PERSONAL-PROFESSIONAL INTERCONNECTIONS: CONTEXTUALIZING TEACHERS’ USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE CLASSROOM

By

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Teachers’ use of information and communication technologies (ICT) in the classroom has largely been studied to date with a focus on what is lacking. An important aspect that seems to have been understudied is how teachers’ own histories and experiences of ICT connects to their teaching practices – in essence, focussing on what is ‘present’ and not what is ‘missing’. This study examines five teachers working in the same school, but working very differently with ICT in their classrooms. The narratives of their lived experiences highlight the acquisition of their beliefs, attitudes and their in situ behaviours about the role of ICT in the classroom. A critical look at the factors responsible for shaping such behaviours suggests the value of understanding individuals’ experiences when planning for technology-utilization, rather than prescribing a “teacher-proof” (Connelly & Clandinin, 1988) approach to technology uptake.
Acknowledgements

Deep down inside, I felt a stirring, an awakening

Through the middle of my Masters, looking for a purpose, a meaning!

Learning by reading, simply wasn’t enough,
So research it had to be, bring on the huff-puff.

Embarked with the sweet captain, very eager, very keen,
And then the blur! The idea of changing the world lost its sheen.
Engines failing! Ahh, emergency! In came the crew, all hands on deck,
Soothing me with theories and dogmas; every now and then—a quality-check!

Slowly, it unfolded. A story. Then, stories within the story—
Some strong, some wandering, some dissipating in a flurry.

Chasing them in the wind, I spotted, there by the side—
The commander! He smiled, nodded and shone the guiding light.

I started to see what was happening right under my nose,
This data, this literature, these frameworks—a ‘thesis’, I suppose!
I summoned the strength of all my angels, as I glided with my wings
Through this ‘precious mess,’ for which my heart will forever sing!

Clare (Brett), my ‘captain’—I never imagined I was capable of this until you came along!

Thanks for your inspiring ways, not limited just to academia. I am so fortunate to have found you. No poetry can ever thank you enough.

The MA ‘crew’—Danny, could not have done it without you at several fronts and you know it; Terry, your will and personal endurance were models to treasure; Seeta, although I saw you only briefly, you inadvertently planted the seed of ‘narrative’ for my study; thank you!
The ‘commander’ of narrative inquiry, Michael Connelly— it was an unexpected pleasure to have had the company not only of your wonderfully inspiring books, but your personal guidance as well in rubbing out the dull spots.

My angels— all of my parents (and I am fortunate to have so many) who gave me the wings to fly and then proudly stood by; my brother Siddharth, who fanned the turbulence away with his ironic sense of humour; and my beloved husband, Prashant, who blew kisses in my flight all along the way, never letting me fall once!

I am surprised at how precious this ‘wonderful mess’ has become to me. Thank you to all of my participants, who sat with me when they did not have to, telling me story after story. I feel blessed.
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Chapter 1

Introduction

The object of this study is to understand teacher perspectives on educational technology through a narrative description of experiences and attitudes around the use of information and communication technologies (ICT). The goal is to gain some insight into how those perspectives might have been acquired, and how they influence those teachers’ application of educational technology for the purpose of teaching and learning. It is understandable that disparity exists among classrooms with regards to the use of educational technology, but we cannot simply drop the blame on practitioners and expect them to ‘catch up’ with the results of research around the potential and effective use of ICT. It is important as well, to understand their stance, their opinions, their perspectives and most of all, their realities. This study has been performed with the belief that this would give an interesting and illuminating insight into the actual working of teachers with instructional technology.

1.1 The context for Information and Communication Technologies

When it comes to applying technology for instruction—as with everything else—it seems as though it is the teachers’ individual philosophies that come into play. “Different teachers operating in very similar settings would be expected to have different beliefs regarding appropriate pedagogical approaches” (Margerum-Leys & Marx, 2004). What works for one teacher might not work for another. It is these beliefs, these pedagogical philosophies that are at the root of how teachers understand their instructional activities and context. The intent of this
narrative study is to interpret teachers’ workings with technology in light of their individual perspectives around the use and application of technology. For the purpose of this study, instructional technology implies the use of computers and similar or peripheral electronic devices (for example, tablets, LCD projector, document camera) within the classroom by the teacher, the students or both.

I would like to clarify that throughout the thesis, wherever I make reference to merely ‘technology’—which could be often—it should be indicated to mean Information and Communication Technologies (ICT). In places where this occurs, the use of the general term ‘technology’—and also ‘instructional technology’ or ‘educational technology’—was intended with the purpose of maintaining a facile, organic flow in the reading. When referring to a specific form of ICT, I have attempted to make clear reference.

1.2 Researcher context

I am a planning time teacher at a small-sized elementary school (kindergarten through grade five) in the suburbs of Toronto. The school comprises a heavy immigrant community from South Asia, with a balanced gender mix. My position is to provide computer coverage to students on a rotary basis. The students leave their homeroom teacher when they come to the computer lab with me. The homeroom teacher uses the period as planning time. In addition to teaching students computers, I am also the Instructional Technology Lead Teacher for my school. It is a voluntary role, but the computer teacher—presently me—automatically takes charge of it. As part of this role, I help other teachers in integrating technology into their own curricula. Sometimes, the support they need is merely hardware-related and at other times, it has more to do with ideas pertaining to technology use in their classroom. On occasions where I am
unable to provide sufficient support, I direct them to appropriate personnel like the Instructional Technology Resource Teacher, the hardware technician or the school administration.

My unique context gives me four different vantage points. From my perspective, I have a view of teachers who value using technology in the classroom; I can see teachers who do not appear keen about technology integration at all; I get an opportunity to observe the perspectives of the principal that set the tone for the use of instructional technology at our school; and finally, amid the varying degrees of technology use, I become conscious of and reflect on my own perspectives around embedding technological practices in instructional practices at a primary-junior school.

I envision the different teacher approaches as a spectrum, the two ends comprising teachers creating technology-rich opportunities for curriculum delivery and teachers not quite seeing the relevance of ICT in their own context, respectively. For a reference point, I see the most developed end of this spectrum as consisting of a constructivist, purposeful approach to technology integration in the classroom with the engagement of students in meaningful redesign of curricular tasks. However, I believe all perspectives along that spectrum matter. The individuals that I place on this spectrum are not ideologized entities but real people who I work with on a day to day basis, who have their own rationales and philosophies of practice. I seek to explore their perspectives in more depth through this study and to contextualize the understanding with a critical approach.

To record individual perspectives of teachers, who are all unique by virtue of their singular experiences, I determined that it would be best to do a qualitative study. According to Denzin and Lincoln (2005) qualitative researchers “stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational
constraints that shape inquiry” (p. 10). Within the qualitative framework, I chose to use the narrative methodology to try and uncover teachers’ mindsets through a continuum of experiences, examples and stories. I wanted to lay out the participants’ lives as best as I could within the time of the study, through their own personalized accounts of their past and present realities, and then subject these realities to a critical study. Using a critical lens for analysis helped me pay attention to how educational technology is actually being used *in situ*, as opposed to conducting a study—yet another one to add to the literature—aiming to provide remedial suggestions for more or better ways to integrate technology.

### 1.3 Perspective Formation

When I was trying to find a foothold in first organizing this study, I found it helpful to reflect on the question, “What is perspective.” Reading Janesick (1978), Blumer (1969) and Shibutani (1967), I formed a loose definition that perspective is a schematic outline that finds its basis in what one has experienced, remembers and feels. Its direct relation to lived experience is ongoing in that it is affected by the past and in turn influences the future.

The experiences that will be created by the individual in the future will be guided by what his or her perspective continues to be. The four aspects that emerged for me as essential to perspective-formation are:

- **Sensory input:** What one has seen, heard, read, felt, sensed gives direction to what one believes and how one feels about something.
- **Social interactions:** The characters involved at different points in one’s life and the conversations, interactions and relationships with those people are strong factors that shape one’s perspective.
Reflection: Reflection is usually an ongoing thought process in the back of our minds when experiencing a situation. As we think through what has happened, we start making our perspectives.

Interpretation: The final stage before a perspective is finally formed is that of analyzing, interpreting and forming conceptions about what has been experienced.

Janesick (1978) concludes that a person’s perspective is a “reflective, socially derived interpretation of that which he or she encounters, an interpretation which serves as a basis for the actions which he or she conducts” (p. 5). Perspectives are often influenced by an individual’s past and by his or her context, which includes the physical location as well as the socio-personal circumstances. In dwelling upon these dimensions and going deeper into them, both for myself as well as for others, I hope to uncover some understanding about factors affecting instructional practice with technology.

In the educational context, it is the teacher’s perspective that governs his or behaviour in the classroom. The perspective takes a long time to form, essentially the entire life lived thus far. Often, these experiences from the teacher’s social and personal life are not considered in understanding a teacher’s instructional activity. The educational tools and strategies used in the classroom are usually considered to be sufficient indicators of the teaching behaviour. I wanted to further explore these observations to try and understand what led teachers to form different perspectives and consequently different teaching behaviours. Working at the same school, with the same administration, similar work environments and similar school-based support networks, how did these teachers come to act so differently within their individual classrooms?
1.4 Minds-on to Hands-on

After deciding that I wanted to explore these individuals’ perspectives, the question that arose was how to get to the bottom of their realities. Would it be sufficient to ask them questions and get them to tell me stories from their personal lives? This was a good question, and a foggy one for a long time! My mind was constantly interrogating and trying to find firm ground about what I was expecting to hear from my participants. Would there be stories, one after the other, fitting perfectly into my narrative work? I doubted that.

In addition, what would it be like for the participants to give up their time and sit with me, talking about their past and their present practices? Would they be relaxed enough to share, or feel like a burden had been put on them to talk? On the other hand, what would it be like for me? Would I feel useless sitting there and getting them to talk? Or would I feel that something really worthwhile was coming out of the conversation? Reviewing the research literature suggested that both of these realities may occur – whereas it can be very exciting for the researcher to discover and learn with the participant, it can also sometimes create a vague, aimless feeling. The next chapter elaborates the background literature and rationale for this study.
Chapter 2

Literature Review

This chapter presents the literature on the existing research around some relevant, yet crucial aspects related to the applications of information and communication technologies by teachers within classrooms:

- Beliefs about the potential of ICT in the classroom
- Functional perspectives on the utilization of educational technology
- Teacher implementation of ICT
- How teachers are constructed within ICT integration
- Holistic and critical lenses on teachers’ classroom practice
- Background on rich-context narrative study

2.1 Beliefs about the potential of ICT in the classroom

With regards to the use of computers in education, the potential impact by now is known to be multi-dimensionally powerful, both theoretically and practically. Some studies foreground the potential of digital tools to change the classroom culture and the teaching-learning process (Culp, Honey & Mandinach, 2005; Koehler, 2005; Schofield 1995; Sherry, Billing, Jesse & Watson-Acosta, 2001), but others such as Cuban (2009 and 2012) and Su (2009) have focused on the reasons behind why educational technology has failed to live up to its potential. Beyond the contextual factors such as the discrepancy between traditional teacher-centred models of teaching and newer, more distributed and peer-driven models are other important factors. For
example, effective use does require the teacher to have multi-dimensional expertise as well. Margerum-Leys and Marx (2004) believe that when it comes to the use of educational technology, “understanding the range of possibilities, the appropriate applications, and the relevant pedagogical strategies requires an array of knowledge on the part of the teacher”. Further to this, Mishra and Koehler (2006) state that “merely knowing how to use technology is not the same as knowing how to teach with it” (p. 1033). Turkle (1997) discusses the changing paradigm of computer literacy with the focus shifting from teaching students how computers work to teaching them about how to make use of computer applications.

Teachers with different pedagogical epistemologies are engaged with educational technology in different ways. In his presentation on the ‘SAMR’ model (Substitution-Augmentation-Modification-Redefinition), Puentedura (2013) stresses the importance of using technology in a transformative manner, recognizing that technology can be used either merely as a direct tool substitute with no or little functional improvement or it can be applied for significant task redesign. Teachers would need to locate their current practice with educational technology to understand where they fall on the SAMR ladder and how they can move forward so that technology ultimately “allows for the creation of new tasks, previously inconceivable” (Puentedura, 2013). There thus exists a spectrum of practices and teachers fall at various points on that spectrum. While on the one hand, ICT is “misguided in some of its uses and in the end may only have marginal effects” (Roschelle, Pea, Hoadley, Gordin & Means, 2000, p.77), on the other, there are teachers who are guided by theoretical commitments of constructivist learning and teaching, involving technology to redefine multi-literacies (Anderson & Wales, 2012). The latter work on the understanding that instructional technology holds the potential to bring unprecedented opportunities for students whereby they not only understand core concepts in
curricular subjects in a far less complicated manner but can also actively participate in experimentation, design and reflection in ways similar to professionals (Roschelle et al., 2000).

2.2 Functional perspectives on the utilization of educational technology

Despite the beliefs described in the latter part of the above section, the enriching affordances of technology have been known for quite some time now. Martin (2006) clarifies that the need for education systems to deliver pupils with technology skills is not a recent move; it has existed since the 1960s. According to Laurillard (2008), “education is on the brink of being transformed through learning technologies; however it has been on that brink for some decades now” (p. 1). It is the transfer of this understanding to learning environments that seems to be taking time. The process of teaching in a technology-rich environment involves knowing how to use the resources available in challenging ways as well as in a manner that will not prove to be distracting or in fact, less effective than other teaching methods (Angrist & Lavy, 2002; Rasmussen, Krange & Ludvigsen 2003). Technology in education is considered an innovation and Margerum-Leys and Marx (2004) point out that “teachers play a vital part in the success or failure of any educational innovation; the use of technology is no exception.”

Culp et al. (2005) have studied various U.S. reports that make it clear that the materials and professional conditions must be in place before teachers can begin the process of embedding technology into their daily instructional practices. Oliver’s (2000) research around the content of computer-based material indicates that “while the materials give a favourable appearance and often use the full extent of the capabilities of modern technologies, when judged from a teaching and learning perspective, they fail badly.” While Kozma (2008) reminds us of the obvious that technology plays a significant role in the educational, economic and social changes that characterize our present knowledge society, Brown (2009) is candid in stating that “the
conditions for the appropriate and productive use of digital technology in education are far from in place” (p. 1166). The ‘design principles’ of learning environments is the factor that eventually seems to determine the fate of educational technology within the corresponding context. A lot depends on the teachers. The approach suggested by Koehler and Mishra (2005) is that of focusing on teachers’ interaction and knowledge intersections between technology, pedagogy and content knowledge (commonly known as TPACK) in the classroom. The interrelationship of these three areas forms the basis in the construction of technology-infused teaching and learning. The determinants that Connelly and Clandinin (1988) hold responsible in creating a holistic picture of the curriculum in its entirety are “subject matter, milieu, learner and teacher” where milieu could be taken to include the technology supports and policies in our context.

2.3 Teacher implementation of ICT

This takes us to an understanding that the pedagogical and cultural designs of teaching-learning environments are in the hands of the teachers that operate them. Several research studies aiming at finding the reason behind effective or ineffective implementation of technology have concluded that teachers’ use of ICT in the classroom is influenced not just by the presence of technology, but actually by factors unique to their personal and professional situations. While some teachers tend to limit the use of abundant technology for teacher-centred applications like lesson planning due to limitations of knowledge and time, others might be engaging minimal technology for purposeful student-centred purposes in the classroom (Palak & Walls, 2009; Cuban, Kirkpatrick & Peck, 2001). According to a study by Granger, Morbey, Lotherington, Owston & Wideman (2002), teachers working in schools with notable technological practices stressed the importance of informal learning opportunities, collaboration and supportive administration for successful technology integration. Policy reports studied by Culp et al. (2005)
similarly reflect that support is needed in the areas of adequate technical infrastructure, sustained leadership that is supportive of experimentation and provides a vision of effective technology use, and opportunities for sustained and in-depth professional development. Penuel (2006) shares from his research that limited— as opposed to ubiquitous— access to technology leads to limited utilization and that, for instance, teachers tend not to make use of computers when they are in a lab setting due to scheduling and transportation concerns (p. 331).

It follows that introducing technology itself cannot bring about a change in education. Rather it is the way teachers use technology that has the potential to do so (Carr, Jonassen, Litzinger & Marra, 1998). For teachers to be able to carry out the promise of technology, however, their needs and contexts need to be investigated and supported. Koehler and Mishra (2005) regard “teacher knowledge about technology as important, but not separate from contexts of teaching” (p 132). What a teacher personally knows about technology also influences what he or she does with it in the classroom. Hoekstra and Korthagen’s (2011) study of a teacher in two situations with differing supports suggests that professional learning will need to take into account personal factors in order to be effective; separating the professional from the personal will just not do. Research on teaching and curriculum often regards teachers in a fragmented way in terms of isolated characteristics and limits the potential to account for the complexity of curricular processes and activities (Elbaz, 1981; Ryans, 1960).

2.4 How teachers are constructed within ICT integration

Clearly, a change is needed to cater to changing students growing up in a changing society. But if, in the end, it is the teachers who carry out that change, then it would seem logical to focus on them, their practices and the outcomes of their practices. The present-day investment in computer technology in schools, however, seems to be justified mostly on the presumption about
the transformative capacity of technology (Web-based Education Commission, 2000). It appears that more emphasis needs to be provided on how the teachers are actually utilizing this capacity. According to Becker (2000), “To influence teachers’ instructional use of computers, simply training them in the use of certain types of software will not suffice. Unless teachers believe tools such as simulation and presentation software can enable students to gain important academic competencies, they will be reluctant to incorporate such sophisticated applications into the curricula” (p. 69). A study of past research about the effective implementation of educational technology by Penuel (2006) reveals that “teachers’ attitudes and beliefs about technology’s role in the curriculum can influence how and when teachers integrate computers into their instruction” (p. 333). Keeping in mind that teaching practices are guided by teachers’ individual beliefs and understandings, it would follow that teachers’ practices should be studied individually and thoroughly before teachers are given policy directions for the implementation of ICT in the curriculum.

Unfortunately, “rather than being the natural starting point for identifying areas of need and priorities for improving instructional practice, teachers are now framed largely in terms of what they are lacking” (Culp et al., 2005). Roschelle et al. (2000) and Don Tapscott (Dunsky, 2011) illustrate a rather interesting comparison between classrooms of the late nineteenth century and the present day, highlighting the stark reality that despite the tremendous societal changes, not much has changed in the face value of education, with ‘chalk and talk’ still prevalent in most classrooms. The 2010 Horizon Report, K-12 edition mentions that one of the critical challenges in K-12 education is that “students are different, but educational practice and the materials that support it are changing only slowly” (Johnson, Smith, Levine & Haywood, 2010). We see and hear of efforts being made to introduce learning opportunities and school conditions to get them
to a state of where they *should* be. Although highly useful for teachers, especially those already enthused about the idea of technology integration, these approaches are not universally effective. Penuel (2006) notes that “all too often, new technological innovations have proven unusable to a wide variety of teachers” due to the individual and situational considerations. Belland (2009) claims that the folk pedagogies teachers develop through home and their own K-12 schooling experience are the cause of their failure to integrate technology, despite the availability of physical and administrative capacity. It has been found that a focus on policy and standardization accompanied by attacks on teachers’ professionalism, does not cause reform; instead, it hurts the very children and schools that these policies and practices are supposed to help (McNeil, 2000; Apple, 2004).

A recent study by Aesaert, Vanderline, Tondeur & Braak (2013) discusses the implementation of educational technology curricula in three different contexts and states that “these curricula add a compulsory dimension to educational technology use, making it less dependent on the willingness and individual initiatives of teachers” (p. 132). Whereas the aim of such policy is to bring about consistent educational practice around the use of technology, Ryberg and Georgsen (2010) warn that “detailed, prescriptive lists are in danger of alienating or marginalizing teachers by imposing curricular limitations onto classroom teaching” (p. 90). Connelly and Clandinin (1988) advocate for teachers to be in charge of curriculum planning and in a shift of the “curricular emphasis from the prescriptions of outside developers, policy makers, academics and others to the decisions of teachers” (p. 147).

As far as the actual state of educational technology in schools is concerned, there appears to be more emphasis on the study of barriers to successful technology integration with research eternally attempting to uncover a range of factors that lead to the ineffective implementation of
technology (Belland, 2009; Culp et al., 2005; Ertmer, 2005; Harris and Sullivan, 2000; Kirschner & Selinger, 2003; Wachira & Keengwe, 2011; Zhao, Pugh, Sheldon & Byers, 2002). Much vaster literature exists around the issue than can be listed here, all aiming to provide a cause for why teachers fail to embed technology into their teaching. There seems to be little concern, however, about the conditions in which this process is played out. Selwyn (2010) concedes that “greater attention needs to be paid to how digital technologies are actually being used — for better or worse — in ‘real-world’ educational settings” (p. 66). Every context is different and should be honoured for what it is worth and not always in terms of what it should ideally look like. In their discussion of the implications of implementing a national educational curricula, Aesart, Vanderlinde, Tondeur and Braak (2013) say that “curriculum developers— especially those of integrated technology curricula— should take into account that educational technology aims must be formulated in a way that leaves room for teacher and school interpretation” (p. 145). This formulation suggests the need for an interactive approach that takes into account the multiple factors involved in making a context unique. Connelly and Clandinin (1988) describe ‘curriculum’ as a set of experiences that happen as a result of the interaction that occurs among the various components in a classroom — persons (teachers and students), things (for instance, technology) and processes (social and instructional). The authors contend that “when we watch a classroom, we watch a set of minds and bodies at work” and that leads them to use a term, “personal practical knowledge” which they believe is found “in a person’s past experience, in the person’s present mind and body, and in the person’s future plans and actions” (p. 25). It is what teachers ‘know’ — not just objectively, but as an epistemology — that affects how they act in the classroom.
2.5 Holistic and critical lenses on teachers’ classroom practice

According to Belland (2009), “each individual has a unique habitus, or set of dispositions to appreciate or do certain things”, and the totality of one’s life conditions influences this habitus (Bourdieu, 1979). Belland (2009) uses this theory of habitus to advocate for increased durations of extensive practical exposure to educational technology and widespread modeling for preservice teachers, supporting the observation that “the pedagogic action that educational technologists [currently] impose on preservice and inservice teachers does not appear to transform teachers’ habitus” (p. 358). It is imperative to introduce technological learning to teachers in a way that is conducive to their personal philosophies and personalities. Becker’s (2000) analysis of surveys involving over 4,000 teachers show that particular types of software were used more often “when the applications were consistent with the teacher’s philosophy and objectives for use of technology” (p. 54). Studying teachers’ mindsets towards the integration of technology, Subramaniam (2007) finds that “the use of computer technology was factored and sieved through the participants’ psychological insights for integrating computer technology into the social context of the classroom” (p. 1067), thus indicating the presence of a ‘psychology’ and not just ‘policy’ behind all educational practice.

It has to be noted that the professional development model provided at Ontario schools is changing. The Ministry of Education’s Literacy and Numeracy Secretariat, established in 2004 to help boost student achievement, is designing new teacher learning using capacity-building approaches to support systematic professional learning for teachers and administrators and share successful practices and research on effective teaching (Ontario Ministry of Education, 2013a). Reflecting on the progress being made, Grady and Overholt (2009) report that “groundbreaking
work in our Teaching-Learning Critical Pathways, along with our capacity building efforts over the last few years, have begun to move Ontario teachers into the 21st century.” Although the focus has primarily been to bring teachers to the point they are expected to be at, the difference in approach with the capacity building model has been that of individualized support, as opposed to only explicit, whole group instruction followed by measuring at the end of the ‘teaching learning cycles’. Speaking about the capacity building efforts in schools in Ontario, the superintendent of Curriculum and Instructional Services in the York Region District School Board feels that “while education is provided in a social setting and involves a great collective effort, we must remember that learning is ultimately a very personal journey for all of us” (Planche, 2012). She bases her arguments for effective conditions for learning on the ten principles suggested by Brandt (1998), which include the understanding that all people learn differently and only what is personally meaningful to them, constructing new knowledge by building on their current knowledge.

Making a case for the critical study of educational technology, Selwyn (2010) advises those currently working in the area of education and technology “to take stock of who we are, what it is we do, and how and why we do it” (p. 65). My study attempts to do some of this through the study of teachers’ perspectives and interpretations of technology integration within their teaching contexts. A study of teachers’ psychological insights about student learning highlighted the mediation of learning actions within the teachers’ respective zones of proximal development and found that those teachers do not “demarcate and delimit the computer technology as a sole imperative for teaching or learning” but reflect a person-centred vision of technology application in education (Subramaniam, 2007). Selwyn (2010) points out that instead of focusing on the “impediments and deficiencies” that are delaying technology integration, the critical study of
educational technology is based upon the understanding of the “‘here-and-now realities rather than future possibilities and potentials of educational technology” (p. 69).

The attempt made in the present study is to use Selwyn’s (2010) idea of “producing academic accounts of digital technology that concentrate on developing ‘thick’ descriptions of the present uses of technology in situ rather than speculative predictions and forecasts of the near future” (p. 70). This helps in refocusing the spotlight on the sociological perspective that Cavanagh (2007) provides to the context of the modern technological society when she clarifies that sociology calls for a “rejection of preconstruction” and a “commitment to the here and now, the empirical and demonstrable” (p. 7-8). Leaving aside questions of what should be happening with the introduction of physical technology in the classroom based on predetermined road-maps, an emphasis on what is happening, uncovers several layers of contextual considerations in teachers’ practical work with educational technology. Brown (2009) makes the point that the manifestation of the practice of technology-embedding relates to the context in which it is embedded and “changes meaning as it moves from place to place”.

There seems to be a renewed, though slow, academic focus on the construction of the social context of technology involving various dimensions. Apple (2004) brings forth the example of the presence of immigrant populations from “Africa, Asia and the Middle East” to pose a challenge to the notion of ‘everyone being the same’ and hence calling for a change in collective sensibilities as a society. This is relevant to the social location of this thesis where multicultural and multidimensional realities co-exist but are not the centre of curricular design. The situation calls for constant re-contextualization and exploration of the “intimate connectedness” between “individuals and groups, and their pedagogic, cultural and social practices” (Brown, 2009; Webster, 2005). It implies that educational technology has to be constructed within the multiple
levels that not only frame it but are inseparable from it. Selwyn (2010) describes the use of digital technologies within educational settings as being situated “within all of the social interests, relationships and restrictions that are associated with the formal and informal provision of education” (p. 70). A study of this rich context would be in place in taking a look at the practical situation of educational technology using a critical lens.

2.6 Background on rich-context narrative study

In conducting such a study as described above, the method of narrative inquiry might be a particularly effective tool. Clandinin and Connelly (2000) argue that whenever a person takes an action, does something, it is a narrative sign and that it is “necessary to give a narrative interpretation of that sign before meaning can be attached to it” (p. 31). Thus, each action taken by an individual should be attached to a reason within the history of the individual’s life. The authors call for curricular actions to be interpreted as classroom expressions of teachers’ and students’ narrative histories. Different aspects bring forth different aspects of people’s experiences. Narrative understandings of people acknowledge the tensions and differences within them. When people narrate stories about their experiences, it is not the parts of those stories that are enlightening as much as the “unities, continuities, images and rhythms” that give rise to the whole (Connelly and Clandinin, 1988). In the teaching context, teachers do not have to say that they value this or that; it just shows through their action or emotional response and the continuity of their story encompassing the temporal, contextual and the personal (Elbaz, 1981; Clandinin & Connelly, 2000). When digital technologies are introduced into such a mix, a strategy suggested by Brown (2009) is to “select and deploy [them] in a way that is more carefully attuned to the specific context and circumstances of their use” (p. 1168). This strategy could be applied in a better way if the specifics are brought out and individual sharing and
observation is encouraged, instead of adopting a ‘teacher-proof’ (Connelly & Clandinin, 1988) approach to the design of materials.

Mary Bateson (1994), in her book ‘Peripheral Vision’ links learning with continuity. The personal observations and experiences of the narrator take the foreground in this viewpoint. Talking about one’s own perspectives, one is able to stay clear of making authoritative generalizations. Multiple realities get constructed and unfolded on the way. On the other hand, when we try to propound, defend or argue a concept in ‘people-free’ terms, we lose some of the meaning and often run the risk of making the research irrelevant or impractical. Johnson (1987) explains that in so doing, we take the approach of ‘objectivism’, reducing the whole to a formulated set of rules. This does not really do justice to the experience, perspectives, emotions and beliefs of the participants. This becomes even more vivid in the face of the present day discursive terrain wrought with an ongoing struggle with “competition, markets and choice on the one hand, and accountability, performance objectives, standards, national testing and national curriculum on the other” (Apple, 2004).

As teachers discuss their practices in a narrative format, it also encourages reflection. Orrill (2001) likens the situation to “holding up a mirror for the teacher and asking her about what she was doing and why.” Selwyn (2010) reminds us that “self-reflection and self-analysis are not common features of the educational technology literature” (p. 65). Exposing teachers’ ‘personal practical knowledge’ and individual reflections and thought processes, could help us “reorient our perspective on teachers, their work, and its place in the curriculum process” (Elbaz, 1981), thus initiating a critical pedagogy approach in current educational reform which calls for a closer look at the interplay of multiple corporate, social and capital factors (Apple, 2004).
Chapter 3

Methodology

In my exploration of the perspectives of different teachers working at the same school, I found qualitative research methods to be most suited for the thick description and personal stories necessary to inform my research questions. Although some studies have been used to understand teacher conceptions and perspectives about different aspects of pedagogy through quantitative measures, several of them indicate that although such measures can point to patterns and reveal some relationships yet a comprehensive and at least a deeper understanding can be had only by adding qualitative and preferably multiple data sources to this type of research (Brown, 1980; Chen, Brown, Hattie & Millward, 2012; Newman & Ramlo, 2010; Ramlo, 2012). Classroom observations and rich accounts of curricular practice need to be included in the body of research in order to obtain a clearer picture of the teachers’ criteria for the perspectives being explored and the origins of those criteria. Qualitative methods with their focus on “describing the constituent properties of the entity, using rich illustrative accounts” (Evans, 2007), thus seemed appropriate for this study.

3.1 Qualitative Approaches

One of the motives behind this study was to create a stronger foothold for evidence-based practice in the implementation of ICT in schools, which entails a careful consideration of past research on the subject, researchers’ own practice experience and expertise and the participants’

"It's like everyone tells a story about themselves inside their own head. Always. All the time. That story makes you what you are. We build ourselves out of that story."
— Patrick Rothfuss, The Name of the Wind
values and preferences. I wanted this exploratory study to yield descriptive and predictive knowledge, characterized by the interpretive paradigms of research, as opposed to treading the ‘prescriptive’ or ‘interventional’ domain (Yegidis & Weinbach, 2009). In the early stages of my topic and methodology selection, one of my reflective journals recounts two experiences of using images for metaphoric interpretation of a professional concept and I end the recount with, “I enjoy making those deeper connections between the concrete and the abstract — between what is visible and what is experienced… Considering, it might serve me well to choose Narratives as my methodology for expressing my interpretations” (May 23, 2012). At the time however, little did I know that ‘going from the concrete to the abstract’ could be accomplished through several different qualitative methodologies. I wanted to be firm in my head as to why I was thinking of narratives and whether or not it would help me reach the goal that I had set out with. Creswell’s (2007) chapter on ‘Five Qualitative Approaches to Inquiry’ was an immense help in the process. It helped me see the approaches of narrative research, phenomenology, grounded theory, ethnography and case studies in a comparative layout. Some noteworthy points that emerged for me were the following: I did not intend to ‘reduce’ all of my participants’ experiences to a single phenomenon [phenomenology], I did not wish to go beyond description to generate or discover a theory of practice [grounded theory], I was not interested in studying the behaviour and interaction among members of a group that shared a ‘culture’ in its entirety [ethnography] and I did not want to simply explore the in-depth development and resolution of issues in particular cases [case study]. That being said, in no way did I consider myself isolated from the tenets of these other approaches. It was just that I found myself more closely identifying with Clandinin and Connelly’s (2000) idea of capturing the detailed experiential stories of the lives of a small
number of individuals, as situated within their personal experiences (jobs, homes), cultures and historical contexts (time and place) — which are the key components of narrative research.

3.1.1 Narrative Inquiry: According to Czarniawska (2004), “narrative is understood as a spoken or written text giving an account of an event/action or series of events/actions, chronologically connected” (p. 17). Using Clandinin and Connelly’s (2000) work around Narrative Inquiry to form the basis for this approach, I wanted to use a subjective lens to see through the experiences that some teachers had been exposed to at different points of time in their lives and in various contexts they had been in. I proceeded on this path with the belief that those experiences helped shape the present identity and behaviour of those teachers, keeping in mind Dewey’s (1938) ideas about the intricate interconnectedness of life, experience and education. Bourdieu’s (1977) theory of habitus also influenced the adoption of a methodology that takes into account the participants’ internal and external factors as interacting and influencing each other. I reflected upon the thought that life is a continuum of experiences, with the past, present and future experiences — personal, cultural and intellectual — overlapping and influencing one another. Schaafsma et al. (2007) name the four features of narrative inquiry as

- A vehicle for juxtaposing multiple interpretations of experience leading to an amalgamated understanding of reality and perception in the educational setting;
- A powerful form of reporting research due to its enactment in the ordinary language;
- Valuing stories as a form of analysis in itself; and
- A shared experience that invites interconnections and collaborations.

In my thesis, the use of a narrative approach helped me develop a comparative perspective that demands difference, diversity and dialogue in the most general terms, and explanation, understanding and theoretical development in more academic terms (Brown, 2009). I wanted to
get an understanding of what teachers do, through a dialogic process that did not invade their pedagogic territory through utopian references or through inviting self-reporting of their teaching practice. I wanted to engage them in stories of their past, in telling of which, they inadvertently applied their experiential, cultural and intellectual interpretations that helped the ‘tellers’ as well as the ‘listeners’ make sense of those stories. Eisner (1988) commented that “narratives are often riddled with metaphor, with individual cadence that convey personal meaning”. These accounts set in a combination of personal, social and temporal matrices come alive to an inquirer who is willing to understand, to participate and to ‘see’ that which he has not himself experienced. In fact, Connelly and Clandinin (1988) suggest the presence of moral, emotional and aesthetic dimensions to these narratives as well.

It appeared to me that in the educational context, as in any other perhaps, history is as important as the current state of things. How things were done at a certain time has a connection with how things are done today, the difference speaking for the causality of the present. Temporality thus becomes a significant component of narratives. Clandinin and Connelly (2000) describe temporality saying that “any event, or thing, has a past, a present as it appears to us, and an implied future” contending that “locating things in time is the way to think about them” (p. 29). When we go back to thinking about our past, we create new stories for our present and possibly the future.

The context that I was interested in exploring was the integration of information and communication technology into classroom instruction. So, my goal was to uncover a corresponding ‘story’ about individual practice and experience within the teachers’ past and present lives, which make them adopt technological practices the way they do. Butcher (2006) indicates that telling stories makes situations ‘real’ for listeners whereby the latter can identify
with the character of the story and see his or her way of thinking. These narratives were composed subtly through informal teacher observation which was part of my daily educational practice and substantively through interviews held with the participating teachers.

3.2 Design of the study

3.2.1 Selection of participants: Four teachers were selected from a K-5 school in the Peel District School Board — the same where I taught. Their differing approaches in the use of and attitude towards educational technology was used as a guiding measure for selection. As the computer teacher at my school, I get an opportunity to see all of the teachers’ technological practices and attitudes in action. Given the same workplace context and being subjected to the same educational technology policy, there had to be something in teachers’ individual life histories, perceptions and beliefs that led them to integrate technology in ways very different from each other. The four teachers participating in the research study were contacted via email. They all agreed to participate in sharing their stories and experiences. Two additions to the group of participants were: the principal of the school and myself. The inclusion of the former I considered important in setting the context of the workplace in richer, first-person terms than simply explained through my own interpretation of the administrator’s attitude and practices. He was contacted by email as well and agreed. Including myself in this research study was a decision that I had made right at the start. It stemmed from the fact that the frustration or the awe that I felt in looking at other teachers’ practices with technology were all in reference to my own beliefs and curricular practices. In Clandinin and Connelly’s (2000) words: “We have helped make the world in which we find ourselves” (p. 61). I wanted to study my own experiences as well in order to see how my present practices and perspectives were interconnected not only with
my own past, but also with the other participants’ realities. This brought me to a total of six individuals being studied.

3.2.2 Researcher-Researched positionality: The teachers I wished to study were all my colleagues, working in the same workplace and the same context as me — subject to the same authority, technological infrastructure and general social environment. They all interacted with me on a daily basis in the school, both professionally and casually. In essence, our lives were essentially intertwined at some level. However, my position being that of a technology lead teacher at the school, some of them would likely see me as experts of the field. From time to time, I hold sessions for teachers in the school on the use of particular software or the adoption of a certain technological practice. My research participants had all been part of these sessions, where I was likely seen at a ‘knowing-more’ level and as a ‘go-to person’ for educational technology. Under the circumstances, there was a chance that this could tint the data with a sense of ‘talking to an expert’ as opposed to talking freely to a friend who had no stake in their responses. In addition, as a narrative inquirer, I understood that it would be impossible to keep my interpretations out of the participants’ stories. In this regard, Clandinin and Connelly (2000) explain that “we work within the space not only with our participants but also with ourselves” (p. 61).

3.2.3 Interviews: I felt I could get a sense of my participants’ (or informants’, as they are sometimes called in Narrative Inquiry) experiences through conversations with them. I wanted these conversations to be informal and open-ended as opposed to a checklist that would merely ‘collect data’. My attempt was to elicit stories, anecdotes and recounts of life-incidents in the informants’ personal and professional contexts that would help me make connections to the lived experience and present practice of these teachers. I felt I would find answers to my research
questions embedded within the interviewees’ accounts. Merely questioning to find what they were thinking and then extending the generalization to their practice did not seem sufficient for a holistic picture. I used what Jovchelovitch and Bauer (2000) suggest: “a specific type of everyday communication, namely story-telling and listening to reach the objective [of going beyond the question-answer type of interview]” using an open-ended interview guide (see Appendix E) leaving ample room for case-specific ‘telling and listening’. At the same time, the purpose of the interviews was not just to “look for and hear a story” — as Clandinin and Connelly (2000, p. 78) advise — but to see the individual as the centre of a life lived, experienced and perceived.

3.2.4 Autobiographical account: In framing the rationale for why and how I wanted to include my own experiences in this research, I took heart in Rob Wallace’s words: “I’m still learning about my teaching practice, and by studying my past experiences and writing about them, I hope to understand better what actually happens in a classroom” (Schaafsma, Pagnucci, Wallace & Stock, 2007). It is in keeping with Connelly and Clandinin’s (1988) argument that “there is no better way to study curriculum than to study ourselves” (p. 31). Keeping this in mind, I exposed my own experiences to similar questions that I sought from my research participants. I wrote out the responses, taking tangents as and when I felt the need to. The responses served as my ‘transcript’ to frame the story of my own lived experiences in the context of the implementation of instructional technology in the classroom.

3.3 Ethical Review

Ethical consent was obtained through my University before the actual research process started through the Ethical Review Protocol. I realized that in talking to my participants, my intention was to elicit stories that would hopefully uncover different layers of their personal
experiences and understanding. Although the experiences under discussion were not typically emotionally charged or contentious, it was fair to assume that the participants might feel uncomfortable sharing their personal histories or particular vignettes at some points. My ethical considerations thus involved respecting the informants’ right to withhold information, or choose to have any section removed at a later date. Their anonymity was protected by using pseudonyms and in no case were their workplace or other identifiable features revealed. Documents including recruitment emails for teachers and principal, letters of information and informed consent for teachers and principal as well as semi-structured interview guides for the participants can be found in the Appendices section of this thesis.

3.4 Analysis

The first step of the analysis started with the transcription of the interviews. Though long and tedious, I found it to be the starting point for observing patterns and narrative continuity. Once the transcription was complete, I read through the transcripts a few times, creating somewhat of a dual text along the way by putting my own thoughts and ideas along the sides left blank for this purpose. It allowed for reflection and exploration of the factors that motivated the ‘storytellers’ to make decisions that influence their practice (Goodwin & Jenkins, 1997). It has to be remembered that these transcripts were the words of research participants — my colleagues — who I saw every day. As I continued to interact with my participants in and out of research contexts, stories about them were unfolding in my mind. In Clandinin and Connelly’s words (2000), I was starting to ‘fall in love’ with the informants’ narratives (p. 81). In composing stories out of these transcripts, I continually referenced to my field texts, that is, the transcripts, which contained the participants’ actual words said within a certain context and with a certain implication.
These stories or narratives of experience were unique to each participant. However, since the object of the interview was common for each participating teacher, I organized the five teachers’ (including my own) narratives loosely around themes that served as binding threads within and across the stories. However, these themes were not meant to mimic what Riessman (2004) fears to be objectivist modes of inquiry, with everyone under the same theme implying to mean the same thing. In fact, the themes in my study were organized to reveal the exact opposite — how one teacher could see and ‘be’ entirely different from another, even within the same realm of investigation. This helped bring “academic comparative scrutiny to the study” which Brown (2009) argues has to date been largely absent in the study of digital technology in education.
Chapter 4

The Narratives

I like to call this chapter the ‘heart and soul’ of my thesis—only because, contained in here, is the metaphor ‘heart and soul’ of my participants. As you read through one story after another, you will notice that the context of the participants is rich with their life histories and images from their past and present. In using interviews as the major source for this data, loosely guided through questions that were “open-ended, personal and concrete”, I was able to get rich details of practice along with the participants’ own considerations of those practices reflecting “the emotional, the moral and the aesthetic” (Connelly and Clandinin, 1988). These narratives emerge from an analysis of the interview transcripts, in combination with subtle observations and past interactions with these participants, with the exception of course, of the section in which I attempt my own narrative. The organization of these narratives has been made thematic to facilitate a comprehensive, comparable analysis based on the context being studied.

“Where do you come from?” said the Red Queen.
“And where are you going?”

— Lewis Carroll, Through the Looking Glass
Part 1: The Administrator’s Perspective

4.1 Mahish D’Souza:

FOR EACH, HIS WINGS

4.1.1 Beginnings: Growing up, Mahish’s exposure with technology was limited to gaming systems that he and his brother would request their parents to buy. The D’Souza family was not a huge proponent of technology. Whereas Mahish’s brother was a little bit more interested in technology, Mahish did not go beyond the gaming, and perhaps some basic keyboarding.

Mahish started using computers when he was in early University. He says that technology was clearly not one of his passions, especially in comparison to some of his friends and cousins. In fact, he found technology intimidating at times. The primary purpose it served for him was as a research tool and for typing up some of his papers and assignments. He tried to use it for entertainment purposes, but there was not too much incentive in it for him at that time.

When Mahish was in teacher’s college himself, he saw the use of information and communication technology as an instructional tool. He noticed how it served a purpose in education. Although he admits that technology was a bit of a stretch for him, seeing it in action acted as a motivator for him to learn more about those pieces for himself.

4.1.2 As a teacher: When Mahish first started in his profession, he was not too inclined towards using ICT. He did not see the necessity of it at that time. He has been in six different schools—middle schools and K-5 schools—and he admits that he did not have any ‘aha’ moments with using technology or watching it being used in innovative ways.

4.1.3 As an administrator: Mr. D’Souza has been at four different schools as an administrator. It was in one of those schools that he saw technology being used by a teacher that made him see the effect. The word that comes to his mind is ‘engaging’. As he moved schools, he was mildly surprised when he saw the power of technology in some of the classrooms he visited. He would see how technology could help differentiate the needs of the learners. He saw a classroom of students with learning disabilities where every child was given access to a laptop. He saw how technology helped bridge the gaps created by those students’ learning deficits.

The school board and the ministry of education have started to push schools to implement technology. But Mr. D’Souza likes to ask himself ‘why’! He likes to take a critical look at the reasons behind doing so. He admits that his own passion around technology is growing and he wants to bring it to his schools.
Last year, as part of a Principals’ Learning Team, he facilitated a collaborative inquiry project involving the application of technology at his school. He finds that most other principals on that team are also passionate about technology and are motivated to enhance the technology at their schools.

His own interests aside, Mr. D’Souza’s goal is to convey the message to his staff that technology is important and it is here to stay.

4.1.4 Learning opportunities for teachers: When administering professional development to teachers—not just around technology, but for any area—Mr. D’Souza is a big advocate of ‘creating a path’. He understands that everyone’s knowledge, skills and comfort levels are not the same. Creating a path for the implementation of the new learning helps create a supportive environment for teachers. Some teachers are not accepting of new policies and directions, despite having their potential value explained and demonstrated and even with comprehensive plans for implementation in place. Mr. D’Souza thinks that it is in large part due to their comfort level, and as an administrator, he says, “You have to be understanding.”

In creating learning opportunities for teachers, he admits that he cannot simply say ‘Here’s our goal, here’s what we need to do, and this is what we need to provide our kids’. Equally important is the question of how to then support teachers to get them to that place where other teachers may already be.

4.1.5 Perceptions about his own expertise: Admittedly, Mr. D’Souza is much more into sports than into technology. He finds a way to connect physical activity into a lot of his learning and teaching. He says, “Technology is not second nature to me. It takes work for me to be comfortable with it.” When he goes home, he is either watching sports or playing sports. He is cognizant that other administrators and a lot of his friends and family are engaged with technology in their spare time which perhaps accounts for their natural inclination to use it in their work environments as well.

Mr. D’Souza’s own motivation though has been acquired as a result of observing the benefits made possible with ICT and seeing the students’ interest levels. Technically, he still perceives this to still be an uphill learning curve for him.

He appreciates the fact that his superintendent provided iPads for all the principals in the superintendency. He feels that his own comfort level has grown as a result of having constant access to that technology and he has started to see its value more.

4.1.6 Perceptions about his workplace: Having been at a number of different schools as an administrator, Mr. D’Souza has observed that it is the teachers’ personal comfort levels with technology that guides their practice in the classroom. Some of them are passionate about technology and love it. Speaking for his present school, he says there are teachers who utilize technology in their homes extensively and have made it a natural part of their lives. They might not be experts but they feel strongly
about it. On the other hand, he acknowledges that there are teachers who are still somewhat resistant to technology and need to be provided more opportunities for getting on board.

Mr. D'Souza notes that “the board is being great, the director is being great, the superintendent is being great and encourages technology in all the messaging to us.” However, he thinks it ultimately comes down to teachers’ comfort levels and packaging professional development in a model that works for all.

Mr. D'Souza points out that his school has a lot of newly-arrived immigrant families who might not have the latest technology at their fingertips. An advocate for eliminating stereotypes, he posits that when his students interact with other students within and outside of the community, he does not want them to respond with, “Oh, what technology is that?” He wants to empower his students so that they are able to say, “Yes, I know that stuff”.

4.1.7 Perceptions about students’ expertise: Mr. D'Souza has seen what students are capable of doing and that leaves him impressed. “You walk into a class where it is just absolutely second nature for students to take that iPad and know all of its applications.” Often, he notices that a teacher does not have to walk the students through every single step. The activity becomes not just student-centred, but in fact student-directed, when technology is embedded in their learning.

4.1.8 ICT in the classroom: What's the fuss: After a bit of introspection, Mr. D'Souza sees the benefits of technology. In his walkabouts in the hallways and in talking to students, he has built up evidence that they are very interested in technology. It is hands-on, it is visual and it meets the needs of many different learners. “Whereas I was using technology for games in grade 5”, Mr. D'Souza says, “kids today are using it for a multitude of reasons.” It is about maintaining connectedness and making learning meaningful, in his opinion. “If I saw kids couldn't care less”, then Mr. D'Souza thinks he would not be as motivated to use technology.

When he sees his primary students’ eyes glued to their iPads, he sees the engagement right away and knows that this is something that should be utilized for other areas of instruction as well. It is one more instructional tool that can lead to good learning in his opinion.

Mr. D'Souza believes that communities, such as those which his school serves—namely, new immigrants who lack resources—deserve learning opportunities in the school, that involve using new forms of ICT. He thinks that just because parents are not demanding to see the technology use does not mean that we should not do it. Their children are going to need the skills in high school and definitely in university, so Mr. D'Souza wants to prepare them for that.

As educators, Mr. D'Souza believes that it is our responsibility to equip our students—students that are put in our care—with skills and character, especially the skills that we know would later be transferred to society. He thinks that we would be doing a disservice to our children if we’re not providing them with technology learning as we can see that technology is here to stay. Despite our own interests and desires,
we need to do what is right for our kids. “And doing what’s right for our kids is providing them with those tools.”

4.1.9 Obstacles to technology integration: One of the obstacles that will always remain will be staff that shows resistance to accepting some of the best practices that exist around technology.

Budgetary constraints are always big in planning ahead with something like technology. Having a small school with a small school council, Mr. D'Souza explains that he has to be careful and creative with the way he uses the board-provided funds as well as the non-board funds. Amidst all the encouragement towards using technology, ‘how to make it happen’ is sometimes challenging.

Political issues are sometimes a barrier in such that they limit teachers’ participation in extra-curricular activities. For Mr. D'Souza this means that he cannot offer any professional development such as ‘Lunch-n-Learn’ sessions or after-school sessions in times when teachers are advised by their political unions to refrain from such activities.

At the end of the day, it is all about time, Mr. D'Souza believes. Just like it takes him time and effort to get used to technology, he is certain that it is similar for some of his teachers as well.

4.1.10 What he would like: More time is what Mr. D'Souza would like the most. Ideally, he would like teachers to be able to get one day a week for good planning that would enable them to create the most dynamic and amazing lessons.

A believer in global connections, Mr. D'Souza says “If we can use technology to create a sense of awareness, understanding, empathy and compassion, oh, that would be great.”

In an ideal setting, Mr. D'Souza thinks that every kid should have a laptop or an iPad accessible to them at all times of the day. “Not that they would be in front of one at all times of the day. But if they need one for period 4, let’s say, it isn’t a struggle because Teacher A has signed them out. It’s there for them to use.” He admits though that he is talking about a dream world.

He would also like more collaboration for professional development purposes. For instance, if the neighbouring schools could all be combined from time to time for learning and training sessions, it would be great, in Mr. D'Souza’s opinion.

4.1.11 Where are we headed: Mr. D'Souza hopes that his school is able to take the path where technology is not unfamiliar territory for anyone any more— for students as well as for teachers. The idealist in him sees each of his teachers having an iPad to be used as regularly as their day plans.
Part 2: Teachers’ Perspectives

4.2 Hazel Czar

LEST THE WIND BLOW ME AWAY

4.2.1 Beginnings: Hazel’s father tried his best to get his family some of the cool, new things that were coming fast. He was very interested in cars and bought their family a convertible when people were just starting to hear about them. He got Hazel a hula-hoop which she got to flaunt since nobody else around her had one. Hazel was excited when they got their first coloured television set. To make the image appear in colour, you had to put a sheet of paper in the back of the television tube, and there were only three colours possible, blue at the top for the sky, orange in the middle and green at the bottom for grass. It gave a funny effect to a lot of things, Hazel recalls.

At school, Hazel’s first tryst with technology was when she won a transistor radio for selling the most doughnuts. It was a big deal in those days. As a student, the only form of exposure Hazel had to technology in the classroom was when her teacher would put up one of the 8 mm films on the reel to show a video. In high school, Hazel learned how to splice the film together if it broke. Her teacher would seek her help whenever that happened.

4.2.2 Personal Interaction with ICT: About twenty years ago, when the idea of computers started permeating into the school where she taught, Hazel decided she wanted one for home too. It was an expensive product, so it took her a while to make up her mind. One of her teacher colleagues helped her make the purchase. She remembers lugging the machine up her stairs and ploughing through the novelty herself. The main reason she bought it was so she could do her report cards easily at home, instead of having to stay back at school.

Nobody in Hazel’s family knew anything about computers either. It scared her to hear stories about computers breaking down or needing upgrading. She has had situations where she lost all her data because of touching the wrong button and would have to call the technical help desks.

Hazel’s personal use of computers has typically been for work-related purposes, for instance, taking students’ stories home for typing or creating a worksheet for them. Gradually, with the advent of the Internet, she started to use it to check her email or to search for information. Now, she keenly uses it for shopping on websites like The Shopping Channel and eBay. She was introduced to these websites by a friend when she experienced a robbery in the house and wanted to buy back a few things she had lost. It was a very rewarding experience. Ever since, she has been addicted to online shopping, from buying jewellery to buying pets. It helps her because she does not have time to go to the stores. She does not trust the computer for online banking though. She has heard of situations where hackers can get your
account information. She is scared of succumbing to scams and heeds any advice that comes her way for online safety — for instance, not to leave your computer on.

While she wants to cut down on her online shopping, there are instances when the computer comes in very handy, for instance, checking her son’s hockey schedule on the online portal, so he does not miss any dates. Whenever technology helps make her life easier, she appreciates it. She also likes learning about new things. However, if she feels like she does not have the need for newer, more advanced technology — for instance, a new cell-phone with way more features than what she currently has or a new digital camera with better specifications — then she is usually not motivated to try it out.

4.2.3 As a teacher: Last year, Hazel collected her service pin for 40 years of teaching. Thinking back to the early years of her teaching, she recalls that the first time anything technological was introduced in her profession was when typewriters were made permissible for writing report cards. A few years later, the board introduced computers for the same purpose. It was a big transition. Hazel still remembers that first computer as a prehistoric dinosaur — a box that looked like a tape recorder with a cassette-like slot. There were two of these cassettes — one for writing and the other for games. The teacher had to load the programs in for the students or to create report cards. In the classroom, the focus at the time was on getting students to use word-processing.

Hazel recalls learning computers as a difficult and scary experience. She remembers that something like a maze would appear on the monitor and she would try to follow the maze on a clear sheet of paper or use the keyboard to follow directions like go up three, left two and so on — seems quite weird and purposeless to her in retrospect. If she made a mistake, she would not know what to do. The mouse did not come until later. When floppy discs were introduced, they seemed like the greatest innovation. Later, when the Internet appeared on the scene, it radicalized a lot of things. Hazel now uses it as a resource to find meanings of words, upcoming events, and any other information that she needs to access for the grade one curriculum that she teaches. Hazel is artistic by nature. When creating her monthly newsletters for parents or cards for staff members, she is able to do it creatively with the help of her computer.

A couple of years ago, Hazel was introduced to the document camera. It reminded her of the old-fashioned opaque projector that would enlarge books or pictures for the students. She was using it a lot in the beginning but now she does not have one in her classroom and has not really felt the need to borrow one.

Last year the administration changed the way the morning announcements were done. Instead of being paged across the school, they were put together as a PowerPoint by a group of teachers and students and Hazel was required to show the slideshow to her class every day. She feels that if you are mandated to use something, you do end up using it more.

Sometimes Hazel collaborates with her technology teacher and they come up with ideas for her class to create digital stories or do a science activity or a drawing-and-labeling assignment using the
computer. Although she would not mind doing such a thing herself with her students, she is scared to try it on her own. She feels that she is at fault for not connecting the classroom learning and computer learning in the minds of her students. “It is a different way to show them what can be done with their stories, just doesn’t have to be printed on a piece of paper, doesn’t have to be cut and paste.”

Hazel is open to new ideas about technology integration in her classroom but does not feel inclined to use it unless it serves a purpose. For instance, if there was a movie about making a soup or about Canada’s food guide, then she would love to bring it in to tie in with her lesson on food groups. She feels she has to be prepared and planned to do this type of integration. The computer teacher at her school will often send out helpful links, but sometimes Hazel does not have the time or the drive to look at them. At other times, she will be looking in the board’s video database, calling her board library and going on YouTube to find more about a certain topic. So, she feels that a teacher’s needs guide her technology use.

4.2.4 A peek into the classroom: Students in Ms. Czar’s grade one classroom are generally engaged in tactile activities. Their curiosity sometimes makes them ask questions that their teacher does not readily have the answer to. Not one to disappoint the little ones, Ms. Czar quickly resorts to the computer to find out what they are looking for. She does not really use her projector to show them the process, believing they are too little for that, but tells them their answers right away.

The walls in Ms. Czar’s classroom are colourful and inviting. She has created a lot of her displays herself using the computer or just creativity. She finds the computer to come in handy for templates for words and graphics, to make appealing bulletin boards.

Ms. Czar turns on her computer the first thing in the morning when she arrives. There is another student computer in the classroom which the students are allowed to go on, but it is usually unoccupied. The teacher computer is set up on a rolling table with the LCD projector and speakers. When Ms. Czar has something to show to her class, she has to wheel the table to the middle of the classroom. With the seating arrangement, some students cannot see very well and keep getting distracted.

Sometimes, the students get to watch videos through the board-provided video programs. Ms. Czar uses YouTube to get Christmas music and songs for their assemblies and sometimes funny commercials for their media literacy lesson. She has an old television set in the classroom for them to watch movies occasionally. Last year, she would show them announcements, created using PowerPoint by the junior students’ computer club, every morning. She liked that it had relevant information for the rest of their day or week, and also images, music and videos. On Halloween Ms. Czar showed them Michael Jackson’s Thriller, prepping them for what it entailed. The music and the dancing, together with the technology made for a great experience.

In one corner of the classroom, Ms. Czar has a table set up with tape-recorders and CD players but she does not let her kids use those things on their own. She feels they are too young for those just yet.
When Hazel’s students made a digital story on Pinocchio and then later on Beauty and the Beast, they had a lot of fun. They did this in the computer lab with the computer teacher. They also got to showcase the stories to the entire assembly so they felt good about it in the end. Sometimes they use the computers in the lab to reinforce whatever they are learning in class, for instance, patterning, addition and subtraction or understanding more about living and non-living things.

4.2.5 Learning as a teacher: Hazel remembers the first in-service she had that introduced her to using computers, twenty-something years ago. It was held in a nearby secondary school and she remembers feeling “lost” and “scared” and “overwhelmed”. The new ‘thing’ they had to learn looked very intimidating to her and her teacher friends. Hazel decided she was going to take some initiative in bridging the gap. So, she enrolled herself in additional qualification courses called ‘Computers in the Classroom’. The three courses gave her ‘specialist’ qualifications on that topic. In practical terms, they gave her some sense of familiarity with computers but did not really reduce her anxiety. They were not focused on applications or programming. She remembers her final course instructor explaining that learning computers was all about experimenting, using it all the time.

After that, Hazel never took any formal technology-related courses. When she needed help with computers, she would go to the computer teacher at her school at the time, who helped bring in a lot of technology support for teachers in the classrooms. Whenever there was some new technology for teachers, there would be an in-service offered during lunch or after school. Hazel used the computers the most for report cards though. Running into problems, losing her work, asking for help, going back and trying to implement the solutions — this is how Hazel mostly learned about the computer.

Hazel admits that new learning about technology usually leaves her feeling overwhelmed. One session is not enough to show a teacher a new technology. A couple of years ago, she was sent by her principal to her board’s technology symposium where she attended a workshop on a program that lets students record and edit their voices and music. It went too fast for Hazel and although she thought it was great, she never used it with her class.

4.2.6 ICT in the classroom — What’s all the fuss: Using technology, students can reinforce their classroom learning in the computer lab. That is very beneficial in Hazel’s opinion. As an example, if students were learning about three dimensional shapes, they could be introduced to it in class, using marshmallows or toothpicks for instance, and then take it to the computer lab and design a computerized model of that shape. It would be a new strategy of learning that students could later apply to other projects too. Carrying around a three-dimensional project is not always easy; doing it on the computer would make it easier. Saving work would also be easier. Their work can then be kept safe for years.

When things are new for the students they are excited about them. Hazel recalls how, years ago, her brother sang a song and recorded it on a red plastic record. They still have it somewhere around the house. It was very interesting. Similarly, if students could read and record their stories, they would thus
create something personal that they can connect to. Students need that motivation. They might even get interested in going home and trying it on their computer to apply what they have learned at school.

Hazel is still figuring out ways on how ICT could be used meaningfully with the students. As she brainstorms, she is able to come up with a list of ideas which could be used to enhance curriculum for her students. With computers offering them everything from research tools to presentation tools, she feels it would make it more exciting for them. They would go home and say, "look at this fantastic thing we did at school." Hazel admits, "I have ideas, I just haven’t done them."

4.2.7 Love it: The designing and graphic tools that the computer offers to supplement word-processing really impress Hazel. With a click of a mouse, she can insert a picture, add a border and change colours and fonts. Things that are graphic and colourful capture Hazel’s attention, as well as that of her students.

Being a very organized person, who has carefully held on to things of the past as well, Hazel finds it thrilling to know that technology is available to help her organize and preserve her work, for instance her fading, hand-written recipes can be transferred to the computer, printed and protected.

4.2.8 Love it not: Hardware problems frustrate Hazel — virus attacks, for instance. She feels that if she pays for her security features, they should protect her computer at all times. Hazel is scared of making mistakes on the computer, because she has had frustrating instances of losing all of her report card data or any saved work, due to a mistake she made.

Hazel likes to be on top of things. Keeping abreast of all email communication is sometimes time-consuming. Sometimes, she would rather have a paper-copy of important information in her mailbox.

Technology started out as a good thing, but Hazel sees it as turning into a negative thing too, with all the reports about cyberbullying and accidents and even deaths being caused by it. Hazel feels that too much technology is unnecessary. For instance, she got the Internet feature blocked on her son’s cellphone. She thought that was an unnecessary and expensive option.

4.2.9 Perceptions about her own expertise: Hazel considers herself to be as expert as an average person. "I can do my report cards, email, find things and use it for eBay and Shopping Channel," she explains. She does not know how to use any of the online social networks like Facebook or Twitter. She does not have the time to learn those things, nor has she felt the need. She would not mind knowing more about those things, but is not sure if she would use them. She also likes to have reliable support when learning new things.

Just by using the computer, she feels her confidence level has grown. Calling the technical help desks for various things, she feels she has become more capable of troubleshooting a few things herself. She has also become slightly better at computer terminology, for instance, she had no idea what a ‘toolbar’ meant a few years ago.
Hazel is too scared to use computers with her own class. She lets the computer teacher take care of that. She feels she would not be able to do a good job if computers were given to her to teach. She would have to do a lot of learning through workshops and a lot of planning.

4.2.10 Perceptions about her workplace: At the time Hazel’s school started adopting computers, about twenty years ago, the computer teacher at her school was quite advanced and very supportive of teachers. He helped get computers into the teachers’ classrooms. Hazel remembers having about six or seven computers in the class.

A few years ago, when the projector and document camera were not readily available, her school had two carts set up and they were used on a sign-up system. Each teacher was given access to the technology cart for two weeks. This made Hazel use it a lot.

Hazel feels that ICT is readily available for teachers to use in the school. Teachers are introduced to the new technologies that become available and then are free to use it with the help of the computer teacher. Until about five or six years ago, Hazel feels that the school and her board were really focused on technology. She thinks that they have left it at that. Literacy seems to have taken the front seat now. Hazel has not had any computer in-service sessions in a long time. Even among her teacher friends at other schools, nobody seems to have a buzz about technology. Her school purchasing iPads or some teachers thinking of online learning methods does not affect her at all. It is irrelevant for her grade one class.

Among staff, Hazel feels that computers are seeping into the way we communicate. There is a shift towards emailing and away from paperwork. When one of her principals had first introduced the idea of checking email for school-related communication, Hazel saw it as additional work. But gradually, she got used to it.

4.2.11 Perceptions about students’ technology usage: Hazel sees technology as more of a ‘teacher thing’ than a student thing. She finds that her grade one students are not really keen on using technology. Except for one child who sometimes suggests typing up a story instead of writing it, the rest lack interest. Her students are not even asking Hazel if they can use a computer during indoor recesses. She is unsure of the reason but feels that perhaps students would be more interested if there were more games for them to play — not just the educational ones, but more ‘advanced’ ones. Every once in a while, she notices that they go into some Math game or reading program that they have seen in the computer lab with the computer teacher.

If students were given the option of using the computer at home to extend their learning, she feels that only two or three from her class would be capable. They are also very forgetful at that age, so the teacher would need to send home information about what to do. She recounts making a Christmas wishlist with her students. As a scaffold, she gave them an example of how she once wished for a rare pink table. She did not get too many technology-rich responses.
In Hazel’s opinion, the technology focus for primary students is just keyboarding, computer terminology, word processing, simple searches and some basic computer programs. They are still not proficient at these things. “They are only six years old, so of course, they don’t know how to use it.” With students of the age she teaches, Hazel finds that the focus stays more on the teaching of social skills. To tap into their creativity, the arts and crafts programs are strong. Hazel does not really include ICT in the mix for this age-group. While speculating what might happen if she showed her students how to do searches, watch videos etcetera, she does not discard the possibility that it might perhaps be possible for them to do it.

Hazel has not heard of any exciting, innovative things being done by students elsewhere but she conjectures that for older students, there might be more emphasis on using ICT for communication with each other, with other schools or with friends in another part of the country. As an example, her son used to be on the computer all the time earlier, but now it is the cell-phone, which helps him stay connected.

4.2.12 Obstacles to technology integration: Being motivated is one thing, Hazel feels, while actually using the technology is another. There is no time in the classroom to carry out the ideas you learn at short, fast-paced professional development sessions. And then, without practice, the learning and the motivation gradually fades away. There is no built-in time or system for individualized support or for planning. If students were given a project that involved technology use at home, it would again require a lot of time to write a letter, send it home, follow it up, explain to parents if they have questions and so on. It would be seen as ‘another thing from school’, she thinks.

Technology is an add-on in Hazel’s eyes. Having other subjects to teach and a homeroom to handle is too much work that makes it hard to integrate technology. Everyone is so busy with everything, it is hard to learn anything new after school or during lunch.

Change is a big obstacle in Hazel’s mind. When teachers are getting used to one thing, a new one is introduced. It is not easy for someone to use a computer when they are used to a typewriter or to start online socializing when they are used to just emailing, for instance.

The logistics of purchasing and managing technology are also an obstacle. For instance, while it might be a good idea to get students to record their own stories for the ‘listening centre’, the question is who buys the CDs and which budget do they come out of? These are Hazel’s concerns that do not allow for easy integration of technology. Years ago, she took her principal’s permission and bought some expensive software for her students, but was never reimbursed for it. In addition, some technologies are available out there, but as a school, we have to consider if we have the money to buy them.

4.2.13 What she would like: It would be nice to have half-day hands-on sessions to introduce new technology programs to teachers. It is important for Hazel to be able to go at her own pace. Also, instead of jumping from one thing to the other, which often happens in school boards, she would rather be given one focus and keep working on that.
As far as hardware goes, she would like her LCD projector mounted on the ceiling. It would make her use it more. With the current set up, it is cumbersome for her to have to roll the table with the projector and its accessories to the middle of the room where the screen is. It is not a student-friendly set up either. Having a document camera in her classroom at all times would be nice as well as she thinks it would make her use it.

Hazel would appreciate some lessons on how to use the digital camera for photos and videoing. She knows how to use the basic digital camera, but for polished presentations — which seems to be becoming an expectation — she would like to use it without any mistakes. She is willing to give up some of her personal time for all this learning.

Hazel would like individual support in helping get started with computer usage with her class. She would like to have a system where the computer teacher starts something new with her students and later, Hazel continues it herself, with the computer teacher still available in the background. It would also be beneficial for her to have a list of programs available that could be associated with her classroom curriculum. She understands that eventually she is the one who has to make the decision. But, knowing what she can do with technology would help her put it to use.

She believes that having the time to sit down as a group and talk about how technology is being used in different classrooms might be a good idea for teachers to learn from each other. “We need reminders. A little push once in a while,” says Hazel.

4.2.14 Where are we headed: Hazel likes project-based learning ideas. She thinks innovative technologies might lead us to better implementation of those ideas in the future, for instance, students creating a class book about field trips on the computer, a story or collage to go with their trip, or a book related to curriculum-specific topics like community helpers. Technology might also provide more advanced resources for literacy teaching. Ideas like class-to-class video conferencing look promising and she feels they might become realities.

4.3 Hemraj Bedi

TAKE ME WHERE THERE IS LIGHT

4.3.1 Beginnings: Hemraj Bedi was in his late twenties when he came to Canada. He had been a teacher in India, but he was not sure if he would continue being one in Canada as well. He realized that he would need to add some more workplace-relevant skills to his portfolio. Hemraj decided to take a computer course. He was totally unfamiliar with computers. When told by settlement counselors that computers were becoming quite popular and promised employment, he thought he would give it a shot. He enrolled himself for a Computer Graphics course at a community college. He was passionate about
art, so the course seemed appropriate for him. He thought that he could probably get a job as a graphic designer with this course.

Macintosh computers were the only ones around in those days as far as Hemraj can recall. The monitor was small and everything was black and white. There was no mouse to work with, only a keyboard through which you were supposed to give commands to the computer. The computer had a small memory and usually a couple of games. The main application was for designing. Hemraj smiles when he thinks that he had absolutely no clue as to how to work with a computer. He was worried that if he touched it, he would ruin it. It took a while to get a hang of it.

Hemraj was also exploring his options as a teacher while taking the course. He was hired to teach an International Language as part of evening/summer school. While doing that, he upgraded his teaching qualifications by taking some Additional Basic Qualification courses. Soon, he started to substitute-teach in a couple of different boards.

4.3.2 Personal interaction with ICT: For personal purposes, Hemraj uses the Internet a lot — from looking for real estate and comparing prices to holding video-calls with his friends around the world. He notes how easy communication has become since the availability of the Internet on cellphones. Texting and emailing take away the hardships of couriers, writing letters and postal mail. He feels that the Internet has made a huge difference in people’s lives, including his own.

4.3.3 As a teacher: As Hemraj visited different boards and different classrooms as a supply teacher, he noticed that computers were slowly coming into school libraries. He does recall however, that the focus was more on teaching students how to operate them, as opposed to what to do with them or how to enhance learning using computers. Some of the other technology forms that Hemraj remembers seeing in classrooms were the tape recorder, maybe CD players and overhead projectors.

Hemraj has taught junior classes as well as primary classes. He finds that using technology is not that much different across the divisions. The teacher just needs to ensure that it is age-appropriate in both cases. Currently, he is teaching grade two.

Today’s classroom is totally transformed, Hemraj thinks, with the presence of LCD projectors. Everything is visual for the students. In addition, the Internet helps him browse for information about topics he has to teach in the classroom. Sometimes other teachers send him websites that are relevant to his classroom and he appreciates the sharing. Hemraj is often sitting in front of his computer in the classroom either looking for content to supplement his teaching or checking his school emails and going through his network of teacher colleagues to see if there is anything of value for his classroom.

When he plans to use technology in the classroom, Hemraj will try and find his sources in advance and have them minimized on his screen for the day. He usually gets to school about thirty minutes in advance of the students’ entry and finds it hard to always find the time to squeeze in technology elements smoothly, due to other commitments, supervision duties, meetings etcetera. He feels that being a
Homeroom teacher requires you to focus on too many things and computers can sometimes take a backseat.

Although he would like to use computers more, he finds that sometimes he just has to find other ways out, as using technology requires a lot of preparation which is not always feasible for him. For instance, Hemraj says, that a brochure can be made using paper and pencil as well, instead of using a computer program. You just have to show the kids how to fold the paper and give them a template to use. They can draw or print pictures and paste them to make it look more visual. Hemraj believes that before integrating technology in instruction, a teacher needs to ask himself, “Why am I using this program?” Thorough planning and meeting curriculum expectations is key to successful integration in his opinion.

For Hemraj, collaborating with the computer teacher is important. He felt the need for it more when he was teaching junior grades. He thinks that students benefit more if there is some coordination between what his students learn in class and what they do in the computer lab.

4.3.4 A peek into the classroom: In Mr. Bedi’s grade 4 class, students were exposed to visual learning from time to time through the LCD projector and document camera. Once when they were excited about their upcoming trip to a place called ‘Medieval Times’ where they would get to see a live tournament, Mr. Bedi spoke to their computer teacher and asked her if she could allow his students to check out the website for this venue as they had just started learning about Medieval Times and were not quite sure about what to expect. The students thus got to research the place and also some other related information and videos. It made everything so easy to understand and relate to. They asked questions and were fully prepared to make the most of the trip.

Mr. Bedi also introduced a fun program to the students about bullying. They all got to log in using their own usernames and then picked the activity as instructed. The students were fully engaged in identifying bullying situations, learning about types of bullies and how to avoid them. There were activities like writing journals, postcards, designing t-shirts and posters to follow-up with the learning. The students were able to do these activities at home as well and then hand them in to the teacher who marked them and returned them back online. The activity continued for a couple of months.

Now Mr. Bedi teaches grade 2. His students find it quite interesting to do language activities through videos he puts up for them. They watch words and hear kids sing along, which helps because they are engaged visually and aurally. They dance and sing around while learning about nouns and verbs. From time to time, they get to see videos about their subject matter, either from Youtube or board-provided resources.

4.3.5 Learning as a teacher: Way back when Hemraj had just started full-time teaching, he heard about the popularity of Microsoft Office. He took the initiative to enroll himself in some courses to familiarize himself with the software. He felt it would come in handy in his profession. As far as teaching-related computer programs went, he attended some workshops related to the report card software.
Hemraj spends a lot of time on the Internet trying to find ideas to enhance his instruction. He is generally impressed with what is available and uses several of those ideas. While most of Hemraj’s learning about ICT applications in the classroom has been through self-teaching, he is excited at the prospect of professional development workshops around technology. Sometimes he attends workshops on technology which admittedly leave him overwhelmed and frustrated. He remembers an instance of a workshop being held on online learning environments in the school last year. He felt like it was too much to absorb and in the end, he could not remember the steps to follow. For him, it makes more sense to be introduced to technology in a practical manner, where everyone can explore the new software together in a hands-on fashion and then teachers have to use it in their class. He feels the need for detailed instructions on what to do and who to contact if he has questions.

These days, he finds that more and more professional development sessions point towards technology in some ways — even if they are not technology-focused sessions. A year ago, Hemraj went to a board-workshop on character education where he learned about a computer program that teaches kids about bullying in a very interesting manner. It is an online database of lessons appropriate to each grade level and students are able to do follow up work and hand it in online. Hemraj liked the program a lot and not only did he use it with his class, but he also shared the resource at a staff meeting for his colleagues to see and use. The learning experience was made more meaningful for him when the program coordinator at the board office emailed him to check if he needed further support or had any feedback.

Hemraj believes that one workshop is not enough for teachers to learn a particular software. “Teachers need more time to explore”, he says. It is also not possible in his opinion for a teacher to learn something at a workshop and try to use it with the students the very next day. He thinks that a teacher should first get comfortable with it himself and think about how it will make a difference in his or her classroom.

When he reflects on his own professional growth plans, Hemraj feels that he has not given enough emphasis on technology. He thinks that he needs to include technology as part of his annual learning plans, but does not have enough understanding of how to source opportunities to do so. “If there was a list of things to choose from, I can probably pick one of them”, he thinks out loud, but he says he is not aware of what his options are. He says that a detailed list of technologies available for use would help him connect those to his classroom instruction and would force him to learn more in that direction.

Hemraj wants to make an attempt to utilize technology a little more extensively in his profession. He confesses that if he was teaching middle or high school, then much more would be expected from him in terms of technology usage. In the primary class that he is currently teaching, he feels like he can ‘get by’ with using what he is and maybe learning a little bit more.

**4.3.6 ICT in the classroom — what’s all the fuss:** Hemraj feels that emphasis on technology is needed to make students competent to enter the mainstream world. Everywhere you look there’s
technology, and students need to be professionally and personally prepared for that. "I have seen many people who are illiterate in technology and they have a hard time finding a job", says Hemraj.

Technology also makes us efficient as teachers according to Hemraj. "Why waste time with paper and pencil or chalk and blackboard when it is already available", he says.

Technology is an easy way to make things fun and interesting for the students. When students use the computer, it is so much more engaging for them. He believes they will be amazed at their own work if they utilize the computer to enhance it. In addition, technology makes everything accessible and quick for students. Booking library times and arranging books on each subject seems so hard in the presence of such a convenient alternative.

Hemraj points out that although ICT is very important and helps make education a better experience for students, we cannot devote all our attention on it. Too much fuss over it might take our focus off of some other important things and we might become too dependent on it. To him, little things like calculators, rulers etc are technology too. All forms of technology really serve as tools in their final outcome.

**4.3.7 Love it:** It is the instant availability of information that impresses Hemraj the most about technology. One day, for instance, he wanted to show his grade 2 students a video on Thanksgiving. He went to the Internet during his recess time, searched for the topic and came across a few videos. He went through them to see the relevance of the content and within no time, he had some videos ready to show his students.

Even though he admits he is still is not aware of the full potential of the computers, the creativity it offers through clipart, graphics and presentation tools is already very exciting in his eyes. Some aspects of technology make life easier for Hemraj as a teacher. His document camera for instance, eliminated his need for extra photocopying on many occasions, saving him the hassle and reducing his use of paper as well as his photocopying costs.

**4.3.8 Love it not:** A lot of times, Hemraj does his research at home. In the past he has run into the issue of finding websites that would not work at school later, so he has to check out the websites on the school computer as well before showing it to his students. If they do not work, then he has to do the search all over again. The problem with technology, he thinks, is that sometimes when you need it, it does not work. Hemraj has been in situations where his lesson depended on a particular website but it did not work, or the audio on his computer would not work.

He is quite good with checking cables and securing hardware connections himself, but sometimes the problem is just beyond his reach. For instance, he wanted to use a document camera just the other day. Last year he used to work with it all the time. This year, he borrowed it from another teacher since there isn’t one in his own classroom. During class time, no matter what buttons he pressed, he could not make it work. Frustrated, he gave up on the idea thinking that he had wasted enough time already and
just used the blackboard instead. Sometimes his computer will not print to the printer. He will then have to go to a different classroom or to the computer lab, open up what he needs from scratch and print it from there. It is cumbersome and frustrating.

4.3.9 Perceptions about his own expertise: Hemraj feels that with experience he is learning a lot about using technology. From the time he first started, to the stage he is at right now seems like a great leap. He does think that he is not delving fully into the details of technology integration yet. He feels that in comparison to younger teachers who come to the profession loaded with technology, experienced teachers like him may not be too comfortable yet. He still needs to develop his expertise. A lot of times, he is unaware of the computer programs that will help him to make a certain topic easier to understand.

Although he often plans ahead whenever he wants to integrate technology into his lessons, Hemraj feels that he needs more time to go through the sites that offer information about the topic. Sometimes, he is able to pull up information at the last minute, but at other times, he simply cannot find what he needs to show them.

4.3.10 Perceptions about his workplace: Ever since Hemraj heard from his daughter, who is also a teacher, that her school uses iPads extensively for teaching, he has been thinking about the disparity between schools, even within the same board. He feels that his workplace has a great need for technology, as there is a high population of English Language Learners. The parent community cannot afford to spend much money and often, the students are new to the country or do not have too much exposure at home. Hemraj believes that these are ideal conditions to use more advanced technology-based methods to help students. He feels that every school, including his own, should have technology resources commensurate with a modern society.

Before working at this school, Hemraj worked at another school where there were only a few computers in the library, no separate computer lab and he says that the kids had access only to the basic program tools. In light of this fact, he admits that for the last couple of years, his present school has been trying to push for technology in a good way. Even though “we still have more needs as compared to other schools”, he says, “overall, we are really progressing into raising technology at our school.”

He thinks that individual teachers’ use of technology depends on their own motivation and comfort levels and despite the board’s and school’s emphasis on technology, some teachers might not be able to use it. On the other hand, other teachers are passionate to use technology as one of their strategies for teaching. Hemraj teaches in a pod connected with three other classrooms. It is easy for him to hear and see whenever any of his neighbouring classrooms are using technology in their instruction. It reminds him of the technological resources available at the school and helps him with more ideas.

4.3.11 Perceptions about students’ technology usage: Children are one step ahead these days, says Hemraj. Even if they are given a piece of technology that they have never used before, they are still
able to make it work just fine. On the Internet, while searching for content to teach, Hemraj comes across great student work sometimes. He feels that students can make great presentations that their teachers are broadcasting on the Internet and making them accessible to all.

Whenever Hemraj uses videos for visual stimulation with his students, he finds they are very enthusiastic. They never seem to have enough of those things. Students know about the Internet and they know how to chat. He is aware of some high school students who even do their homework on the computer and hand it in through the Internet.

Hemraj has experienced that students as young as nine years old know how to use memory keys, how to create presentations without being taught in class, how to add voice-overs to their presentations and how to use the LCD projector. He says they can do it all if you give them the opportunity and if they have access to the resources. To realize students’ full potential with the usage of technology, teachers should be creating more technology-rich tasks — for instance, for a character building unit, students could be given digital and video cameras and the opportunity to find examples in the school, take footage, then upload and put it together, and share their story. Students are capable, he thinks, they just need the chance to do it by having more hands-on time with technology, just like with other things in the classroom.

Cultural restrictions sometimes play a role in the students’ usage of technology, Hemraj finds. Some families do not allow children to use a computer, perhaps because they are afraid of the wide open Internet. Hemraj thinks that it could be because the parents are not “computer-literate” themselves. Regardless, those children still use cellphones and other forms of technology. Cultures like Hemraj’s own, focus on the positive effects of technology on children’s learning, which is the way to harness its benefits.

Hemraj is well aware of the negative effects that technology is having. What worries him the most is the availability of ‘free stuff’, which gives students the impression that it is okay to use it since they don’t have to pay for it. His own son who is in high school, keeps playing online games and downloading them whenever he wants. Hemraj feels that this behaviour affects the social life of children. In addition, technology makes them lazy and they do not take care of their health. It propagates a lifestyle of using gyms and artificial means of keeping healthy.

4.3.12 What he would like: Hemraj argues for fully upgraded classroom technology so that there are fewer chances of glitches and freezing up in the middle of lessons. Teachers need to be comfortable and free-minded when it comes to using technology. They should not have to change their plans in the middle of the lesson due to unreliable technology, as Hemraj has had to do in the past.

There should also be more computers in every classroom so that “any time you want students to learn technology, they can use it,” says Hemraj. It should not just be dependent on computer periods. He is very passionate about art and wants to supervise some of their graphic creations tied in to curricular learning on the computer, for instance artwork representing students’ traditions and celebrations.

Something Hemraj believes he would benefit from is a ready-made list of software that can be used within classroom instruction. The list would need to be sorted by topics and include descriptions, sample
lessons and ideas for integration. It would motivate him and other teachers like him to use those programs.

Hemraj would also like to have more intensive professional development. One session on a new technology is simply not enough. He even suggests the idea of involving students in these sessions, so that they can get as enthusiastic as the teachers. He recalls that there was once a workshop on a kids’ animation program that was available at his school. He found it mesmerizing and wanted to try it, but needed more support and time. One of his colleagues agreed to help him, but busy schedules got in the way and then the momentum was gone. If students had been involved or more PD was provided, he might have made it a reality.

4.3.13 Obstacles to technology integration: In Hemraj’s experience, old, non-updated computer systems that do not work in the middle of lessons really leave teachers with a negative impression about technology. In addition, technology is not readily available to all teachers. For example, Hemraj had to borrow a document camera from another teacher as his new classroom did not house one. There appeared to be a problem in some of its connections and he could not make it work. The teacher who lent it to him, in the meantime, was unable to work on her LCD projector as removing her document camera upset some of the cabling in her classroom as well. It was a dissatisfying experience for both the teachers and Hemraj did not try using the document camera again. Inequitable distribution is thus an ongoing obstacle.

The absence of consistent professional development also prevents teachers from keeping up with the exciting new learning that is thrown their way. Hemraj remembers the instance of switching from the overhead projector to document camera, when everyone wanted the new technology, but then a lot of people stopped using those things, due to other, more time-bound priorities taking precedence over trying to learn how to use the new technology.

4.3.14 Where are we headed: The whole world now realizes the power of the Internet. Ten years ago, Hemraj’s own children did not know much about the Internet and now they cannot get off it. He remembers the time years ago when it was impossible to imagine a video call where you could see who you were talking to in real time. Thinking about twenty years from now, the possibilities seem endless to him. “What I am thinking in my dreams might come true.”

However, Hemraj thinks that no matter how much technology we have, paper and pencil tasks have their own importance. Too much of anything is bad and it applies to technology as well. He firmly believes that we need to maintain a balance and apply technology only when required. For teaching purposes, Hemraj believes that he will continue to explore the wonderful sites that continue to get added on the Internet.
4.4 Bertha Demko

HIGH UP AND COUNTING

4.4.1 Beginnings: The three children often took turns playing on the computer. While her brother and sister liked to play PacMan and DonkeyKong, Bertha loved Frogger the most. Navigating through the many obstacles, six-year old Bertha found it stimulating to get her frog safely home across the empty lilypads. For the 80s, it was a special thing to be born with a well-functioning computer in a household, even in a North American country. The Demko family saw to it that their children got a computer to play and work with as it promised to be an important tool in the coming times.

Bertha went to a well-funded school, replete with a computer lab. Some of her lab activities involved using a word-processor and practising spelling and grammar. Occasionally, her class also got to play some activities that tied in to the curriculum, for instance, games that helped them understand the life of the Early Settlers. She still remembers the image of the brown raft going down the river that marked an important part of the Early Settlers’ journeys.

As Bertha grew older, she started playing more advanced games like Treasure Island, Theme Park, Sim City, Star Wars and Doctor Brain. In high school, she took a typing course to get better at keyboarding. In grades 11 and 12, she took a programming class in which she learned how to use various codes to create computer games. She also used the computer to research and write assignments. During her university time, Bertha was using online databases to find journal articles for the vast number of essays she had to write. She stepped into the world of online courses during her last two years at university. In one of the terms, she even took three online courses in which she recalls listening to lectures on a CD and submitting her assignments online. Then, her social life also started getting connected to the electronic world through programs like ICQ, MSN and later, Facebook, where she would communicate with her friends.

4.4.2 Personal interaction with ICT: At home, the computer is an important part of Bertha’s life today. The first thing she does when she goes home from work is to turn her computer on. She checks her emails and does some housekeeping, for instance, does some of her banking and check up on other financial aspects like stocks etcetera. Television is important to Bertha. However, she does not have cable. She watches all of her favourite shows through the Internet. “I hook up my computer to my television and that’s easy to do once you’ve learned how. I then watch all the shows on the big screen.” She either logs into her TV channels on the Internet to watch the shows directly from there or she sometimes downloads them and then plays them on her ‘computer-television combo’ at her leisure. Whether it is an entire series of a show or whether it is movies, it is all done through the Internet at Bertha’s.
When things go wrong with technology — like loose connections or the Internet not working — Bertha is proactive. She tries to troubleshoot herself and that usually works. In the event that it does not happen, she takes the initiative to call her service provider. Regardless, she resumes connection with her technology tools as speedily as possible.

4.4.3 As a teacher: Currently a grade 5 teacher in an elementary school, Bertha considers technology to be an important part of what she does. The moment she walks into her classroom in the morning, she turns her computer on. “For work purposes, I do everything on my classroom computer”. In teaching lessons to her grade 5 class — language, math or any other subject — she puts up the content on the computer and then uses the ceiling-mounted projector to show it to the students. She signs up for using the computer lab with her class very frequently so that students can carry over their classroom assignments to an innovative platform on the computer. Bertha likes to use different software with her students so that they can become competent at doing different things on the computer and not using the computer for just one particular thing. She also uses board-hosted video databases in her classroom.

Bertha’s ICT choices for instruction are often guided by her students’ experiences and actions. For instance, she used a certain computer program with some of her struggling students a couple of years ago. The general feedback she received from the students was not encouraging. Thenceforth, Bertha has never been too interested in the software. “I don’t necessarily want to introduce that program to new students if my old students found it boring”, she explains. Similarly, sometimes her students will ask her to go to a website that she is unaware of. An example she recalls is that of a website where the students were able to play Math games against each other from their own computers. Irrespective of the concept, she did not feel like it was an activity educational enough to be continued again. “They were all out of their seats trying to do the same game as their friends.”

Bertha supports the belief that in a school setting, computers should be used in educational ways, and not just for games and other low-yield uses. In the computer lab, when students are done their work, she will get them to pick a program that is educational in some way — either typing activities or a music program. She is hesitant to let them go on new programs that she herself is not familiar with.

In general, it is the stimulating and engaging aspects of technology that Bertha likes the most for herself as well as for her students. She likes to keep things interesting and challenging, so she will learn a new program one year and use that for a particular assignment and then learn a different program for the same assignment the following year. She feels that it helps the mind to learn something new and to go above and beyond.

4.4.4 A peek into the classroom: Students in Ms. Demko’s class get to experience some of the classroom instruction in ways different than many other classrooms in the school. For instance, when their teacher wants them to write a journal entry, students do not take out their journals. Instead, they are told to blog their responses in the computer lab or even from home. They love it and before they know it,
they have written much more than they would write on paper. She sometimes assigns blogging for homework, which requires students to go online at home and post their work on the Internet for Ms. Demko to check later on. It is time-stamped, so they try to be punctual. Their teacher will look their work over, suggest changes and then post it for others to see.

When learning about Media Literacy, the students get to design CD covers or mock-Facebook pages using interesting programs like Comic Life. Their research projects are made richer with the utilization of the Internet. They are able to get information easily and quickly. Ms. Demko also lets them work from home to gather and organize information and gives them a rubric to help them see if they are meeting the mark. When writing narratives, they use a word-processing program that helps them format their work neatly. Sometimes, they get to go to their friends’ computers and add on to their narratives.

While students get two periods a week with their computer teacher, Ms. Demko makes it a point that she takes them in to the computer lab herself as well. On an average, she signs the lab out for about two to three periods per week. Students are excited to go to the computer lab, although computers at their school does not ever seem to be about playing games. Getting extra time on the computer helps the students do their assignments well or else they would have to come in to the lab during recesses and lunch time and rush through their work.

Sometimes, the students will ask questions or be curious about things that are not commonly known. Ms. Demko will tell them to ‘Google it up’. As a result, students are starting to use the Internet for a lot of things as opposed to going to the library and finding books on the topic. It is just so much easier because the Internet is always there.

4.4.5 ICT in the classroom — what’s all the fuss: Learning needs to be made interesting for children in Bertha’s opinion. She thinks that drawing things out using a pencil and paper might be boring for students whereas using the computer’s graphic and visual methods might be way more engaging and stimulating for them. When she is marking some of the students’ computer-generated work, Bertha herself feels more invigorated than marking their traditional, paper-based work, which starts to get dull after a point.

When Bertha explains a computer-based activity to her students, she finds that they are far more motivated to do it than non-computer tasks. They also ask less questions as “it is all trial in there anyway”, she says. She also finds that students are able to do their work much faster and much more creatively using computer-based environments. “The quality of their work is much higher”, she says and at the same time, they are learning a new tool that they can use later more proficiently.

4.4.6 Learning as a teacher: Bertha has not had any formal training in the use of computers in the classroom. As far as professional development opportunities go, she went to a board-organized technology symposium last year. Some of the sessions in the symposium were not as stimulating, because the information was not new for her but some of them were interesting where she learned about
two types of mobile technology for use within the classroom. She also occasionally speaks to other teachers who she knows at different schools to get an idea of what programs they are trying and to see if she can implement those. When the school’s instructional technology resource teacher comes in, Bertha is quick to sign-up for support so he can help her plan a lesson infused with technology, which she can later continue doing with her class. She admits that she had had to pass up on a good inter-school opportunity to learn more about technology integration last year, because she was too busy with another project. Last year, Bertha was on the school’s technology team due to her interest, which helped her learn from other teachers. She would like to continue doing so and taking more professional development sessions as she believes that it would help her “progress and move forward as a teacher and keep up with technology and the students.” A step that she thinks she could take down the road is to take an Additional Qualification course in technology.

4.4.7 Love it: For Bertha, working with technology is less time-consuming than working without. She feels that technology makes things so much easier. As a teacher, she can save, modify and reuse her material whenever she wants. She is able to input her students’ marks on an Excel spreadsheet, assigning a value for the denominator, to specify what the assignment is out of, and the percentage of their overall mark. If she needs to make adjustments, it will take another couple of seconds. She smiles as she says, “How easy is that?” Even during the teaching, writing on the blackboard is more time-consuming for her than using the computer.

In her personal life, streaming television shows is a great experience for Bertha most of the time. She is amazed at how the Internet can take her through one show in such less time and with so much ease than the cable, for instance.

4.4.8 Love it not: As much as Bertha loves technology and uses it, some things bother her. More than a few times, Bertha has had to frown at the incompatibility between her home computer and school computer. “I have to redo it if I want it that day, or then go home and re-save it.” For a tightly-packed day schedule, this can be quite frustrating.

Given her reliance on the Internet at home, Bertha seems to have slipped unknowingly into an ‘instant access’ world. When the Internet is down, she feels very frustrated. “You expect it to work all the time”, she says, while understanding that “sometimes, technology fails us.”

4.4.9 Perceptions about her own expertise: Bertha finds it interesting to note that amidst her colleagues, she is quite advanced at technology. She explains that she has friends who work for corporations that require a very high level of technical expertise. “They do all kinds of things on their computers”, she says, adding that she is not even close. She instantly categorizes herself as low-skilled on the general spectrum of expertise, but at the same time notes that her technological skills are quite high within the context of her own workplace.
Bertha says she generally tends to use the programs that she is already comfortable with. However, she does like to learn more applications one by one. For instance, she learned how to do blogging with her class last year. She believes new learning takes takes time and patience, but then you become an expert at that. “Now I would be comfortable going back to it with my new class.”

It is only a matter of minutes for Bertha to create a technology-infused lesson for use with her class. She says it is as simple as coming up with an idea for what to do and then deciding which program to use on the computer for that. Plus, when students are introduced to that program, it takes them a few minutes as well to get a grasp of it and the lesson is in full swing from there on. Some detailed units like the Canadian Government, for instance, might take more time to plan, based on what resources she can find on the Internet or through other teachers.

4.4.10 Perceptions about her workplace: Bertha has taught at a middle school that had far more technology resources than her present workplace. There were two computer labs in the school and the teachers were sharing ideas and resources all the time, so that everyone was on board with technology in their classrooms. Bertha admits that the school had acquired this technology through a funding grant and was somewhat under the obligation to put that technology to effective use. Using technology was not an option at that school, it was mandatory.

At the same time, she understands that there are schools that have way lesser access. She knows that in some schools, the teachers are not even using their computers and still have ‘ancient’ equipment like the overhead projector.

As far as her present workplace goes, she believes that the school is in the “middle somewhere” and thinks that the board is doing a good job with hosting technology-related professional development and getting people to think more about technology. However, she thinks that the teachers at her school are not using enough technology in their classrooms. She attributes this to the fact that the teachers are not required to teach computers to their own classes. While someone like her feels frustrated that she does not get to teach computers herself to her class, for other teachers this might be a preferable option. She believes that the way to get teachers to use technology requires a lot of instructing, getting them on board, showing them how to use different programs and “not only encouraging them, but kind of forcing them to actually do it.” In Bertha’s opinion, having an extra computer lab in addition to a dedicated computer teacher would be fantastic for her school, especially in relation to moving forward with technology.

Bertha sees that the school is trying to push for technology, but she believes that more pushing is needed. She considers funding limitations to be a major obstacle in buying and maintaining new and innovative technology. For instance, she understands that with the school buying iPads, there will be more cost-issues involved in the purchase of apps and accessories.
4.4.11 Perceptions about students’ technology usage: Children these days start learning computers from a very young age. Bertha believes that this makes them technologically advanced. She contends that if you put a child in front of a computer, he or she can learn any new program in no time. At the same time, she does not necessarily agree with the analogy of ‘we are behind and catching up to them’. She feels that we are just learning along with them. Adults who are more proficient users of technology are able to learn faster.

Bertha feels that students are very graphic now and technology really helps them to get their information in a visual way. The Internet seems to be a big thing in the lives of students these days as well and Bertha thinks that it might be making them more cognizant of what’s happening in the world. She sometimes gets unexpected questions from students and when she asks them where they got that from, they say, “Oh, I saw it on the Internet.” Even if they are not academically as advanced as they used to be, in Bertha’s opinion, they are certainly more socially advanced. Plus, she thinks that using computers and the Internet for classroom assignments helps us cash in the students’ extensive use of technology.

Having an excuse to work on the computer will make students do a better job at computer-based assignments, Bertha thinks. For instance, as opposed to her class of last year that was doing their journal entries in a duotang, this year’s class, which is blogging their journals, end up doing such a better job. Each paragraph they write has about seven or eight sentences, the work is usually handed in on time and she does not have to deal with any of the laziness or doing a poor job that she had to deal with before.

The negative impacts of ‘too much technology’ concern Bertha. “I know students spend hours a day on the computer”, she says, “and most of them are gaming.” She has heard of studies that show that video games cause stimulation of the brain and kids are unable to sleep well if they play those games before going to bed, instead of reading a book for instance. Violence in video games is one aspect of the dark side of technology, while another is the online chats and the dangers of cyber-bullying. Unlike the games that Bertha herself played when she was young that were science or math-based and taught her how to do riddles or solve math problems, today’s children seem to be playing a lot of violent games. Bertha thinks that in large part, parents are responsible for students’ online activities and behaviour.

4.4.12 What she would like: Bertha would like to start using her document camera more — perhaps through some practical PD around that. She would like a more up-to-date and reliable classroom computer. The location of her computer is also not ideal for her — it is in a corner far away from her desk. So, she thinks that wireless would be beneficial to be able to move the computer around. In addition, she would like to have some mobile technology at hand. The school had also purchased a ‘Mobi’ last year, which can be defined as a hand-held mobile interactive whiteboard. Bertha is not using that yet but would like to. More than anything else, however, a class set of iPads would be ideal in her opinion. Her school currently houses ten. She has also seen netbooks in action at her previous school. “They are just a little thing and the keyboard flips open and it was perfect”, she says. She recounts how students could be
sitting on their desks with those netbooks and typing up notes from the board, or writing a story or even taking a test. She sees this as a way to eliminate the bottlenecks for booking the computer lab as well.

She feels the need for adaptive technology programs in the school. She has had experience using some adaptive software at her previous school, and appreciates the results. The software available at her school for the purpose does not impress her much.

Having more computer time for her students is what Bertha would love. It would enable her to try out things like online learning environments with the students. A model where she could have seven or eight computers in her own class would be beneficial as well. Students would be assigned computer time on a schedule and the computers would be available to them throughout the day. She only has one student computer currently. “It does not make any sense”, according to Bertha. The teacher computer is being used by her every single period so it is not available for students.

4.4.13 Obstacles to technology integration: Bertha believes that financial limitations stand in the way of getting technology inside classrooms. She feels that as a school, there simply are no funds available to get what we want. She tries to capitalize on what is available by booking the computer lab as often as she can, but another obstacle she runs into is clashing with other teachers. Since the computer lab is only available a certain number of periods, all the teachers who want to use computers with their classes — currently there are two more other than Bertha — have the same options, leading to time-clashes.

4.4.14 Where are we headed: With the Internet available to us all the time, Bertha thinks that it is just a matter of someone bringing ideas to our attention. Once the idea is there, you can make it possible with technology. For instance, she was talking to a colleague recently and discussing how doing projects like Flat Stanley can perhaps be taken to a whole different level with the students being so technologically advanced. “I think there are [global] projects out there that would benefit students”, says Bertha.

Despite being a ‘computer person’ admittedly, Bertha seems to have mixed feelings about the radicalization of classrooms through technology. She is skeptical of classrooms going ‘paperless’ a few years down the road. She feels that paper has a definite value in that the students can highlight important things and she can go over those with them and help them with comprehension. However, the more she thinks about it, she starts feeling that these things can also be done without paper “but you have to have forms of technology in school to be able to do that”. She sees mobile technology like tablets in the hands of every child as a solution to this issue.

Her board has recently announced its Bring Your Own Device (BYOD) policy whereby students are encouraged to bring their handhelds to school and utilize them for learning in the classroom. Bertha is not sure of how that would work, since the policy is very new and has not been put into action. She feels that a low socio-economic parent population would not be able to afford that, and even if it happened, there would be lots of supervision and monitoring issues to take care of.
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4.5 Rosanne Brock

THE FUTURE IS NOW

4.5.1 Beginnings: Rosanne Brock went to a private school. Until grade 7, she had no exposure to computers. When computers were introduced, the focus was operational, rather than functional — identifying the different parts of a computer and writing quizzes about it. There was also a bit of word processing for doing assignments. In high school, computers were an optional subject. For any type of research based assignments, students could use the computers in the library. However, Rosanne was not using computers for anything creative just yet. She was even embarrassed at her poor typing skills.

At home, Rosanne’s parents had a desktop computer. Her father used it sometimes for work-related purposes. Her mother did not start using it until after Rosanne. Her parents used to laugh when Rosanne showed them something new or interesting on the computer. They did not understand how she was able to learn those things without them teaching her. At the same time, they encouraged her to explore new things. In their family, making mistakes was okay. Rosanne extended this understanding to her use of computers as well.

At the end of high school, close to Grade 12, Rosanne was introduced to ICQ — a synchronous chat environment. She would chat with her group of friends on the home computer after school. Gradually other chat media like MSN started becoming popular. Social networking became a big deal in Rosanne’s life. She admits that she was addicted to it. Sometimes, Rosanne played video games as well but that was not as important to her as chatting with her friends. She did take a typing course to become proficient at the keyboard.

In University, Rosanne also got her first laptop. She thinks that this was what marked her uphill journey with technology. She started using it a lot for research-related purposes. She took a media course to get more familiar with the uses of the computer for academic contexts. She learned about issues like copyright, plagiarism and reliable sources. In her final year, she got on to Facebook and still loves it.

4.5.2 Personal interaction with ICT: Social networking, finding videos and music are some of the major interactions Rosanne has with her computer today. On an average she spends about four to five hours on the computer after going home from work. She admits that this time also comes from not watching the television. Comparing herself to people who have smartphones with loads of games, Rosanne had a simple flip-flop phone until recently and is a self-proclaimed non-gamer.

Rosanne finds the Internet to be very appealing for her interests. She is very fond of traveling, for instance. She finds she can spend hours looking at different places and hotels and trip-planning websites. Whenever she is looking for a new apartment to live in, the Internet comes in very handy for all the research about the area and her needs. She is into cooking as well, so she likes going online and looking for recipes. However, being on Facebook and looking for classroom ideas are the two things that
Rosanne uses her computer the most for. Rosanne’s friends find her an informed person as far as global awareness goes and she attributes some of this to being connected to the Internet quite a lot.

4.5.3 As a teacher: In her first year of teaching about five years ago, Rosanne felt the Internet was a great aid. She would go online and try to find lesson plans and ideas. Even now, she uses the computer for a lot of her lesson planning. This year, Rosanne’s assignment includes teaching Grade 3 for half the day while the rest of her day is divided between teaching music and providing ESL support to other classes. She finds the Internet to be a wealth of resources for music teaching and believes that YouTube and other innovative resources have radicalized the way we look for information now, as opposed to when she was a student.

She uses unique tools like the Smart Ideas timer (a cliplet available through a mindmapping software provided by the board) to keep things interesting and visual in her primary classroom. She will sometimes create powerpoints for her students. When approached a couple of years ago by the technology teacher and teacher-librarian at her school to participate in a project involving the creation of an online learning resource for her classroom, she was very excited. Collaboration is really important for Rosanne as she believes that it enhances the learning experience of teachers and students both. It also makes planning easier. Sometimes she will just bounce off ideas with the technology teacher at her school and together they come up with a plan in no time, with technology and curriculum totally integrated. Rosanne has also been a part of the technology committee at her school, to provide input to the school’s growth in technology and to learn more about the new technologies available. She has co-presented workshops about some computer programs and applications she has learned and would like to be involved in improving the technology at the school.

It is fun for Rosanne to plan a lesson that is based around the students’ use of technology. Even though it might be time-consuming to set up something like online forums, for instance, she is always willing to take the time. She is a risk-taker and does not always have to have control in her classroom. This personality, she believes, is well-suited for technology. Whereas for some teachers using technology might see it like an additional hassle, to Rosanne, it is exciting. She thinks that teaching students how to work with that technology also might not be that difficult in today’s times where children are already comfortable with online socializing. She is looking forward to using the iPads that her school has recently purchased.

Rosanne’s major stumbling block in effective lesson planning is to address the diverse needs of her classroom. It is not sufficient for her to use ICT in her classroom, unless she has planned for it in a way that caters to the differentiated requirements her students have.

4.5.4 A peek into the classroom: Ms. Brock’s split junior class was learning social studies using an online learning environment. Their teacher created this database for them in collaboration with the teacher-librarian and technology teacher at the school. The cool thing about learning this way was that
the information they needed was all on the database, they were able to communicate with their peers and explain their thinking to each other about the topics learned, they posted their responses on to this database and could even access it from home to work on it. Ms. Brock called it a community of online learners because they all felt very connected to each other while learning about Medieval Times and Ancient Civilizations in this interesting way. Before they began, Ms. Brock introduced them to ‘netiquette’ — norms of online behaviour on the Internet. These norms were posted on the wall for them to refer to.

The use of chalk is very limited in Ms. Brock’s grade 3 classroom of this year. Neither does she photocopy too many materials. Instead, the document camera and LCD projector in her classroom are usually always on. Every day, the students get visual doses of information for their subject matter. Ms. Brock is often showing them books, work samples and other activities right under the document camera. The students’ eyes are often glued onto the big screen. Sometimes, they are watching videos to learn more about an important subject area, while sometimes Ms. Brock will put up Smart Ideas on the screen to help the students understand a key concept in a mind-mapping format. When introducing an assignment, Ms. Brock will often include students in the co-construction of assessment criteria through the use of her LCD projector. Students go up to the computer and type in their ideas. Later, their teacher will print the sheet off and post it up for them for ready reference. Ms. Brock’s classroom does not have many store-bought posters; instead the walls have work created by students, or anchor charts co-constructed on the computer.

Just the other day, while showing them examples of city landscapes for an art assignment, Ms. Brock put in names of different cities and countries in the search engine as students were calling them out. They were learning not only how to search for information, but also about the world while using the computer to get ideas for their assignment. Later, during snack-time, Ms. Brock put on a song on YouTube indicating that the end of the song meant the end of their eating time. Students gave input on what song to put and what video she could use the next time, which Ms. Brock thought was fantastic as it helped her bring students’ real life into their classroom.

Often, Ms. Brock will sign-out the computer lab so the students can extend their learning — they type letters to authors, post book recommendations on their class wiki, create presentations and do research. Her mind is always overflowing with ideas that she can integrate in the computer lab.

4.5.5 ICT in the classroom — what's all the fuss: The question of ‘Why use technology’ is a no-brainer for Rosanne. The fact that technology completely engages children, helps them learn new things and builds them up for future success is enough to keep her going and experimenting with new technology. Students use computers all the time, she thinks. They are texting, chatting and surfing the net at home. When doing online learning projects with her students, she realizes how important it is to give them a variety of ways to utilize their computer skills and interests. Getting them to do a math problem through a computer game or an opportunity to communicate and discuss their opinions about plastic bags, for example, on an online forum — this is how learning becomes meaningful. She believes that
technology can be integrated to make and support global connections in the classroom too. In her mind, the possibilities are endless. “Something like that would take time, but it’s worth it. For these students, it’s worth it.”

In her own classroom, when Rosanne uses the LCD projector and the document camera, she feels as if it is like another world to the students — it is in colour and it is engaging. Part of her role being an ESL teacher, Rosanne goes to other classrooms to support students while the homeroom teacher is teaching. She sometimes finds herself thinking that the projector and the document camera could have livened up a lesson for the students or made it easier for them to understand. She believes in the power of modeling and engaging the students’ attention and feels that the document camera does both these things effectively. She recalls going to an in-service Math workshop presented by a brilliant mathematician who was using the old-fashioned overhead projector and was thus failing to engage his audience the way he could have done with a document camera. Having a paper copy of the presentation and hands-on manipulatives in front of her did not do much to get Rosanne’s attention. She feels that if an adult learner like her needs visual stimulation, her eight-year old students definitely need it too.

Rosanne thinks that she will not always be lucky to have a computer teacher around her, so it is in her best interest as a classroom teacher to start learning how to integrate technology effectively. “This is the century of technology,” she says, “whatever the students’ profession is going to be, it is going to involve technology.” In her opinion, therefore, teachers have to see the value in technology, not for themselves, but for their students. “Computers are a tool that they are going to need forever,” she feels. It is a disservice to children, she thinks, if they are not given opportunities to use technology. Having done a blended learning project in her classroom, she clearly saw how it helped some students come out of their shells and communicate online. Communicating effectively in writing is an important skill that students need to be taught and Rosanne thinks technology should be harnessed for it. In addition, she believes that using the Internet to showcase students’ work would be very powerful, as it would be a very big boost for the students to see their work presented.

Sometimes Rosanne feels like she is going to witness the elimination of paper and pencil. With the ‘touch-technology’ of tablets, “you are not even focused on the keyboard anymore”. Through some relatives in educational administration, Rosanne has heard that innovative technology like the iPads works really well for students with special needs, for instance, oral language issues or concentration problems. She believes that technology is seeping more and more into several occupations as well. “Students need to learn those skills in order to be successful in life”, says Rosanne.

4.5.6 Learning as a teacher: Most of Rosanne’s technology learning comes from taking the initiative to try to use different programs and technologies that she needs for her classroom. She sees the computer teacher in her school as a major resource for a lot of her own learning. Rosanne often arranges brief one-on-one learning sessions with her to get hands-on training. After that, she experiments with the
program herself. She also keeps track of what the students are learning in the computer lab and learns through that.

She attended a board-organized technology symposium a few years back where she learned how to use a document camera. The learning did not stay in her head or in a folder on a shelf. Instead, it came out into her classroom soon after, to the point that the document-camera has now become an indispensable part of her classroom. She admits that sometimes the new learning makes her feel overwhelmed, but most of the times it feels great and excites her.

Looking at other teachers’ use of technology invigorates Rosanne to learn more. She remembers being “mesmerized” last year when she saw a grade 5 teacher show students how to make three-dimensional animations of the human body. She thinks that watching your colleagues actually do it, not just talk about it, helps you feel less intimidated about technology.

Rosanne believes that workshops and conferences can give you ideas but the real learning happens by getting right into it, which is what teachers expect of and model for their students as well. This is how she learned how to use an adaptive learning program which her Special Education Resource Teacher once showed her. Rosanne played around with it herself and then took a student and the parent into the computer lab to show them how to use it. Similarly, when she hosts information sessions on grade 3 provincial testing, she organizes them in the computer lab so parents can log in and try out the resources she is sharing, right then in front of her so they feel comfortable about the learning. Learning by doing is big for Rosanne, whether it is for herself or for others.

Admitting to being a shy person, she finds that online learning suits some personality types much better as opposed to face-to-face learning. In taking some teacher courses in an online format, Rosanne has found that “when we express ourselves online, we are not afraid to take risks in what we say.”

The motivation behind her willingness to learn about integrating technology comes from her desire to support students in making meaningful connections to the world that they live in. “The world is changing and I want to learn with the world,” says Rosanne, not wanting to be left behind. At the same time, she wants to be a model and support for other teachers and make them feel that they do not have to be afraid to learn.

Not complacent about her learning about technology-infusion, Rosanne says, “I have only touched the surface”. Technology was a front-runner in Rosanne’s ‘annual learning plan’. She thinks that there is much more learning she needs to do, but is confident about the direction she is taking and the changes she is making in her teaching.

4.5.7 Love it: “When you go online, you see how much technology is integrated into all different aspects”, says Rosanne. “I am fascinated by what I can find now.” It is thrilling to get any television episode or any movie by simply typing in few words. Her jaw drops when she sees how much is available to her through the Internet.
In school, just by clicking a cliplet, Rosanne is able to put up a visual, coloured timer on the big screen for her class. She gets to rest her voice and does not have to give repeated reminders to her students. They see it big and clear in front of their eyes.

4.5.8 Love it not: Rosanne’s biggest grudge with technology is when she cannot make it work — for instance, when the connection is lost or if there is a problem with her speakers. She cannot quite remember how and when she started relying on it so much that it almost became a necessity.

4.5.9 Perceptions about her own expertise: Rosanne came into the teaching profession, never having created even a slideshow. Totally new to technological modes of teaching, she learned fast. She realized she had to change very quickly, given the promising hardware and applications that were being offered at her school.

Rosanne expresses high confidence at using computers — especially the Internet, for educational and personal purposes. At the same time, she does not feel too confident about her overall expertise, especially hardware-related issues. As much as she admits that she loves technology, Rosanne knows that in terms of knowing the software available for students’ use and their applications within the curriculum, she cannot do it all alone. She understands that if you are not familiar with something and did not grow up with it, it is not easy to become an expert at it. You have to be willing to experiment, which she does all the time. From time to time, she also likes coming out of her teaching zone to share with her colleagues what she knows about technology, at staff meetings or one-on-one.

4.5.10 Perceptions about her workplace: At Rosanne’s school board, there seems to be an encouraging stance towards technology. As a trickle-down effect, her superintendent is nudging principals to use more technology in the schools. Rosanne’s school, though small, has a lab which she thinks is great, as the students are building on whatever they are doing in class.

Something that frustrates Rosanne is that her board does not support all operating systems. The operating system on Rosanne’s personal computer is not compatible with her board’s report card system. The board refuses to support her. She believes that if the world is becoming so permeated with different forms of technology, then the board should make an effort to support all of its teachers. The same goes for the students, she believes. Referring to a device that her school purchased last year — the Mobi (a tablet-sized mobile interactive board), she feels that purchasing needs to be directed towards things that students are going to be using in real life, like iPads for instance, which her school is now starting to do.

Some of Rosanne’s friends work in another board and talk about having much more advanced technology, like the IWBs (Interactive White Boards). She knows of some schools within her board that make extensive use of iPads, especially for students with special needs. Even on the news, she hears of schools that are ‘above and beyond’ when it comes to technology. Rosanne herself has supply-taught at a private Intermediate school where students used computers for everything, instead of using pen and
paper. Other schools have laptops that students can sign out and even take home. Even though her school does not have any of these technology provisions, Rosanne does not have any complaints. She thinks that disparity will always exist between different schools and although in an ideal world, all graduating students in a certain board should have had equal exposure to technology, it is really not realistic. As long as students are getting exposure to some forms of technology, it is fine.

Regardless, her school is not far below either. She sees her principal as pro-technology. In the few years that he has been at the school, he has encouraged the use of technology in various ways — for instance, technology clubs to create electronic morning announcements and a digital display monitor for the front foyer to replace bulletin board and paper-based information. He also bought ten iPads for the school, with the support of his superintendent. The computer teacher at the school is also building capacity for technology in the school, she thinks, by attending workshops, learning about what's new, sharing with all interested staff and then supporting them with implementing it.

In terms of her colleagues' technology usage, Rosanne believes that teachers’ backgrounds and their personal interaction with technology are all factors that decide whether or not they prefer to use technology in their lessons. Their motivation levels are quite different, she notices. Rosanne admits that for some of them it is hard to find the time to learn new things. She notes that they often resort to requesting the computer teacher to take care of the technical things, for example, organizing a presentation, filming and showcasing student videos and so on. They do not appear keen to jump into using technology. Rosanne uses the analogy of riding a bicycle to explain that teachers have to try it for themselves once in order to know how to do it. On the positive side, she does think that a few of her colleagues are really a ‘ten out of ten’ with technology and find creative ways of integrating it into their classroom program. Some are influenced by Rosanne and other teachers to use technology in ways in which they see it being used.

4.5.11 Perceptions about students' technology usage: Technochildren! That is what Rosanne calls the children of today’s age. She thinks that teachers tend to underestimate students’ abilities. Within a matter of minutes, students are able to navigate through programs and even troubleshoot technical issues in Rosanne’s classroom. They notice things and their expertise comes from their constant proximity to technology. Children as old as eight are able to text each other and independently do social networking. They even use this whole ‘computer language’ these days. When it comes to curriculum learning, students readily accept and even prefer the use of technology for learning and expressing their learning. “They are so into it.”

Rosanne does worry a bit about the disastrous impacts technology could have on children, if not used in a somewhat controlled environment. “Something important related to computers and the Internet is — being safe,” says Rosanne. She believes there is a reason why some things are age-inappropriate and students are realizing more and more that using the Internet, they can access anything at any age.
Sometimes, it scars them for life. Online safety is sometimes compromised to serve the innovation offered by technology. Parent awareness about technology is a big issue in Rosanne’s mind.

**4.5.12 What she would like:** “If we were to have a computer for every child, it would change everything,” says Rosanne. It would make it much easier for Rosanne to implement her lessons in a student-friendly way. Her students would be researching on their own computers in the classroom and using all the great programs that they have been exposed to in the computer lab. Without the students having their own computers, Rosanne feels that she is the one using the technology in the classroom more than the students. As a second resort to having a computer per child, she feels that having access to the lab for at least a period a day, above and beyond the assigned periods with the computer teacher, would be fantastic for her students, and would change the entire way that she conducts her classroom, for instance, journaling through blogs.

She thinks Interactive White Boards (popularly known as Smartboards) would be a great addition to the technology resources at the school. She is aware that her board does not support them, but the interactive features of this ICT excite her for possible uses in the classroom.

She would like her LCD projector to be ceiling-mounted. Even though she is cognizant of the high costs involved, she sees her projector setup as a safety issue with cables running under the table and hanging out. It also blocks off an area of physical space in the classroom. Some of the students’ views are obstructed because of the way the projector has to be set up. In addition, the setup has to be dismantled and reset after every holiday break. The ceiling mount would take care of that.

**4.5.13 Obstacles to technology integration:** There is no money in the school boards, says Rosanne. Several things that would be ideal are not realistic because of financial constraints. Other than that, not having wireless Internet in the school is an obstacle to bringing mobile technology in the classroom.

Not having all the school applications on her home computer is another limiting factor for Rosanne. Staying at school to learn those applications is not always an option for her, or in her opinion, for other teachers either, so it becomes challenging.

**4.5.14 Where are we headed:** “Paperless”. That’s the word that describes Rosanne’s vision. Ten years down the road, Rosanne envisions an ideal school where every child would have his or her own computer and/or a mobile device. Learning by writing on paper is not going to be important any more and Rosanne anticipates its effect in the classroom.
Part 3: Autobiographical Perspective

4.6 Nita Shori

LET’S SET SAIL

4.6.1 Beginnings: In a private elementary school in India, I was introduced to a real computer in grade 5 when we were all taken to a nearby ‘computer centre’ to see a computer and type our names. For two years after that, I was taught computers out of a long yellow book containing photocopied material about the parts and functions of computers. Then I switched schools and went to publicly funded schools until grade twelve. There was no sign of computers in those environments. It was only in University that I saw computers actually being used by students. The library housed a small computer room with about ten computers used on a sign-out system with a minimal charge. I still did not know how to use computers, nor felt the need for them at that time. However, I felt excited to try them out whenever I passed by the computer area. I would linger around for a couple of moments to see students peering intently into their screens. It felt as if I was missing out on something ‘quite cool’.

Then one day, recalling the advice of a cousin who encouraged me to try new things that were out of my comfort zone, I booked a computer for half an hour. With some help, I created an email account. Soon after, I became a regular user of the computer area. I was mostly emailing, looking up information about other universities and researching about my coursework. Since we all studied out of textbooks, what I was doing was quite unique. I was fascinated by the possibilities of the Internet. Very soon, I started participating in paper-writing contests and essay submissions related to Biophysics—my field of study at the time. Some of my friends started using the computer too and very soon we were exchanging emails and forwarding jokes and chain emails to each other.

Seeing how I was making progress with the help of computers, my parents decided to buy me one, albeit no Internet. Regardless, my brother who was eight years younger than me, was obviously the most excited one in the house. Both of us would sit together and explore some new features and get excited. Whether or not we were doing anything productive, we just enjoyed sitting in front of it and figuring something or the other out.

Being fond of writing and academics, I started using the computer to write scientific papers and for some university-related projects. One of my papers got selected for presentation at a national level competition, for which I then explored PowerPoint as a presentation tool. I was using floppy disks at that time. From time to time, I would also go to one of the computer centres for professional help with graphics or printing.

I was still using the Internet at the university lab and at cyber cafes. My mother started worrying about what we were using the Internet for and decided to get an Internet connection, so we would not use it unsupervised. My main Internet activities were checking emails and researching. Then I started getting
a hang of chatting and began using it, but only with a few select friends, and those too mostly pre-scheduled.

4.6.2 Personal Interaction with ICT: I am addicted to the computer to the point that I deliberately have to build in 'screen-off' time into my routine a couple of times a week. The general things I tend to do on the computer are emails—professional and personal, and word-processing—lists, letters, documents. I also love using video and audio tools—either for work-related or for home-use purposes. I have blogs about different topics—spirituality, professional support, personal thoughts and inspirational issues—and I try to maintain them.

Internet browsing, just for the sake of it, used to be quite huge for me, but not anymore. Now, when I am on the Internet, I usually need a purpose. I have to admit that it comes in very handy. Sometimes, I go on the online dictionary to find out the correct pronunciation of a fancy word and at other times, I will research a popular artist or celebrity to become more aware about pop-culture. I am not in the habit of watching too much television or listening to the radio too often, and as such I was missing out on current affairs. So, I set my computer home-screens to news websites so that the latest news would be right there in front of me.

I have successfully refrained from using Facebook so far—not because I don't think it is valuable, but because I fear that in my case, it might take more than it will give. I am not a very outwardly social person and Facebook would put me out there and I would have to interact with people I do not necessarily feel close to. I do use Twitter though, mainly for professional purposes. Its use comes and goes in waves though.

Studies are another thing that I use technology for. Graduate research is indeed making me a more proficient user of academic databases, scholarly journals, collaborative tools like Google Docs, university-based databases and online learning environments and organizational software.

4.6.3 As a teacher: My first year of teaching was in a grade 4 class. I was located in a portable and the only technology in the room was an old computer and an overhead projector. Towards the end of the year, I did some negotiations with the computer teacher of the school and she let me drag in an LCD projector cart in there from time to time, which was very cumbersome anyway. However, I did introduce my students to the concept of blogging, and used PowerPoint presentations from time to time.

The very next year, I took on the assignment of teaching computers as a planning-time subject. Continuing in this position to the present day, I teach all the classes from kindergarten up to grade five. Whereas I focus more on hand-eye coordination activities for the tiny tots, I try to use technology very creatively for the junior classes. The key for me is to try and keep it meaningful for the students. Technology, just for the sake of it, is not an appealing idea in my mind. The technological experience should either enhance their learning at their grade level or make them better computer users. When teaching the use of search engines, for instance, I show students how to apply filters to narrow down to
the information or images that are copyright-free. It gets us into meaningful discussions and helps students learn skills that they will need to use more and more in their life outside the classroom.

I value collaboration with other teachers in order to give students an enriched experience with technology—whether it is collaborating with the homeroom teachers or with teachers at other schools who are using technology creatively and purposefully. Whenever I come across a resource that I feel others might benefit from, I usually email it to the school staff.

4.6.4 A peek into my classroom: Classes rotate through Ms. Shori’s class throughout the day. Whether it is a grade five class or a kindergarten class, they are always excited to go into the computer lab. Sometimes the students bring in their own work that their classroom teacher has assigned them to continue in the computer lab. For instance, Ms. Brock’s grade three class sometimes comes in to research Early Settlers’ food so that they can design a ‘Pioneers’ menu’ for their assignment.

Ms. Shori is not in favour of ‘free-time’ on the computer. So, the students are always doing something creative or educational. However, they are always engaged. Students love using drawing programs to either create posters, specific scenes or even digital stories. Students love it when they get to record their own voices too. The junior students get to use online programs to make their work innovative as well, for example, creating magazine covers, word clouds, comics etcetera. They also use board-provided software for creating multimedia like brochures, flyers etcetera. As they learn the basics of word processing, they are also sent on Typing games from time to time. Ms. Shori encourages them to practice typing at home as well.

Students get to explore different programs for creating presentations about topics being learned in class—for example, how the government works, a particular biome, a novel study summary etcetera. To give a few examples, the grade 5 classes participate in live online ‘twitter-like’ feeds about the digestive system or human rights. The grade 4 classes research information and create project reports while the grade 3 students contribute book recommendations on their wiki. The grade two students create mindmaps about media and celebrations around the world. The grade one students create Halloween stories using pictures and background music while the kindergarten students are mesmerized, looking at videos of their favourite animals and listening to the sounds they make. From time to time, all the primary and junior classes engage in audio-recordings to share perspectives about themselves, to create specific parts of a story for assembly presentations and even just for fun. The students’ joys know no bounds when they get to bring home a CD with their work on it or are given a link on which they watch their creations at home with their families.

When students are having difficulty reading the hard words on a website they are using for research, they use one of the assistive software tools, present right on the toolbar, to read the text back to them.
The bulletin board displays in Ms. Shori’s room reflect the innovation that students can make possible with technology— word clouds, live discussion feed transcripts, magazine covers, motivational posters etcetera, all leave the students proud and the viewers impressed.

4.6.5 ICT in the classroom — what’s all the fuss: Technology creates empowerment for the students. A few years ago, I created a school blog and posted the weekly lunch-hour computer club’s very first podcast. It was exciting not only for them but for me as well. One of my grade 2 classes was able to utilize the power of the Internet to connect with an author whose book they had used to create and showcase an audio play. The author had found us, and not the other way around! Students’ creations posted on the web continue to be visited by people all over the world. Their excitement and enthusiasm makes me want to keep doing this.

What students can do on the computer instantly and in correlation to classroom teaching is very valuable. When students are about to learn about the human body, for instance, I let them find resources on the Internet and post their thoughts, questions and learning in a synchronous environment, where they learn from each other and are accountable for their own learning.

Students are already using technology to play games and the purpose of using it in the classroom is to show them how it is a tool that they can command and use for their creative and innovative explorations. A bunch of students huddling around a computer to play a racing game when it is raining outside, is the worst possible use of technology to me. I value the presence of computers and the methods in which they are integrated, and want students to do the same.

With the Internet making everything accessible so easily, I think we owe it to the students to teach them the skills that will help them utilize ICT effectively, evaluate it and make their own contribution to the online world.

4.6.6 Learning as a teacher: I have no official training in computers. I did an Additional Qualification course titled ‘Computers in the classroom - Part 1’ before I began my current role. It gave me a sense of friendliness with technology. I took the course online and realized that the format suited my learning style very much. I was also able to get creative with my assignments and enjoyed the experience. It was the first time that I was exposed to any literature and theory on technology integration in the classroom.

I had two mentor teachers in my first year of teaching— one of them was my grade level partner who was quite into technology and when she left on maternity leave, the computer teacher of the school was made my new mentor. The latter mentor-mentee partnership unfolded into a great collaboration that made the context of technology relevant for me. We both went together to a conference on educational technology. It significantly widened my perspective on using technology in the classroom. By the end of the year, my learning around technology comprised of a mix of technological and pedagogical principles and both came in handy in my new role as a technology teacher, as my mentor retired.
During the first couple of years as a computer teacher, I enrolled in several evening and summer workshops and applied the learning enthusiastically in my classroom. I also made contact with the resource teachers at my board who supported me in the best possible ways. I registered for webinars that were becoming popular as a new format for adult learning, and participated in a few online professional learning communities of educators with common goals as mine. While most learning left me very excited and eager to implement technology in the classroom, sometimes it also left me overwhelmed, disappointed and frustrated. Regardless, it always helped me put technology into perspective in the classroom.

At present, I usually try to attend at least one educational technology conference a year to stay abreast with the latest in the field. I also seek out a lot of one-on-one and school-based support of the instructional technology resource teachers. Before implementing new programs, I often use the help of online resources like video tutorials and functional examples. Often this is time consuming and sometimes baffling, but I always learn a lot in the process.

4.6.7 Love it: Nearly unlimited access to resources would have to be my biggest ‘aha’ with technology. Whether it is finding and connecting with people or accessing information and knowledge, it is all available all the time. As far as education goes, the Internet opens up the world for students and brings it right in front of them to see.

I find the creativity aspect of technology very captivating. I have to stop myself from jumping up and down with excitement when I see something interesting that I feel that students will enjoy too.

4.6.8 Love it not: Network issues are the biggest bug for me, especially since most of my teaching depends directly on the students using school computers which access all information and software from the board’s network. Hunting for good hardware to support my program is also a hassle, for instance, headphones and microphones that will last long and will work for all programs.

It frustrates me to have discovered a great program and then not be able to use it. The usual reason for this is the fact that our school server is frozen and only the board-provided image is allowed on it. Sometimes, this wise approach acts against itself in the practical context.

4.6.9 Perceptions about my own expertise: When I first started to seriously consider technology to augment and redefine students’ learning experiences, I would sometimes spend hours figuring out how to work things out. For instance, when I wanted a group of ESL students to create their first digital story, I had to determine which of the two programs that I knew would be better. In addition, how would I get students to create something as an image to import into the program. But once I spent all that time in gaining better understanding, the new learning became part of my repertoire and acted as a scaffold for acquiring more expertise.
I now consider myself ‘moderate to high’ as a technology user. Although I am usually always on the front-line with respect to technology integration in education at my workplace, yet there also are times when I feel limited in my ‘technical’ abilities. I frequently have to troubleshoot issues in the computer lab where I teach and sometimes in other teachers’ classrooms as well. With time, I have got very good at it, but there still are times when I cannot grasp the technical issue.

I usually like to check out a new technology in advance and ‘play around’ with it so that I am comfortable with it and know the extent and limitations of it. I am often able to independently locate the support that I need in using a particular technology and sometimes try to use a combination of different programs in a particular lesson or unit.

Slowly, but surely, I have learned to be calm about technical glitches. They don’t affect me as much as they used to initially. I have come to realize that nothing is hassle-free and try to use the most promising alternative.

4.6.10 Perceptions about my workplace: In the six years that I have been at this school, I have noticed a shift in the technology culture. Whereas at that time, we only had two LCD projector carts in the entire school to be signed out by teachers, now every classroom has its own LCD projector and some of them also have a document camera. I also notice a big shift in the usage of the computer lab. A few of the teachers are now keen on taking their classes into the computer lab themselves during available times, as opposed to leaving ‘computer education’ solely in the hands of the ‘computer teacher’. Our board also seems to be investing more money in making ICT more ubiquitous across schools.

The board’s policy until recently, called the ‘Sustainability Plan’, supports one teacher computer in every classroom, along with one LCD projector. Our school is on this plan but also tries to go above and beyond it, by placing extra computers in classrooms or giving exclusive access to document cameras.

We receive the support of instructional technology resource teachers periodically. Our board only has four of these resource teachers to cater to all of their elementary schools. As such, it is hard to arrange for the support of these teachers. I try to be proactive in maximizing the usage of their support for our school’s technological practices. A hardware technician makes regular visits to our school as well. I am usually the school contact to connect with these personnel, but with time, I have empowered teachers to get active in the process as well. Some have taken control while others still do not see their role in the process.

 Whereas I definitely do know of schools that are functioning at a much more advanced level than us, I think we are in an excellent place as far as ideas and the vision goes. The administration is very receptive to new ideas and technologies, encourages staff to see the value of technology in education and in the world, supports capacity building to bring everyone on board with technology and also acknowledges the different levels at which people are working. The principal wants to push ahead with technology and raise the standards for our school and therefore any initiatives that involve the use of technology are encouraged and supported as feasible.
As the technology lead teacher at my school, I also take a lot of initiative in bringing new directions to everyone’s attention and offering my support. I consult with the principal and the board personnel to ensure that we have the best that we can afford as a school and that we receive help as required. With the support of my principal and a direction that our superintendent would like to take, our school has got ten iPads and is thinking of adding ten more to create a class set. We do not have wireless Internet though and I had to advocate for getting partial wireless access to at least make those iPads functional. I was supported and the devices are now being used enthusiastically by some teachers.

4.6.11 Perceptions about students’ technology usage: I have seen students who blog when they are five years old, who Skype when they are six and who talk about Twitter in grade two. In my own teaching, I learn new things from students all the time about technology usage. Their comfort levels have grown rapidly and the kindergarten students of today, I find, are capable of absorbing much more than the kindergarten students of six years ago, who were already racing ahead with technology anyway.

Sometimes students ask me what program they could use to create a certain presentation and then go home and try it out. Occasionally they bring in graphic productions on a USB stick just to show me or to ask for suggestions.

At school, I believe that students need to be taught how to use technology appropriately and effectively, especially with the burgeoning information now readily accessible. From helping them question the content of their video games to developing critical thinking skills, students’ effective technology usage depends on adults around them.

In a project I did last year with a colleague, students created 3-D models, animations, screencasts and then collaborated online to share their learning and ideas. One of the parents informed us that their child had never been so engaged in science as he was for this project. Students’ peer chats showed how positive they felt about using technology for learning.

I see the Internet seeping into the kids’ daily lives. They are talking about messaging, chatting and Facebook regularly and casually. When I show them a new website in class, I find that some students have already checked it out at home earlier. For cultural events at school, students are familiar with looking up songs and videos from YouTube and similar sites and burning them onto their USB sticks or CD drives. Some of them watch movies online and are aware of all the great things that the Internet can do.

4.6.12 What I would like: Although my position is exclusively computer teaching, I would still advocate for more computers in every classroom. Technology in the school should be up to date and compatible with what the users tend to have at home. I sometimes plan a whole lesson incorporating several innovative and engaging technologies, but the next day, they do not work at school. Out flies my lesson! I understand that the board needs to put certain filters, but their testing should be regular and in keeping with the shifting educational culture towards more collaborative learning environments.
I would like to be provided sturdy, reliable hardware that I know will not fail. Although I do not mind troubleshooting to some extent, it takes away from the actual learning time.

4.6.13 Obstacles to technology integration: Slow, old computers are the biggest demotivator for students and teachers alike, I think. For some teachers, me included, having ancient, non-upgraded technology is the same as having no technology at all.

In addition, there are certain software that have come to be regarded as ‘basic’ for most computers. The board seems to be going in the direction of ‘open-source’ which I highly appreciate, but sometimes I feel that they are compromising quality and functionality. For instance, students have not been given any good alternatives to creating brochures, in the absence of Microsoft Publisher. Knowing this, I either have to decide to not do brochures, or to not use technology!

Effective technology integration is not possible without effective collaboration. Busy schedules, last-minute agendas on teachers’ plates and no built-in time for co-planning comes in the way of this collaboration. To carry out a technology-infused lesson incorporating all the pedagogical principles purposefully requires immense planning and skill. In my case specifically, where I see the students for only forty minutes at a time, it becomes very tricky and sometimes futile to use a certain technology. For instance, when students are given an opportunity to do voice recording in the computer lab time, managing twenty five animated and excited voices all together in the same room becomes difficult.

4.6.14 Where are we headed: I think we need to pick up pace with regards to the utilization of the Internet. I can see that inter-class collaborations using video conferencing will start to become more common. The four walls of the classroom can be brought down with students learning with their peers in a different part of the world. I believe that students will get to see a whole new side of the world and get the kind of global education that they deserve.

The growth of the so-called ‘Internet Age’ has been so rapid that it has been hard to catch up. If it continues at the same pace, then it is hard to say what the future will hold. At the elementary school level, I think the Internet will become a ‘given’ in the students’ lives. I understand that it is about affordability, but that will somehow have to be arranged as part of the educational system. Mobile devices with Internet will likely become very popular. Wi-Fi will be standard.

I remember when I started out as a computer teacher about five years ago, I went to a workshop where the presenter had put up a cartoon as a refreshing start to the session. It had a picture of a small boy returning home and complaining to his parents, “How do you think my first day of Kindergarten went? They did not even have Wi-Fi.” At that time, everyone was very amused. But now, I find that I am nodding in agreement with the little kid.
Chapter 5

Results and Discussion

In composing and analyzing these narratives of experience, I developed somewhat of a ‘beyond the surface’ understanding about the situation of our school, with respect to technological practices. As I dwelt upon each of the participating teachers’ individual journeys, I came to see what Connelly and Clandinin (1988) say about situations being directional. With increasing access to ICT and with some teachers becoming more familiar with the potential of educational technology, certain shifts seem to have happened over time. Some things might not have changed the way the stakeholders would have liked them to, simply because teachers’ own viewpoints and experiences stood firm. On the other hand, some teachers looked beyond the ‘explicit’ dimensions and perceived the ‘digital era’ in a whole new light. Connelly and Clandinin (1988) remind us that “a situation does not merely move into the future simply because time passes but is pulled into the future by the ends we all hold out before us”. The different ends held out by different teachers gave rise to variable results at our school, suggesting that even within the same context and being exposed to the exact same policy and guidelines, teachers’ practice with regard to the adoption of educational technology emerged quite differently from each other, as evidenced by all the different sections of their narratives.

“The world isn’t just the way it is. It is how we understand it, no? And in understanding something, we bring something to it, no?”

— Yann Martel, Life of Pi
In writing the narratives, I tried to highlight the identities of those individuals— who they were as people and how and why they did certain things. I summarize my findings below, categorizing the participants’ perspectives as pedagogical, ontological and epistemological:

5.1 Pedagogical perspectives

Teachers’ approaches to teaching and learning are informed by their experiences that lead to the respective beliefs and attitudes they have about what works in the classroom. Thick descriptions, such as narratives created out of participants’ experiences as done in this study, help to trace some of these connections. With relation to the utilization of instructional technology, some of the relevant pedagogical considerations that the participants displayed in very different manners were the following:

5.1.1 Critical and Radical pedagogy: In analyzing research around some technology-rich teaching environments, Travers and Decker (1999) find that “the preponderance of references to student-centered learning, a democratic learning environment, the shared construction of knowledge and the changing of teaching practices in… the positive presence of technology on campus persuades us that technology and critical pedagogy have a promising relationship.” The types of learning tasks and the way in which those are created by teachers shows what they believe to be true of setting up learning environments. Teachers like Rosanne and I believe in the creation of collaborative environments in our classrooms and are in favour of putting technology in the hands of the students as much as possible, leading to exploratory, student-centred type of environments where they are able to use technology in ways meaningful to them. We do not undermine the opportunities to learn from students. Bertha seems not far behind in embedding technology into her teaching but usually likes to keep more control over what students will be doing with that technology, giving them tasks that are structured, and encouraging students to
use programs with which she herself is familiar. In her classroom, the students would likely be “dependent on the teacher to authorize their understanding in relation to the knowledge domain” (Rasmussen et al., 2003). Hemraj’s learning tasks are typically not intended to be constructivist or technologically empowered. According to Dede (1996), 'technologically empowered' pedagogies are characterized as being analogical, case-based, learning-by-doing ... giving learners constructivist experiences, facilitating comprehension and ability to generalize ... structuring group dialogue and decision making, facilitating collective activities (p. 13). While this seems to be generally lacking in Hemraj’s classroom, there does seem to be a seed of technology-enabled constructivism, waiting to sprout somewhere within his professional ‘milieu’ — a term used by Connelly and Clandinin (1988)— as might be inferred from his perceptions about students’ technology usage. Hazel’s classroom is still quite ‘traditional’ in the sense that she believes her students are too young to be able to work with technology. As Garrison, Cleveland-Innes and Fung (2004) point out, collaborative online educational experiences inevitably call for role adjustment where “students are required to learn new protocols and expectations” (p. 62). Teaching in the K-5 panel for over forty years now, Hazel does not appear prepared for this role adjustment that requires a significant change, redirection of teaching-learning focuses and the ability to accept some uncertainness in the classroom.

5.1.2 Designing for technology: In a study evaluating student responses to student-centred learning approaches, interestingly, Jones and Jones (1996) found that learners seemed to have a strong preference for the retention of conventional presentation forms, such as lectures. This indicates that the design of the learning environment is an artful task that requires critical evaluation and careful implementation of design principles, if it were to be effective in promoting constructivism in the classroom. Rosanne and Bertha have both tried to create a
community of online learners through blended learning and blogging respectively. However, Rosanne’s implementation seems to have been more carefully planned through collaborations with colleagues and teachers in different capacities (for instance, teacher-librarian, computer teacher). She affirms the time-consuming nature of this sort of planning but considers it significant in the contemporary educational scenario. Bertha on the other hand, does not see technology-infusion into her lessons as requiring time and planning. In some cases this could be a result of strong familiarity with and constant use of ‘technology empowered’ learning experiences in the classroom. However, in Bertha’s case, it appears that this ‘spontaneity’ in the application of ICT comes from simplified and substitutive uses, as opposed to using technology for redefinition of students’ learning experiences, as pointed out by Puentedura (2013) through the SAMR (Substitution-Augmentation-Modification-Redefinition) model.

Hemraj’s technology application in his classroom cannot typically be seen as constructive or student-centred. Correspondingly, his use of technology in the classroom is also not for the designing of collaborative, analogical environments constructed to promote students’ critical thinking, but for occasionally attempting to make student experiences somewhat relevant and fun through the use of technology in a teacher-directed manner. Oliver (2000) reminds us that while there exist explicit established guidelines for conventional instructional systems design, the nature of the guidelines surrounding the creation of technology-rich classrooms is quite nebulous, which likely accounts for Hemraj’s uncertainty about how to utilize technology effectively in the classroom, despite the awareness that his students’ personal lives are quite rich with technology.

Hazel’s understanding of using technology in the classroom over the decades of teaching experience she has accumulated seems to have stemmed from “workshops that focus on the
development of software and hardware skills [and that] do not help teachers understand how technologies interact with particular pedagogies or specific subject matters” (Koehler & Mishra, 2005). She consequently does not bring ICT into the mix of her classroom design at all, relying on the computer teacher to ‘teach’ her students technological skills.

While these participants are homeroom teachers, I am a rotary teacher with a space of my own in which to teach, that is, the computer lab. The setting calls for ‘quick teaching’ of technological skills as opposed to taking the time to establish a learning environment full of opportunities for students to actively construct knowledge and to explore authentic connections to the curriculum in collaborative, inquiry-based methods. According to Jonassen, Davidson, Collins, Campbell & Haag (1995), the four constructivist attributes for building learning systems are “context, construction, collaboration, and conversation.” These attributes can be best met in situations of which learners are a natural part, constantly negotiating roles and interacting with the context and the content— namely, their regular classroom. In some unfortunate cases, my teaching setting— the computer lab, also amounts to merely keeping the students busy while their homeroom teachers do their lesson planning. Despite this design in which technology is isolated from students’ usual learning setting, in my practice I try to minimize the one-time introduction to specific programs that show students how using technology is ‘fun’. Lashing out against this notion that technology makes learning fun— which could be argued— Stoll (1999) asserts that learning takes work, discipline, commitment and responsibility from both the teacher and student, and “the payoff isn’t an adrenaline rush” (p. 12). With all of these aspects not being meaningfully feasible in two forty-minute periods (thirty in reality, including transition and settling time) in a week, often accompanied by a lack of direction and attempt at collaboration by the homeroom teacher, I try to model innovative uses of everyday technology, showing the
students how to make sense of the relevant technological avenues they are surrounded with. In so doing, I assume the role of a “facilitator and problem solving expert rather than an expert in the content” in the classroom (Koehler & Mishra, 2005). In addition, standing up for ICT-embeddedness within homerooms, I demonstrate strategies and facilitate pedagogical approaches for teachers, to utilize different forms of technology to enrich the curriculum and make it relevant for students. This includes setting up and moderating online learning environments for teachers and students to use, creating blended learning units and searching for and sharing technology-based resources that can be used in student-directed ways in the classroom.

With reference to the TPACK model described in Chapter 2, some of the teachers’ pedagogical and content knowledge (PACK) seems to be completely disconnected with their technological (T) knowledge. For instance, while Hemraj understands the need to provide for newly-arrived, English Language Learners, indicating that sophisticated technology is a need for such a population, he does not refer to the masses of research and resources available through the use of computers to cater to ELLs. Nor does it not seem to occur to him to take the time to collaborate with someone like Rosanne, whose role it is to provide support to ELLs and who is keen on using ICT. While some teachers might try to implement what they know about information and communication technologies into their classroom teaching, they seem to do so in an isolated manner. The conversation and the shift in the design of learning environments facilitated with ICT has not yet become common discourse in this school’s setting. The role of stakeholders like the ministry and the board in the existence of the present situation is discussed later in this chapter.

5.1.3 Learning and Technology—perceived relationships: Having sought and been consistently exposed to several opportunities to understand technology implementation in action,
I seem to have formed a belief that technology empowers the students. I value the students’ use of computers in relation to their classroom teaching to extend and enhance their learning experiences in meaningful ways, hinging on the interactivity offered by Internet-based learning environments. Although none of us explicitly says so, some participants seem to abstractly agree with Sherry et al.’s (2001) finding that students’ enthusiasm in learning with technology might stimulate their metacognitive or strategic thinking processes. Some of the perceived impact of ICT is seen by Rosanne in the form of ‘engagement’ for the students and as a way for them to ‘learn new things’, while Bertha finds a higher level of ‘creativity’ in students’ work done through the medium of technology. Hemraj, not having entered the ‘promised land of technology’ fully yet, believes nevertheless, that using technology, students will be ‘amazed at their own work’. Hazel seems to be the only one who has not, in any memorable way, experienced improved metacognition with the use of technology, although she does see it as another tool to reinforce the students’ learning.

5.1.4 Teaching and technology—perceived relationships: When faced with the prospect of using technology for teaching, Hazel probes for the need to do so. She is not convinced in the rationalization that simply due to the widespread presence and free availability of these tools for young people, they should be adopted in education (Green & Hannon, 2007). They need to serve a purpose that is not currently being fulfilled by the means she has and is comfortable with. Hemraj also sees the importance of thorough planning and reasoning through how a particular form of technology fits the curriculum needs in his classroom, before adopting it. All participating teachers, however, see ICT as a tool that makes teaching easier and find it helpful in finding ideas for the classroom. Hazel addresses technology as more of a ‘teacher thing’ than a ‘student thing’, using it to create documents and occasionally to show something to her students.
Bertha on the other hand uses spreadsheet software for her assessment and finds it convenient to grade her students’ online work rather than hard copies. Rosanne’s teaching with technology includes some handing over of power to the students and involving them in the utilization of technology for co-construction of assessment criteria. Finally, my own pedagogical intersections with technology highlight the use of technology which students are exposed to every day, trying to utilize those ‘technology moments’ as authentic ‘teaching moments’ for the classroom.

5.1.5 Differentiating Instruction: The thoughtful and purposeful use of technology is hailed as a method that “allows other avenues to be explored and helps in the process of differentiating instruction” (McCoog, 2007, p. 27). None of the participants seem to be seeing this point of view as the direct cause for the need to introduce technology into the classroom. I occasionally show students who have difficulty reading how to use an assistive software tool embedded in their Internet browser to read any website text back to them. Bertha is the only other one whose narrative suggests the use of adaptive software and her desire to have it for her classroom, indicating that she has experienced the use of technology for learners with special needs. Rosanne has difficulty implementing technology without careful planning in which she has ensured that the diverse needs of her classroom will be addressed. This implies that she has not attempted the use of technology itself as a medium to differentiate instruction, although she recognizes the need to use technology to provide students a variety of ways for them to put their computer skills to practice. Hemraj views technology as engaging all students, not necessarily seeing it benefiting some students more than others, depending on their needs. He is still in the process of becoming aware of what is available to him in terms of technology to use in his classroom. His intended application of technology in the classroom, at present therefore, is not geared towards differentiating instruction, but for using it as an interesting alternative to
traditional teaching. Hazel sees one child in her classroom as possibly ready to accept technology as a vehicle for learning, indicating that she notices different levels of student expertise with technology. However, with regards to her teaching foci in the classroom—social skills and creativity—she has not used technology to do what Callahan, Shim and Oakley (2000) say technology makes possible, that is, increase content retention of the learners “by engaging multiple senses, including auditory, visual, and kinesthetic ones.”

5.2 Epistemological considerations

Different teachers know different things about information and communication technologies and related practices. What constitutes as each individual’s knowledge is unique to that particular individual and arises from his or her experiences and the interaction of those experiences with the surroundings. Knowledge is thus the result of “the mind’s operation on perceptual stimuli” (Stone, 2008). In the contexts of the teachers participating in this study, their knowledge about technology and its use in instruction seems to have been acquired in several different ways and as a result of differing circumstances. The epistemological perspectives in this study, thus emerge as poststructuralist whereby “prescriptive ideological frames or meta-narratives that clearly define and place boundaries around certain forms of knowledge are rejected” and emphasis is placed on “people adopting different roles and giving different sets of meanings and accounts in differing situations” (Fawcett, 2008). Connelly and Clandinin (1988) use the term ‘personal practical knowledge’ to capture the idea of “teachers as knowledgeable and knowing persons” with their knowledge found not only in their minds and bodies, but also in their practices (p. 25). Some of the aspects of the participants’ knowledge as underlined within their narratives are as follows:
5.2.1 The Utility of the Internet: All of the participants seem to be impressed by the capability of the Internet, both in their personal lives and for the classroom. I use it for maintaining several personal blogs, keeping up with pop culture and for productivity. Rosanne and Bertha use it for online socializing. The Internet comes in very handy for Rosanne’s personal interests of traveling, cooking and constantly browsing for information, and for Hemraj’s interests of exploring real estate. Bertha uses the Internet to substitute her cable television and is thrilled with the live streaming and downloading capabilities. Her banking and financial planning is also dependent on the computer. Hazel is hooked on to the shopping channels on the Internet to the point that she light-heartedly calls herself ‘addicted’. These are some of the ways in which we hold the Internet useful in our personal and social lives, which indeed would influence the decisions for the use of ICT in the classroom. The broader range of experiences evident in the narratives of Rosanne’s, Bertha’s and my life reflect the capacity-building possibilities of the Internet which then helps us transfer those applications to the classroom more than Hemraj and Hazel who are using the broad applicability of the Internet in limited ways.

5.2.2 Personal Knowledge-Building: Selwyn (2010) explains that contemporary educational technology literature seems to be paying little attention to the social ‘milieu’ surrounding the use of technology, which includes the household, the workplace and the wider community settings (p. 68). What teachers understand and learn about technology needs to be understood as being intertwined with other dimensions of their social life, which includes their personal interaction with it. Jaber and Moore (1999) argue that teachers’ access to computers at home plays a role in their use of computers for instructional purposes. All the participating teachers have computers at home and seem to use them often. It is interesting to note how each of the participants acquired a home computer. While Bertha and Rosanne were born with a
computer at home, I did not have one until University. Hemraj had not used one until he migrated to Canada in his twenties and Hazel bought one for home only after it was implemented in the school where she taught, about twenty years after she started teaching. In a study of teachers’ perceptions and practices with regards to computer technologies, Abrami, Venkatesh and Wozney (2006) found that “teachers' personal use of computers outside of teaching activities was the strongest predictor of technology use in the classroom” (p. 193). In their narratives, the participants call for more time to play with and get comfortable with technology in general and with new software in particular, they would like home access to the programs available at school, and issues of home-school compatibility of technology seem to bother most of them, implying that what we all do with ICT in our personal time could be used to increase our repertoire of technology usage in the classroom.

5.2.3 Knowledge - Attitude - Behaviour: It would probably be safe to say at this point that what we know and experience leads to what we believe in and eventually to the way we are and the way we act. For instance, Hazel has experienced issues with getting reimbursed for software she purchased for her students, at a time when digital technologies were just being introduced into education. Knowing that the technology resources she purchases might end up being paid for by her personally, she is not very eager to try out new technologies, unless they are free of cost. She even questions the prospect of using CDs for the creation of students’ audio recordings due to the hassle and uncertainty of the purchasing procedure, even though she likes the idea of the project. Bertha and Rosanne on the other hand have an open attitude towards expensive software and hardware (interactive whiteboards, adaptive software) as their experiences have only allowed them to see the positive effects of those technologies, with no personal ramifications whatsoever. Mr. D'Souza’s experiences with school budgets have taught
him to be careful but creative, and so he adopts a positive attitude towards investment in technology as well.

Although the expression of an attitude does not necessarily ensure that the conditions for the enactment of the attitude will be in place, yet its presence is an indicator of a subjective will. According to the ‘theory of reasoned action’, there exists a causal chain wherein “both personal and collective attitudes towards a behavior determine the intention to perform the behavior, and consequently the performance of the behavior” (Casimir, Ng & Cheng, 2012). It also has to be remembered that when behaviour becomes habitual, the behavioural responses are activated automatically (Aarts & Dijksterhuis, 2000). For instance, when Hemraj is out of ideas for starting a unit, his first response, based on his habits, might not be to take students to the computer lab to build mind-maps to test their diagnostic understanding of the topic— which might in fact, be one of my own first reflexes, being accustomed to the computer lab environment for the entire teaching day— but to quickly search for a video that can substitute for what he would have instead told his students. While teachers like Hemraj and Hazel might be quick in creating worksheets and photocopying them, as they have been habitual of doing, Bertha might give them an invigorating question to blog about, while Rosanne might pull something under her document camera to invoke classroom discussion relevant to the upcoming unit of study. The idea of ‘what is convenient at the last minute’ varies for all these teachers. Different responses to similar situations come from teachers’ exposure to different forms of knowledge and as a result, the adoption of varying attitudes and behaviours.

5.2.4 Transition between knowledge domains (shifting understandings): Most teachers and the principal, seem to be cognizant that a change is required in education in light of the rapid advancement of technological practices in their surroundings in general. Hazel seems to
be the only one that is not on the ‘bandwagon’. Explaining how all teachers and administrators cannot be placed in the same boat, Hill, Cross and Kilgore (2000) clarify that “many have job security that allows them to resist school-wide improvement efforts that might require changes in their teaching practices” (p. 18). This might hold true for Hazel who is in her forty-first year of teaching.

Teachers’ differing understandings about the required shift emerges in different ways for different people. I go to conferences and notice advanced applications of instructional technology that qualify as redefining learning experiences (Puentedura, 2013); Hemraj sees a huge shift in general uses of technology as he looks back from where he first started; Rosanne and Bertha grew up with technology in their households and use it themselves extensively; and Mr. D’Souza observes what a huge impact technological tools make in the learning of students. However, there may still be a gap between teachers simply ‘understanding’ that a change is required and their actually making the mental transition from one knowledge domain to the other. In the shifting understanding with regards to the adoption of ICT, “teachers are transforming from a ‘figure-head’ (with authority and power) to a ‘participant’ among active learners in the classroom” (Leong, 2006). This might be seen more clearly in some classrooms than others, based on the varying knowledge schemata that teachers possess or acquire and the transitions they successfully make from one knowledge domain to the other. Just because we find ourselves in the so-called ‘knowledge era’ at this point of time, does not guarantee the adoption of technological means to fulfill the demands. James (1996) points out that changing cultures do not adapt rapidly or smoothly and that “vestiges of old beliefs hang on long after the technological, economic and demographic systems have changed” (p. 22). Connelly and Clandinin (1988) sum up the nature of change in saying that “old practices cannot be
‘strategized’ away by replacing them with new ones” and that “practices are expressions of a teacher’s personal practical knowledge and are not without meaning in the way teachers know their teaching” (p. 184).

5.3 Ontological perspectives

Not only do our individual understandings, knowledge and experiences guide our professional work as teachers, but they also form our reality—how things came to be in our life, what gives grounding to the conditions that exist. “Ontology is essentially a form of questioning. Questions open up the field of research; they do not determine answers” (Noonan, 2008). In the present study, the questions pertain to the differing practices and beliefs of teachers working at the same school. The policy that drives the school context deserves a mention in the analysis of the conditions that exist, along with the participants’ responses to this policy. Further to the discussion of ontological perspectives, I next attempt to unpack the critical layer of the different stakeholders that the teachers considered to be major contributors influencing the actual state of classrooms.

5.3.1 The policy: There is an increased push for the use of technology at our school board, as evidenced by the Board’s ‘Vision for Learning and Instructional Technology Plan’ released in March, 2012 which formed the basis for an investment of seven million dollars to set up the infrastructure required to move schools into the twenty-first century vision that emphasizes creative and critical thinking and collaborative learning (Peel District School Board, 2012). The board states that technology enables this kind of learning by providing opportunities for anywhere-anytime learning, supporting teacher innovation and capacity building, enhancing equity of access through personal mobile devices and Internet resources, using social media for educational inquiry, communication and for teaching of digital literacy and for strengthening
connections with parents. This vision was shared with all schools in April, 2012. At our school this vision was discussed at one of the staff meetings. A poster highlighting this vision was sent out to all schools by the board at the start of the current school session, in September 2012 and is displayed in our school as well.

As can be inferred from the highlights of this approach, the Board has started to give emphasis to the need for embedding technology across the teaching-learning environment, a position that academic literature has argued in favour of for a long time. Several educational policy reports dated as far back as 1989 have also presented strong assertions for using ICT as a catalyst to trigger the onset of constructivist, inquiry-oriented classrooms (Culp et al., 2005).

Finally making a case for this type of learning, the Peel District School Board has now started to take the stance that while it may be good to use a certain software or app for a particular lesson, technology seems to have taken a more widespread foothold and should thus become a more ubiquitous part of classrooms and actually mediate the construction of student-directed educational activity. In an examination of case studies that used innovative pedagogical practices in different countries, Law (2004) finds evidence of the approach now being adopted by Peel, as she mentions a shift towards “more collaborative, student-directed, inquiry-based and productive modes of learning” (p.151). Brown (2009) warns us however that such observations are made on the basis of examples of best practice and are not representative of the general teaching population. This implies that policy directives in this direction, albeit progressive, do not have a guaranteed manifestation because of the widely varying pedagogic approaches adopted by teachers.

5.3.2 Participants’ Response to policy: In analyzing teacher-participants’ perceptions towards their workplace I found that Rosanne, Hemraj and I were the teachers who perceived our
school as progressing towards the adoption of ICT in our teaching and learning. While Bertha thought that we could do better, Hazel thought that the school was really not focused on technology. Bertha’s thinking came from her having seen other schools including one of her prior teaching locations, doing much more with technology all-round. Hazel, interestingly, holds her view about the peripherality of ICT because she perceives it as being emphasized by the school only when there are sessions and seminars showing teachers how to operate specific technologies. The “image” that Bertha and Hazel have in their minds of what typical technology adoption by teachers would look like, although contrasting from each other, affects their perceptions and perspectives. According to Connelly and Clandinin (1988), “an image reaches into the past, gathering up experiential threads meaningfully connected to the present” (p. 60). The detailed one-on-one conversations with the participants about their thoughts and perceptions about policy issues and their implications highlighted that “experiences take place with our total being” suggesting that our experiences are affective in nature and are associated with emotional, moral and aesthetic content as well, meaning that our experiences can be felt, valued and appreciated (Connelly & Clandinin, 1988, p.26). These dimensions are explored below with regards to participant responses to the policy set out by the board.

5.3.2.1 Emotional responses. Mr. D’Souza, the principal of the school, does not show a sudden ‘liking’ for technology in light of the board’s new vision, despite his lack of interest in it throughout his own education and even his teaching career. He does not think of technology as ‘high and mighty’ merely because the board’s research says it is. At the same time, he does not pass it off as unnecessary either. In fact, he is strongly in favour of using technology, because of what he perceives to be the effects on learning. His positive attitude towards educational
technology is largely based on observation, introspection, conversations with teachers and conversations with students.

Hazel’s repeated emotional responses to adopting technological practices in her pedagogy include being ‘lost, overwhelmed and scared’. This has held true for her for over twenty years now. That is how she claims to have felt when computers were first introduced and she had no idea about their role in education, and that is how she feels now when suggested to use computers independently with her class, instead of relying on a computer teacher. It is worth considering that nothing seems to have been done in all these years to help her tackle her feelings and make her feel more comfortable, other than to perhaps ‘expect’ her to get on board. Relan and Gillani (1997) talk about how the traditional methods of teaching— that is, the non-implementation of technology— incur criticism. The question however remains whether enough has been done to establish and introduce alternatives. Hazel has tried, more in the past than currently, to get better at using computers by taking courses, going to the technology teacher, trying to implement some ideas in bits and pieces, but has never been able to cross the bridge standing between her and technology, and as a result does not feel any better about technology emotionally. Rosanne and I are very excited about utilizing the full potential of the Internet in our classrooms and having access to mobile devices as part of the new direction being taken by the board and the school. Hemraj feels excited about technology integration but is also frustrated with the fast pace at which it all comes and wishes for a more detailed, step-by-step approach in getting teachers comfortable with ICT.

5.3.2.2 Moral perceptions. Mr. D’Souza feels obliged towards the students he is responsible for. He feels that we owe it to the community composed largely of immigrant families, low socioeconomic community that we teach to use innovative resources like
technology. He does not want the students coming out of his school to have any lesser knowledge about using technological resources than students coming from more well-off schools and neighbourhoods. In addition he feels that students will need these skills in high school and university regardless, and so we have to be proactive in getting them ready for that. As a principal, his practice and support for technology is influenced by these perceptions, which is in support of Hill et al.’s (2000) statement that “Schools are places where teachers and others stand in for parents, and they have a responsibility to make sure children learn things they will need to function as adults.”

Hemraj conveys a similar sense in his cognizance of the needs of the school community—high number of English Language Learners, highly transitional community, financially constrained parents—and wants to advocate for more technological resources to help them better in bridging the gaps. He believes that the board should in fact see the state of the school as ‘ideal’ conditions for bringing in technology with more, if not equal, force as wealthier schools. He also thinks that the unequal presence of amounts of ICT among different schools within the board is unfair. This perception comes from learning about his daughter’s experiences as a teacher in a technologically more advanced school.

Rosanne and I consider it a moral imperative, a part of our professional duty, to equip students with the right tools to face the future they are entering. Rosanne assumes responsibility in working through difficulties in order to give a sound education to her students, which for her includes integrating technology as much as she can. In analyzing my own perceptions, I see technology as a very important and relevant tool to prepare students to critically evaluate and synthesize the information-overload that is growing exponentially. When prodded in the direction of policy and new directions, Hazel holds herself responsible for not taking initiative in
connecting students’ classroom learning to technology learning, but at the same time does not show strong inclinations towards doing so, due to her fears and hesitation with using technology. Bertha’s moral perceptions towards technology inclusion are directed towards teachers who she thinks need to learn more, even if it is a little at a time, in order to bring technology into their instruction. She thinks that we need to make learning interesting for our students and that ICT serves this purpose really well.

Reflecting on the all-round aspects of ICT, all of the participants seem to understand its negative impacts and agree that setting a balance would be the best way to establish effective practice around the use of technology with young students.

5.3.2.3 Aesthetic considerations for policy implementation. Embedded within the participants’ responses to changing technological practices is their appreciation for certain things more than others. Mr. D’Souza’s appreciation for technology comes from observing the students in action. He is invigorated by the level of engagement and enrichment of learning experiences fostered by the use of computers or mobile devices. He sees it as an instructional tool that makes learning meaningful. So, he sees the push from the board as justified.

Rosanne, Bertha and I notice how students are using computers extensively at home and are very proficient at learning technology fast. For us, this implies that we should be building up the home-school connection. This makes us believe in going further and improving our own and our colleagues’ technological practices. We seem to share the belief that with the technological tools available, learning can be significantly enriched — it can be made captivating, fun and in fact, easier for the teacher and the learner both.

At the same time, Bertha believes that with more hands-on devices in the classroom being permitted, monitoring and supervision issues will start to surface and teachers might need to
spend more attention to those as opposed to the actual teaching. While it would be inaccurate to assume that Bertha could have said this as an excuse to get out of implementing the new policy, it has to be noted that the new directions pertain to establishing a classroom culture that some teachers have not been exposed to yet and it will take time to build towards it. At a much different level, Hazel does not allow her students to operate the tape-recorders and CD player technology thinking that they are not yet ready for that. Perhaps, like Bertha, she too lacks the model that needs to be provided showing what the new environments could look like.

Hazel seems to like the 1.0 uses of technology more than the interactive, web-based utilizations. For her, it is the creation of colourful documents, newsletters and displays that is the most exciting thing about technology. She does believe that using technology is another way to reinforce students’ classroom learning, seeing it as a substitutive tool. Hazel is still trying to figure out ways to purposefully integrate ICT and admits that although she does have some ideas, she really has not worked on implementing them. Hemraj on the other hand, notices that his use of technology in the classroom leaves students stimulated and enthusiastic about learning. He wants upgraded, reliable technology in his classroom that he can make use of, for enriching his lessons and utilizing students’ technological potential. Hemraj sees the relevance of technology in the lives of his grade two students and appreciates its uses.

5.3.3 Stakeholders: There seem to be several layers involved in what finally ends up happening in the classroom. Brown (2009) explains the presence of organizational levels involved in the operation of classrooms, stating that classrooms have to be understood “in relation to the systems in which they operate, and in turn act to constitute the system as instances of it” (p. 1170). As a result, it is important to understand how the use of educational technologies
is “socially constructed, shaped and negotiated by a range of actors and interests” (Selwyn, 2010). Some of these key players can be categorized as the following:

5.3.3.1 Government. The Ontario Ministry of Education sets forth curriculum guidelines for teachers to carry out within classrooms. In the K-5 panel that we teach in, technology is not a reportable subject, that is, the student report card does not carry a separate mark for technology. The idea behind this, as interpreted in my own narrative perspective, is that the curriculum be enriched and enhanced with the use of technological tools available to teachers and students, instead of being focused on as an independent entity, separate from the rest. Although some specific expectations embedded across the many different subject areas and units allude to the use of ICT in the ministry’s curriculum guidelines, there is no particular teaching strand that caters to the explicit teaching and assessment of students’ use of technology. This seems like an appropriate choice in the present times, with the distribution of ICT deliberately across the content learning, indicating new methods of learning, not newer content. However, as a result, some teachers including Hazel and Hemraj do not appear to do any structured planning for the integration of technology within their curriculum. Bertha uses technology for specific purposes as she sees fit, while Rosanne attempts on her own accord to embed technology constructively. In addition, accountability of teachers towards the curriculum makes many of them adhere strictly to the expectations to be covered in the curriculum documents. Hazel and Hemraj, for instance, see technology as an add-on that requires time and energy and is not easy to manage amid the pressing demands of homeroom teaching that requires a focus on ‘subjects’ and ‘skills’. Teachers’ focus remains the ‘explicit’ curriculum, while the ‘implicit’ and ‘null’ curricula— to use Eisner’s (1979) terminology to refer to the things to be taught even though they are not listed
and the things that might deliberately have been excluded—are lost in the mayhem of the ‘list to be covered at any cost’.

Interestingly, I found none of the ministry’s publications—as posted on their website—to be specifically geared towards the implementation of ICT in the K-5 panel. The only two reports pertaining to “teaching and learning in a digital world” that can be found in the section of ‘Research in Education’ (Ontario Ministry of Education, 2013b) suggest that the Ministry’s current status is that of inquiry into the adoption of digital practices in schools. A report by Jenson, Taylor and Fisher (2010) is based on an investigation of what the Ministry’s comparator jurisdictions (outside of Ontario) are doing in the area of twenty-first century learning “broadly conceptualized as learning that is supported through and enabled by the use of the broad range of Information and Communications Technologies.” The more recent report by Beggs, Shields, Telfer and Bernard (2012) studies school boards within Ontario using an individualistic, evidence-based approach to analyze the results of forty seven pilot projects undertaken by schools across the ministry, which highlights a “shift in thinking on multiple levels that resound with changes in regard to the use of technology in teaching and learning.” As such, there appears to be no solid directive and guidelines for the implementation of technology in the classroom.

A rather strong form of governmental influence in classrooms is through the funding allowed for teacher supports. The trickle-down effect of the governmental decisions makes it impossible for schools to work as independent organizations where for instance, “budget shortfalls are met by mandated district-wide reductions in school staffing or services” (Hill et al., 2000). Currently, based on the funding our board has, we have four elementary Instructional Technology Resource Teachers to cater to more than two hundred elementary schools. Needless to say, we are hardly able to seek the support of resource teachers as and when required. In light
of the fact that the importance of individualized and extensive opportunities for professional development has been emphasized in research as well as in participants’ narratives, it follows that the teachers’ unwillingness to adopt technological practices cannot be regarded as the sole factor responsible for the lack of such practices. Abrami et al. (2006), while investigating computer practices and attitudes among teachers in 764 schools in Quebec also found thirty-eight percent of the respondents saying “that teacher access to computer resource personnel in their school was either “poor” or “extremely poor”” (p. 183). Even though the Ontario ministry’s Literacy and Numeracy Secretariat seems to be theoretically working on capacity-building among staff, provision of resource personnel does not seem to be a priority. As a result, research mobilization is not widely possible in classrooms.

5.3.3.2 School Board. Fullan (2006) talks about the gap that exists between educational policy and educational practice and argues that in actuality, we only go as far as partial implementation, due to the differing perceptions and attitudes of the ‘frontline’ workers — the principal and the teachers. Unlike the ministry’s stance of being engaged in inquiry but not active in implementation of ICT, as inferred from their public website, the Peel District School Board’s progressive policy around technology is visible and prominent on the current opening page of their public website, stating that “Students want to take the technology they use in their daily lives and integrate it with how they learn. In Peel, we’ve embraced this and made a $7 million investment in our 21st Century Teaching & Learning Initiative” (Peel District School Board, 2013). This bright and optimistic approach of the board has transferred into schools through the installation of wireless Internet which Bertha, Rosanne and I look forward to using in our classrooms with the recently purchased iPads and through the model in which mobile devices are being made available for school purchase so that technology can be embedded more deeply.
Despite this however, the board is prescriptive—and in some cases, unreasonable—in the directions it gives for the usage of the money allocated to schools for purchase. For instance, we are not allowed to use the technology funds to ceiling-mount our LCD projectors. This is obviously thought of with good intentions and valid reasoning, but it is the individual needs of not only the school, but also the teacher, that makes this practice an obstacle rather than progressive movement. Hazel and Rosanne’s classroom teaching is also negatively affected by this decision.

The principal of our school admits that the utilization of finances to suit the needs and desires of the school often involves careful work. Bertha and Hemraj find that their classroom practice is limited by the financial constraints on purchasing more technology. Sometimes, “the authorized layer” (Anderson & Wales, 2012) imposed by the organization can take away from an enriched learning opportunity. For instance, Rosanne Brock is in love with the idea of Interactive White Boards and anticipates this form of technology to be highly beneficial in the classroom. However, the board does not support the purchase of this technology, holding the view that this expensive technology is not always used effectively. In Rosanne’s classroom however, this decision seems to have taken away some of the exciting prospects for student learning in the presence of a highly motivated teacher.

Similarly, the board’s shift towards ‘open-source’ software with the aim of facilitating the spurt of technological tools, has led to the discontinuation of certain software that are expensive but do not have ‘open-source’ alternatives and have left teachers like me hanging without digital options for certain projects. These observations lead one to agree with Mills, Simmons and Mills (2010) in that “Organizations are something that people serve, rather than the other way around” (p. 4).
Also included in the impact the school board has in the classroom, is the perspective of the superintendents of education assigned to respective schools. The principal maintains the school’s contact with the superintendent. Mr. D’Souza considers his superintendent supportive of technology. Last year, she provided our school with part of funding for a few iPads for students, in response to our request to change the way technology looks inside the classroom. However, it is the schools that request, put proposals together and try to ‘get out there’ to make themselves visible, that in the end are able to secure these funds. It requires awareness on part of the principal and understanding politics on part of the teachers to make use of such ‘hidden’ opportunities.

5.3.3.3 School Administration. The principal of the school is responsible for introducing and setting the tone for the structured uptake of new innovations. Mr. D’Souza recognizes the power of technology and his efforts to implement it in his school are based not only on the push from higher authorities, but because of his own belief in the rich learning opportunities created for students. However, he does not mandate teachers to use technology simply because of his own belief. Nor does he expect teachers to jump in and start doing a great job at implementing ICT as soon as new policy is introduced. Interestingly however, several of the participants — Bertha, Hazel and Hemraj — actually think that if teachers were mandated to use technology, they would.

Mr. D’Souza is sensitive to the different levels of technology expertise of his staff and sees that capacity-building is required in varying ways for all teachers. He believes in the ‘creation of a path’ whereby a supportive environment is created for teachers to adopt technological practices in small steps conducive to their needs. However, the question to be asked is whether teachers ‘see’ this path as available to them or not. It seems that teachers who already are comfortable
with technology seem to want more from the administration— for instance, Bertha would like more built-in time for the use of the computer lab— whereas teachers who need the ‘path’ are still not getting enough opportunities to learn technology— for instance, Hazel and Hemraj do not see professional development to be catering well to their needs. Rogers (2003) proposes that in most systems, there is usually a small nucleus of adopters that carries out an innovation effectively. Mr. D’Souza sees this happening in his own workplace as well with some of his staff members making strong efforts for the inclusion of technology while the rest of the teachers are hesitant about the idea.

In a critical analysis, Brown’s (2009) findings about teachers’ usage of different types of digital tools suggest that “the manner in which the technology is used in teaching is highly variable, with the most innovative practice being most evident in the practice of those leading in the introduction of the technology” (p. 1163). Considering my own professional position within the school from this viewpoint, I am expected to model and facilitate the innovative uses of technology for staff and students, besides being the first one to receive communication about technological policy and changes. I am also the school’s direct contact with instructional technology resource personnel. This places me nearly at the centre of the eager ‘nucleus’ of adopters. The principal often appoints me to take charge of relevant professional development for staff or to moderate the upkeep of technological practices at the school. A case study by Avidov-Ungar (2010) to investigate whether this small nucleus or ‘island of innovation’ could be successful in spreading the effect or if it stayed isolated and autonomous, finds that “neither the pedagogical nor the organizational management islands of innovation managed to lead to comprehensive innovation within the organization as a whole in a manner that creates new work patterns.” The research suggests that having a small group of teachers carrying out the
implementation can sometimes lead to a “blinding effect” giving the impression that innovation is happening within the system, while in actuality it is not, since time and energy has not been invested by the organization to create a new culture “in which there is a fundamental change in values” (Avidov-Ungar, 2010, p. 276). Thus, the school administration would have to work at several fronts to bring about the desired change. One impending change evident in Hemraj’s narrative reflects the need to revise the over-condensed ‘quick and easy’ approach to professional development. One session on a new form of ICT or merely the mention of useful software, for instance, does not include any opportunities to build technological-pedagogical knowledge among teachers or help them see the intersection of these two aspects of knowledge. The technological knowledge delivered using the existing formats continues to stay separate from pedagogical knowledge in the minds of many teachers.

5.3.3.4 Teacher Unions. Political issues between the government and teacher unions affect the way classrooms function. Mr. D’Souza says that when such issues occur, the teachers’ union advises its members to stop participating in voluntary activities conducted outside of instructional time. As a result, he is not able to offer professional development opportunities to his staff during the lunch hour or after school, which are commonly used times for professional development sessions. Even during calmer political times, some teachers tend to adhere more closely to union contracts than others, depending on their personal situations and political attitudes. Hill et al. (2000) suggest that efforts to strengthen schools “constantly struggle against the centrifugal tendencies created by federal and state program requirements and work rules established in union contracts” (p. 18). The new learning of digital technologies for professional purposes by some teachers could be seen as ‘outside of their union contract’ since they are already meeting the criteria required to ‘do their job’.
5.3.3.5 Parents. Although in Abrami et al.’s (2006) study, the participating teachers did not attribute the support of parents or the presence of computers in students’ home environments as the only factors that resulted in the successful implementation of technology, yet the role played by parents and the home in all aspects of children’s education cannot be underestimated. The school context characterized in the present study by the participant narratives speaks of a parent community that is not socio-economically privileged. Hill et al. (2000) talk about how, especially in private schools, “different parents sometimes make competing demands, and the way these are resolved can affect teacher actions and student opportunities”. Talking about his school, Mr. D’Souza clarifies that his school’s parent community is not demanding. Mostly new immigrants, the parents might not have technology as their number one priority. This could imply that the school might be able to ‘get by’ with whatever little technological practices it decides to implement. Brown (2009) warns against “giving up on digital technology in all but the most economically privileged circumstances” suggesting that it would only enlarge the already massive ‘digital divide’ (p. 1168). In keeping with this consideration, Mr. D’Souza wants to create opportunities for his students to be able to develop their technological expertise on par with peers outside of their school and community, and not just resigning himself to accepting that such opportunities may be less possible, or unnecessary.

Studying the research about ‘digital divides’ before seeking parental perspectives on the use of technology at home, O’Hara (2011) uses the report by the Organization for Economic Cooperation and Development (OECD) to identify a range of social, economic and cultural factors that play a role in creating disparities among children’s access to technological tools beyond the classroom (p. 222). Hemraj refers to the community’s needs as well, urging the board to pay more attention to such communities and make educational technology more accessible in
these areas and utilize its potential to help bridge the socioeconomic gap. Bertha alludes to the parent community’s lack of resources in reference to the board’s recent adoption of the ‘Bring Your Own Device’ approach, which allows students to use their personal handheld devices in the classroom. She does not see this model as relevant to her school’s situation, which implies that this shift might occur in some schools but not in others. Without deliberate attention then, the likelihood is that such disparity would always continue.
Chapter 6

Conclusion

Connelly and Clandinin (1988) remind us that “narratives are too complex to summarize neatly”—you cannot reduce them to a “logical, coherent, sequential story” for “experience is not like that” (p. 77). This study of teacher narratives studied independently within each unique context and then collectively within the common context of their workplace, has been true to the postmodernist views that emphasize context, subjective meaning, process, discovery versus verification, the theory-and-value-ladenness of facts, the interactive nature of inquiry and the impossibility of objectivity (Denzin, 2008; Guba & Lincoln, 1994).

To quote Mills et al. (2010), “People do not leave their selves behind when they come to work” (p. 121). Teachers whose perspectives have been explored in this study all come with their ‘personal, practical knowledge’, perceptions and attitudes and it would be impossible to keep this segregated from their professional behaviour. When it comes to the use of digital technologies in the classroom, a productive stance going forward may be one of critical scrutiny that values a comparative perspective which is rooted in context, difference, diversity and dialogue, that would aid in the construction of thick descriptions of the present uses of technologies in situ rather than speculations into the future (Brown, 2009; Selwyn, 2010). Through this study, some
of this critical scrutiny has been made possible, keeping in mind that systemic change will fail without having an understanding of individual teachers’ processes of thinking and working.

The study has highlighted the perceptions of the participants about different areas of their practice. Through narrative inquiry, I have reaffirmed what Conle (2000) says, that is, “making choices can not… be arbitrary” (p. 192). Teachers cannot simply be regarded as choosing to implement ICT or not choosing to do so. Doing so creates a screen—a ‘teacherproof’ screen (Connelly & Clandinin, 1988)—that inhibits us from analyzing the reasoning and the conditions in which those individual choices were implemented. This study looks into teachers’ beginnings with technology and subjectively explores their past with reference to the use of and experiences with technology. The variation that emerges demonstrates the significance of analyzing the comparative context and highlights the importance of understanding people over systems.

The participants’ differing approaches to pedagogy influenced their decisions to include ICT in instruction, depending on their understandings and viewpoints about critical pedagogy, classroom design, role of technology in teaching and learning as well as their thoughts on differentiation of instruction. The analysis of teachers’ interactions and workings with ICT revealed the lack of conditions conducive to the effective development of technological-pedagogical-content knowledge (TPACK) among teachers. Stakeholders’ approaches for the integration of instructional technology were found to be inadequately teacher-centred, thus leading teachers to be discretionary in their decision to implement ICT in the classroom.

Another dimension that influenced their teaching practice was their personal knowledge and perspectives about the affordances of ICT. This knowledge could form the directional basis for their future technological practices. Teachers’ current knowledge influences their future knowledge, just like their past has influenced their present. The varying tendencies and styles of
learning also place teachers in the social construction of the ‘Matthew effect’ in education which can be simplified as “the rich get richer; the more you know the more you can learn” (Scardamalia & Bereiter, 2003). Their attitudes and teaching behaviours emerge out of their knowledge, as does their approach towards systemic change.

Finally, I have discussed how systemic regulations invoke experiential responses among participants—emotional, moral and aesthetic—and how external factors influence teachers’ classroom realities including but not limited to curricular practices, access to resources, professional development opportunities, workplace culture and shifting perceptions. The discussions with participants have highlighted the fact that “life’s narratives are the context for making meaning of school situations” (Connelly & Clandinin, 1990, p. 3).

On a personal level, this research has provided me with a more tolerant lens, not only in my teaching practice but also in my general interactions with others. I have come to appreciate the richness of people’s lives as well as factors that bind them, yet separate them from each other. In general life, I have become more observant of my perceptions about people. I have become more conscious of times when I, or others, are likely to ‘judge’ people and situations too soon and based on too little evidence. In people’s eyes, their own perspectives are well-justified, based on the story of their lives, based on their contexts. The same holds true for teachers, even those whose physical context, their workplace, might be the same. Failing to see the reasoning behind their perspectives does not empower the system with the right to impose change on them. I wish and hope that the unraveling of this wealth of experiences will help the participants themselves in reflecting on their own practices and using that reflection to guide and improve their future practice.
Chapter 7

Implications and Next Steps

What has emerged for me from this study as significant is the intersection of the interpretive and critical paradigms—not just limited to the understanding of how human experience is subjective, but also to put the subjectivity into perspective to make a case for improvement of educational systems that involve information and communication technologies. The study, like several other narrative inquiries in education, illustrates the importance of focusing on the ‘personal’ dimension of educators and viewing them as individual people before casting them as a collective entity in a system. As far as the application of educational technology is concerned, from a critical point of view, it is not just the teachers who need to understand the potential of ICT to reach out to the diverse needs of learners. Equally important are the opportunities they are provided to see this potential. Oliver (2011), in exploring alternative ways of thinking about the relationship between learning and technology refers to Vygotsky’s theory of studying a phenomenon as a whole to imply that claims cannot be made to elements—such as ICT—taken out of context and that social and cultural perspectives in technology’s educational use are inevitably bound to the ‘milieu’ (p. 377).

7.1 Implications

Some specific implications from this study are as follows:
7.1.1 Differentiation of training: Teacher professional development might benefit from adopting a needs-based approach where each teacher is given the choice to select from a variety of modes being offered to learn about a particular technology application in the classroom. We are all at different levels of our learning, based on our personal interactions with and attitudes towards technology. This diversity needs to be appreciated and utilized for effective knowledge mobilization into classrooms and schools.

7.1.2 Aligning training to teachers’ frame of reference: As teachers do their curricular planning, they follow a certain frame of reference, which Connelly and Clandinin (1988) refer to as ‘rhythmic knowing of the school year’. The yearly plans which are further divided into term plans, seasonal lessons, rotary cycles, report card timelines, holidays and breaks spread throughout the school year— all are embedded in teachers’ minds as they do their planning. Trying to teach teachers how to set up and work effectively in a constructive online learning environment, for instance, might not work well at a time when a teacher is preoccupied with getting students are getting ready for the winter concert. Perhaps more suitable to them at that time would be training about a technological tool that helps them annotate video recordings of students’ performances to improve their practice. Keeping in mind the teachers’ priorities for the particular time of the school year, the professional development might be most easily and effectively received when what is taught to teachers is relevant to their current frame of reference.

7.1.3 Awareness about holistic integration: Based on the fact that teachers have differing views, the latest research about the integrated approach of ICT into the various subject areas and the embeddedness of digital technologies across the curriculum needs to be highlighted more. Models like Technology-Pedagogy-and-Content-Knowledge (TPACK) and Substitution-
Augmentation-Modification-Redefinition (SAMR) need to be brought to the forefront of discussion and practice. Whereas it might be a ‘given’ for some teachers who are on board with the new digital methods of teaching and learning, for some others it appears not to be obvious due to their personal outlook and professional climate. If a shift in time demands a shift in working methodologies, it needs to be explicitly communicated by the authorities, instead of being assumed, along with an organic dispense of the rationale, resources, supports and expectations.

7.1.4 Opportunities for personal use: Most teachers do not mind spending personal time on learning computer skills relevant to their classroom. In fact, most depend on home time to get familiar with resources and technology tools for their classroom. They ask for home-school compatibility, access to programs at home and in some cases personal access to mobile devices provided by their workplaces. In the presence of these opportunities, they might be able to get more comfortable with the integration of technology.

7.1.5 Negative perceptions about teachers versus empowering conditions: One of the most important implications of this study is that teachers are not deserving of negative perceptions in light of their practices. If their practice does not conform to policy directives, then the systemic approach should be that of identifying the issues encountered by the individual and performing a gap analysis. The analysis should serve to segue into creating empowering conditions for the practitioner instead of criticizing their traditional practices. It will also need to be borne in mind that the manifestation of the change will appear different from teacher to teacher and classroom to classroom. This is in line with an approach of inquiry, allowing teachers to “work out new practices as expressions of their personal practical knowledge”
(Connelly & Clandinin, 1988, p. 185) as opposed to mandating them all and expecting all teachers to implement the imposed practice as directed.

7.1.6 Referencing the present, not the future: Technological predictions and forecasts do not have to be presented as utopian narratives about the future, nor as stories about a better world to come, as tends to be the case (Nye, 2007). Studies such as these show that no matter what image of the future has been created for practitioners, it is always their present, their immediate context that drives their pedagogy and practice. Thus, when making a case for ICT in education, researchers and policymakers might perhaps do better to tend to the present needs of the classroom and adopt “a critical approach towards educational technology [that] does not entail a dogmatic adherence to any particular theoretical stance, school of thought or -ism” (Selwyn, 2010, p. 68). If first-hand accounts of the actual state of conditions were explored and analyzed, it would likely be more meaningful for those for whom the case is being made.

7.2 Next steps

Design research would be an ideal next step to these types of studies, where the voices of participants are heard to shape the design environments and to guide further theory. Listening to and deconstructing participant narratives is crucial in a critical understanding of the in situ environments where they work to make teaching and learning happen. Equally important however, is to utilize this understanding in an evolutionary design process. In addition, interviewing students and including their perspectives in the research milieu can impart crucial advantage to any research that studies teachers. A teacher’s practice and the school’s environment, can thus be viewed from the perspective of the end-user as well. Anderson and Wales (2012) call for the need to “work the margins, so to speak” (p. 188) implying that ‘top-down’ educational initiatives cannot bring about the desired change. The players involved in
carrying out the change are the ones that need to be empowered. Further examination into the complex interrelations between structure and agency would also be helpful and as Carroll, Motha and Price (2008) suggest, would help to see learning as ways of ‘being’ and not just ways of ‘doing’ and ‘performing’ in preset methods and to suit predetermined outcomes. Narrative inquiry, as a way of trying to make sense of life as lived, would be helpful in creating thick descriptions that illustrate such relationships multi-dimensionally, illuminating both teacher’s and students’ learning lives.


Appendices: Documents from ethics review protocol

Appendix A: Teacher Recruitment Email

Information and seeking agreement to participate

(This message is sent to teachers who have been pre-selected to participate in the study. This message will be emailed to them on their work email from the researcher’s work email (nivedita.shori@peelsb.com). If a reply is not received within a reasonable period of time – two to three days – then it will be followed up in person in school.)

Dear ____________

As you are probably aware, I am working towards an M.A. at the University of Toronto (OISE). As part of my thesis component, I am looking to explore various perspectives from different teachers about the integration of technology into teaching and learning. For the purpose, I would like to interview teachers who are using technology with their students in different ways. I would also like to represent these teachers from different grade levels. I have selected a few teachers based on these criteria and would really appreciate if you agreed to participate in this study. You would be required to volunteer for three interviews of typically half an hour to forty minutes in length. In return for your time, I am willing to offer you three additional planning times. If you would consider doing so, please email me at nivedita.shori@peelsb.com and I can send you details and further information.

Thanking you in anticipation,

Nita Shori.
Appendix B: Principal Recruitment Email

Information and seeking agreement to participate

Dear ___________

As you are aware, I am working towards an M.A. at the University of Toronto (OISE). As part of my thesis component, I am looking to explore various perspectives from different teachers and the administrator about the integration of technology into teaching and learning. For the purpose, I would like to conduct interviews with some pre-selected teachers and also with you as the principal. I would really appreciate it if you agreed to participate in this study. You would be required to volunteer for one interview of typically half an hour to forty minutes in length. I understand that you are extremely busy, and so I will request a second interview only if deemed absolutely necessary for the study. If you would consider doing so, please email me at nivedita.shori@peelsb.com and I can send you details and further information.

Thanking you in anticipation,

Nita Shori.
Appendix C: Letter of Informed Consent for Teachers

Thank you for offering to participate in this project. This letter explains what is involved so you can make an informed decision about taking part. I am conducting this research with Dr. Clare Brett from OISE/UT at the University of Toronto. The project is titled “Teacher perceptions about computer applications for teaching and learning in a primary-junior setting – a narrative study”

The object of this study is a narrative description of the perspectives of teachers and some insight into how those perspectives might have been acquired and how they influence those teachers’ application of educational technology for the purpose of teaching and learning.

When it comes to applying technology for instruction, it seems as though it is the teachers’ individual philosophies that come into play. “Different teachers operating in very similar settings would be expected to have different beliefs regarding appropriate pedagogical approaches” (Margerum-Leys and Marx, 2004). What works for one teacher might not work for another. It is these beliefs, these pedagogical philosophies that are at the root of making teachers who they are. The intent of this narrative study is to interpret teachers’ workings with technology in light of their individual perspectives around the use and application of technology.

Perspectives are often influenced by an individual’s past and by his or her context, which includes the physical location as well as the socio-personal circumstances. In dwelling upon these dimensions and going deeper into them, both for myself as well as for others, I hope to uncover some understanding about factors affecting instructional practice with technology.

The study will continue over a period of approximately four months. As part of the study, you will be participating in three interviews with me, each about thirty to forty minutes in length, at a mutually convenient time. The first interview will be semi-formal and the rest will be informal. I will be asking questions pertaining to your personal and professional use of technology, your perspectives, your philosophy and your thinking. Your interviews will be recorded so that I can participate in the discussion with you, instead of transcribing on the spot. I will later transcribe the interviews. Your name, location of work, real names of other people and places will be replaced with pseudonyms to protect your confidentiality. If there is any additional information that you willingly wish to provide to me to facilitate your role in this inquiry, please feel free to do so. You are welcome to review any data pertaining to you collected as part of this study.

In return for the time you spend with me at each interview, I will give you an additional planning time during your work schedule. Please consider a token of appreciation for the time you have agreed to devote.

There is practically no risk involved in this study. Since the goal of the interview is to discuss personal perceptions and experiences, please do not feel like you have to share anything too personal if it makes you even slightly uncomfortable. Please note that you only have to divulge the information that you wish to and can conceal any experiences even if you consider them relevant to the topic in question. My intention behind asking your personal experiences is only to see how different teachers’ personal contexts, lives and philosophies influence their use of technology in classroom practice. I will also be participating in this research as a participant, exploring my own perspectives in an autobiographical form.
Before this study begins, I would like to reassure you that as a participant in this project you have several very definite rights.

- First, your participation in this study is entirely voluntary.
- You are free to refuse to answer any questions.
- You are free to decline participation at any point of time during the study.
- Excerpts from the transcript of this study may be included in published accounts, but under no circumstances will your real name or identifying circumstances be included, unless you specifically want it to be, as indicated in your permission form below.

I would like to express my appreciation for your participation in this project. Should you have any questions you are welcome to contact me in person, by phone (905-293-9525) or by email (nivedita.shori@peelsb.com). If you give your consent to be interviewed and understand your rights as a participant in this project, please sign below.

**Signature and Permissions:**

I understand that I may withdraw my permission at any time, with no consequences and without providing a reason, by contacting the researcher at nivedita.shori@peelsb.com or by calling her at 905-293-9525.

I agree to allow my interview responses to be used as part of the research described above. I understand that these data will be used in accordance with the anonymity rules I choose below, and that if I do not specify any rules, these data will be completely anonymous by default.

Name: _______________________________ Date: _______________________________

I wish to make the following information available for the researcher to use in the body of the text (understanding that if I take no action here, by default all information will remain anonymous). Please check all that apply:

☐ My name
☐ The name of my institution
Appendix D: Letter of Informed Consent for Principal

Thank you for offering to participate in this project. This letter explains what is involved so you can make an informed decision about taking part. I am conducting this research with Dr. Clare Brett from OISE/UT at the University of Toronto. The project is titled “Teacher perceptions about computer applications for teaching and learning in a primary-junior setting – a narrative study”

The object of this study is a narrative description of the perspectives of teachers and some insight into how those perspectives might have been acquired and how they influence those teachers’ application of educational technology for the purpose of teaching and learning.

When it comes to applying technology for instruction, it seems as though it is the teachers’ individual philosophies that come into play. “Different teachers operating in very similar settings would be expected to have different beliefs regarding appropriate pedagogical approaches” (Margerum-Leys and Marx, 2004). What works for one teacher might not work for another. It is these beliefs, these pedagogical philosophies that are at the root of making teachers who they are. The intent of this narrative study is to interpret teachers’ workings with technology in light of their individual perspectives around the use and application of technology.

Perspectives are often influenced by an individual’s past and by his or her context, which includes the physical location as well as the socio-personal circumstances. In dwelling upon these dimensions and going deeper into them, both for myself as well as for others, I hope to uncover some understanding about factors affecting instructional practice with technology.

The study will continue over a period of approximately four months. As part of the study, you will be participating in a semi-structured interview with me lasting about thirty to forty minutes in length, at a mutually convenient time. I will be asking questions pertaining to your personal and professional use of technology, your perspectives, your philosophy and your thinking. I will request a second interview only if deemed necessary. Your interview will be recorded so that I can participate in the discussion with you, instead of transcribing on the spot. I will later transcribe the interviews. Your name, location of work, real names of other people and places will be replaced with pseudonyms to protect your confidentiality. If there is any additional information that you willingly wish to provide to me to facilitate your role in this inquiry, please feel free to do so. You are welcome to review any data pertaining to you collected as part of this study.

There is practically no risk involved in this study. The goal of the interview is to discuss personal and professional perceptions and experiences. Please note that you only have to divulge the information that you wish to and that do not infringe upon professional confidentiality. You can conceal any experiences even if you consider them relevant to the topic in question. My intention behind asking your personal experiences is only to see how different personal contexts, lives and philosophies influence our use of technology in schools. I and some other teachers from our school will also be participating in this research as participants.

Before this study begins, I would like to reassure you that as a participant in this project you have several very definite rights.

- First, your participation in this study is entirely voluntary.
- You are free to refuse to answer any questions.
• You are free to decline participation at any point of time during the study.
• Excerpts from the transcript of this study may be included in published accounts, but under no circumstances will your real name or identifying circumstances be included, unless you specifically want it to be, as indicated in your permission form below.

I would like to express my appreciation for your participation in this project. Should you have any questions you are welcome to contact me in person, by phone (905-293-9525) or by email (nivedita.shori@peelsb.com). If you give your consent to be interviewed and understand your rights as a participant in this project, please sign below.

**Signature and Permissions:**
I understand that I may withdraw my permission at any time, with no consequences and without providing a reason, by contacting the researcher at nivedita.shori@peelsb.com or by calling her at 905-293-9525.

I agree to allow my interview responses to be used as part of the research described above. I understand that these data will be used in accordance with the anonymity rules I choose below, and that if I do not specify any rules, these data will be completely anonymous by default.

Name: ___________________________ Date: ________________

I wish to make the following information available for the researcher to use in the body of the text (understanding that if I take no action here, by default all information will remain anonymous). Please check all that apply:

- [ ] My name
- [ ] The name of my institution
Appendix E: Interview Guide for Teachers

1. Past experiences with technology
   - When did you really start using computers? In school, college, university and for what purposes? (As an introduction, researcher will start with an anecdote how she started using a computer only in University and for what purposes.)

2. Confidence about technology integration
   - How skilled would you consider yourself with using a computer – low, moderate or high?
   - Can you describe to me how you use computer technology generally in your life?
   - In your teaching?
   - Any instances of feeling frustrated or particularly pleased with the way technology has not worked or worked for you?

3. Availability of technology at school
   - If you have ever considered using technology with your class, how has the availability of technology in the school influenced those considerations?
   - Are there things you would like to change in terms of computer resources, software or access for either yourself, or your students?
   - Any stories you have heard of other schools that might have more or less technology than what we have access to?

4. Preparation for integration of technology
   - Can you recount any specific incidents of hassles you have had in planning to integrate technology in your lessons?
   - If you had to use computers in your teaching, how much time and what resources would you likely need for preparation of a lesson?
   - Can you share some examples of how you might have done this? If not, what considerations (time/resources/comfort level) might have prevented you from doing so?
   - Do you value spending time in preparing a technology-infused lesson?

5. Support/Mentoring/Training received for adoption of technology
   - Have you received any mentoring or professional development related to technology? Please describe its nature – technical, instructional/pedagogy-related, resources?
   - Do you remember how you felt at the end of the particular session? (Researcher will share how sometimes she comes back all motivated, and starts playing around with technology on her own time before rolling it out to the kids; while at other times, she comes back frustrated with a hurting head at the information overload).
   - How would you describe your school’s and board’s support for students’ use of computers at school?
   - Have you individually sought any support for these kinds of technology-based plans?

6. Students’ motivation in using technology at school
   - How do you think about students’ interaction with computer technology as part of the classroom experience? Do you see it as unnecessary or useful in particular situations? Can you describe your thoughts about the role of computer technology in teaching?
   - Whenever you have used computer technology in the classroom, do you consider those successful teaching/learning experiences? In what ways were they successful or unsuccessful?
• How prepared or motivated do you consider your students are to accept technology as a vehicle for learning in their classroom? Why would you say so?

7. Creative uses of technology
• If you use computer technology in your teaching, what are some typical ways you might use it? Please describe.
• Have you used computer technology in other ways occasionally in your teaching? Or for particular purposes? Can you describe?
• Is there an example of computer technology use in your teaching that you saw as particularly innovative or valuable? Can you describe it and explain why you feel that way about it?

8. Perceived value of the Internet in students’ educational lives
• How do you perceive the role and value of the Internet broadly in students’ lives for the purposes of learning and education? Is this something you see happening a lot? A little?
• How do you see the future of the Internet being used in students’ lives for educational purposes?

Branching Question:
8a (For teachers who are found to be using technology): What motivates you to adopt technology so extensively for teaching and learning?
8b (For teachers who are found to be not using technology): What would have to change to make you use technology in your teaching?
Appendix F: Interview Guide for Principal

1. Past experiences with technology
   • When did you personally start using computers? In school, college, university and for what purposes? (As an introduction, researcher will start with an anecdote how she started using a computer only in University and for what purposes.)

2. Professional experience with technology
   • You have been at many schools. Do you have any stories or examples where you used technology or noticed it being used in a certain way?
   • As an administrator, have you had any frustrating experiences with technology?
   • Or any motivating experiences with technology?

3. Leadership with technology
   • I am aware that you have participated in a technology-related project with other principals in order to enhance technology at the participating schools. What led you to do that?
   • Do you find other leaders share concerns similar to yours?

4. Professional outlook towards technology
   • What are some typical ways you would like technology to be used for in your school?
   • Do you have any ideas about how you might want to package professional development related to technology?