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Special Issue: Issues and Challenges of Training Teachers to use Technologies in the 21st Century

Numéro spécial : Enjeux et défis de la formation des enseignants à l'usage des technologies au 21e siècle

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Introduction

The seven papers in this special issue focus on various aspects of learning technologies and teacher training in Quebec (Canada), including both initial training for future teachers and professional development for more experienced ones. In a few short years, various technologies have made unprecedented inroads into Canada's elementary and high schools. For example, over 500,000 Canadian students are using tablets in class every day, and over 100,000 are using laptops. This extensive penetration is due as much to the appeal of technology as to its often claimed potential for education: that it motivates students to learn.

In recent years, information and communications technology has been gaining significant ground, not just in the day-to-day lives of the young and not-so-young (Endrizzi, 2012), but also at school, where many believe that it is the very future of education (see OECD, 2015). According to Livingstone (2012), technology has transformed society from top to bottom, and particularly in terms of education and what the public expects education systems to deliver. In the Google era, people are deluged with information. Technology has made it possible to view the world through a digital lens, and teachers can access this knowledge at will via interactive smartboards or students' laptops and tablets. The philosopher Michel Serres (2012) views the exponential growth of technology as an alarming societal shift, equaled only by the invention of writing—against which Socrates strenuously warned us—or perhaps Gutenberg's printing press. Others fear that the widespread and startling inroads of technology into classrooms will completely destroy so-called traditional interpersonal relations, and that peer relationships will be preferred and fostered over hierarchical ones (Mouissset-Lacan, 2012). Some authors, including Jouneau-Sion and Touzé (2012), consider this a major advantage. They believe that it is the cherished idea of Edgar Morin that enters the classroom: a form of teaching that considers the world in its inclusiveness, that situates students in a climate of autonomy and interaction so

that they can construct relationships between knowledge, between the school and the world, with responsibility for their own learning.

According to Dutta and Bilbao-Osorio (2012), decision makers also see in technology—and with good reason—a solution for improving students' academic performance. Thibert (2012) sees new ways of learning for young people, notably owing to a permanent connection to the Internet. Others view technology as providing limitless opportunities for formal and informal learning (see Deschryver, 2010; Redecker & Punie, 2011). Further to this last point, we note that recent technosocial changes have led us to rethink what the term "digital divide" means. Normally understood as unequal access to technologies (Warschauer & Matuchniak, 2010), it is beginning to be understood as inequalities that perpetuate a digital underclass of people who lack the skills to use emerging technologies, between those who can put them to good use and those who merely submit to them, between youth who use technologies for learning and those who spend their time gaming or texting for fun. Moreover, despite the significant potential of technology for education, it remains an enormous challenge to introduce it into classrooms (Underwood & Dillon, 2011), when not enough is known about effective pedagogical uses that have real impact on academic performance (Alluin, 2010; Thibert, 2012). In previous studies, for example, we found that young people are using technology mainly for amusement, and not necessarily for learning. Although many studies have focused on the impact (or lack thereof) of technology on education (e.g., Livingstone, 2012), it appears that in 2017 we have arrived at another phase in Canada and elsewhere: we now understand that it is how technology is used for education that counts, not the technology itself (e.g. Chauhan, 2017; Zheng, Warschauer, Lin & Chang, 2016). In agreement with several studies (see Fourgous, 2012; Goulding & Kyriacou, 2008; Norris, Hossain & Soloway, 2012; Paryono & Quito, 2010), it can be said that the teacher (and therefore teacher training) plays a central role in the successful pedagogical integration of technology. Therein lies the motivation for our symposium. Accordingly, we will focus on various aspects of ICT and teacher training in Quebec. The aim of this special issue is to inspire both new and experienced teachers to leverage the full potential of technology for education (see Norris et al., 2012).

The first paper, by Lefebvre, Samson, Gareau and Brouillette "TPACK in Elementary and High School Teachers' Self-reported Classroom Practices of the Interactive Whiteboard", examines how elementary and high school teachers use the interactive whiteboard for teaching. The study design includes teachers' self-reported practices as well as the technological pedagogical and content knowledge (TPACK) model, used as a conceptual framework for successful integration of technological tools. Lefebvre et al. collected data from 30 teachers who participated in discussion groups. Overall, the results show a predominance of statements concerning technological pedagogical knowledge (TPK) and technological knowledge (TK), regardless of grade level, gender, or number of years of teaching experience.

The second paper, by Fournier-St-Laurent, Poellhuber and Moukhachen, "Liens entre le modèle CBAM et l'approche d'enseignement dans le contexte de l'adoption d'une classe d'apprentissage actif par des enseignants au postsecondaire" focuses on active learning classrooms (l'apprentissage dans le contexte de l'utilisation de classes d'apprentissage actif – CLAAC). These are learning spaces that are purposefully arranged to allow teachers to make effective use of technologies and active learning. Their multiple case study uses both the CBAM model (Concern-Based Adoption Model) and the ATI model (Approaches to Teaching

Inventory) to describe 15 teachers who are using this type of classroom context in junior college. Their results highlight interest and anxiety profiles that are sometimes surprising, particularly for new users who fit the profile of an advanced user. This profile distribution could be explained by correlations between interest profiles and teaching approaches.

The third paper, by Simard and Karsenti, "Quantitative and Qualitative Inquiry into Future Teachers' Use of Information and Communications Technology to Develop Students' Information Literacy Skills" explores how pre-service programs prepare future teachers to use ICT to develop students' information literacy skills. They conducted a survey with 413 future elementary and high school teachers at four universities. Forty-eight student teachers were also interviewed. The findings suggest that, although future teachers receive formal ICT training as part of their program, information literacy is not formally addressed. Nevertheless, they stress that information literacy is perceived to be an important skill for teaching success. In addition to a lack of formal training, future teachers perceive that barriers such as lack of time and access to necessary technologies in the classroom will prevent them from developing students' information literacy skills for their future professional role.

The fourth paper, by Giroux, Gauthier, Cody, Coulombe, Gagné and Gaudreault "Stratégies de prise de notes à l'aide d'une tablette électronique chez des étudiants du secondaire", focuses on note-taking by high school students in a 1to1 iPad program. A series of questions related to note-taking was addressed to 294 high school students who use a tablet daily. Their analysis suggest that teachers should play an active role in the appropriation of this tool. Their results show that teachers need to play an active role in fostering student appropriation of the iPad.

Pellerin, Maheux, da Silveira, Allaire and Paul authored the fifth paper, "Un projet de mise en place de la visioconférence en support à la formation des enseignants Inuit : enjeux et bénéfices d'une recherche collaborative en milieu nordique". In this geographically remote region where the people are bilingual or trilingual, Pellerin set up an experimental videoconferencing system to support training for Inuit teachers in Puvirnituq and Ivujivik, in Nunavik. Over three years of testing, Pellerin et al. experimented with different uses of videoconferencing. The results reveal both benefits and limitations of such systems. The results also show that, despite the harsh northern environment, which made for a challenging experience in many respects, a videoconferencing system is clearly an asset that can support Inuit teacher training: it is a beneficial, effective, and expedient innovation.

The sixth paper, by Collin, Karsenti, Ndimubandi and Saffari, "A Connected Generation? Digital Inequalities in Elementary and High School Students According to Age and Socioeconomic Level", aimed to better understand the relationship between students' age and socioeconomic level, and its influence on students' digital uses. They conducted a quantitative study of 401 elementary and high school students in Quebec. Four independent variables were initially selected: two related to age (actual age and education level) and two others related to the socioeconomic environment (school poverty index and parents' employment status). The dependent variable that represented students' digital uses was the number of different technologies they used weekly. They conducted correlation tests followed by a linear regression analysis. Their results highlight that socioeconomic levels appear to have a stronger influence on students' digital uses compared to age, and explanations for this are proposed.

The final paper, Karsenti's "The Interactive Whiteboard (IWB): Uses, Benefits, and Challenges. A Survey of 11,683 Students and 1,131 Teachers", aimed to identify how the IWB is used in Quebec schools and the associated benefits and challenges. It begins with a presentation of the main educational uses of the IWB, followed by the many benefits as perceived by teachers and students. The key challenges that this technology poses for teachers and students are then addressed. Far from calling into question the need to integrate technology in education, the results reveal that certain tools, such as the IWB, may be more complicated and time-consuming to integrate than others. Thus, teachers appeared to have problems with technical aspects of the IWB. Nevertheless, the results also show that the IWB has real educational potential.

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