

Digital Literacies: a comparative analysis of in-service teacher education in Brazil and Canada

Letramentos Digitais: uma análise comparativa de formação continuada de professores no Brasil e no Canadá

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Abstract: In the constant flux of global migratory patterns, shifting borders, transliteracies and cross-cultural changes, digital technologies add certain complexities to an increasingly intricate and evolving educational landscape. In-service teachers grapple with digital literacy challenges in their appreciation of technology, changing teacher-student paradigms, and their own personal pedagogical philosophies. Within the context of the Brazil-Canada Knowledge Exchange Project and using a case study approach, this paper focuses on a comparative analysis of digital literacies amongst Canadian in-service teachers and their Brazilian counterparts. It further elaborates digital literacy concepts and considerations for mutually inclusive collaborations in multi-spherical global/local contexts. Supported by a bibliographic research and empirical data from two different case studies in Brazil and Canada, the paper examines in-service teacher professional development with a specific focus on technology education. The main findings suggest that pre-service and in-service teacher education should include digital literacies as part of their programs. They also suggest that these programs could take place through a critical framework, which can aid such practices so that technology education can be viewed as part of evolving social practices.

Keywords: transliteracies. digital literacies. in-service teacher education. Pedagogies. Brazil and Canada.

Resumo: No constante fluxo de padrões migratórios globais, mudanças

de fronteiras, transletramentos e alterações “cross-culturais”, tecnologias digitais adicionam certas complexidades ao crescentemente complicado e em processo de mudança contexto educacional. Professores em serviço lutam contra os desafios do letramento digital ao lidarem com a tecnologia, modificando paradigmas da relação professor-aluno e suas próprias filosofias pedagógicas. No contexto do Projeto de Troca de Conhecimento Brasil-Canadá e fazendo uso de um estudo de caso, este artigo foca-se numa análise comparativa de letramentos digitais entre professores canadenses e brasileiros em serviço. Ainda, elabora conceitos de letramento digital e tece considerações acerca de colaborações mutuamente inclusivas em contextos múltiplos, locais e globais. Tomando como base pesquisa bibliográfica mas também levando em conta dados empíricos coletados por meio de dois diferentes estudos de caso no Brasil e no Canadá, o artigo analisa a formação de professores em serviço com foco específico em educação tecnológica. Os principais resultados sugerem que as formações de professores inicial e continuada deveriam incluir letramentos digitais como parte dos seus programas. Ainda, sugerem que esses programas poderiam adotar um viés crítico, o que pode auxiliar tais práticas, de forma que elas sejam entendidas como práticas sociais em mudança.

Palavras-chave: transletramentos. letramentos digitais. formação de professores em serviço. Pedagogias. Brasil e Canadá.

Introduction

What may have been previously considered constant, stable or consistent patterns of life has been subjected to strong impulses of change across the globe, most of which have caught the attention of researchers and academics in areas of globalization, fast capitalism, cross-cultural/multicultural demands, post-modernism, the role of nation states, migratory flux, to mention a few (APPADURAI, 1996, 2000, 2006; BRYDON, 2001, 2010; HLYNKA, 2013). The introduction of digital technologies further complicates an already intricate and evolving terrain. In this paper, we reflect on our experience working with in-service teachers’ professional development in two countries: Brazil and Canada, the influences of the aforementioned impulses of changes, and our perceptions of the complexities introduced by digital technologies. We define in-service teachers as those who are already teaching, and the professional development they receive

during their work as teachers.

In this regard, we aim at considering some challenges and issues related to technology use in the classroom and how in-service teachers grapple with digital literacy challenges, with implications on their personal pedagogical philosophies. Digital literacies is considered here within a wider framework of multiliteracies and multimodalities.

Understood as much more than an approach or method for research, but as a notion which supplements traditional literacy practices, multiliteracies connect to multiple forms of meaning making, not only to the one centered on language alone. In this sense, multimodality plays a very important role, since verbal forms of meaning making have increasingly been related to other forms of representation, such as the visual, the audio, and so on (COPE; KALANTZIS, 2000). Multimodality in other words refers to the various modalities of meaning making, which have become more common due to new digital technologies. After all, they have not only helped transform the way texts have been produced, but also made easier to include images, sound, movement, etc, to our textual production. As a consequence, “writing is no longer a full carrier of all meaning, or of all types of meaning” (KRESS, 2003, p.21).

Driven by the Brazil-Canada Knowledge Exchange Project (BRCAKE), this paper examines digital literacies and technological professional development for in-service teachers in both countries in the context of multiliteracies and multimodalities, and draws lessons that are applicable to similar North-South collaborations. The text is divided into five sections. The introduction describes the complex nature of the global context connected to the ongoing dilemma of digital education technology. Part two is a description of digital educational technologies. The role of professional development for in-service teachers in both countries is discussed in the three sections that follow, and then there is a conclusion with lessons drawn from these contexts and considerations for future research. Professional development and in-service teacher education are used interchangeably in this text.

Digital Educational Technology use in a Complex Global Context

The forces of globalization create anxiety, especially for academic administrators and teachers who must balance market forces with certain global demands such as increasing inequality and decreasing powers within

and beyond the confines of conceptual nation-states, unfamiliarity with the concept of globalization and surely uncertainty about the shape of things to come, changes in the academic job market with specific demands from students, parents and industry for globally sound technological capabilities, and the anticipated state of future student markets (APPADURAI, 2000). In this complex milieu lay the issues of internationalization for which most academic institutions and their host governments have to define policies and programs that respond to global forces, through creating a foreign presence or opening up collaborations and borders between institutions in two or more countries (ALTBACH et al, 2009).

In the midst of this context, the introduction of information and communication technologies, new forms of learning and access to content such as open education resources, social media and increasing possibilities for distance and online education makes the academic landscape rather interesting and complex.

One response to these forces is the Brazil-Canada Knowledge Exchange project (BRYDON, 2011) established to strengthen cross-cultural understanding, develop site specific pedagogies that respond to global challenges, understand the impact of globalizing forces on education, and develop relationships and working partnership between a developed country (Canada) and a developing one (Brazil). In the face of globalization and increasing needs for standardization across countries, the project recognizes and appreciates local and “regional differences without discounting national needs and global demands” (BRYDON, 2011, n.p.). These sorts of mutually respectful relationships create opportunities for knowledge exchange and information sharing among peers and practitioners across countries in a context influenced by globalization. The impact of technology in teaching and learning is one area of the project’s interest which is explored in this paper as a function of the project.

Because the context of globalization is already complex, the introduction of educational technologies does not make it any easier. The debates on media or technology and its impact on education is age-long. A recent one is the Clark/Kozma debate in which Clark argues that the value of media or technology in an educational setting is justified only if that media or technology is the only means by which learning outcomes can be attained, and if there is no alternative or more economical means of doing so (CLARK, 1986). In other words, Clark argues that the introduction of media or technology to learning is unnecessary unless it offers explicit

value, whereas Kozma would argue otherwise. This dialectic remains today, especially against the introduction of educational technologies with ulterior agendas.

There have been numerous instances where the introduction of technology into the classroom has yielded very little value, instead it served political and industry interest. Cuban (2003) argues that computers have been oversold but underused as has been in the US and specifically in California across the Kindergarten to Grade 12 and post-secondary levels³. A review of policy documents do not reveal any difference in Canada as suggested by Lanning (1994, p.467) that technology introduction often times does not consider the sustainability of educational futures rather, the future is “approached as a set of ambivalent circumstances leading to persons’ experiences of uncertainty”; suggesting that technology introduction could be disorienting and divergent from future sustainable goals.

The situation in Brazil is comparable, as researchers have indicated that the first governmental program related to introducing computers into schools (PROINFO – National Program for Educational Technology)⁴ have had similar challenges; many computers have arrived but few have been used (LIMA, 2002). Although somewhat forward-looking, recent projects such as the “One laptop per child” (OLPC) initiative have faced similar challenges related to poor internet connections or to a lack of electricity or both in their host institutions (Source: field research in Sergipe, Brazil). At the inception of these programs, divergent, and in some cases, nonexistent policies at the local level (states and municipalities) conflict with those of the federal government. In some schools, computer labs are equipped but are yet to be utilized because of a lack of internet access; infrastructure is nonexistent in other schools to make the computers work; and in other cases, teachers are ill-prepared to make use of them (source: field research in Sergipe, Brazil). In response to these challenges, the federal government has implemented some programs that address knowledge and information sharing such as the Teachers’ Portal, the International Bank of Educational Objects, besides the Public Domain website; and the emphasis on teacher education through programs, such as: e-Proinfo and Integrated Proinfo⁵. Within the context of negative outcomes, technology is a double-edged sword that also offers a positive side and opportunities for in-service teachers in Brazil and Canada who must deal with these perceptions to address their own confidence and self-efficacy levels with technology use.

Digital educational technologies for in-service teachers in Brazil and Canada

Teachers' confidence or self-efficacy is often influenced during their pre-service teacher training experience or during their first years as teachers (MOORE-HAYES, 2011). The stronger their perception of preparedness, the more success they are likely to have in the classroom. Having teachers learn to teach with technology at the pre-service level could have a strong influence on their confidence and self-efficacy. But most in-service teachers have not had the recent technological benefits of pre-service technology training beyond their undergraduate teacher education. To respond to the increasing demands for technology education, they have had to resort to professional development courses to address their training needs.

In certain instances in Brazil, teacher education, whether in-service or pre-service has traditionally been thought of as one of three possible formats centered around a "specialist": a) one in which the specialist takes the stage and delivers lectures to listening teachers; b) the specialist delivers lectures and teachers are offered the opportunity to interact, and c) a participatory approach that allows for interaction to take place but supervised by the "specialist" who doubles as the professor, in the case of pre-service experiences. All three formats have the "specialist" as the center of the teacher's educational experience. He or she selects and delivers contents to the audience, in our case, in-service teachers. In other words, it is not uncommon to find teacher education courses in Brazil that are designed by specialists who may be ignorant of the teachers' realities and context, that may not have been taken into account during the preparation or delivery of the professional development course or training.

Traditionally and generally speaking, our observations indicate that teacher education in Brazil has been driven by temporary government programs rather than a more systematized approach underpinned by structural definitions of government policies. There is goodwill that is hampered by long-term strategic systems. In-service teacher education is consequently commonly conducted by academics who are concerned about educational quality, and who believe that improving teachers' knowledge through continuous professional development could contribute to improving the administration and delivery of education in the country. By consequence, technology education for both pre-service and in-

service teachers is minimal and sometimes nonexistent in most parts of the country. Although there is an increase in the use of technology by university professors for pre-service education, it is a matter of personal preference than institutionalized practice. In general, institutionalized practices that involve technology content consist of approximately five percent of required pre-service teacher education major; leading to more demands by student for commensurate teachers' inclusion of technology content for in-service training.

Education in Canada is jurisdictionally the responsibility of the provinces and territories. There is no federal educational institution responsible for administering national education policies although the federal government takes responsibilities for certain educational aspects such as those of First Nations peoples, of service chiefs, and for federal institutions such as prisons. The provinces are responsible for defining their curriculum and content. As a result, educational advancements are at various levels. In the absence of a national ministry of education, forums such as the Canadian Council of Ministers of Education provide a platform through which the different provinces can share knowledge and experience. What is common across the provinces though is the strong emphasis on pre-service teacher education. Most provinces require at least a year or two for teachers to acquire a teaching certificate in addition to an undergraduate degree prior to becoming teachers. Provinces rely on professional development or advanced teaching credentials including educational technologies to address gaps in teacher education post pre-service education.

In-service teachers, like their pre-service counterparts are required to acquire technology training for inclusion in their instruction, assessment, and professional productivity as a requirement for national and provincial certification standards. This requirement places pressure on teachers' self-confidence and self-efficacy to use computers in their classroom. For in-service teachers, "the most critical obstacles to successful technology integration are most often personal barriers. Despite the increased availability of both educational technology and professional development opportunities, many teachers are still hesitant to integrate technology into the curriculum" (MOORE-HAYES, 2011, p. 3–4), regardless of the demands from an increasingly diverse student population which require teachers to apply different methods and theories to their practices.

There is not much difference between pre-service and in-service

teachers on technology preparedness and teacher efficacy (MOORE-HAYES 2011); if any, pre-service teachers marginally acquire more technology knowledge and thus increase their self-efficacy and confidence levels than in-service teachers. On the overall, both types of teachers may be inadequately prepared for technology use in their classroom. The option of professional development courses and training for both Canadian and Brazilian in-service teachers offers an interesting opportunity to increase their self-efficacy and confidence levels to teach with technology.

In the next section, we describe two projects, one in Brazil and one in Canada and then describe our perception of teacher's technology professional development/training. In the follow up section, we will comparatively analyze our perceptions.

New Literacies and Multiliteracy Theories and Practices in Brazil

Our focus in this section is on the role of new literacies and multiliteracy approaches in Brazil. One important initiative to consider is the national project called: *“New literacies and multiliteracies theories and practices: critical education and the teaching of languages in Brazilian Schools”*, implemented from 2009 to 2013 to investigate the practice, educational background, epistemologies, methodologies adopted in the teaching of the English language by English language teachers located across Brazil⁶. The project, an initiative of some researchers of the University of São Paulo, aimed to study how the participating teachers viewed local and global issues through exploring the processes of knowledge creation in the local context of the classroom in relation to the global context, and to map the condition of English language teaching from the point of view of the teachers involved. Professors and undergraduate students from public universities across Brazil were invited to participate voluntarily.

In addition to the research component, the project offered continuous teacher education and experiential learning for mutual knowledge creation and sharing among participants which involves identifying teachers' needs and co-deliberating on teaching plans and materials, taking into account the Foreign Languages National Curriculum Orientations for Secondary Education in Brazil. The intended outcome was to promote actions that considered both local and global needs and specificities as emphasized in the project's objectives which among other things, focused on “[...] introducing language and new technology theories (literacies,

multiliteracies, hypertext) and providing suggestions on Foreign Language Teaching practices making use of them” (BRASIL, 2006, p.87).

The study of new literacies and multiliteracies including digital literacies is an educational proposal which relates to different possibilities of reading, understanding and utilizing all kinds of texts, and knowledge creation leading to a critical practice (COPE; KALANTZIS, 2000). In this sense, the study of digital literacies as proposed by Lankshear and Knobel (2008) relates to the capacity to critically reflect upon the uses of technology in different contexts, involving knowledge creation and attitudes related to it, beyond the mere use or knowledge to use technologies.

The national project was driven at the local level by initiatives implemented at partner universities such as *Universidade Federal de Sergipe (UFS)* whose project “*In-service English teacher education in Sergipe based on the new literacies theory*” focused on digital literacies for teachers as a component of the broader theoretical framework of multiliteracies and multimodalities⁷. The project was driven by an understanding that the:

The ‘information revolution’ is here and it’s here to stay. It is therefore incumbent upon educators to be informed about the many issues at stake in order to take informed positions on IT [information technology] implementation, on the development of supportive teacher professional development, and on the theoretical and practical development of a Multiliteracies and multimedia cyber-pedagogy. Equally important is the need to give all students the critical analytic tools with which to assess the sociocultural and political consequences of technological change [...] (LUKE, 2000, p. 90-1).

A total of twenty in-service teachers were invited as participants to the project by completing an initial questionnaire with questions related to their professional experience, teaching beliefs, practices and philosophies. The research team observed that only twelve participants demonstrated interest in being part of the project. A follow up interview was conducted by a team of professors accompanied by an English language undergraduate student (as part of their teacher education). A discussion group and several scheduled meetings followed to deliberate theoretical and practical issues

involved in the local teaching and learning of the English language. The undergraduate English language students were invited to participate in these meetings to connect their current experiences as students with their past English language learning experiences in public schools, and to provide input to the project.

Project classes were initiated in which in-service teachers were required to prepare and teach a class consistent with the theoretical concepts of multiliteracies and multimodalities. Classes were video recorded at two different moments: a) classes prepared by the teacher alone, and b) classes prepared with inputs from the researchers, other teachers and students.

Throughout the project, teachers were encouraged to consider the use of emerging technologies in their teaching practices and to develop a more purposeful approach, or agency as English teachers and technology users. Agency here is understood as a critical approach to addressing the strong influences of colonialism, dictatorship and authoritarianism in Brazilian political history that have subjected human capacity to a traditional view of teaching based only on content, teaching methods and techniques (MONTE MÓR, 2013).

Because the project involved several participants such as the researchers, undergraduate students and professors, these contributors brought different perspectives including challenges and opportunities for digital literacies, multimodalities and multiliteracies in the context of teaching the English language. Knowledge was shared that produced some observations worth noting.

For instance, in-service teachers observed a deviation from the standard practice of having “specialists” determine the course content, as was the general practice across Brazilian schools; what Gee (2004, p.117) refers to as “content fetish”. Rather, using a constructivist approach teachers collaborated with researchers and other students to develop knowledge through constant interaction and exchanges that were contextually relevant.

The project produced some concerns and frustrations especially with the use of educational technologies for teaching literacies in their classrooms. Four out of the twelve participants showed great interest but reported some frustration related to unavailability of pre-service teacher education on emerging technologies even though their schools had technology equipment and internet connection. Three of these four had taken some in-service teacher education program offered by the Secretary of Education for teachers in public schools on the use of educational

technology. The lessons learned are still new to them, their confidence level and self-efficacy with the use of technology is still low, and they are still in need of additional support to implement most of the lessons from the program. The last one of the four was self-trained having had no formal technology education but mostly associating technology to her teaching practice.

A final observation relates to the agency of teachers. Because of the traditional focus on content, teaching methods and techniques; teachers neglected core issues of literacies, autonomy and agency that could foster inertia and a focused behavior towards improving their confidence and self-efficacy with educational technologies. Agency is required to understand the digital world and to be critical of it.

Some of these outcomes are not too different in Canada, although the challenge is less about the availability of technology and more about the confidence required to use them.

Emerging Technologies for Teaching and Learning in Canada

Pre-service teacher training in Canada is not merely about learning to become a teacher of a particular subject, rather the emphasis is on learning to be a (well rounded) teacher (ILLINGWORTH, 2012) or focusing on the art of teaching. In-service teachers similarly feel pressured to broaden this art with the inclusive use of digital technologies in their pedagogies. Those seeking to improve their confidence or self-efficacy levels tend to enrol in professional development or online adult education courses such as the *Introduction to Emerging Technologies* courses offered through Continuing Education, Extended Education at the University of Manitoba. The 12-week course is delivered fully online and addresses teachers' capacity to use emerging Internet technologies as a part of their pedagogical practice.

The course content emphasizes issues of teachers' teaching philosophies with respect to constructivist approaches and its relation to the role of teachers in the student-instructor learning continuum. Teachers enrolled in the course are expected to demonstrate knowledge of their personal learning environment, which they would have to map as a part of their critical reflection exercise. Each week, they submit a critical reflection about how the lesson resonates with their personal teaching philosophies. As a critical part of their learning, students are required to demonstrate

understanding of multiple literacies (LANSHEAR; KNOBEL, 2005) often challenging their existing perception of literacy (singular) to mean just reading, 'riting and 'rithmetic.⁸

The Canadian elaboration of literacy skills extends beyond these basic skills to encompass what has been defined as essential skills that are "needed for work, learning and life; are the foundations for learning all other skills; and help people evolve with their jobs and adapt to workplace change" (ESDC, 2013), including the use of technology.

Teachers are not only responsible for learning these skills but must similarly transfer them to their students. Teachers are also required to understand the concepts of their personal identity and security in relation to their dual corporeal and digital personas. Finally, the course introduces the students to the use of social media in their classroom for which they are required to develop a learning unit. The following is the instructor's personal reflection of teaching this course for over five years, and how his observations related to multiliteracies and multimodalities.

As an online course, introductions are often fundamental to the success of each class. Trust relationships are developed between participants and instructor, as they are required to elaborate on their challenges with the use of technology in the classroom in their introductory remarks during the first week of the course. The success of the class is determined by the quality of these introductions. An established level of trust fosters exchange of knowledge, experience and learning among participants who are often international across both developing and developed countries (BRUHN, 1998). Canadian students reluctantly establish trust for students from other countries most of which are seeking to establish better relationships that could influence their own local teaching practice. In certain cases, teachers from developing countries share knowledge about more advanced technological experiences such as mobile learning, which their Canadian counterparts have less experience with. The establishment of a trust relationship facilitates easier flows of localized knowledge with implications on teaching practices with other instructors across the globe.

Besides developing trust across geographies, Grade K-12 (from Kindergarten to Grade 12) Canadian classroom teachers often have to develop trust for, and earn the trust of their students as it concerns the use of technology. Most participants are often overwhelmed when their students display more knowledge of technology than they do and they grapple with the level of control to cede to the more technology savvy

students in their classrooms. To protect their self-efficacy, they often tilt the class back strongly to teacher-led instructional methods than student-led at the expense of innovative outcomes of learning. Because teachers are taught to learn the art of teaching rather than the teaching of a subject, they oscillate rather easily though painfully between both philosophies within a finite boundary of the lesson unit.

However, most teachers tend to struggle with the technology used in the course such as the learning management system which most are using for the first time. They find the requirement of logging into weekly one-hour online virtual synchronous classrooms with microphones and headphones extremely challenging. Trust issues emerge here at two levels, first with the use of the technology – whether they are able to understand it enough to meet the course requirements, and secondly about the safety and security of their online and physical identity and persona – whether they are confident enough to provide their personal data for registering on online sites. Most teachers still do not trust the technology to do what it is promised to do and thus tend to find it difficult to engage with the rest of the class. Because teachers are required to register to online sites some of which they consider too social, or to which access has been blocked in their schools, they feel it is unsafe to log in. Certain teachers circumvent this by using pseudonyms, yet others feel complete distrust of these sites.

These challenges were a reflection of some of the ones they were going through in their classrooms. Most educational divisions block certain access to some social media sites such as YouTube, Twitter or Facebook, often giving teachers little agency to utilize them for their teaching practices. This administrative distrust is transferred to the teachers whose own perspective of their uses for teaching and learning has become heavily influenced. The fallout is a low confidence and efficacy levels in their use.

One glaring challenge relates to the role of motivator and the dialectic of teaching as a facilitator or as a “sage on the stage”. Making sure teachers are motivated throughout the course becomes a primary preoccupation. Adult learning principles subscribe to recognizing the knowledge of the students and to leveraging their prior teaching and learning experience. Teachers who enrol in the course do so without prior knowledge of some of the technology or social media tools in use or how their personal philosophies relate to teaching with these tools and with technology. The dilemma is often on why teachers choose to learn about technology by using technology and how much of their prior knowledge

would be applicable in this context. Thus it is the moderator's role to draw and establish links between their prior knowledge, pedagogies and philosophies and technology.

Secondly, teachers enrol at different levels of knowledge and expertise. Moderating a discussion-based class becomes incredibly challenging especially if mutual respect and trust are not established as the basis for collaboration amongst teachers with students having different levels of knowledge. It is this sort of respect that the BRCAKE project describes as relevant for sharing and exchange of knowledge especially within an international context (BRYDON, 2011).

Thirdly, the student-instructor dialectic emerges as the teacher cedes control to the students in the class. The challenge is often how much of control and consequentially, trust should be given to students to direct their learning (BRUHN, 1998). Playing the role of the facilitator helps to foster experiential and constructivist approaches to knowledge creation and sharing between the students in the class and the learning unit, especially if it is done within a finite boundary.

Looking at in-service teacher education comparatively: a Brazil-Canada Experience

The focus on in-service teacher professional development in the context of digital literacies using a framework of multiliteracies and multimodalities allows us to present some similarities and differences, and an opportunity to draw comparisons between both contexts with a purpose of enhancing our understanding and improving collaboration between them.

In-service teachers in both countries are clearly in need of technology professional development to address the lack of technology content in pre-service education or of their early years of in-service work. The importance of such training results from the strong influences of globalizing changes which demands that teachers prepare students for future work, position their institutions to engage in the knowledge economy, and contribute to their nation-state's policies to respond to globalizing trends relating to technology education demands. While our focus has been on in-service teachers, the same recommendation applies to the revision of existing pre-service curriculum for would be teachers in preparation of future student and global economic demands for technology education.

Beyond this, multiliteracies and multimodalities should become a national endeavor and a matter of government policy at the national level in the case of Brazil and a more clearly defined articulation of provincial and territorial policy in the case of Canada to drive technology education and digital literacies for in-service teachers. Policies should be supported by carefully designed and implemented programs at both levels to systematically narrow perception gaps between where in-service teachers should be and where they actually are. Care must be taken to develop policies and implement programs that are not directly driven by political influences so that technologies do not become tools that undermine teachers' confidence and self-efficacy but tools that are relevant, applicable to their knowledge and work contexts and that recognizes and leverages their existing skills.

In-service teachers in both countries already explore professional development opportunities to augment their teaching methods and pedagogies as students whose daily experiences involve technology are demanding more inclusive technological pedagogies. Teachers bring lots of experiences to their practices, and through an exploration of their own learning philosophies and personal learning environments, they contribute their wealth of their knowledge and epistemologies into the classroom. Thus the recognition of adult learning principles and their application to technological professional practices should define professional development programs as opposed to those that encourage the "sage on the stage" or "specialist" approaches.

While Canadian teachers perceive the inclusion of technology as a fundamental success factor in the delivery of technology education, it is unclear whether delivering professional technology education using online methods yields substantially more effective results than if it was delivered face-to-face as was the case in Brazil. For one, teachers that have low confidence levels and self-efficacy with the use of technology may be unwilling to take a technology course online but likely to do so face-to-face. Conversely, an online delivery could effectively accelerate professional development; say in Brazil where teachers who are used to face-to-face methods of delivery could be deeply immersed into carefully planned fully online sessions. Further research may be required in this regard, though.

Final Remarks

In this paper we have explored the demands for digital literacies or technological professional development in the context of a theoretical framework of multiliteracies and multimodalities for in-service teachers in Canada and Brazil within the context of the Brazil-Canada Knowledge Exchange project. The forces of globalization, internationalization, global movement of students, and increasing demand for inclusive educational technologies require creations of policies and development of programs for in-service teachers to narrow existing gaps. Policies and programs should be carefully designed and stripped of political and ulterior agendas and they should seek to improve in-service teachers' confidence and self-efficacy levels through adult learning principles that recognize their inherent knowledge and expertise. A level of trust is required to deliver programs in country and between countries such as Brazil and Canada in which there could be mutual benefits to both.

Endnotes

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- ³ Here we are referring to grades in Canada, as follows: Preschool to Kindergarten (4-5 years old); Grade 1 to 6 (6-12 years old); Grade 7 to 13 (12-18 years old). Those grades are all mandatory. Compared to Brazil, that would be equivalent to: Preschool to Kindergarten (4-5 years old); elementary school - Grade 1 to 9 (6-14 years old) and secondary school - Grade 1-3 (15-17 years old). Beginning compulsory education at age 4 in Brazil is a recent change in the national educational policy and it was defined in 2013 according to the law: 12.976/2013. Before that, children were only obliged to start schooling at the age of 6. See: https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2013/lei/112796.htm.
- ⁴ See: <http://portal.mec.gov.br/index.php?Itemid=462>.
- ⁵ See: http://portal.mec.gov.br/index.php?option=com_content&view=article&id=18838&Itemid=811.
- ⁶ The project was coordinated by Prof. Dr. Walkyria Monte Mór and Prof. Dr. Lynn

Mario Trindade Menezes de Souza, both members of the Department of Modern Languages at Universidade de São Paulo, and it was connected to the Brazil-Canada Knowledge Exchange (BRCAKE) Project, coordinated by Prof. Dr. Diana Brydon, Canada Research Chair in Globalization and Cultural Studies at the University of Manitoba.

- 7 Connected to and supported by the national project, the UFS project was funded by the National Council of Research (CNPq - under n°. 401394/2010-7) from 2010 to 2012 and coordinated by Dr. Vanderlei J. Zacchi, with one of the authors of this paper as a member of the research team.
- 8 Reading, [w]riting, and [a]rithmetic: often referred to as the #R's of literacy. Today's concepts of literacies elaborate beyond these three basic concepts to include technology literacies, among others.

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