Benefits and Challenges of Information and Communication Technologies (ICT) Integration in Québec English Schools

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ABSTRACT
This paper investigated teachers' and educational consultants' perceptions of ICT integration in Québec English Schools, specifically with regards to the benefits and challenges of ICT integration therein. 23 teachers and educational consultants from seven different school boards participated in the focus group sessions. Results revealed higher student engagement levels, glocalization of the 21st century education and enhancement of the learning process as the main benefits of integrating ICT in English Québec Schools. In addition, participants highlighted the following challenges: lack of supporting school leadership, inconsistent investments in ICT equipment, infrastructure and resources, inflexibility of funding, the need for additional professional development and support and incorporation of technology in evaluations and curricular plans.

Benefits and Challenges of ICT integration in Québec English Schools
The job demands of our present era require individuals who are knowledgeable in their fields and who are technologically savvy. Since technology is a powerful and flexible tool for learning, it is needed and desired to meet globalization challenges, to advance our country's economical status, and to motivate and aid students to learn better. In fact, technology is being integrated in educational institutions all around the country to make sure that Canadian citizens meet global technological criteria. The knowledge and communication breakthroughs that the world can achieve using information communication technologies (ICT) are so numerous that educational institutions are striving to invest in ICT tools in an attempt to help raise citizens who are ready to face the challenges of the 21st century where media, manufacturing industries as well as commerce have become increasingly technology-oriented. ICT tools integration is becoming a *sine qua non* in schools. The primary goal of educational technology as applied to pedagogical contexts is to facilitate the teaching/learning process. Accompanying this evolution has been ongoing research into the relative effectiveness and efficiency of educational technology to enhance learning and achievement.

Many researchers claim that the successful incorporation/implementation of ICT in schools still faces myriad obstacles along the way (BECTA, 2004; Hew & Brush, 2007). Lim (2002) suggests that researchers need to take a more contextual approach when studying ICT integration in education, taking into consideration the environment in which ICT is being used (Lim, 2002). Tondeur, Devos, Houtte, Braak, and Valcke (2009) add that useable solutions can emerge only after taking into consideration the structural and cultural aspects of the school where ICT is being integrated. The structural aspects of the settings that need to be taken into account comprise elements such as the distribution of classroom space and resource availabilities and distribution, support and maintenance of ICT integration. The cultural aspects could include a school's vision and mission for ICT integration or adequate guidance and support for all stakeholders involved in the process (Tondeur et al., 2009).

In my paper titled *A Holistic Approach to Technology Integration in Education* (Rabah, *in press*), I highlight the importance of drawing a contextual delineation when investigating ICT integration in educational settings. From this viewpoint, it would be inappropriate to view ICT-based education without taking into consideration the school's context, setting and environment. The classroom 'micro-level' issues can only be fully appreciated after having taken into consideration the entire perspective in which educational technology is situated such as the school's infrastructure, vision and mission. The 'meso-level' of the administrative infrastructure and objectives of the school as well as the 'macro-level' of a broader perspective of socio-political and/or ministerial policies surrounding the school and the classroom have also to be taken into consideration. Differentiating between those levels certainly does not mean that one is above the others in standing. However, it draws an understanding of 'the intimate connectedness' between 'wider contexts and conceptualisations' and the 'merely particular' (Webster, 2005, p.453). I am not denying the unquestionably constant attention that should be warranted to the 'micro-level' of the teacher and student in the classroom; however, we need to contextualize it, especially as related to the ongoing significance of environmental-level contexts in impacting learning.

A contextual delineation when analyzing ICT integration is especially appropriate in pedagogical settings like the Québec English Schools. The Advisory Board on English Education's (ABEE) report titled *One Size Does*

not Fit All is addressed to the Minister of Education and delineates the special situation of Québec English school boards and recounts their special situation (ABEE, 2013). The English school boards cover broad, large territories with some areas three times bigger than any of the French school boards. In fact, some English school boards cover geographical areas that are the size of Belgium in terms of territory. Distances between schools and centres are at times enormous. English school boards also have declining school enrolment rates even though they cover a wider scattered population of students than the French school boards. This results in very small school populations in certain areas, which affects the quality of education and funding. Some English school boards have fewer personnel and resources to service their student population, which is smaller in number but as diversified as other schools. Personnel carry many responsibilities because of lack of budget availability. For example, a technology consultant could be responsible for technology, adult education, and physical and social sciences dossiers. English schools have more special needs students than the French sector and less access to professional services from psychologists, speech therapists and the like. Those aforementioned contexts raise serious different challenges to the boards to provide the students with quality education.

In light of the above, the main purpose of this study is to reveal the perceptions of teachers and key informants regarding the main benefits and challenges to ICT integration in pedagogical settings such as the English Québec Schools. Ertmer, Addison, Lane, Ross, and Woods (1999) highlight the importance of delineating the affordances as well as the constraints perceived by stakeholders when researching proper integration of ICTs in schools. Adopting such a contextual perspective to ICT integration in schools is important, especially when conducting studies in education, for the result should not be "simply knowledge, but useable knowledge" (Lim, 2002, p. 411).

RESEARCH OBJECTIVE
This study addresses the following main objective:
To gauge teachers' and educational consultants' perceptions of benefits and challenges of ICT integration in Québec English Schools' context.

RESEARCH METHODOLOGY
This study was conducted following a qualitative research methodology. The primary source of data collection consisted of focus group sessions. In January 2014, three focus groups[1] were conducted with a total of 23 teachers, and key informants, i.e. educational consultants from seven different Québec English school boards. Participants were selected by the Director General of their respective school boards to participate in this research study. The focus groups were conducted to solicit information from the aforementioned participants and initiate an open-ended discussion to voice the benefits and challenges of implementing ICT in their respective schools. A copy of the focus group questions is provided in *Appendix A*.

For the analysis of my data, I used Glaser's grounded theory, which hypothesizes that the theory is the product of data and cannot be separated from the manner by which it is obtained (Glaser, 1978). Consequentially, queries, theories, and conceptions are produced from the data and resolved during the ongoing progress of the research (Glaser & Strauss, 1967). " By its very nature grounded theory produces ever opening and evolving theory on a subject as more data and new ideas are discovered. This nature also applies to the method itself and its methodology" (Glaser, 1978, p. ix).

Glaser created the grounded theory methodology for qualitative data analysis basing it on his experience in positivism (Glaser, 1978). Glaser asserts that he used the methodology of statistical analysis as a paradigm for the qualitative method in grounded theory (Glaser, 1992). Therefore, the paradigm for quantitative analysis furnishes the distinctiveness of the aforementioned qualitative approach.

In terms of researcher positioning, I saw myself in this study operating from a post-positivist ontological stance. Being one of the research representatives of ABEE, who initiated the research, I felt I was an outsider, detached from the participants in the process. I was recording the participants' answers and collecting their voices. My perceived stance facilitated the collection of unbiased data and representing teachers' and consultants' views as precisely as possible. Participants noted at the end of each focus group that they felt empowered and were pleased by the fact that representatives from the ABEE were listening to their inputs and teachers and consultants' voices were being heard.

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1 *Each focus group consisted of seven or eight participants subdivided into different education cycles.*

Focus group discussions and interviews were audio-recorded and then transcribed. Data analysis process started with open coding. Then subsequent categorization of codes was done in order to develop an emergent set of themes from the collected data. During the analysis process, I continuously related back to the codes and constantly classified the data to ensure that only the codes that repeated themselves were used to construct the themes discussed in the results. This method enabled me to approximate theoretical saturation. The thematic findings that arose from the analysis of data are presented here below.

RESULTS
Perceived main benefits of ICT integration in English Québec schools
Higher student engagement levels. Participants highlighted that when they integrate ICT in their classrooms, they grab the attention of students that are in their turn using these tools outside in their regular lives. Furthermore, educational technology aids teachers deliver diversified instruction to a larger number of students. It also allows learners more autonomy, more cooperative learning, while individualizing information and resources related to the students' needs and interests, all of which can help secure higher student engagement levels. One participant noted, *"The engagement level whenever you pull out any technology in the classroom is so elevated in comparison to paper and pencil. Looking at the world, we have to prepare the kids for that"*.

English Québec schools high inclusion rate of special needs students is significant. Students particularly benefit from assistive technologies in the classroom. Assistive technology could be any technological tool that a student uses to cater for a specific identified need important for completing a certain learning task whether it helps in planning for the task, organizing it, producing and/or sharing an output. One teacher noted, *"We don't really have any studies, just anecdotal. Some students started using electronic readers last year as assistive technologies. Teachers noted dramatic results including higher confidence levels"*. With the help of technology, peer tutoring is also facilitated as a method for engaging students. A very excited participant noted *"I am at a school where I have many students with learning difficulties and challenges…I have students that don't engage a lot when holding a pencil but will do a lot more if they engage with "Audio Boo" or "Siri" and writing an assignment in a different way. They are still producing…and when it is published online and see their work being seen outside their binder…such as in a digital portfolio…or out there on the Internet where someone can give them immediate feedback…their academic performance goes up"*.

Glocalization of the 21st century education. Educational technology gives teachers the affordances of connecting the local classroom to global places. The global world can be opened up in the classroom. Through visual conferencing English school boards have the opportunity to communicate with people from all around the world. In that way, global connections increase and richer learning opportunities are available to students including more collaborative learning opportunities. One participant mentioned the delight of the students when they met with the author of a book they were reading by a video conferencing interview. *"One of the things that we did recently was that we had a Skype session with an author and that went very well. The kids were really excited"*.

Enhancement of the learning process. Using ICT in the classroom, teachers have the opportunity to develop their lesson plans, make it more inquiry-based, project-based or collaborative-based. There are a plethora of opportunities for students to benefit from technology in the classrooms. They range from simple browsing of the World Wide Web, to using word processors, presentation tools and professional graphic software. Participants mentioned the benefit of integrating technologies in lesson plans, relating to Puentendura's (2006) SAMR model. According to the participants, ICT integration in English Québec schools is still in its potential phase especially as it relates to the SAMR model where only the first two levels are currently integrated in most classrooms. *"Right now what we see in the classrooms are the Substitution and the Augmentation. We don't see the Modification and the Redefinition. Technology allows us to go towards the Modification and the Redefinition where we do things we couldn't do before. Some are starting to bud out. Some teachers can do it all the way through SAMR. But little pockets here and there. We are still waiting for this higher level of integration to pick up."*

Perceived main challenges of ICT integration in English Québec schools
Many educational technology equipment and software integrated in schools are not being utilized in manners that notably improve education and instruction. Participants perceived the following main challenges with regards to the ICT integration in English Québec Schools.

Lack of supporting school leadership. With regards to ICT integration in schools, the participants perceive that school principals' leadership as one of the most important catalysts affecting the successful integration of those tools. Institutions should clearly work towards vision and mission for technology integration, planning for it

comprehensively, and connecting the dots of technology investments to classroom uses. Without supporting school leadership and vision, ICT integration will be limited to isolated initiatives like investments or training sessions. According to the interviewees, integrating technology in schools requires a clear vision from the leaders at the school. One consultant said, *"Our current director is devoted in promoting iPads in the classroom. He has pushed many of us towards training sessions and sharing sessions in order to promote the use of iPads in the classroom. We didn't feel that with the previous director"*.

Inconsistent investments in equipment, infrastructure and resources. ICT integration in education requires large budgets and financial investments. Investments should not involve only purchasing new equipment and software but also developing school infrastructures for example by installing Wi-Fi, adapting classroom settings where necessary and/of course refurbishing and maintaining existing equipment. After all, some existing school classrooms are not designed to incorporate ICT when they were initially built. They do not have enough plugs or the classroom walls might be getting in the way to proper Wi-Fi distribution and the like. Participants noted: *"We suffer and struggle from broadband so that ICT keep on functioning and don't crash. Access in our centers is pretty tricky"*. Another participant said: *"I have only one outlet in my class. It is connected to the plug in the hall as well as my neighbor...our school buildings are simply too old to support technology"*.

Inflexibility of funding. Last but not least, when ministerial funding is diffused to the school boards, it is usually policy-based and standardized regardless of whether or not the funding fits the needs and preference of individual school boards. Funding policies that are set equal across all English boards is very challenging for schools to manage with, because operationally there is a lot of difference in terms of school needs and equipment. One example mentioned by participants is the Ministry's policy of buying equipment only from certain specified technology vendors. Teachers complained: *"We have a restriction policy by the Ministry that allows us to buy only certain devices and not others...it may not be about the tool...but it is also about how comfortable you are [as a teacher] with the tool you use..."*

Need for additional professional development and support. The next challenge addressed by participants is the fact that teachers need more training and support for integrating technology when it comes to day-to-day classroom instruction so that integration is more successful across most classrooms. Some highlight the fact that although standard professional development sessions are held three or four times a year to train teachers to use the technology and the equipment, it is not enough. Technical support and pedagogical support are insufficient. If a computer problem occurs, whether at the level of lesson planning or at the level of technical problems that the teacher and students cannot solve, there may be long delays before help is available to address it. Thus teachers feel they are not supported with these new tools. In light of that, they do not prepare to utilize it for integral parts of their lessons or depend totally on it in the classrooms. There are simply no adequate support programs in place for teachers. *"Teachers are intimidated. They have the knowledge and baggage but they are hesitant just because they don't feel they are supported enough while it is happening. We need to have someone in the school who can help them...teacher or research person or ICT person who is there at school that they can turn to if an iPad does not work...or kids cannot access X...this is lacking.... It is like when little children are learning how to ride their bike. There is someone behind them holding the seat. At some point, they let go of the bike but they are still behind. I think that is the support that is lacking for the teachers"*. Teachers mentioned that the classroom support they were getting was not enough. School consultants are usually very busy and diffused to schools an average of one day per week. For technical issues, such as sometimes some task that is as simple as a light bulb for the smartboard, teachers have to wait for days and sometimes even for weeks. They have to send emails to the school administration that in turn hands it to the technician. And then, the teacher has to wait. Teachers are not allowed to touch the equipment. They are not allowed to change a simple light bulb. They need to wait for the technician.

Need to incorporate technology in evaluations and curricular plans. Because curricular planning and student evaluations are closely intertwined, there is a necessity to reexamine the evaluation approaches when ICT is integrated into the pedagogical programs to take into consideration how the utilization of educational technology can meet the requirements of students' evaluations. Participants highlighted specific training needs as related to students' assessment when assessing ICT related outputs. Some teachers noted, *"Evaluations need to allow for technology integration as well"*. A teacher elaborated on this point, saying: *"How you evaluate digital work and how you integrate technology evaluation in your work can skew how learning goes up. I know that it does, but it does not show necessarily in everyone's classes."* Others mentioned that ICT objectives need to be integrated in the curriculum plan. Currently, ICT objectives are getting lost (falling into a grey zone area) because the focus is on the content instead of the process. Another teacher noted, *"If you are a creative teacher, you can sneak it, in whichever way you can. We have done a lot of professional development sessions this year on it, but a lot of teachers keep on saying, but how do I integrate it in my class?"*.

DISCUSSION AND CONCLUSION

ICT integration in education can enrich teaching and learning processes in numerous ways. That being said, the value of ICT integration in educational settings depends on the goals it serves and how well it is used by the teachers and students in the classroom. The fundamental theme underlying all results is that while ICT in education has great potential to enhance teaching and learning processes, turning that into reality is a complex and multifaceted job. To integrate ICT properly in k-12 education, long-term, carefully devised plans are required for meaningful changes to occur whether at the level of instruction, curriculum or simply classroom management. These changes cannot be changed after a couple of training sessions. Change is noticed gradually, over a number of academic years and necessitates significant professional development and ample support for stakeholders to progress from stage to stage.

According to the participants, the main benefits of ICT integration are higher student engagement levels and enhancement of the learning process. These results resonate with the recent study by Karsenti and Collin (2012). Their survey of 2,712 students from grades 3 to 11 and 389 teachers regarding their perceptions of the use of laptops in elementary and secondary schools in Québec English Schools shows that the perceived use of available laptops appears to be particularly conducive to student learning. The authors list a higher student engagement ratio as one of the main benefits, immediate access to a plethora of information and resources, in addition to students benefiting from additional time needed to practice challenging notions and increase self-competence levels.

As for the significance of ICT to special needs students, LEARN, Québec[2] highlights that there is no argument that ICT has a positive effect on the academic achievement of special needs pupils. The assistive technology signifies equality of opportunity for the special needs student. It is viewed as a tool that successfully supports the academic success of the student with learning difficulties and helps the student attain certain competencies, in addition to being more engaged in the classroom (retrieved from *http://learnQuébec.ca/en/content/pedagogy/insight/intech/assistive_technology/index*).

According to the participants, the complexity of integrating technology in educational settings is contingent upon a supporting school leadership. The presence of a school leader who knows about educational technology and whose goal is to integrate ICT in the school is a necessity to gear 'the ship' in the right direction. Means and Olson (1997) thus advise educationalists to have a clear vision before investing and spending money. In addition, this vision should not be a solid hand press from top to bottom. It should go in many directions with various stakeholders involved in building the vision, including teachers, board members and IT consultants (Costello, 1997). Ertmer (1999) claims: "A vision gives us a place to start, a goal to reach for, as well as, a guidepost along the way" (p. 54).

Previous research done by Anderson et al. (1998), Cuban (2001), Cuban et al. (2001), Ertmer (1999), Schoep (2004) and Vaughan (2002) indicate that investments in schools consisting solely of buying technological tools are not enough. Budgets for ICT investment should include equipment, resources, and software, as well as developing the infrastructure, updating and upgrading the latter regularly. Therefore, the budget for ICT integration in an educational institution should translate into consistent investments that include equipment, infrastructure and support services.

According to Papert, when technology enters classrooms, it "weaves itself into the learning process in many more ways than its original promoters could possibly have anticipated" (Papert, 1993, p.53). The trainings offered need to be delivered by qualified educational technologists and are not geared towards teaching them about the technology alone. Teachers need more than professional development workshops to help them utilize these technologies in the classrooms. They also need to take into account research that demonstrates the value of incorporating a variety of technologies into learning environments and how these tools can be incorporated creatively and effectively into instruction. If educators do not buy into the pedagogical value of various technologies, they will remain just fashionable add-ons in our curricula. Salomon (1993, p.189) claims: "No tool is good or bad in itself; [technology's] effectiveness results from and contributes to the whole configuration of events, activities, contents, and interpersonal processes taking place in the context in which it is being used." In light if this, if teachers or pedagogists do not change in the activities, curriculum and learning environment, it will stay un-integrated because of pedagogical constraints (Salomon, 1993).

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[2] *LEARN, Québec is a non-profit educational foundation funded by Québec-Canada Entente for Minority Language Education that offers English Québec school boards educational technology support and e-learning services.*

Anderson and Dexter (2003) have narrated several examples of how educational institutions can incorporate ICT in curriculum programs and students' evaluation plans. Teachers can do it gradually by investing a lot of time, careful planning and collective effort. For example, the school can manage to integrate project-based learning as a form of students' output and find ways to evaluate the work even if the students use computer laptops. Dexter and Anderson (2002) report that once this planning phase is completed, technology can be used more, students' engagement will be higher and the school will certainly feel an improvement in student achievement outcomes because individualized learning and interest levels of the students will be much higher. As for classroom support, whether pedagogical or technical, schools could collaborate with other post-secondary institutions like colleges or universities in order to have access to staff that cannot be recruited full time. These collaborations could result in (further) training, pedagogical integrations and technical support.

Last but not least, I believe the chief benefit English school boards can stand to benefit by is informally cooperating and coordinating amongst each other. Networking among English school boards could be very beneficial especially as it relates to joint support mechanisms as well as problem solving opportunities.

I end this study with a recommendation that resonated with me from the latest Advisory Board on English Education report (ABEE, 2013): "The Advisory Board respectfully asks the Minister to ensure the involvement of the Assistant Deputy Minister and his office in the development of policy and to provide them with flexibility in the application of policy and resource management." (p.30). The contextual particularities make it hard to develop and abide by a generalizable ICT funding policy for the English schooling sector. ICT integration in the English sector needs different levels of investments. The English school boards differ from each other with regards to size, geographical area and population nature/number. School boards cannot abide by a generalized ministerial funding policy. They simply have different needs that necessitate different investments.

FUTURE RESEARCH
This study is limited to a number of teachers and consultants per school board chosen by their corresponding Director General. In addition, it is also limited to one data collection technique. Future research should target a larger number of participants that is also more diversified with data collected from several sources including in-depth interviews to gain a comprehensive perspective of stakeholders' perceptions as it relates to ICT integration in Québec English school settings.

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Appendix A
Focus Group Questions

If you had to define ICT integration in your school/school board, what would you say? What technologies come to mind?

In your opinion, how well does your respective school/school board integrate ICT? How do you feel about that?

What do you think about student's academic performance and ICT integration? How do you see the two connected? Please explain.

Do you think ICT affect your students the same way (boys vs. girls, low SES vs. high SES; minority learners, students with special needs, as well as other possible digital divides)?

Do students generally have access to all the ICT tools they need to complete their schoolwork? How do you feel about that? How does it affect your teaching?

Do your students ever teach you new ways to use certain technologies or the impact a new technology can have? Do you ever involve your students to help you in developing new ways to incorporate technology into the classroom?

Talk about the support your school system provides for the integration of ICTs in classrooms such as professional development and pedagogical support.

What initiative(s) are put in place by the school system for technical support (such as technology personnel/ IT division) needed for teachers to integrate ICT in their classrooms?

Do your students have the necessary skills to manipulate and benefit from using different ICTs in pedagogical contexts? If not, who teaches them those skills?

What/who influences your decision to integrate (or not) ICT in your lesson plan or classroom?

Do you have a Facebook or Twitter account?

Do you talk to other teachers or do you discuss your experiences and communicate and/or collaborate with one another, outside of classroom time (e.g. email, Facebook, Twitter, etc.)? What issues do you usually collaborate/talk about?

Is there anything we haven't asked that we should have asked, and that you would like to talk about?