Implementation of Assistive Technologies in Classrooms: A Shift in Attitudes

By

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Abstract

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Educators who do not embrace technology are providing a huge disservice to their students. Not only is a change required in educators attitudes, a change in teacher's pedagogy also necessitates reviewing in order to fully support the learners in their classrooms. This project investigated the process required to help scaffold educational staffs' learning so they become comfortable with change…focusing on this change and enabling an attitudinal change so a development for an appreciation for the possible pedagogical change needed to support student learning could occur. Essentially the focus is on shifting attitudes before skill level.

The questions which helped guide this project are:

- Why are educational staff so resistant to change when it comes to using assistive technology for student learning?
- What needs to be in place for attitudinal change to occur?
- How can I support educational staff so they can reach a level of 'readiness'?

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A special thank you to all those who supported me during this Masters adventure. Thank you to all the people in my North Island cohort, your motivation and encouragement is what kept me going. I also want to thank those who helped me with editing and proofreading, every little bit of advice was appreciated, thank-you.

I'm also thankful for the quilting industry, because without you, I think I would have lost my mind years ago. The best therapy when overloaded with assignments and due dates is getting lost behind a sewing machine piecing a quilt top. Nothing feels more relaxing than losing track of time while creating a quilt.

Finally, thank you to all the students I work with, you are the reason why I continue to be motivated to learn. I cannot think of anything more rewarding than supporting you in your journey through school.

Dedication

I dedicate this project to my three beautiful children; Mitch, Geena and Ross. It is amazing what I have learned from each of you so far in life. I want to thank you for putting up with me while I completed my studies mostly through distance education, I realize it was not easy for you when I was pre-occupied with studying or getting assignments done. If there is anything you can take away from my experiences completing a Bachelor's degree and a Masters degree while raising kids is to make sure you finish any of your schooling BEFORE you have kids…it's much easier doing schoolwork when you are younger! Thank-you for your support and understanding, I am so incredibly proud of each of you.

Introduction – Chapter One

"Fair doesn't mean giving every child the same thing,

it means giving every child what they need." Rick Lavoie

My Identity…who am I?

It is funny how you arrive at a certain place in life. I truly believe everything happens for a reason. For instance, I am passionate about quilt making, particularly quilting and piecing. I love the whole process; the excitement of choosing a project, finding the patterns to use, the fabrics, and the threads. The planning and drafting, cutting yardage into pieces and sewing it back together again to form designs and patterns using different coloured fabrics are rewarding on many levels. I can make the most intricate designs with shapes of fabric and thread. I piece quilt tops and challenge myself to try different ways of accomplishing what I had envisioned. It is a process from start to finish that involves my curiosity, learning, failing, inquiring and trying again.

One of the biggest hurdles in quilt making, though, is being able to change one's choices so many times. I often get stuck on deciding what is best amongst all of the choices that there are; immersing myself in my projects, losing any sight of time or existence. I have always been able to change ideas or my mind though. I have no problem with change as it is what keeps me fresh and creative. My mantra has always been "change is good". Amidst this change I have found that I have an eye for seeing shapes, designs and patterns; seeing them everywhere, in nature, in behaviours, in life. Quilting patterns and shapes can be rather organic in form, such as freehand cut applique patterns, or they can be very clear and straight cut, such as squares or triangles. It is no surprise then that I can easily pick up on seeing patterns in every facet of my

work as a Child and Youth care provider. Patterns represent themselves in many forms in my work life. The most obvious one is the pattern of behaviours, either organic ones which can be discovered through qualitative analysis/interpretive inquiry, or very clear and unmistakable ones like the square or triangular shapes in quilting.

I feel blessed to have completed my undergrad degree in Child and Youth Care, a field I am also passionate about. Child and youth care is a profession founded on a commitment to the well-being of children, youth, families and communities and emphasizes developmental practice, social competency, and the use of relationship in therapeutic interactions within the life-space (UVIC, 2013, SCYC website). It is an ecological, unique and holistic way to interact and work with people in their environment, meeting them where they are at and providing the opportunity for them to build upon their present skills and strengths through planned change.

The first two years of my degree, CYC First Nations, was studied through the lens of a First Nations culture on reserve lands in my home area. This experience first introduced me to indigenous worldviews, perspectives and ways of knowing. My curiosity was piqued…here was another way of doing something differently…I could accomplish something by trying and looking at it another way, looking through another 'lens' so to speak. Working collaboratively with my cohort, I gained many skills, most notably a team-focused orientation to working with others. I could see patterns now, from yet, a different perspective. I was given this opportunity to embrace indigenous ways of knowing and combining them with my own learned and life experiences. Martin (2012) describes this type of framework as two-eyed seeing which "honours and accepts diverse ways of knowing" (pg. 24) and stresses of being "mindful of alternate ways of knowing in order to constantly question and reflect on the partiality of one's perspective" (pg.

31). I could see a remarkable resemblance of this framework in my passion for quilting and child and youth care work.

The last two years of my degree were completed through distance education through the School of Child and Youth Care at UVIC. Reflecting back on the process I was immersed in years ago, I realize the value and knowledge I gained and have been able to apply to my work with all learners/students, and my life, through my years of working in the school system. It amazes me how my passion for quilting, CYC, and my understanding of different ways of knowing had set the foundation of how I work with students and how I see my 'self' as part of the process. It is my hope that I have been practicing what Halbert and Kaser (2013) describes as ***Emhaka7***, "keeps an eye on others to be helpful" (pg. 16) while remaining as open as possible, being a good listener, and to empowering students to have a 'voice' in their best interests so they can effect change in their lives. My work thus far has felt like a big quilt project underway, the fabrics and threads have been chosen, the pieces are cut, the layout has been decided upon, I have changed my mind a few times and now the pieces are all starting to be sewn into place. My quilt top is beginning to take shape.

What I do

I love working in the education field just as much as I love the quilting industry. I see many parallels between the two. The therapeutic working relationships I am able to build with students and teachers is the glue that binds us together and is the foundation for empowerment, growth, and wholeness. It is from forming these relationships and effecting planned change that I feel the most gratification in my school-based job. I get the same kind of feeling when I sew a perfect ¼" seam along a full length of border fabric on a quilt top, that's pretty darn good. I have

taught community-based youth and adult sewing and quilting classes in an effort to build capacity and life skills and to introduce people to an outlet where their creativity is only bound by their imagination. For my professional work, I work in the public school system, holding many different support roles in the same district for a number of years; from special education assistant to first nations in school support to my current position as itinerant assistive technology support. This position finds me working collaboratively with students, teachers and other educational staff with assistive technologies in the classrooms to promote student learning. My present mandate is to support educational staff with the software program Kurzweil 3000 and other technologies as they become identified through consultations to support, enhance and meet a variety of diverse student learning needs.

> Kurzweil 3000 is an assistive technology, text to speech, learning tool that supports the concept of Universal Design for Learning with a suite of powerful reading, writing, test-taking, and study skill tools that makes curricula accessible to all students. It is particularly appropriate for students with learning disabilities such as dyslexia, dysgraphia, those who require reading intervention, students struggling with reading comprehension and English Language Learners (Kurzweil website, 2013).

Further, I curate technology related resources in a blog for access by all district personnel and I am involved in a number of classroom inquiry based projects. The position I hold is the first of its kind in my district, and with that, comes many obstacles and hurdles. First and foremost, was getting the educators in the district to know what service I offer and how I could support them in their work. A lot of ground work needed to be done in order to build those

essential trusting relationships. Through building those relationships, discourses around assistive technology and how this could support diverse student needs began to unfold.

The use of 21st century learning tools such as web 2.0 tools and computers are not widely used to their capacity in my district. There seems to be this rather large disconnect to technology use and its' acceptance with some of my colleagues in classrooms. A number of factors could be contributing to this phenomena, for instance; the lack of understanding how these tools could be of benefit to an educator, the lack of understanding of how computers work, initial hesitation to learn something new, lack of time to learn something new, lack of professional development and support after the fact, outdated equipment, not enough equipment, unstable Wi-Fi or internet connections or lack of funding to purchase software programs.

The use of assistive technology in a classroom is an integral part of a 21st century student's life. Teachers and educational assistants who do not embrace technology are providing a huge disservice to their students, as these students require those skills in order to become productive members of society. These new literacies and 21st century technology skills have to be learned in school and professional development can help alleviate some of the underlying issues the adults experience. Not only is a change required in teacher and educational assistants attitude, a change in teacher's pedagogy also necessitates reviewing in order to fully appreciate and support the 21st century learners they come in contact with in schools.

Why I'm Interested

I always knew I was going to work on a Master's degree. I always thought I would work on a Masters program in child and youth care because I am so passionate of that field. Through my workplace I had heard of a cohort forming to work on a Master's of Education program –

curriculum studies, and I thought to check it out. The opportunity was ideal, studying with co-workers and doing the program from the comfort of my hometown. This equates to less costs and less time away from other commitments. Even though the department of curriculum studies was not my first choice in programs, I thought I would give it a try. To my amazement, this program has been the most thought-provoking and experiential program I had ever taken…thoroughly enjoyable! I have now blended together my love of child and youth care work with the education field to a deeper level of understanding. I am certainly feeling that I can accomplish anything I set my mind to, kind of like the feeling of accomplishment I get when I chain-piecing together blocks, each section is connected to the next with thread and everything is falling into place behind my sewing machine.

In my job as assistive technology support, I quickly realized how lacking in skills many educational staff were. This was a pattern I saw in all the schools I support. For the purpose of this paper, I will be defining educational staff as teachers, special education assistants, child and youth care workers, first nations staff…adults who work with students in a school setting. I found I was supporting educational staff who were all at different levels of 'knowing' about technology. My first instinct was to produce short videos that were easily accessible for reference and educational staff could easily access them and figure out what they needed. Upon deeper analysis, I came to the realization that not only were these folks lacking in skills to be able to do that, regardless of how many videos I had made, their readiness levels to take initiative was still not there. An attitudinal shift in pedagogy is needed before any videos I produced were ever to be watched.

My inquiry for my Master's project is to discover how I can scaffold educational staffs' learning so they become comfortable with change…focusing on this change and enabling an

attitudinal change so a development for an appreciation for the possible pedagogical change needed to support student learning can occur. Essentially I will be focusing on shifting attitudes before skill level. My project will consist of a case study: me designing and implementing a Kurzweil workshop or two this fall, self reporting on my experiences and observations of what effects my workshops had on staff using interpretive analysis (qualitative), and action research to some degree, not just for my research but for ongoing support for my work once my Masters project is completed.

My guiding questions:

- Why are educational staff so resistant to change when it comes to using assistive technology for student learning?
- What needs to be in place for attitudinal change to occur?
- How can I support educational staff so they can reach a level of 'readiness'?

Chapter Two: Literature Review

"Successful reform occurs in a thousand small ways during the journey"

Ben Levin and Michael Fullan (2008)

Introduction

The effective preparation of educators to teach students who require the use of assistive technology tools such as the Kurzweil 3000 software program is vital to those students' school successes. There is clear evidence regarding the educational benefits of using technology (Organization for Economic Co-operation and Development 2006, 2010). Yet, Aldunate and Nussbaum (2013) report "it is well documented that teachers do not generally make effective use of information technology in their teaching" (pg. 519). Teaching a curriculum incorporating the use of assistive technology, such as computers and software, has to be learned because not only does the teaching need to be adjusted with this new pedagogy, so do the learning outcomes.

In this literature review I will discuss the importance of assistive technology adoption for learning, personalized learning, barriers to implementation, professional development, changing attitudes and beliefs, and the stages of concern model in relation to supporting teachers' understanding and implementation of assistive technologies in their classrooms for students' success.

Assistive Technology

Literature indicates that educators are the central gatekeepers towards successful implementations and integration of assistive technologies in classrooms (Hartsell, Herron, Fang,

Rathod, 2010; SETBC website). Meuller, Wood, Willoughby, Ross and Specht, (2008) state that "educators are the focus of interest because it is educators that have the primary contact with students and it is educators that experience the barriers and supports to integration of technology" (pg. 1524). There are many layers to implementing assistive technology use in the classroom. It is a complex, and challenging task to accomplish. Research studies in education show that the use of technology can help student learning (Hew and Brush, 2007). Mitchem, Wells, and Wells (2003) quoted in Hartsell et al 2010 state that "research on schools and teaching has suggested for decades that student success and achievement are intricately associated with students' interactions with effective teachers" (pg. 48). It is of paramount importance for teachers to overcome personal, professional and attitudinal barriers in order to support student learning to its' fullest, and to provide the necessary skills and experiences for students to become productive and participating citizens in society.

Personalized Learning

Educators, like students, require a personalized approach to learning the operation and implementation of new assistive technologies as they have similar experiences to new learnings as the students in their classrooms. Educators are not a homogeneous group of people where everyone learns at the same pace and in the same method (Hartsell et al, 2010). Everyone is at a different place in their learning and recognizing this factor in order to provide support is a very important first step. Kolas and Staupe (2007) focuses on Gardner's (1985) theory of multiple intelligences (visual, verbal, logical, bodily, musical, interpersonal intelligence, intrapersonal intelligence and naturalistic intelligence) and Dreyfus' (1998) proficiency stages (novice, advanced beginner, competence, proficiency and expertise) while also adding in Hofstede's

(2001) cultural dimensions (power distance index, individualism vs collectivism, masculinity vs femininity, uncertainty avoidance index, and long-term vs short-term orientation).

Gardner's (1985) Model of Multiple Intelligences provides a contribution about who the learner is with the idea that all persons have eight intelligences, but that some intelligences are better developed than others. This makes it possible to use this knowledge about a students' intelligences and letting them feel mastering, but also giving adequate challenges to improve weak abilities. Dreyfus proficiency stage model (1998) considers the acquisition of skills through instruction and claims that students on different stages have different needs. The 'novice' for instance, needs models, rules and prescriptions; the 'advanced beginner' starts to recognize based on experience, and with 'competence' the user chooses a plan of progress to reach the goal based on instruction and experience. A learner at the 'expertise' stage, not only sees what needs to be done, but also sees how to achieve the goal (Kolas and Staupe, 2007). Shi and Wang (2011) best describes Hofstede's (2001) cultural 'dimensions' paradigm, as taking into consideration the differences in organizational culture based on geographical location and societal beliefs and values. The model, or paradigm, explores the differences in thinking and social actions. Hofstede (1998) further defines 'organizational culture' as the collective programming of the mind that distinguishes the members of one group or category of people from another, and within this definition, Arrindell (2003) further reports Hofstede states that 'mind' stand for thinking, feeling, and acting, with consequences for beliefs, attitudes and skills. See Figure 1 for a summary of Hofstede's five cultural dimensions as reported in Shi and Wang, (2011). Kolas and Staupe (2007) argue that a holistic approach is necessary to address heterogeneous factors in a group of learners. All the heterogeneous "factors must be taken into

account and should be implemented to create a personalized learning environment that offers individualization and differentiation to every individual" (pg. 2674).

Power Distance Index (PDI)	The extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally. It suggests that a society's level of inequality is endorsed by the followers as much as by the leaders.
Uncertainty Avoidance Index (UAI)	A society's tolerance for uncertainty and ambiguity; it ultimately refers to man's search for Truth. It indicates to what extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations.
Individualism (IDV)	The degree to which individuals are integrated into groups. "Collectivism" refers to the group, not to the state.
Masculinity (MAS)	The distribution of roles between the genders which is another fundamental issue for any society to which a range of solutions are found. The assertive pole has been called "masculine" and the modest, caring pole "feminine".
Long-Term Orientation (LTO)	LTO versus short-term orientation. It deals with Virtue regardless of Truth. Values associated with Long Term Orientation are thrift and perseverance; values associated with Short Term Orientation are respect for tradition, fulfilling social obligations, and protecting one's "face".

Figure 1 Five Dimension of the Cultural Measurement in Hofstede Model (Shi & Wang, 2011)

Identifying the Resistance to Adopting Assistive Technology

A review of the literature indicates there is resistance to adopting computer use in the classroom. There are various reasons for this resistance. We are living in an era of incredible invention and growth in information and communication technologies while computer technology continues to advance at an unprecedented rate in all aspects of our society (Meuller,Wood, Willoughby, Ross and Specht, 2008; Dumont, Istance and Benavides, 2012; Woodhouse and Jones, 1988). Traditional approaches to teaching do not fully address the changes that are taking place in society and for learners. Such change requires a shift towards a new pedagogy, in order to meet the needs of students. Fullan (2013) describes this new pedagogy as a "learning solution that would have to meet four criteria: 1) irresistibly engaging

for both students and teachers, 2) elegantly efficient and easy to access and use, 3) technologically ubiquitous 24/7, and 4) steeped in real-life problem solving" (pg. 24). However, before such a shift could occur, there are many different factors regarding teachers' efficacy, teaching context and professional learning that need to be addressed.

A large body of literature identifies such factors for teachers including: environmental constraints, lack of knowledge, individual differences in beliefs, attitudes and skills (Kopcha 2010; Meuller et al 2008; Woodhouse and Jones 1988); top down directives, (Maskit 2011); lack of trust (Scherer 2011); lack of time, deeper professional development (Kopcha 2010) and lack of proper teacher training (Hartsell et al 2010). These factors regarding the successful adoption and integration of technology by teachers are complex. In addition, each factor has a different impact (positive or negative) on the others depending on a teacher's beliefs and knowledge about technology (see Figure 2). Here one sees an inter-related set of circumstances that form potential points of resistance, with the educator in the center.

Hew and Brush (2007) further identify the barriers often encountered by educators, and classify them into six main categories including: 1) resources, 2) institution, 3) subject culture, 4) attitudes and beliefs, 5) knowledge and skills, and 6) assessment. Kopcha (2010) classifies educators' technology adoption and implementation barriers as: time, beliefs, access, professional development, and culture. The literature therefore revealed that many researchers found the same barriers, however had worded them a bit differently to fit their models or approaches in the integration of technology.

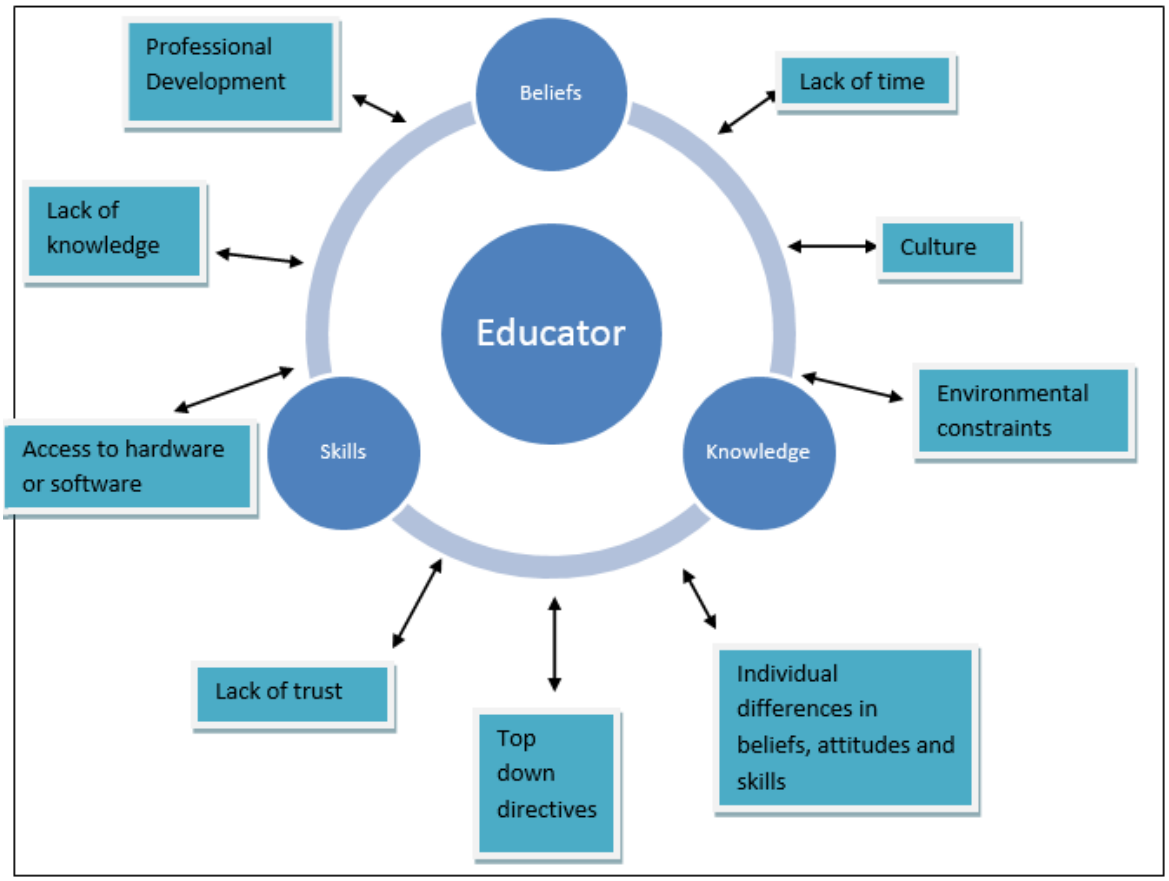

Figure 2 Reciprocal nature of assistive technology implementation barriers (Wilson, 2013)

Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur and Sendurur (2012) helpfully distinguish between two types of barriers that impact teachers' uses of technology in the classroom as *first-order barriers* and *second-order barriers.* *First-order barriers* are those that are external to teachers such as hardware and software, training, and support. *Second-order barriers* are identified that are internal to teachers, such as self confidence, beliefs about how students learn, as well as perceived value of technology to the teaching process. The studies conducted by Ertmer et al, (2012) demonstrate that second order barriers are the main gatekeepers of the technology integration process in classrooms; not first order barriers.

Further, in a meta-study conducted by Hew and Brush (2007) they found that the three most frequently cited barriers impacting technology integration are: 1) resources, 2) teacher's knowledge and skills, and 3) teacher's attitudes and beliefs. Similar findings amongst educational researchers demonstrate that an educator's attitude and beliefs, knowledge and skills and professional development play an important role in successful technology integration in the classroom. Having an understanding of these barriers leads to identification and implementation of strategies to help overcome those barriers. A large part of affecting change in the school system requires educators to shift their attitudes and belief system in order to be able to integrate assistive technology and its use into their pedagogy.

Professional Development

For the purpose of this paper, *professional development* will be recognized as Maskit (2011) describes: "as a life-long dynamic process that occurs throughout [an educators] professional career" (pg. 852). *In-service* is a term used broadly to include any professional development after one's initial training period (Woodhouse and Jones, 1988). The literature indicates that professional development is an important factor in the change process. It is through continual professional development that teachers gain the skills and knowledge to affect change in their attitudes, and therefore, in their pedagogy. Maskit (2011) describes a five-stage model of career development. The career stages are as follows:

1. Exploration
2. Trial
3. Establishment
4. Maintenance
5. Preparation for retirement

They further point to and discuss their teacher career cycle model in relation to eight stages of teachers' professional development. The professional development stages are:

1. Pre-Service
2. Induction
3. Competency Building
4. Enthusiasm and Growth
5. Stability
6. Career Frustration
7. Career Wind-Down
8. Career Exit

Maskit states that "the significance of identifying the professional stage in which the teacher is operating is underscored throughout the literature as a helpful tool for planning efficient professional development for educators" (pg. 852).

Maskit (2011) conducted a study to determine to what extent teachers at different stages of professional development hold different attitudes towards pedagogical changes, in terms of cognitive, emotional and motivational aspects as well as in terms of a comprehensive attitude. He conducted a quantitative study which encompassed the use four measurement instruments, namely two questionnaires, self-reporting and open interviews. The results of the study are significant to anyone planning professional development activities for educators because knowing where a teacher's attitude is in relation to their career stage will set the difference between an effective and an ineffective professional development activity. Utilizing the two stage models – career and professional development, the study examined teachers' attitudes toward pedagogical changes at different stages of their professional development. The data found that there is a positive rise in attitudes towards pedagogical change between the stage of induction and competency building, a drop in attitudes towards pedagogical changes when moving from the stage of enthusiasm and growth to that of stability and a further drop when moving into the stage of career frustration and career wind-down. Figure 3 plots the teachers'

attitude profile in relation to their stage of professional development. The results of this research highlights the significance of the stages in continued professional development, and its influence on teachers' attitudes towards pedagogical changes.

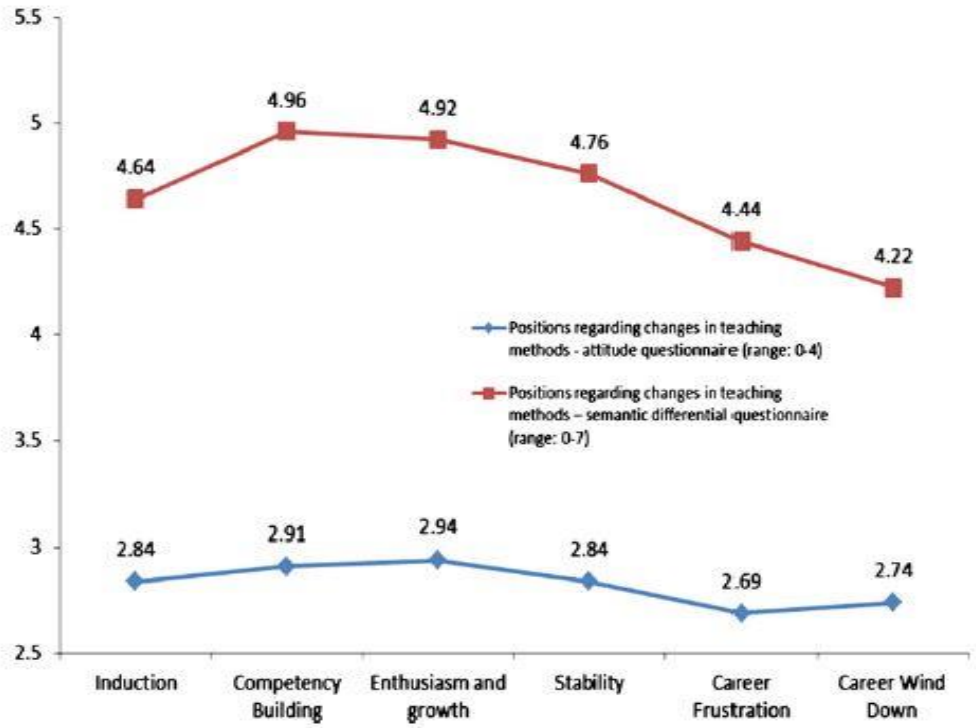

Figure 3 A profile of teachers' attitudes towards pedagogical changes in relation to their stages of professional

Changing Attitudes and Beliefs

Mentoring

There exists a large and growing body of literature regarding the subject of teachers' attitudes and beliefs towards pedagogical change. The barriers towards technological adoption and integration, discussed above, can potentially be overcome. For instance, teachers may not be adopting student-centered pedagogy because they lack the knowledge needed to do so. Kopcha (2010) emphasizes that managing barriers to technology integration is complex. The author claims that using technology in student-centered ways "enhances curriculum, motivates students

to learn, and improves student learning of subject-specific content" (pg. 176). In the article he states that *mentoring* had been found to overcome many common barriers to technology integration. Mentors provide teachers with "just-in-time" support while they integrate technology into lessons they were actually teaching. The author found that this support improved teachers' level of confidence and creativity which then translated into higher levels of motivation and self-efficacy for them. Dumont et al, (2012) discussed the theory of socio-constructivism in which learning is understood to be shaped by the context in which it is situated, and is actively constructed through social negotiation with others. They claim emotions are a primary gatekeeper to learning; where positive emotions encourage learning and information recall, and where negative emotions have the potential to disrupt learning. Motivation helps educators and students acquire knowledge and skills in a meaningful way. Further, the presence of positive motivation increases the likelihood that "deep learning" (pg. 4) will take place. A mentor model then, has the potential to shift an educator's attitudes and beliefs when integrating assistive technologies in the classroom as it aids in teacher motivation.

Systems-Based Mentor Model

Kopcha's (2010) *systems-based mentoring model* (see Figure 4) moves teachers through four specific stages of technology adoption toward using technology to support student learning in more student-centered ways. Kopcha (2010) claims using a system to facilitate the process of technology integration is important because it helps the mentor accommodate the complex evolutionary nature of the process and individualize each teacher's process of learning to integrate technology. This model uses mentoring as the main approach to professional development. The model's four stages are: 1) initial setup, 2) teacher preparation, 3) curricular focus, and 4) community of practice. It is the small steps along the way in this model that are the

stages for technology integration. They all work together and towards the goal of supporting teachers as they learn how to integrate technology in a way that supports student learning.

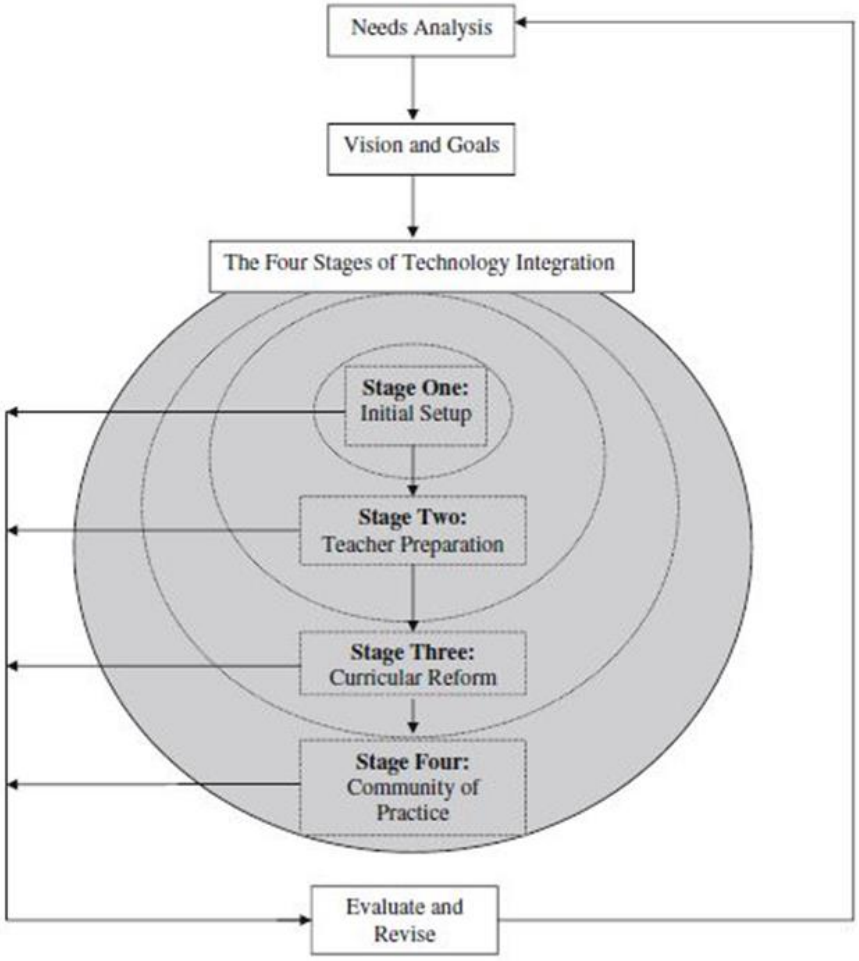

Figure 4 Systems-based mentoring model containing the four stages of technology integration

Coaching

Another approach educators can use to improve their pedagogy is what Scherer (2011) refers as *coaching*. Coaching is a way to get educators to reflect and improve upon their theoretical knowledge and pedagogical practice by 'pondering' on what they used to think and do, and to be open to changing their minds. The role of a mentor can easily fit within the description and role of a coach. As Scherer (2011) states, helping educators learn from one

another boosts teacher effectiveness, enhances student learning, deepens subject expertise, and improves relations.

In Fullan and Knight (2011) article, they report that school systems in developing countries that improved from great to excellent in student success and achievement focused 78% of their interventions on professional learning and only 22% on accountability. It was concluded that "once the capacity of teachers reaches a certain level, peer culture becomes the source of innovation and energy…thus peers become change agents" (pg. 53). This is good because part of a coach's role is to help develop a peer culture while linking them to the bigger system. They further state that "the work of coaches is crucial because they change the culture of the school as it relates to instructional practice" (pg. 53).

Stages of Concern Model

Woodhouse and Jones (1988) introduce us to their *Stages of Concern Model* that measures and analyzes the concerns of teachers about educational innovations such as assistive technology integration. This model claims that if the content of a training program is related to the level of concern of the learner, then there will be change in both the level of concern and the attitude towards the innovation. The authors claim many in-service activities are not successful and useful because the designers fail to take into account the existing developmental stage of the participants' attitudes, understanding and skill in relation to the technology. The Stages of Concern taxonomy of reaction to innovations can be described as:

Awareness – coming into contact with computers and educational software

Information – gathering facts about computers in the classroom

Personal – concerns with the impact of computers on self

Management – using computers in the classroom

Consequence – concern about the effect of computers on students and subject

Collaboration – interacting with other teachers using computers

Refocusing – refining classroom use of computers

Woodhouse and Jones (1988) further state that passage through these stages involves a significant period of time. Similar findings are present in the literature; that it takes time to see any change in attitudes and beliefs. Not only does it take time but, as mentioned above, each person progresses through the stages at different rates according to differing stages of career and professional development.

Woodhouse and Jones (1988) summarize a number of different scenarios/lesson plans showing how the stages of their concern model could be applied in order to build confidence, knowledge and skills for teachers and their adoption/integration of technology. Themes that emerged from their article include the use of a mentor system or a 'critical friend' to provide structured feedback and curriculum advice, and the importance of collaboration amongst co-workers.

Summary

In this literature review I discussed the importance of assistive technology adoption for learning, focusing on educators' personalized learning, the barriers to implementation, professional development, changing attitudes and beliefs, and the stages of concern model in relation to supporting teachers' understanding and implementation of assistive technologies in classrooms for students' success. My project, discussed in detail in Part 3, will report my findings of the Kurzweil 3000 software program workshop I developed and offered to educators in my school district for introduction to and experience with the assistive technology software program. This literature review was a guide which provided invaluable information in the

planning and executing of the workshop. Shifting attitudes, building capacity and improving pedagogical skills is a journey, and as Levin and Fullan (2008) so eloquently state, requires hard, patient, unrelenting effort over a period of years.

Chapter 3

"The three secrets of effective communication – repetition, repetition, and repetition"

Ben Levin and Michael Fullan (2008)

The Starting Point

In an effort to understand and make sense of my project, and to inform my practice, I undertook case study and action research methodology as my main approaches to my study. These methodologies fit well with my role of assistive technology support in the district I work in, especially action research, as a need has been identified for change to educators' pedagogies in relation to using assistive technologies in the classroom. My project consisted of creating/developing and implementing a few Kurzweil 3000 workshops for educators in my district for introduction to and experience with the assistive technology software program. Further, I created and implemented a few Kurzweil 3000 software workshops for students, in order to observe and understand their take and use of the software. The case studies provided me with thick descriptions representing the participants' point of view, while also provided rich data in which I could then use interpretive analysis to determine if any patterns of attitudinal change emerged from attending my workshops.

The district I work in is rather rural, and the position I hold is the first of its kind. I am working from a grassroots level, passing many roadblocks and hurdles along the way. In my discussion with professionals from other districts, it appears these issues are not my community specific, other districts appear to be struggling with variations of the same issues. Even though these issues are faced by other districts, there is a rural component to the issues faced by my

district as there are not a lot of other people to learn from; a few technology keen teachers and my position is it. Further, geographically, there is much travel time between the different schools in my district, some even necessitate a ferry ride to visit. Not only am I really the only one, also, there is a lot of territory to cover in order to support educators.

My District

As noted above, my district possess a rural component to the issues its' faced with. The population of the north island is scattered across a wide distance and through many communities. Further, the communities of the north island are faced with many socioeconomic issues such as unemployment, poverty, drug and alcohol abuse, low income families, single parenthood and are comprised of many diverse cultural backgrounds. There are many layers that apply to and are distinct about each separate north island community. We see the culmination of this in our schools. Our north island communities also see the highest suicide rate amongst its youth population as compared to others communities in British Columbia. There is also a larger than average issue with drugs and alcohol use within our communities. The Vancouver Island Health Authority engaged in community consultations a couple years ago to produce a report which addressed some of the addictions issues and to help identify possible community-based support systems already in place to help support its members. The statistics surrounding addictions issues were staggering compared to the provincial average. Collaboration between community-based services and school-based services ensure students have access to the services they require in a somewhat fashionable time frame in our district. As one can imagine though, the services are stretched pretty thin. This is definitely a unique area with unique issues. Furthermore, we have a shrinking population on the north island since major industry has either slowed down and/or ceased to operate. This in turn has caused our district to close down schools district wide

and to combine two elementary schools into one building in my home town. Our school district will be facing more budget cuts in the next couple of years, which means less personnel and/or available services for the students. It is important to note that each North Island First Nation community operates their own private band school.

Our Special Services Department, in our district has above the provincial average of students who require support services in classrooms. For various reasons there are many students who are not funded, yet, they require the services. This really puts a challenge on the schools to offer supports in a creative manner for these students to support their learning needs. Using assistive technology is one way that meets the learning needs of some of these students. Our district recognizes the distinct issues the schools face and has recently embraced the Response to Intervention and Instruction Model (RTi) in an effort to ensure all students have the opportunity to learn in a manner best suited to them. It is rather exciting from my perspective to see this shift in the way of doing "business" as I can see how it will become effective for students as soon as educators become more aware of the guiding principles and benefits of this shift in pedagogy. I can see how this model will ensure no students are lost "in-between the cracks" of the education system. Our schools are working hard to get RTI implemented.

Our educators are a diverse group of people, and as noted earlier, educator is defined in this paper as all adults who work with students in our schools. Our district has some very long standing teacher members who are close to retirement, a few new younger educators, and a large group of aging support workers who have worked in this school system for a long time. I think it is safe to say that there is burnout within the educator pool. This group of educators all range in their ability levels to address the learning needs of students; some have more skills than others and some are more willing than others to learn new skills. Given our rural flavor, it is also

difficult for some of the educators to build on their skills as innovative training and professional development opportunities available locally are far and few in between and any travel necessary to attend out of district training is costly. Each school has their appointed learning assistance educators, usually 2 or 3 within each school dependent on student numbers. These educators are required to have more specialized training in special education, however, they face the same issues as all other educators in the district with professional development opportunities.

With the recent onslaught of available online training opportunities such as free MOOC's (Massive Online Open Courses), social media professional development through building personal learning networks (ex: Twitter), school inquiry-based learning and more availability of distance education opportunities, the professional development gap is narrowing. With this narrowing gap, more educators have the opportunity to be embracing this type of professional development and be self initiating in order to increase their skill set to best help support student learning; there really is no reason why these opportunities are not being embraced by educators, other than self-motivation.

My Goals for the Workshop

When I began to plan for the workshop I was designing, I thought about where the educators I had met thus far in my role as assistive tech support were in their learning curve, their career cycle and their ability level. I soon realized I needed to begin with my training program at what I called the 'basement' level. I needed to address the lack of computer skills some educators were facing, and I'm talking about really basic skills such as, how to check their school based email and things like file management: how to open, close, save and find/retrieve files. This is not to say all the educators where at this starting point, but there were definitely

some, and these are the adults who work closely with students. I decided to design my workshop for a person who did not know anything about either the software program Kurzweil 3000 or how to manage their file system on the computer. I figured that if someone attending had some of that knowledge then my workshop would have been a good review or refresher course for them too. My goals for the participants were to ensure all attendees knew about: 1) the basics about file management, 2) the main features of Kurzweil 3000 and examples how to use it in their pedagogy, 3) copyright law as it pertains to downloading digital files, 4) my role as assistive tech support and how I can support them, 5) where to turn to for help, and 6) to be motivated, empowered and excited to start incorporating technology, especially Kurzweil 3000, in their pedagogy to see more successes with student learning. The reasons I chose these goals were to have as many educators as possible at the same, or relatively the same, starting point because that would afford me a lot of saved time in having to repeat myself over and over again with anyone requesting further training if they did not know some of the basics. In my mind it made sense to give everyone the same basic information and then work up from that. One of the goals I set for myself for the delivery of the workshop was to be really clear with the topics, to use common language and explain in detail, so everyone could understand and grasp what I was presenting them with. I ensured this was happening during my presentation because I would periodically stop and ask the participants to repeat in their own words what we had just discussed and allowed room for questions if they had any.

The Workshop

Figure 5 Title slide

I struggled with how I was going to deliver my presentation. I knew I would have participants with all sorts of different learning styles and abilities in attendance. I settled with a presentation that would reach as many of those learners as possible. I designed my workshop with a 36 slide PowerPoint presentation as the focal point, shown on a SmartBoard, and with me giving my 'talk' as I advanced the slides. Once this part was done, then I purposely built-in a hands-on component for the participants with time for them to sit at a computer in the same room as the presentation so they could try the program and I was there to offer immediate assistance if they had questions. This was my effort to engage the participants and for them to try some of the

things they just learned in the presentation. I offered my workshop a couple of times, each time I ensured I had booked a room for the workshop with a SmartBoard and a bank of computers. I knew I would have to relay a sound presentation because this was my groundwork; paving the way and setting a solid foundation to accepting a different way of doing 'business' for educators in my district. I had to do it right, and it had to be done right the very first time. I had to 'sell' the idea. I set very high standards for myself and in turn, perhaps raise the bar for the participants too.

I also had available print documents for participants to review should they be interested. The print documents were copies of copyright laws, copyright matters document, copyright information for teachers, and the fair dealings guidelines among a few other documents. I also supplied the workshop participants with a master list of all the hyperlinks from the presentation so they could review the items on their own time based on their own interest levels. I included this document in an email to them after the workshop along with a workshop questionnaire/survey for evaluation of the presentation and my delivery of it. I asked them to return it to me as soon as possible. Instead of appending the whole PowerPoint presentation to this paper, I will discuss some of the slides I feel are more important in further detail.

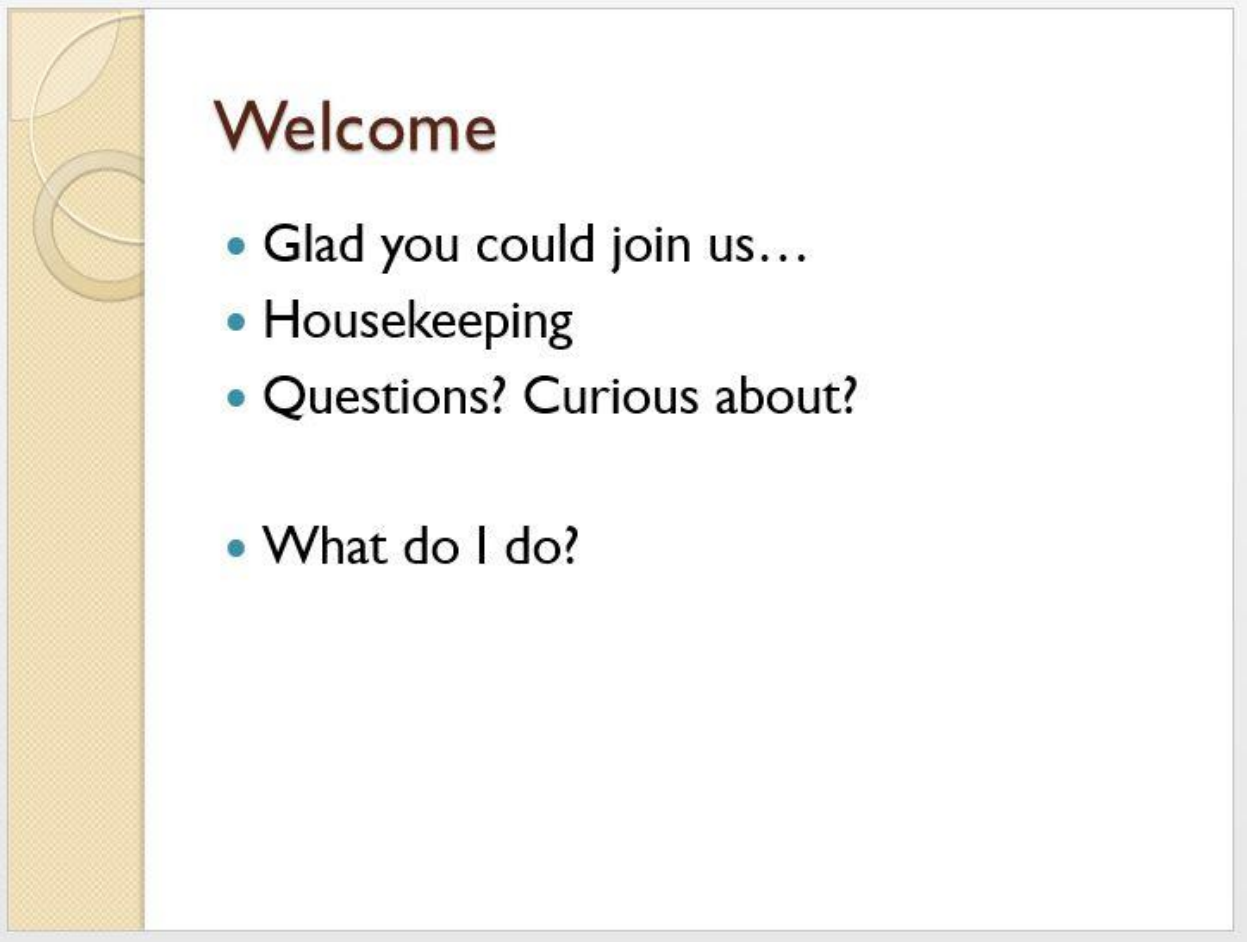

Figure 6 Welcome

With this slide (figure 6), I wanted to begin by asking what questions the participants were coming with to the workshop. I wanted to make sure that I heard from everyone in the room and I wanted to ensure their questions or curiosities were going to be addressed during the workshop. I made a list on a word document I had opened up on the SmartBoard. See figure 7 below.

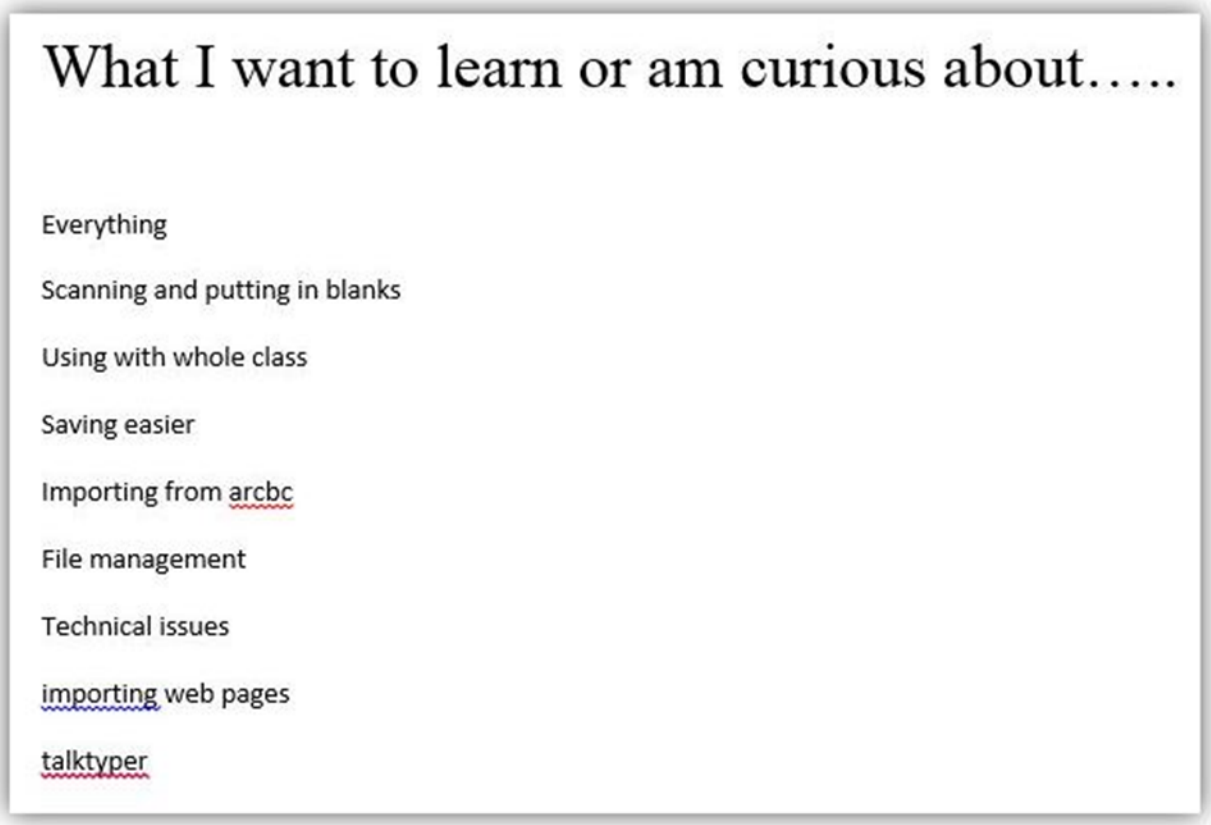

Figure 7 Learn More Word Document

Each time I navigated away from the PowerPoint on the SmartBoard, the Word list was visible so we revisited the list a few times throughout the presentation and talked about the answer and how we got it. I really wanted to have a flip chart or a whiteboard to write on in the room so these topics could have been visible the whole time and revisited more often, but I had to make due with what was there, which was just the SmartBoard and my laptop. I really felt it was important to have the participants input into what they wanted to know, and not just what I was spewing out to them. I really believe in engaging participants so they do not become bored, because if they are bored, they would take that message out with them to their colleagues and my workshop would have had a negative effect, the opposite of what I was striving for. My goal

was to motivate the participants and have them ‘buy in’ into the software and to see the real benefits to them in their work with student learning. Then I introduced my role in the district.

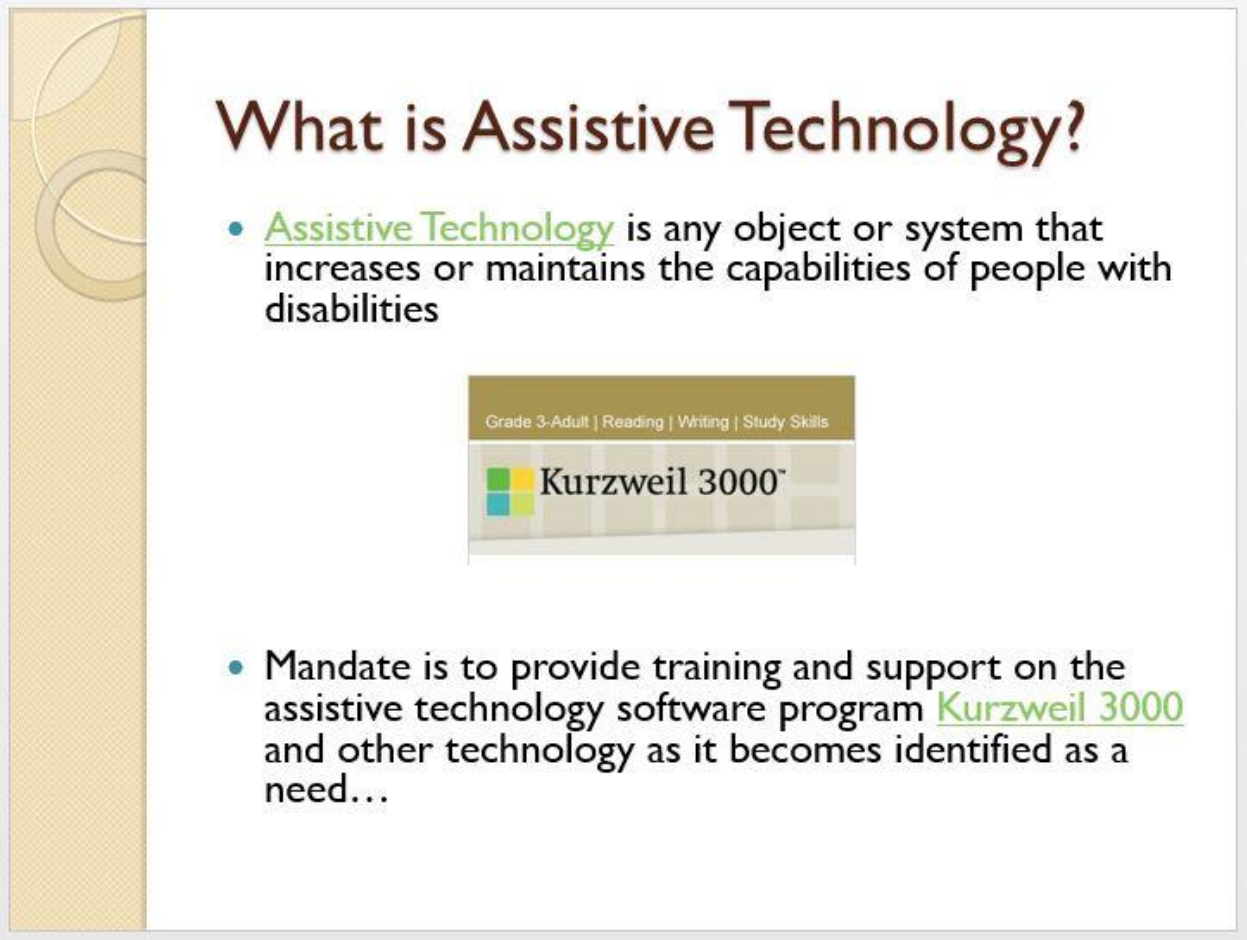

Figure 8 Assistive technology slide

I introduced the topic of assistive technology, making note of defining the difference between assistive technology and adaptive technology and a brief note as to what my jobs mandate is. I included a few hyperlinks that I navigated to as I was explaining and giving my talk on this slide. I gave them the ‘formal’ description of my job, as detailed in the job posting. Once they understood this, I began to explain what I *really* do.

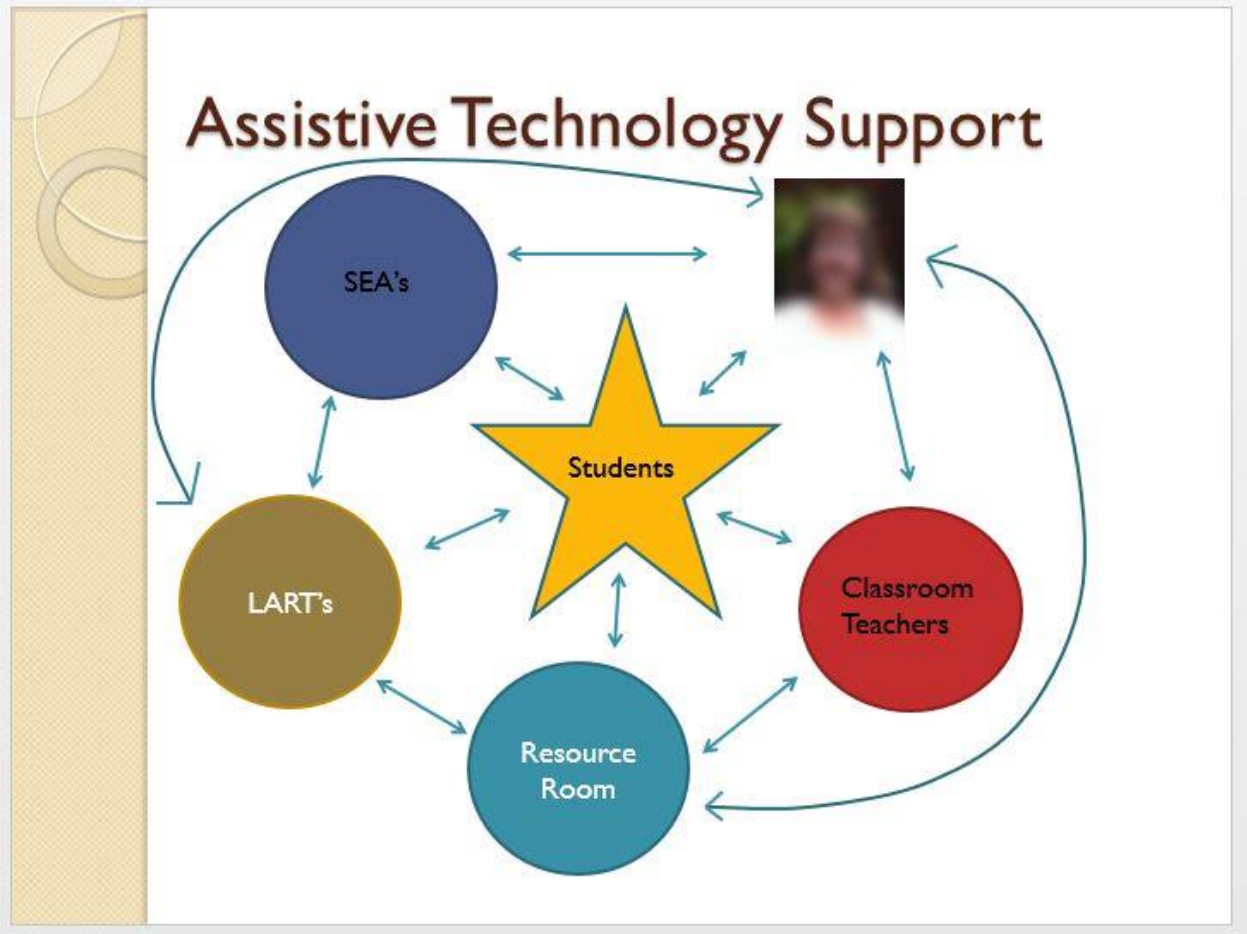

Figure 9 AT support

I continued and explained the reciprocal and interconnectedness nature of my position and how it "fits" in the school system and how I am in contact with everyone. Sometimes it is hard to get a verbal message across to people, thus providing them with a picture, or visual, helps them with clarity and we then are both at the same understanding. I really wanted to be clear with what my role was with the educators, in hopes they would see me as a resource and utilize my services rather than thinking I was going to place judgment on their teaching when I came to work in their classrooms. I did not want them to perceive me as a threat, rather as help. In order to maintain my privacy, I opted to blur out my picture in the slide above, it was not blurred out in the presentation. Figure 10 is another visual depicting how interconnected all our positions are

and the reason we are all working together, to support students with their learning. I was hoping that by emphasizing the interconnected nature of our roles, that collaboration and the importance of collaborating with fellow co-workers was a theme that would come up for the participants. I wanted them to figure this out as opposed to me telling them 'everyone needs to collaborate' because in order for some people to accept this idea, they need to think about it and come up with that for themselves. They need to see that what they have been doing may not be working for them or their students and by giving them suggestions and ideas, such as using assistive technology, may spark a thought for them and they may be open to try something new.

Figure 10 Interconnected Visual

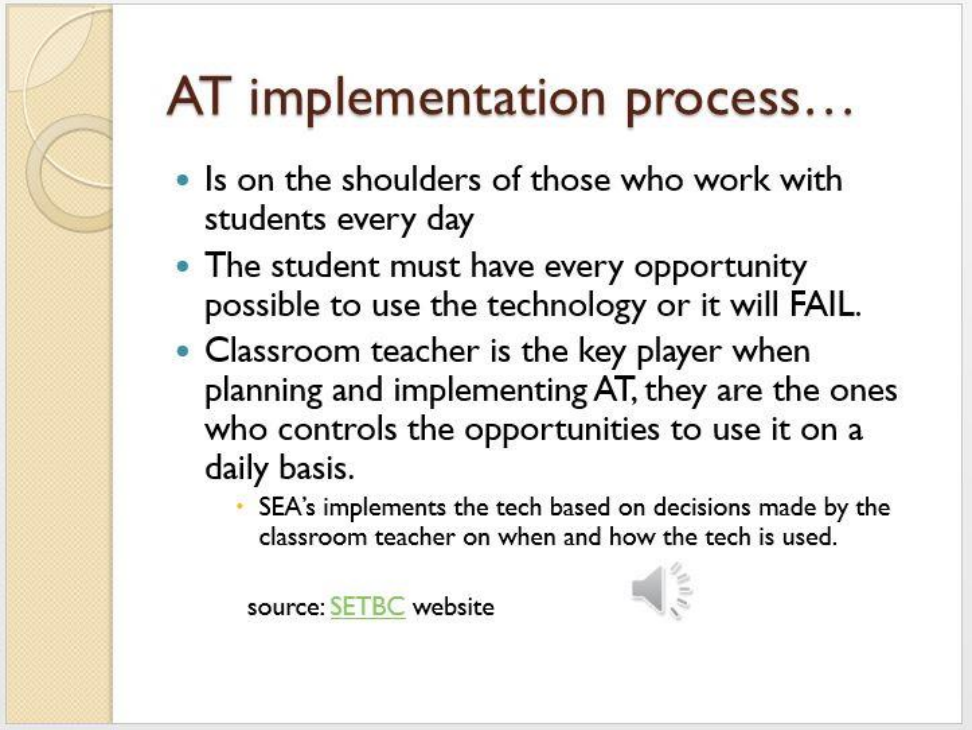

Figure 11 Implementation process

The slide associated with Figure 11 is where I feel I began to really start to make it clear about whose responsibility it was to initiate the use of assistive technology. I really wanted to be clear with whose responsibility it was to ensure that assistive technology was implemented, I can't stress this enough. I did not want to relay any messages that could potentially cause a 'blurring of the lines' in the responsibilities between a teacher position and a support worker position. I feel it was important to do this because some support workers take on responsibilities that are not within their job description but feel if they don't do it, it won't get accomplished. Some teachers have no problem with this occurring (allowing support workers to take on more responsibilities), however this is where problems start to surface as it is not a support workers responsibility to do this, it is the classroom teachers' responsibility. Classroom teachers are the key players when it comes planning and implementing assistive technology, they are the ones

who controls the opportunities to use it on a daily basis, and they are the ones providing curriculum for the students. They are the ones who make the decisions, this is a boundary that must be adhered to, and ultimately they are the ones paid to do that.

Figure 12 Accessible Resource Center (ARCBC) and figure 13 Special Education Technology – BC (SET-BC) were included in the presentation in order to clear up long standing confusions about what each entity does or the service it provides. I cannot express how many times when I am out in the field that I have to explain the two different organizations to educators. It amazed me how many times I had to repeat the same information to people, thus, I felt it had a well deserved spot in my presentation. Again, I wanted to be really clear to the participants what services were available from each organization in order to debunk the confusion surrounding those services.

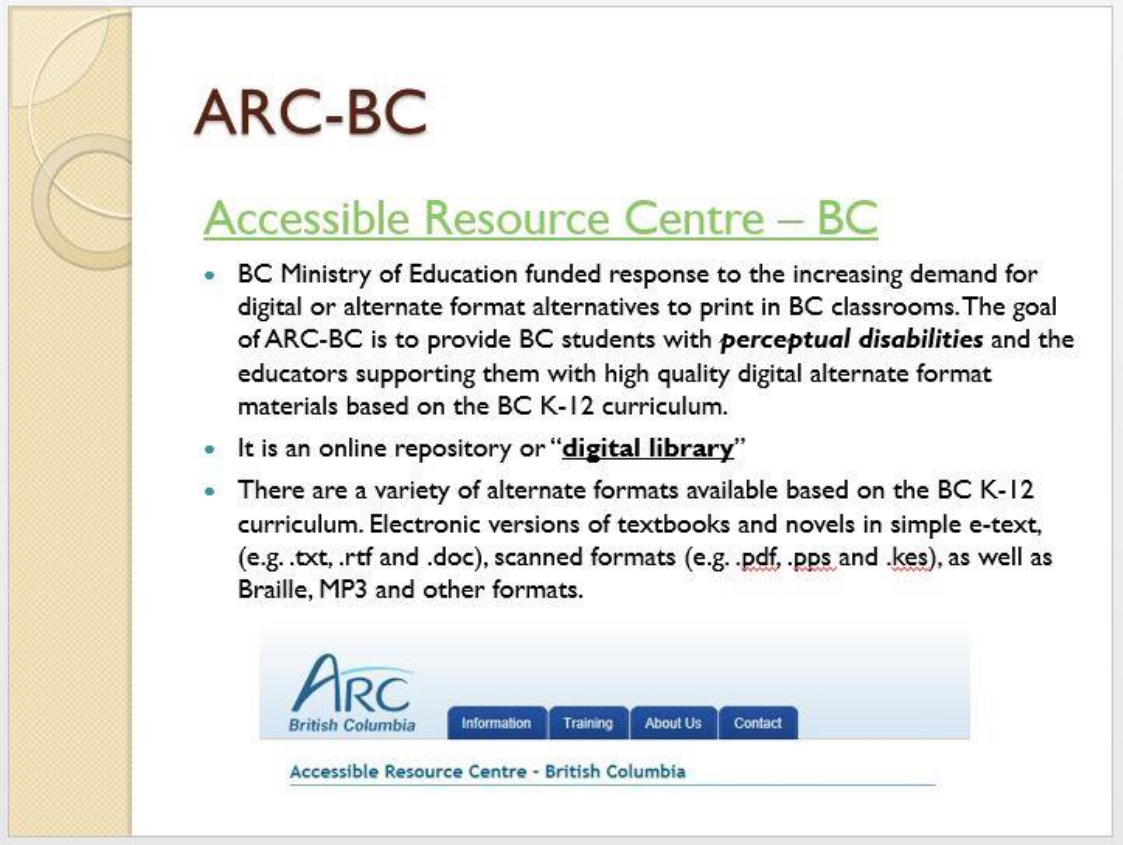

Figure 12 ARCBC

Figure 13 SETBC

One of the goals I had set for the participants of my workshop was to ensure they knew how to perform some of the file management functions in computers. One of the more important functions I chose, based on my experience working in the different schools and seeing where some errors were being made, was knowing the difference between 'save' and 'save as'. I showed the participants how to save their work on a USB (stick) drive and how to save to the shared server as our district utilizes this type of system. Once they knew how to save their files properly, it was rather easy finding them to open them again. I also stressed that file management was something that would be the same if they were using Kurzweil 3000 or Microsoft Word, it was the same procedure. Figure 14 outlines some of the topics I discussed

with the group of workshop participants. Most of the participants were comfortable with this but some did not know the difference between saving and saving as.

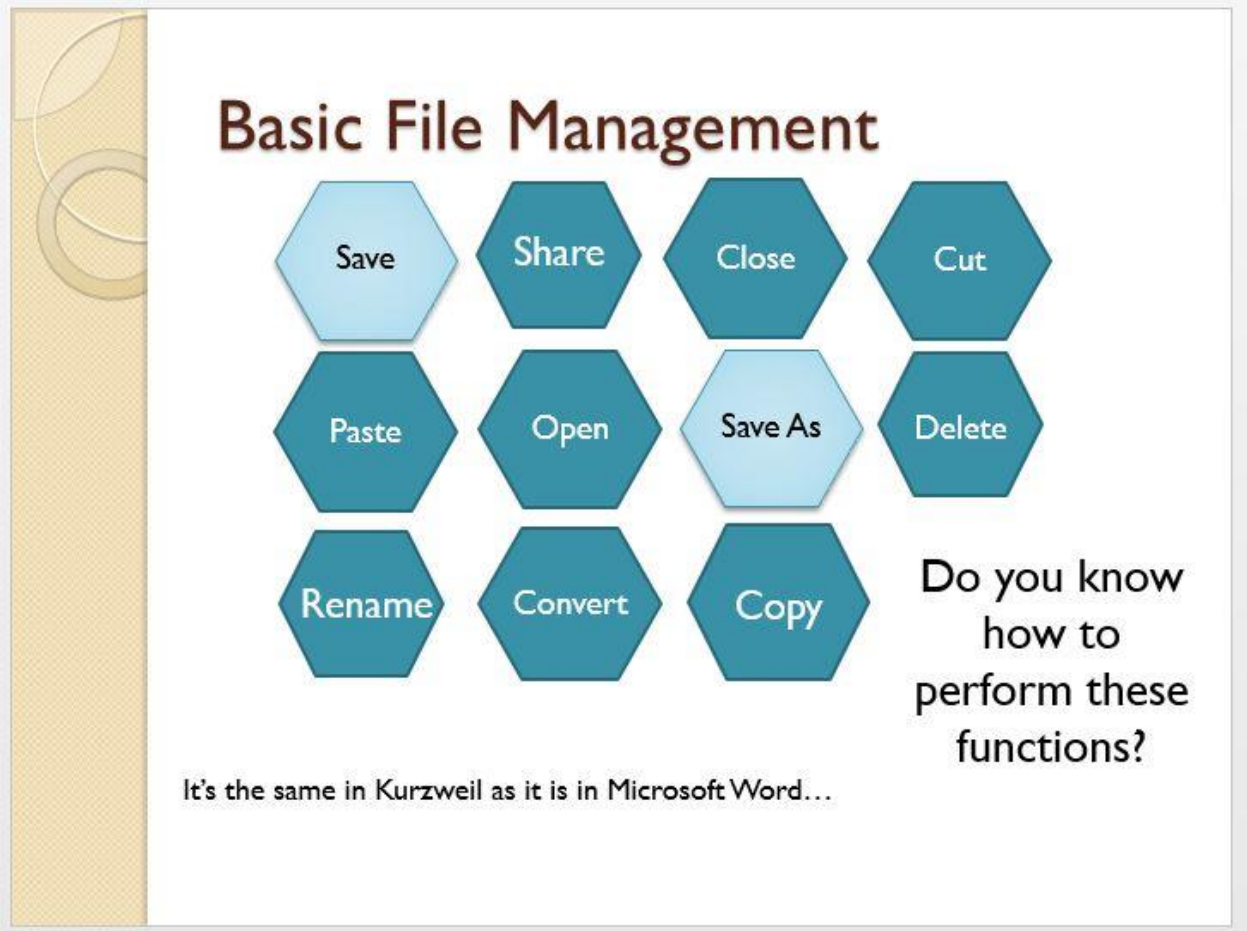

Figure 14 File management

I felt once I had covered the above slides, I had given the group a fairly good introduction to being able to incorporate assistive technology in the classroom. The next part of my presentation discussed the actual software program Kurzweil 3000 in detail.

I began this part of the presentation by giving them the background information on how the software came to exist. I gave them information on who the inventor was (Ray Kurzweil) and a brief talk about the history of the software and how it evolved to what it is today. See Figure 15.

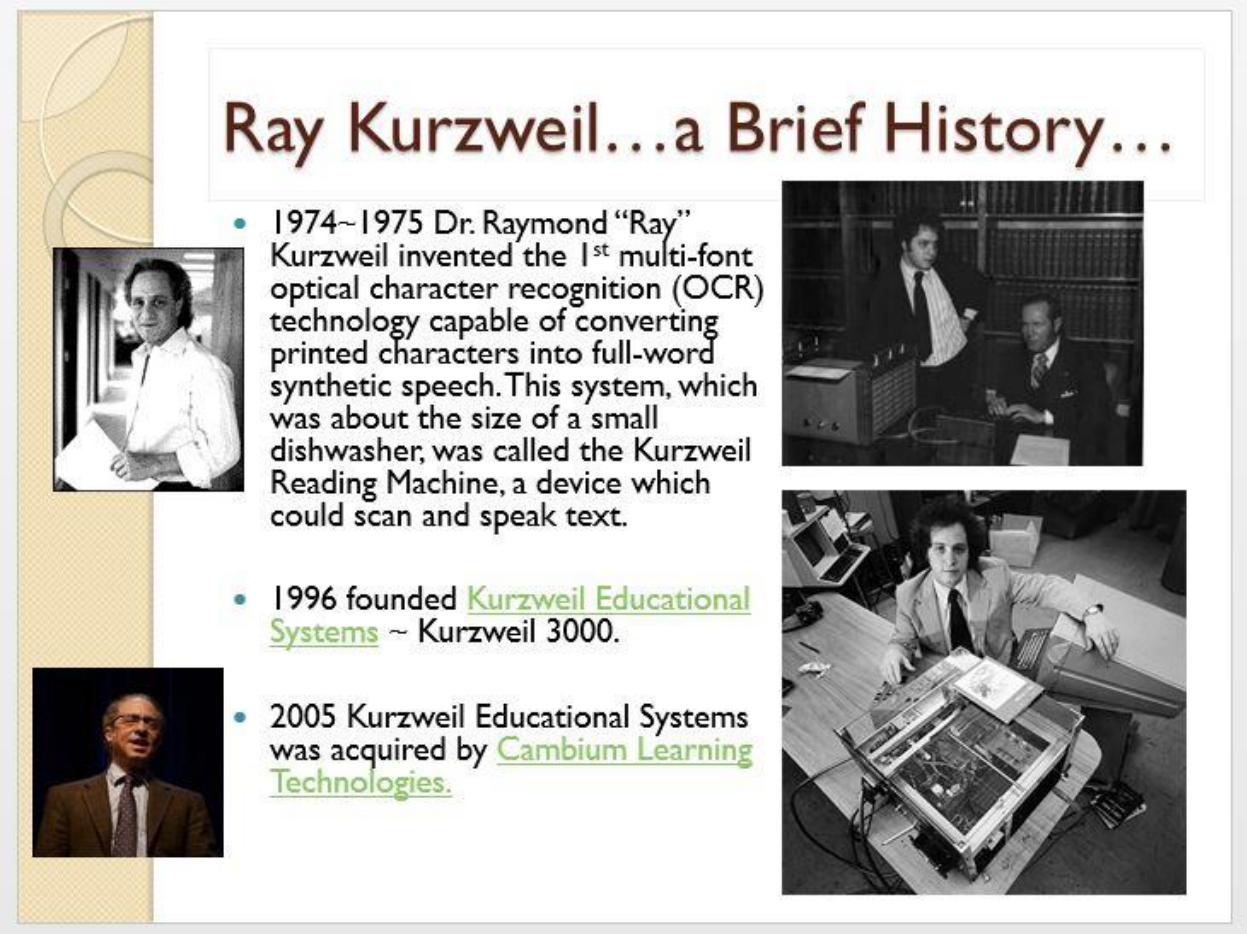

Figure 15 A brief history

I felt it was viable to show the history and the importance of the software program to ensure the participants knew the extent and value of expertise that went into developing it, its purpose for being developed and to the extent this powerful, and in-depth program really was and how it could be used. By knowing some of the history, it was my hope they would value it as something that has been tried and tested over time and it is still as relevant now as it was back when it was invented. It is a proven software program designed to assist people in need with reading, writing and study skill functions. This slide lead into my discussion of explaining what Kurzweil 3000 is and how it can be used with students in classrooms to promote independency and student successes. See figure 16.

Figure 16 What is Kurzweil 3000?

You may notice on certain slides there is a speaker icon located within the text or diagrams. In an effort to reach as many of the participants as possible, I also designed my workshop based on the Universal Design for Learning (UDL) framework. UDL is a set of principles for curriculum development that give all individuals equal opportunities to learn. UDL supports diversity in a classroom. I needed to ensure I provided multiple ways of how I represented what I was teaching to this group of participants in order to [hopefully] reach all my participants so they could be successful, independent learners when it came to using Kurzweil 3000. The three core principles of UDL are:

- Multiple Means of Representation (the 'what' of learning)
- Multiple Means of Engagement (the 'why' of learning)
- Multiple Means of Expression (the 'how' of learning)

By using the UDL framework in my workshop, I was also able to effortlessly explain that Kurzweil 3000 is also a tool that supports UDL as it offers students multiple ways of expression, engagement and representation of curriculum and student assignments. Again, this is another example of how I was trying to reach one of my goals by incorporating what I was teaching in my lesson to empower and excite my group of participants with the ease of using assistive technology to help support the diverse learners found in every classroom. See figure 17.

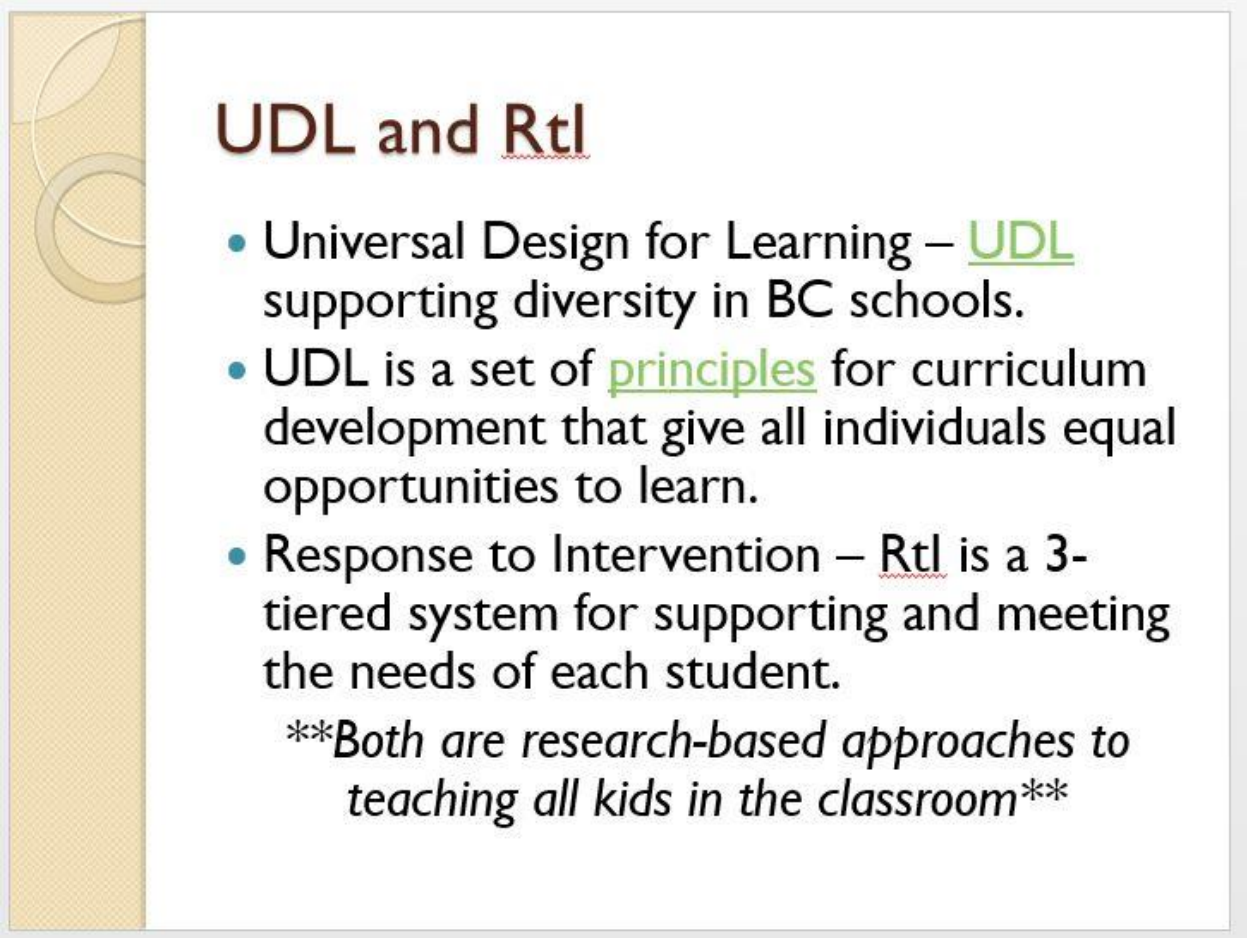

Figure 17 UDL and RTi

Figure 18 explains who typically the users of Kurzweil 3000 could potentially be. Essentially, any person can use the software program, it isn't designed in a manner that screams special needs. The platform is very similar to other software programs such as Microsoft Word or Publisher. It is very user friendly and easy to navigate and designed to be used by people of all ages. Albeit, people who have challenges, will find this software program invaluable in their daily work at school.

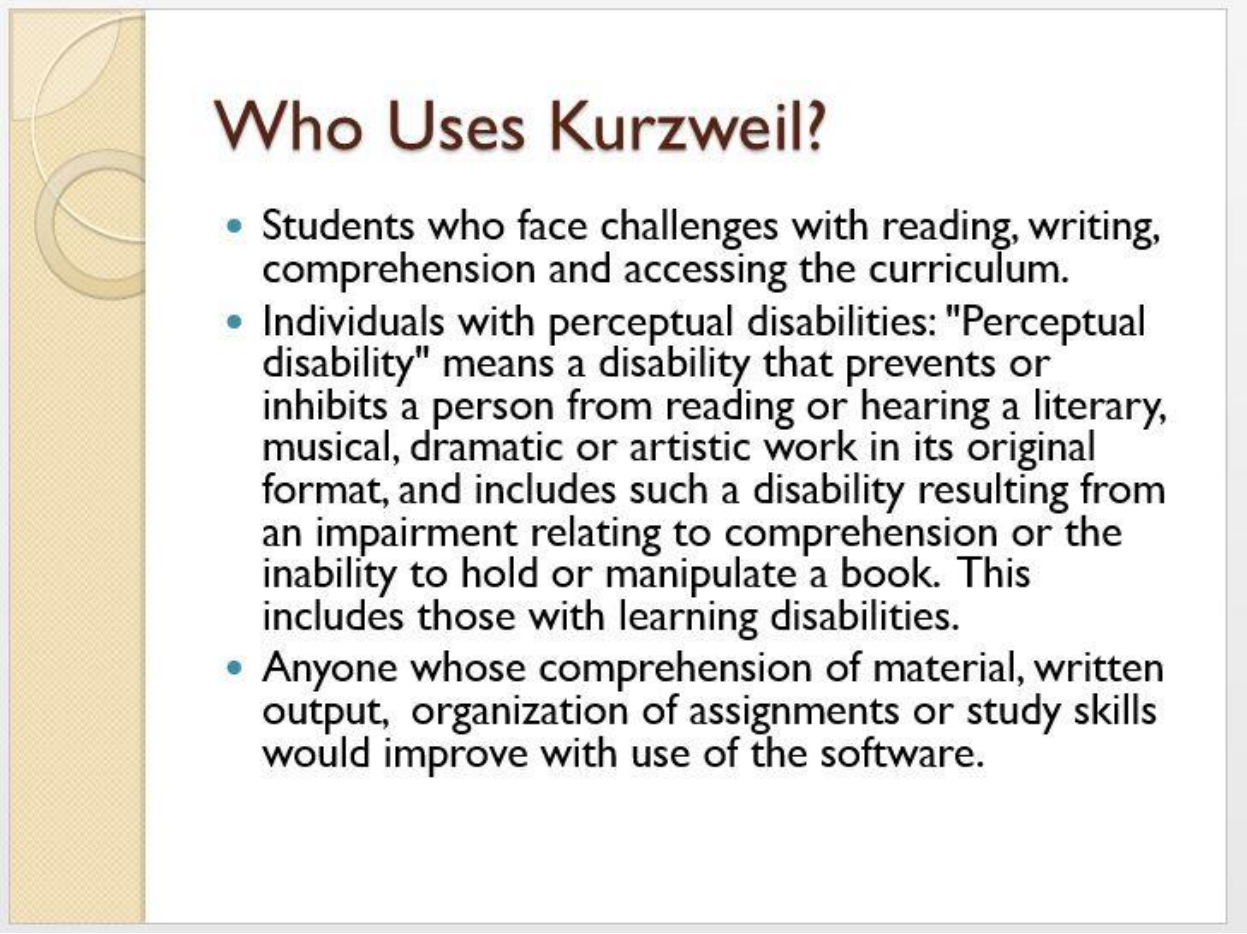

Figure 18 Kurzweil users

Figure 19 sets out the goals of the program. I felt it was important to clearly outline the goals of the software in order to emphasize the purpose and importance of using it, to strive for

independent learners. When students are empowered with independence, they rise to occasions, they have motivation and a sense of belonging and a sense of accomplishment with their studies. This in turn will facilitate more engagement and less negative behaviours in the classroom.

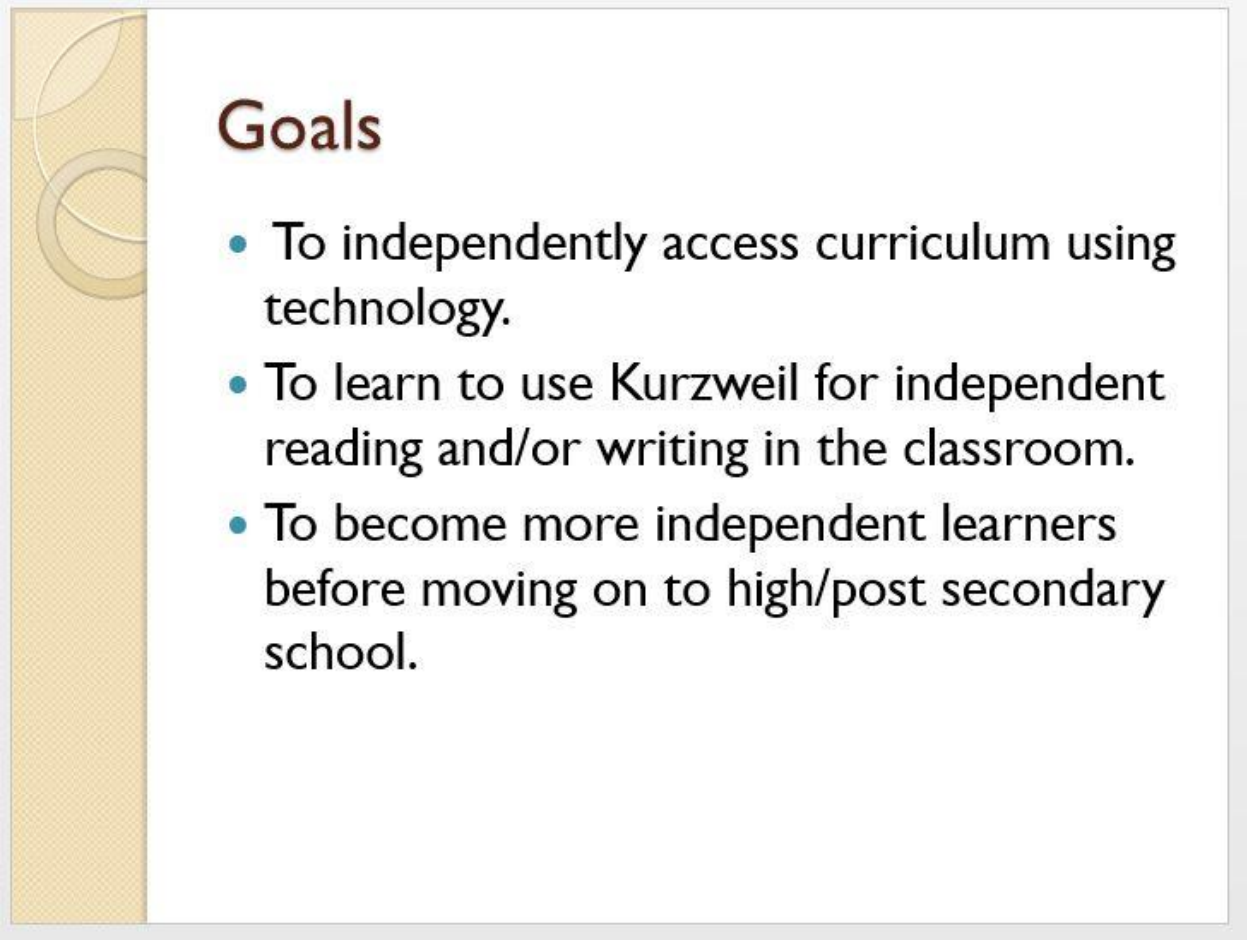

Figure 19 Goals

The remainder of my presentation, the next 8 slides in my presentation discussed the different features of the software program; the reading, writing and test taking functions and features. Within this I demonstrated how those functions worked by providing examples and working through them on the SmartBoard so everyone could see how and what I was doing. I attempted to include examples that were relevant to the participants in the group in hopes they

could easily see how to incorporate the program into their pedagogy. The program becomes that much more meaningful if educators see the program in operation in their context. This part of the workshop provided a lot of information and I ensured I paused many times to ask for questions from the participants.

As this was a whole day workshop, I ended the morning session with sharing out the different projects I'm involved with in the district that support student learning with Kurzweil 3000 and a brief sharing out of resources pertinent to the software. After lunch was the hands-on portion of time with the software, I offered a list of features to try out with the software as a guide for getting started.

To wrap up the workshop in the afternoon I reviewed the questions/curiosities the group had in the morning plus any other questions that arose from the day. I ensured I asked each individual participants what their thoughts and feelings were of using assistive technology before taking the workshop and their thoughts on how they could implement assistive technology now after taking the workshop…how they could imagine assistive technology incorporated in their pedagogy. I ended the session with giving them my contact information if they needed further support and also a demonstration on how to access the Kurzweil 3000 online help which is very detailed and supportive.

Next Steps

Since my initial workshop, I offered another workshop to educators and a number of group workshops to students. I redesigned the student workshop as they did not require as much of the foundational information, I simply went over the program feature and functions with them and gave them ample opportunity for hands-on time with the program. Another reason for this

change was because I was afraid of losing the student's interest if the workshop became long and boring to them, I wanted to ensure this was a program they were wanting to use. I wanted their initial introduction to the program to be a positive experience for them. As for the educator workshops, for any future sessions I hold, especially for the group that has already taken my first workshop, I will incorporate more advance Kurzweil 3000 features enabling them to further incorporate those features for their students. I would also like to go more in depth in using Kurzweil 3000 has a whole class teaching tool, especially for classrooms that have a SmartBoard installed. For example, instead of using a few laptops with Kurzweil 3000 installed on them in the class for struggling students, the teacher uses the resources on the SmartBoard for the benefit of the whole class. This way the students who really need the assistive technology will fit in with the rest of the class and not feel singled out, learning will become fun and motivating for them also. In the course of my job, I also plan to offer more lunchtime or after school mini session for educators to help answer questions or give demonstrations on more advance Kurzweil 3000 features.

Conclusion

As is demonstrated by the literature review, the integration of assistive technology is a complex phenomenon requiring careful attention to many factors; it is not an easy task. My inquiry for my Master's project was to discover how I could scaffold educational staffs' learning so they become comfortable with change and then focusing on this change and enabling an attitudinal change so as to develop an appreciation for the possible pedagogical change needed to support student learning. The research has demonstrated it is a complex task. This literature review and project has enabled me to think more deeply in my planning and approach in my role

as assistive technology support, in that now I must be aware of many other factors and their effects and their interventions when planning and supporting educators with professional development activities. To answer, in part, my guiding questions:

1. Why is educational staff so resistant to change when it comes to using assistive technology for student learning?

There are many reasons educational staff are resistant to change as noted in the above literature review. Kopcha (2010), Maskit (2011), Meuller et al (2008) and Hartsell et al (2010) discuss the factors which can potentially lead to becoming barriers to technology integration. An inter-related set of circumstances form those points of resistance. Ertmer et al (2012) distinguished between *first-order barriers* and *second order barriers* to technology integration and concluded that *second order barriers* (barriers internal to teachers) such as self confidence and beliefs about technology integration are the gatekeepers of effective technology integration. As uncovered in the literature review, educational researchers demonstrated that an educator's attitude and beliefs, knowledge and skills and professional development play an important role in successful technology integration in the classroom. In my role, having an understanding of these barriers will lead me to identify and implement strategies to help educators overcome those barriers and help to assess their 'location' within their professional development. This can be accomplished through thoughtful and trusting communications, collaboration, and planning effective interventions to suit their needs while working within their contexts. Hartsell et al (2010) explain, " not only do classroom teachers need constant instruction and assistance using various hardware and software application tools, personal self-aptitude and esteem are also essential criteria toward effective [technology] integration" (pg. 49). I feel it is important to note that Levin and Fuller's (2008) quote at the opening of Chapter Three states the three secrets of

effective communication – repetition, repetition, and repetition. I cannot stress how important it is, and integral to, forming working relationships with educators that communications, assurances and instructions be repeated over and over again to build self confidence and encouragement. This is what is needed for educators to effect change within themselves and become less resistant to integration of technology for student learning.

2. What needs to be in place for attitudinal change to occur?

In the preceding literature review it was noted that attitudinal change will begin to occur once the factors and interventions are personalized for the educator. Every person is operating from what Maskit (2011) describes as a different stage in their career, and from various stages in their professional development. Within my role, drawing from my child and youth care background and the theories of educational change, by allowing and giving the process time and genuine support will help to pave the road for educators, allowing them the opportunity for pedagogical change. My role is somewhat multi-faceted in that I also take on the position of what Kopcha (2010) describes as a 'mentor' and Scherer (2011) refers to as 'coaching'. The Stages of Concern model introduced by Woodhouse and Jones (1988) must also be taken into account because knowing how concerned and educator is about technology integration has a direct impact on their ability to integrate technology successfully in the classroom. As you can imagine, this is a process which requires time to unfold and is a multi-layered progression for educators through various stages and processes.

3. How can I support educational staff so they can reach a level of 'readiness'?

Every educator is potentially at a different level of 'readiness' within their career at any given time as there are many factors that can affect it. I can support educational staff by helping them overcome the factors identified as barriers through collaboration and genuine support in the

classroom. This will ensure the educator has a sense of self-confidence and will be motivated to try integrating technology in their pedagogy. Through designing effective personalized professional development activities using the Kurzweil 3000 software, I can ensure I am meeting the needs of the educator in their context, while working in a holistic manner within the systems of change.

"I can't go back to yesterday because I was a different person then."

Lewis Carroll, Alice in Wonderland

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