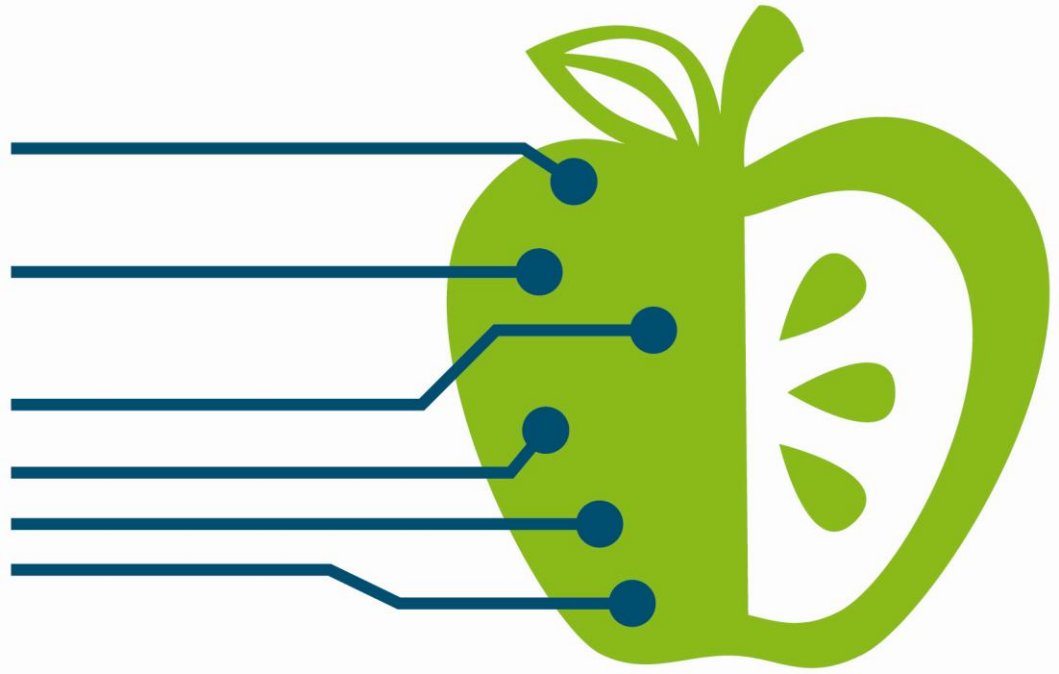
Teachers' Views on the Relationship Between Technology and Aspirational Teaching

Findings from a CTF National Survey



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Teachers' Views on the Relationship Between Technology and Aspirational Teaching

by Bernie Froese-Germain, Richard Riel & Bob McGahey

Background

In May 2012 the Canadian Teachers' Federation (CTF) conducted a national teacher survey on the theme of "Teachers' Aspirations" as part of a joint research project with the Canadian Education Association (CEA). The research project involved extensive input from over 200 teachers who participated in CEA focus groups across the country and over 4,700 teachers who responded to the CTF online survey. A report on the project was released at the CTF President's Forum in July 2012.

Access to adequate and up-to-date technology and an adequate technology infrastructure were identified by teachers as being among a number of important contributors to aspirational teaching (aspirational teaching is defined in the report as teaching in a way that resonates with teacher beliefs about teaching and learning).

These are among the other research findings contained in the report (excerpted from *Teaching the Way We Aspire to Teach: Now and in the Future*):

- A significant proportion of teachers have experienced teaching the way they aspire to teach, at least occasionally.

- Although teachers are able to teach the way they aspire to teach on occasion, this does not always happen on a consistent and system-wide basis. Teachers identified the following as being key elements supporting them in teaching the way in which they aspire to teach:
  - Professional learning opportunities, particularly those that are relevant and support teachers in their collaborative work with other teachers;
  - Trusting relationships with students, parents, and the administration;
  - Being supported, valued, and recognized as professionals by governments, the public, parents, and the school administration;
  - Visionary instructional leadership;
  - Policies, programs, and infrastructure that increase flexibility in the classroom;
  - Assessment and reporting policies and practices that provide parents, students, and teachers with information useful to adapting learning.

As a follow-up to this research project, in October 2012 CTF conducted a national survey of teachers to explore the relationship between the use of digital technologies and aspirational teaching in elementary/secondary education.

The online survey, consisting of nine questions including an open-ended question, was administered through CTF Member organizations from October 9-16, 2012. We received nearly 4,600 responses from classroom teachers, special education teachers, administrators and others. Due to the variety of delivery methods, the number of invitations cannot be tracked and hence a response rate cannot be calculated.

This article presents the major survey findings and concludes with some of the key messages we heard from teachers.

In order to provide some context for our findings we begin by looking at some other recent research on teaching and learning with technology.

Research on teaching and learning with technology

In 2011, CTF collaborated with MediaSmarts (formerly the Media Awareness Network) on their ongoing research project, "Young Canadians in a Wired World – Phase III". This exploratory qualitative research study examined teachers' perspectives on the use of technology to enhance student learning. MediaSmarts spoke with key teacher informants (CTF working with its Member organizations assisted in obtaining an appropriate sample) from across the country to better understand how digital technologies are being integrated into classrooms, how they enhance learning, and the impact on the teacher-student relationship.

An interesting finding from the study is that, when it comes to learning, students are "not so savvy surfers". The report notes that,

> All of the teachers we talked to indicated that their students loved working – and playing – with smart phones, iPods, iPads, computers and networked devices of all kinds. But they also agreed that simple access to networked technologies has not made their students better learners. In spite of the fact that young people demonstrate a facility with online tools, many students lack the skills they need to use those tools effectively for learning. There is also a real propensity on the part of students to take what they find online as "given". (Steeves, 2012, p. 3)

Teachers in the study identified several obstacles to integrating technology into learning including the following (as cited in Couture & Murgatroyd, 2012, p. 152):

- Internet filters and bans on personal digital devices such as tablets and smart phones
- Pressure to teach technical skills instead of digital literacy skills
- Potential for digital technologies to cause disruptions in the classroom [this was one of the findings of the 2010 CTF teacher survey on cell phones in the classroom]
- Shortage of professional learning opportunities on technology integration

Couture and Murgatroyd point out that, despite these obstacles, "respondents overwhelmingly noted that digital media provide tremendous opportunities for teachers and students, as long as students can engage critically with media and consider the ethical ramifications of what they do online. As one elementary teacher put it, 'The biggest skill students need is a moral compass.'" (p. 153)

On the "concern over whether teachers are digital immigrants or natives", which they describe as a "common distraction", Couture and Murgatroyd state that "the critical factors to successful technology infusion are a teachers' pedagogical experience, deep curricular knowledge and effective classroom management skills, as opposed to their age or 'savvy' knowledge of technology." (p. 158)

Also in 2011, the Alberta Teachers' Association (ATA) in collaboration with the University of Alberta conducted a major study of Alberta teachers' experiences with flexible and/or digitally mediated learning environments and the impact on their conditions of professional practice. This study is the largest of its kind in the country to date. Data was obtained from over 1,450 K-12 Alberta teachers, through a mixed-method research approach involving an online survey and a series of focus groups, on their "efforts to make student learning more flexible using emerging technologies." (McRae et al., 2012)

In this study, flexible and/or digitally mediated learning environments were classified into three categories:

1. Face-to-face teaching environments in which digital technologies are used as a component of students' learning experiences (this represented about 80% of study participants)
2. Primarily digitally mediated learning environments, such as online learning, e-learning and/or distributed learning (about 10% of participants)
3. Outreach schools and/or distance education (about 10% of participants).

The introduction to the report cites these findings from the research literature on digitally mediated learning environments (Alberta Teachers' Association, p. 10):

- Some research on distributed learning suggests that personalized learning environments in which instruction is made more flexible in terms of both timing and pacing are conducive to student performance, resulting in achievement results that are comparable with traditional delivery methods.

- Although digitally mediated learning environments bring about flexibility and personalization, they also commensurately affect teachers' conditions of practice. The research literature suggests that such environments increase the workload of teachers.

- The literature further suggests that the factors responsible for the enhanced workload are individualized communication and personalization.

There is much food for thought in the major findings from the study which are grouped here by key themes (the following are selected excerpts from the full research report):

Teacher satisfaction

More than 80% of respondents rated the experience of teaching in their current "flexible" context as positive, yet only 63% indicated that they would recommend such a situation to others. With reference to their overall experience, outreach teachers, at 94%, were the most positive group, and those in a primarily digitally mediated learning environment were the most negative (20% rated their fully online teaching experiences as negative). Participants' satisfaction with their teaching experience and the likelihood that they would recommend their work to other teachers was independent of years of experience.

Focus group discussions highlighted several potential explanations for the 20% difference between satisfaction scores and participants' willingness to recommend their particular teaching context to others. Among them was deteriorating conditions of professional practice – teachers were satisfied with their current context but would not recommend the teaching profession in general because they felt that their conditions of professional practice were deteriorating with respect to workload, role expansion and lack of personal and professional boundaries.

Expanding roles for teachers

Focus group participants expressed concern about the many ways in which their role as a teacher was expanding beyond the scope of what they considered to be their primary responsibilities. Among the additional responsibilities that were being downloaded onto teachers were providing technical support and counseling students with complex social and emotional needs. The kinds of additional duties that were being downloaded varied somewhat depending on the type of flex environment in which the teacher was working.

Online reporting and learning analytics

Participants observed that online reporting tools, because they enable information to be shared immediately with parents, are dissolving the boundaries between work and personal time. Some parents, for example, expect assessments to be posted a few hours after a student has turned in an assignment. Others expect teachers to respond before the start of the next workday to e-mails that were sent after school hours. In short, systems that afford "anytime" access are creating the expectation of "anytime" service. Participants observed that, in the absence of overarching guidelines to manage expectations around parent-teacher interactions, individual teachers are being left to establish and maintain boundaries on their own.

Participants in the focus groups also noted that, in some circumstances, online reporting tools may diminish the opportunities that teachers have to engage in meaningful conversations with parents about student progress. Rather than engaging in a dialogue with the teacher, for example, some parents are focusing only on the impersonal, quantitative representation of their child's progress as presented in the online report.

Lack of time

The study suggests that lack of time is the most significant factor restricting a teacher's ability to provide instruction. Such duties as reporting student progress online, developing individualized program plans, organizing extracurricular activities and frequently communicating electronically with parents all reduce the amount of time that teachers have to work with students. Large classes, both online and offline, significantly restrict the amount of time and the level of assistance that teachers can provide to individual students.

Selected technologies – frequency of use and pedagogical usefulness

There were interesting findings on the perceived usefulness and frequency of use of selected technologies in schools.

Both teachers and administrators were overwhelmingly positive about the potential of technology to render the timing and pacing of instruction more flexible. Teachers working in a primarily digitally mediated learning environment are more frequently engaged than their face-to-face and outreach colleagues in such online activities as instant messaging, employing Web 2.0 tools, holding video conferences and holding web conferences. They also find these activities more useful in meeting their teaching requirements. Outreach teachers make the most frequent use of digital marking and reporting tools (68% use them almost every day), whereas face-to-face teachers make the most frequent use of interactive whiteboards (53% use them almost every day). Personal hand-held or portable computing devices used by students, cloud computing and online professional development are on the cusp of being used frequently and being deemed useful (or not). As a result, they bear watching.

Participants rated interactive whiteboards and administrative technologies (such as learning management systems) the highest in terms of both frequency of use and usefulness (see Figure 1). Both these technologies are mandated in many school jurisdictions. Conversely, social networking technologies such as instant messaging and online social networks, although used frequently, were perceived to have little usefulness for teaching and learning. Participants raised two concerns about social networks: (1) they may increase the prospect that teachers inadvertently overstep the professional boundaries between themselves and their students, and (2) students may object to allowing teachers to access their social networks for pedagogical purposes.

Participants deemed video conferencing to have very little value in increasing the flexibility of instruction. Indeed, 83% of respondents reported that they do not hold video conferences with students, and only 20% of respondents felt that video conferencing was useful in making instruction more flexible.

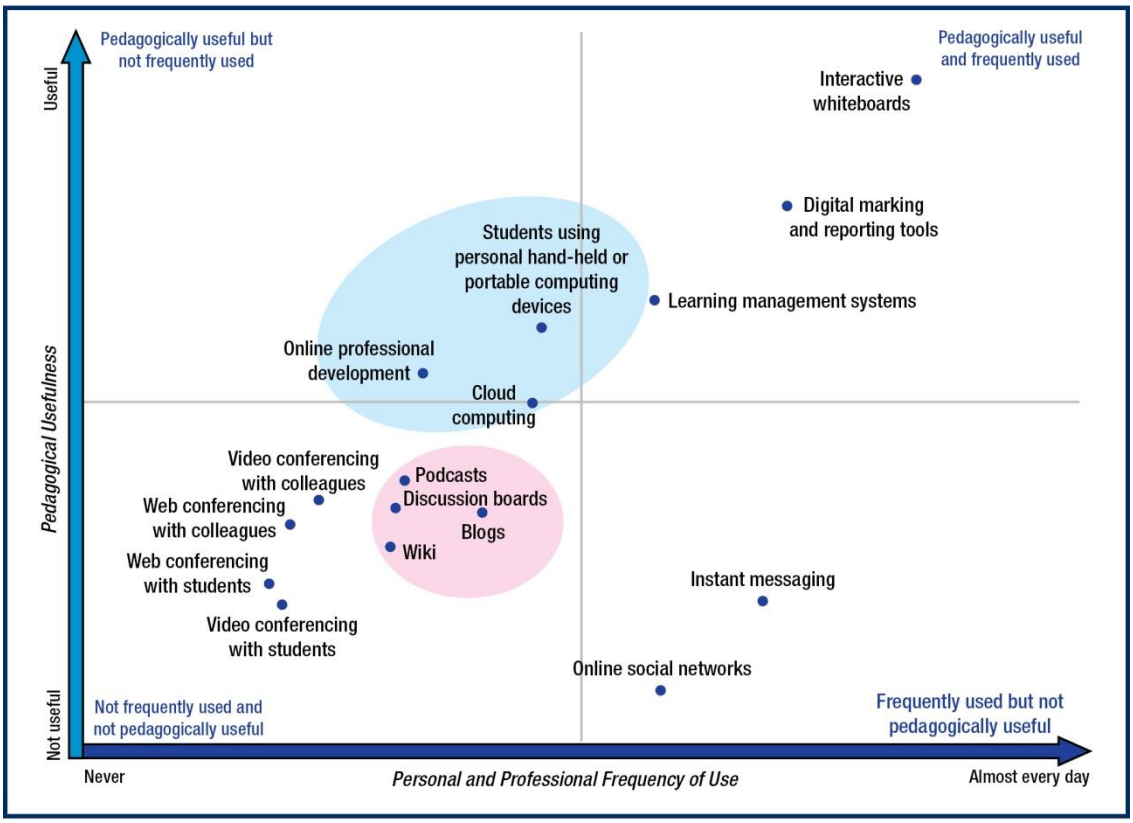


Figure 1: The Perceived Usefulness and Frequency of Use of Selected Technologies

(Source: Alberta Teachers' Association (May 2011). *The Impact of Digital Technologies on Teachers Working in Flexible Learning Environments*. ATA Research Update.)

Filtering, firewalls and access to technologies and training

Participants cited a lack of technology and restricted access to technology (because of filtering and firewalls) as factors that limit their ability to make teaching and learning more flexible in terms of time and space. Participants noted, for example, that technology is not always available for every student, that teachers often do not receive the professional development they need to use technology in a way that fully supports learning and that many available technologies are unreliable.

Factors enhancing and restricting instruction

Respondents generally reported low levels of satisfaction with the support they receive in their teaching situation. They were most satisfied with support that is directly related to their interactions with students. Except for technical support, teachers working in outreach schools/distance education are more satisfied with the support they receive than their face-to-face and primarily digitally mediated colleagues. Participants were least satisfied with the availability of support related to developing and planning instruction. Such support includes time to design courses and access to professional development related to the use of technologies.

Changing conditions of professional practice

Overall, participants reported that, compared with last year, their teaching conditions had either worsened or stayed the same rather than improved. Teachers were most negative in their assessments of items related to class size and composition. Many participants reported that the readiness, willingness and ability of students to learn had significantly declined in the last year. How focus group participants defined "student readiness" depended on their particular teaching context.

In general, however, participants focused on two aspects of readiness:

- Physical and emotional readiness: Students who are not physically and emotionally ready to learn are less likely to achieve their learning goals. Their lack of readiness may be the result of such factors as hunger, sleep deprivation, anxiety or emotional distress. What participants had to say about students' physical and emotional readiness varied greatly within and across focus groups and was directly related to the participant's particular teaching situation.

- Academic readiness: To progress in school, students need to have strong foundational skills upon which to build new knowledge. Teachers assess a student's academic readiness in order to determine the appropriate level and pace of instruction. Several participants in the focus groups observed that students' academic readiness is declining. Participants also noted that students vary in their digital readiness and that, as a result, educators should not assume that all students have the requisite digital (citizenship) skills to succeed in a flexible learning environment.

Overall the study raises a number of important questions for potential future research on flexible learning environments, including some related to student success in these environments (ATA, p. 28):

- What does it mean for a student to be self-directed in a flexible teaching and learning environment, and how is student success affected by such factors as age, gender, education level and the type of flexible learning environment chosen?

- How will the curriculum (that is, programs of study, assessment tools and learning and teaching resources) need to change in order to support learning that is more personalized and more flexible in terms of time and space?

- To what extent can wraparound and inclusive education services be provided to students in non-brick-and-mortar learning environments?

- What learner attributes are linked to success in a flexible learning environment, and what supports do these students need in order to succeed?

- What basic proficiencies and pedagogical knowledge do teachers require to succeed in flexible teaching and learning environments, and how are new teachers being prepared to enter these environments?

Commenting on the significance of the study, Phil McRae et al. note that “it is increasingly important for Alberta teachers to understand how emerging technologies are affecting their overall workload and conditions of professional practice”, an observation that applies to all Canadian teachers.

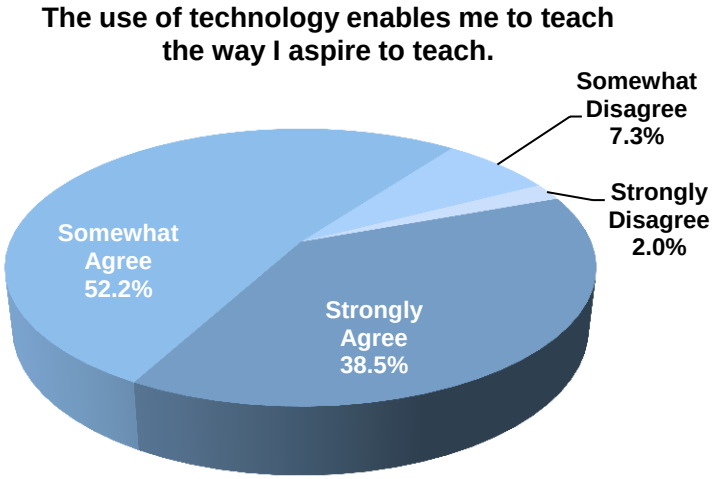
We hope that the findings from our national teacher survey, presented in the next section, contribute to this understanding. Not surprisingly, the CTF survey found similar results to those for Alberta. In general, teachers reported that they agreed technology could assist them in teaching the way that they aspire to teach, however they also expressed concerns about equitable access to technology and a lack of training and support.

CTF teacher survey – major findings

Technology & aspirational teaching

While the vast majority of teachers surveyed agreed (over 90% combined “strongly” and “somewhat” responses) with the statement, “The use of technology enables me to teach in the way I aspire to teach”, 52% responded that they somewhat agree with the statement. Some of the reasons underlying this qualified support are revealed in subsequent findings.

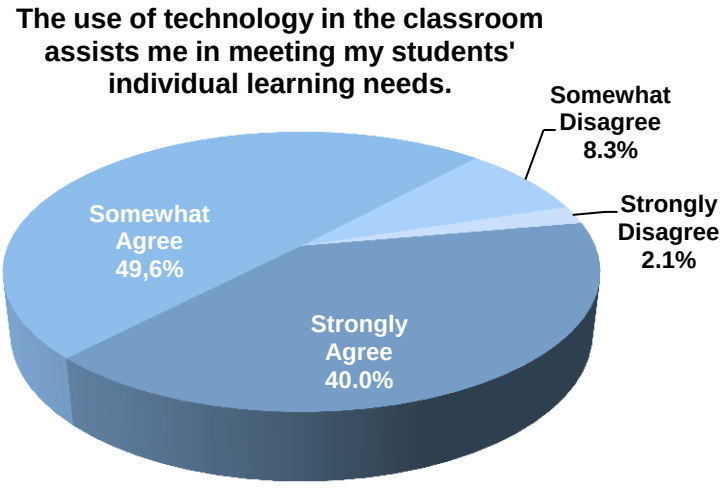
Chart 1



Meeting students’ diverse learning needs

Again, while the vast majority of teachers agreed (90% combined “strongly” and “somewhat” responses) with the statement, “The use of technology in the classroom assists me in meeting my students’ individual learning needs”, half of these respondents indicated that they “somewhat” agree with this statement.

Chart 2



There was a general sense that technology – **readily available, properly supported and effectively used** – could provide flexibility to accommodate diverse learning styles, different modes of learning among students.[1]

> *Technology will continue to help me find ways for students to demonstrate and apply their knowledge to me and to each other in ways that work best for them. It can make the lesson more multi-faceted and support various learning styles.*

> *Je rejoins beaucoup plus de styles d'apprentissage et mon enseignement est plus interactif. Les élèves participent, sont motivés et ils aiment ça.*

Several respondents expanded on the benefits for children with special educational needs including students with autism.

> *Avec des enfants autistes, la technologie me permet plein de tâches différentes, du vidéo-modelling et des apprentissages simples et efficaces.*

> *Assistive technology has opened doors for many exceptional students. It is an indispensable tool in the special needs classroom.*

Another common related theme was the potential for using technology to support differentiated instruction in the classroom as reflected in these comments.

> *Technology will help me to truly differentiate instruction. It will help children on IEPs access the curriculum through use of computers, laptops, iPads, and interactive whiteboards.*

> *La variété d'activités permet de mieux implanter la différenciation répondant plus efficacement aux besoins particuliers des élèves.*

According to these teacher respondents, when used appropriately, digital technology can facilitate the teaching of abstract ideas and concepts (for example through illustration, simulation, animation, etc.) that may otherwise be more difficult to teach.

> *It helps me make things more visible and real for my EAL [English as an Additional Language] learners. They're more able to understand ideas and concepts with better visuals.*

> *La technologie me permet de conceptualiser des phénomènes et de faire des simulations dans mes cours de sciences.*

Some respondents felt that the interactive nature of technology was conducive to student learning.

> *Technology makes the classroom a much more hands-on experiential learning environment.*

> *La technologie me permettra d'enseigner de façon interactive, de garder l'attention des élèves et de les garder motivés.*

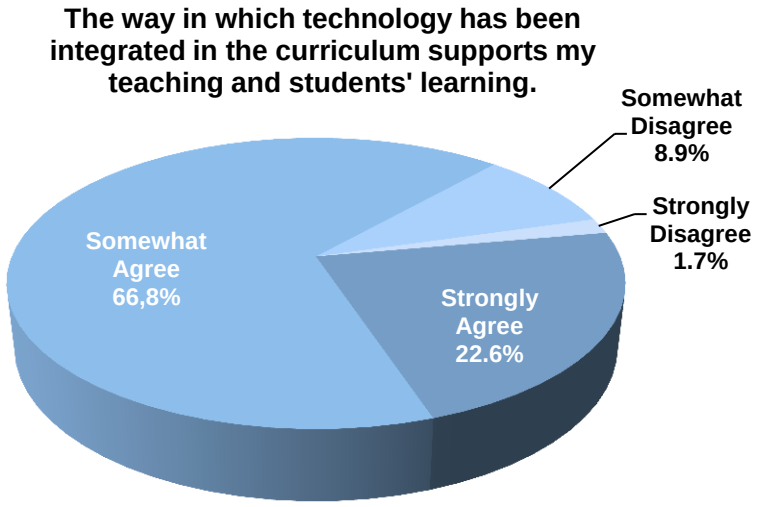
[1] Note that comments are presented in the language of the respondent and may have been edited for clarity.

Curriculum integration

Teachers were asked if the curriculum had been revised to incorporate technology. 46% said yes, 38% said no, and 16% indicated they didn't know.[2]

Of the 46% who said the curriculum had been revised to incorporate technology, the vast majority agreed (almost 90% combined "strongly" and "somewhat" responses) with the statement, "The way in which technology has been integrated in the curriculum supports my teaching and students' learning". While this still shows strong agreement overall, interestingly two-thirds (67%) only somewhat agreed with this statement indicating that there is considerable room for improvement in this area.

Chart 3



For example the interrelationship among pedagogy, curriculum and technology was addressed in many of the comments, particularly the need to properly integrate technology into the curriculum.

> *Technology should be seamless, non-intrusive, and make the curriculum more accessible, interactive, and engaging. [It] should also be practical and inexpensive.*

> *J'aimerais avoir un TBI [tableau blanc interactif] en permanence dans ma classe et avoir accès à un réseau de programmes reliés au curriculum ontarien.*

Some felt that sound pedagogy must be the primary driver for student learning, with technology being used in support of pedagogy.

> *Technological change is driving instruction. [There is a] need to look at the present/future developments to insure that we are not fitting instruction based on technology but using technology to support pedagogy.*

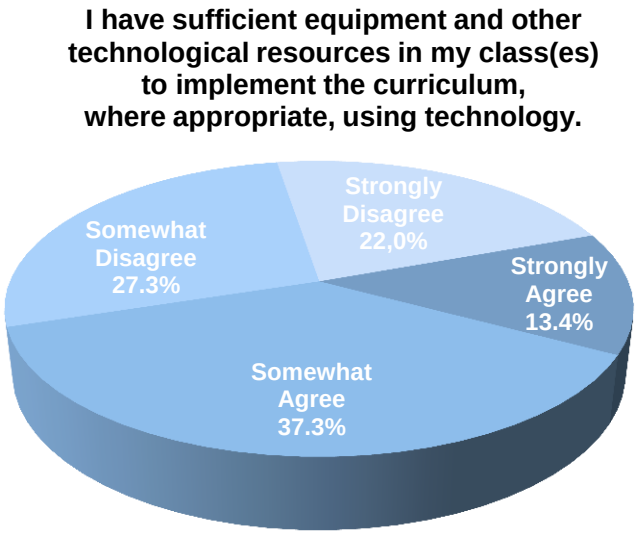
[2] The survey did not ask why teachers did not know. It is likely that these respondents had only worked with one curriculum and thus were not aware of changes from previous versions.

Technology resources

Teachers were asked if they agreed with the following statement: “I have sufficient equipment and other technological resources in my class(es) to implement the curriculum, where appropriate, using technology”.

Teachers’ views were divided on this issue. While 51% of respondents agreed (13.4% strongly / 37.3% somewhat) with the statement, 49% of respondents disagreed (22% strongly / 27.3% somewhat).

Chart 4



This finding is borne out in the qualitative data – lack of availability and access to up-to-date equipment and other technological resources was among the most frequently cited concerns of teachers.

> *All students need equitable access to appropriate technology for each class. We need a laptop (or other device) on every desk to truly teach the way I aspire to teach!*
>
> *En n’ayant pas accès à la technologie 100 % du temps, il est impossible de faire l’intégration!*
>
> *It would help make lessons more interesting and provide more hands-on opportunities for the students, if the technology was up to date and readily accessible.*

Not surprisingly, laptop/notebook computers and tablets equipped with a variety of educational apps as well as Smart Boards received particular attention among valued resources.

> *Every student with a laptop and all classrooms equipped with smart boards.*
>
> *iPads and tablets for small group instruction and inquiry, consistent use of Smart Boards – bringing technology to kids instead of kids to technology.*
>
> *Je crois qu’en 2012, il devrait y avoir dans toutes les classes des tableaux interactifs et ce n’est pas le cas dans toutes les écoles.*

In addition, teachers expressed a need for ongoing technical support due to concerns about technology not working as it should or being unreliable in the case of outdated equipment. As one respondent noted, when the technology doesn't function as needed it can "take the wind out of a teaching sail".

> *It's sometimes more bother than it's worth especially when it doesn't work. You lose a lot of instructional time when you have technical difficulties.*
>
> *Technology is great when it works. It takes the wind out of a teaching sail when it does not function as needed. :(*
>
> *Les ordinateurs de l'école ont toujours des problèmes techniques donc cela devient un élément frustrant!*

Lack of time – a highly coveted resource among teachers – to not only learn about new technologies but how to successfully integrate them into daily teaching practice across a range of subjects was cited as an issue.

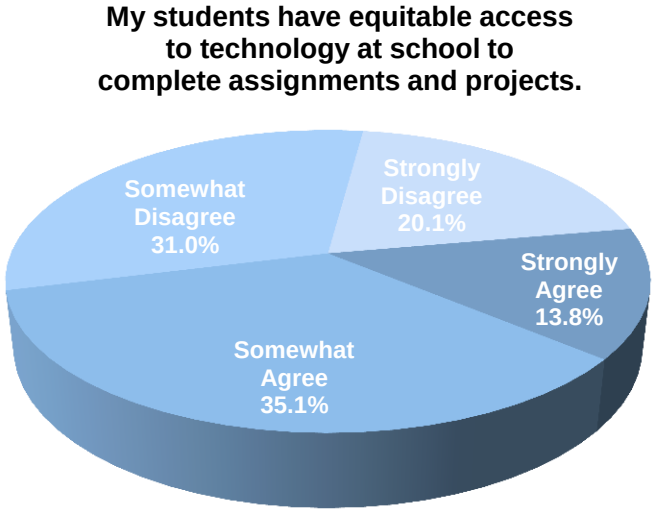
> *I wish I could use technology more efficiently, but it's hard to find the time to learn it myself before I use it with students.*
>
> *Planifier avec la tech prend plus de temps, mais on n'a pas plus de temps de planifier.*

Equitable access to technology

This is another area in which teachers' views were divided.

Teachers were asked about the following statement: "My students have equitable access to technology at school to complete assignments and projects". 51% of respondents disagreed with this statement (20.1% strongly / 31% somewhat), while 49% agreed with it (13.8% strongly / 35.1% somewhat).

Chart 5



Again, the qualitative data provides some insights into this finding. Teacher respondents raised numerous concerns about inequitable student access to technology in the school environment.

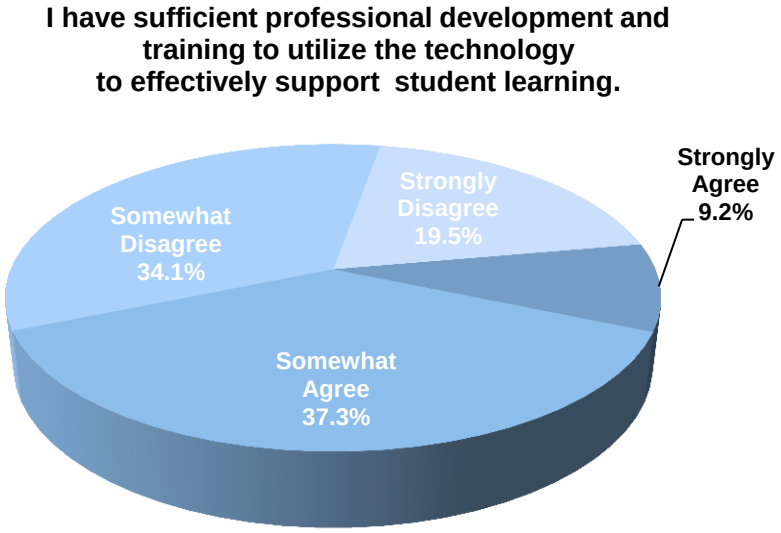
> *I like feedback aspects of some programs where students contribute in real time. However, without the resources, technological tools simply emphasize class and economic differences among the students, reinforcing inequities.*
>
> *Lorsque tous les élèves auront accès à des ordinateurs à tout moment de la journée, j'aspirerai à enseigner à ma capacité.*

Professional development & training

Finally, teachers were asked for their opinion on the following statement: "I have sufficient professional development and training to utilize the technology to effectively support student learning".

Teachers' views were also divided on this issue. A slight majority of teacher respondents (54%) disagreed with this statement (19.5% strongly / 34.1% somewhat) with 46% in agreement (9.2% strongly / 37.3% somewhat). This question yielded the strongest negative response of all the survey questions.

Chart 6



Many of the comments focused on the need for sufficient, appropriate, ongoing and timely professional development to enable teachers to utilize new technology to effectively support student learning. These respondents believe PD is key to properly integrating technology into the curriculum and to ensuring they can have a positive impact in their classrooms.

> *Technology moves faster than we are able to incorporate it without adequate PD. If we expect our students to move ahead, then we must be assisted to move ahead ourselves.*
>
> *Je souhaite fortement recevoir plus de perfectionnement professionnel pour approfondir l'utilisation des TIC [technologies de l'information de la communication] dans ma salle de classe. Plusieurs ressources sont disponibles (et parfois gratuites), mais inconnues...*
>
> *Technology can only have an impact if we provide all teachers access to appropriate professional development and equitable access to technology for all students.*

Other issues

Teachers raised a number of other issues in their responses to the open-ended question.

For example, the potential for new technologies to engage and motivate students and to make learning more relevant to students' lives was frequently cited by teacher respondents.

> *Technology would provide unlimited opportunities to engage student learning by augmenting the curriculum and using the tools that students are already familiar with to reach and teach them.*
>
> *Les technologies me permettraient d'engager davantage les enfants dans leur processus d'apprentissage.*

A related theme was that of technology enabling students to take more responsibility for their own learning, to make their learning more self-directed, potentially changing the role of the teacher in the process.

> *I envision less direct teaching/facilitating/collaborating in person, and more self-directed/self-paced learning.*
>
> *Je pense qu'avec la technologie, on peut rendre les élèves plus autonomes. L'élève devient l'acteur principal de ses apprentissages.*
>
> *I want it to allow more responsibility to be placed on the students for their own learning.*

Another theme was the rapid pace of technological change and the implications of this for cash-strapped boards and schools trying to stay current with the latest developments in digital technology.

> *I don't think schools will have the financial ability to maintain what technology is now in the system.*
>
> *À moins que les fonds soient augmentés, la présence de la technologie en éducation va tirer de la patte. Difficile de toujours avoir à courir pour l'argent...*

Some teacher comments highlighted the important recognition that teaching is essentially a communication process between teacher and student and that, while technology can facilitate this process, it should not replace this fundamental human relationship. One respondent noted, "*I find face to face time more valuable with my students than face to iPad time".*

> *It is an important teaching tool. However, the interaction between a teacher and their students cannot be replaced by technology.*
>
> *À la maternelle, la technologie est utile et est un outil d'apprentissage extraordinaire. Mais le besoin humain est encore prioritaire à ce stade.*

There were also comments on the need for teacher input into technology-related educational decisions. Teacher professional judgement and autonomy regarding how best to use digital technologies is critical in meeting the diverse learning needs of their students, as reflected in this comment:

> *A profound impact if those who actually use the technology had a say in why, how and what technologies are implemented. Decisions come from [an] IT perspective, not an instructional one.*

What we learned

These are the key messages we heard from the teachers we surveyed regarding the relationship between technology and aspirational teaching.

- The vast majority of teachers surveyed agreed that the use of technology enables them to teach in the way they aspire to teach.

- The vast majority of teachers also agreed that the use of technology in the classroom assists them in meeting their students' individual learning needs.

- Of those teachers who indicated that the curriculum had been revised to incorporate technology, the vast majority agreed that the way in which technology has been integrated in the curriculum supports their teaching and students' learning.

It should be noted however that the high proportion of "somewhat" agree responses to these statements suggests qualified support for them, borne out in some of the respondents' comments as we have seen.

Teachers' views become more divided when we look at the specific areas of technology resources, student access to technology, and professional development, indicating that there is considerable room for improvement.

These survey findings suggest that there are a number of conditions of teachers' professional practice that must be in place to ensure that new and emerging technologies can more effectively support teaching and learning, and assist teachers to become the teachers they aspire to be. These conditions include:

- availability of and access to a range of up-to-date equipment and other technological resources.

- ongoing technical support to ensure that technology works as it should so that instruction can proceed smoothly.

- ensuring equitable student access to technology in the school environment.

- provision of appropriate, job-embedded, ongoing and timely professional development and training to enable teachers to keep up with the pace of technological change and utilize new technology to effectively support student learning – this includes sufficient time for teachers to learn about new technologies and how to effectively integrate them into daily teaching practice.

- careful consideration of the interrelationship among pedagogy, curriculum and technology, particularly the need to properly integrate technology into the curriculum so that student learning is the primary outcome of the education system. Technological tools should assist in the delivery of the curriculum, rather than drive the development of the curriculum.

- providing opportunities for valuable teacher input into technology-related educational decisions.

In his keynote address at the CTF National Staff Meeting in November, Stephen Murgatroyd, Chief Innovation Officer with Contact North, spoke on the theme of technology in the classroom – trends, myths, challenges and opportunities. He noted that teacher organizations need to continuously monitor developments in technology for learning, with a view to understanding, championing professionalism and working to create the conditions of practice in which technology is truly supportive of effective teaching. The kinds of studies undertaken by CTF, ATA and other teacher organizations are all examples of this work. We also need to continue to gather evidence of effective practice and share this widely within the profession.

As thought leaders, teacher organizations should be celebrating innovative practice driven by teachers in which technology plays a part but in which the focus is on pedagogy, learner engagement and learning outcomes – on achieving deep level learning by design as he described it.

According to Murgatroyd (2011), the challenge before us is considerable: "how do we leverage current and rapidly emerging technologies to increase the quality, depth and meaning of adult-student interactions in education, and to increase student engagement with learning, knowledge and understanding so as to encourage their passion for learning?" (p. 151)

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Bernie Froese-Germain and Richard Riel are Researchers at the Canadian Teachers' Federation. Bob McGahey is CTF's Acting Director, Research and Information.