate their newly acquired skills.

In sum, adequate time and training are the pillars on which to build successful digital integration in education.
6. Recommendations

Based on the results of this study, we propose the following recommendations:

1. Find ways to give teachers the time they need to build their skills in technology use for teaching and learning.
2. Find ways to give teachers time to appropriate the digital tools that they use for teaching and learning.
3. Find ways to recognize the time that teachers spend on integrating technology into their teaching practice.
4. Offer teachers a range of training programs so they can integrate technology into their teaching practice effectively and appropriately.
5. When teachers use technology for work outside of regular working hours, ensure access to the tools at school and outside of school.
6. Provide adequate pedagogical support to teachers who use technology for teaching and learning.
7. Provide adequate technical support to teachers who use technology for teaching and learning.
8. Make students accountable for their use of technology for learning.
9. Respect teachers’ autonomy in their technology integration approaches.
10. Consult teachers before making technology choices and policies.
11. Train teachers in classroom management when students are equipped with technology devices.
12. Raise teachers’ awareness of the importance of disconnecting from technology devices at times.
13. Train teachers in email management.
14. Conduct regular inquiries to better understand teachers’ needs in terms of technology use for teaching and learning.
7. References


British Educational Communication and Technology Agency. (2003). *What the research says about interactive whiteboards*. Coventry, United Kingdom: BECTA.


