

**AN EXPLORATORY SURVEY OF TEACHERS' USE OF KURZWEIL
ASSISTIVE SOFTWARE WITH STUDENTS**

by

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KURZWEIL SURVEY FOR TEACHERS

Abstract

This exploratory study used an online survey in one British Columbia school district to determine (a) whether supports were needed to include Kurzweil assistive software when teaching students with learning disabilities, and (b) which specific supports were required. Kurzweil 3000 assistive software (Kurzweil) is aimed at individuals from Grade 3 to adulthood who experience planning, reading and/or writing challenges. Past research has found assistive software, like Kurzweil, to be a cost-effective way to increase independent learning opportunities (Chiang & Liu, 2011), engagement, and improve academic achievement for students with learning disabilities (Epps, 2007). Analysis of the 50 survey responses indicated supports were needed as part of four broad themes: Time, Supports for Teachers, Supports for Learners and Families, and Kurzweil Program Suggestions. Findings from this exploratory study could be used in the future to better support students with learning disabilities who use Kurzweil, and the BC teachers who educate them.

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Chapter 1

Introduction

Kurzweil 3000 (Kurzweil) software is an assistive technology tool for individuals ranging from Grade 3 to adulthood. Kurzweil can help users with reading, planning, and writing, allowing for potentially greater academic success and independence from adult support such as Educational Assistants (EA) and Teachers. Kurzweil is not a new program, it is often found in many school districts across British Columbia (BC). In the school district where this current research was conducted, various versions of Kurzweil have been available for many years. However, according to two Special Education Technology British Columbia's (SET BC) consultants, a District Technology Integration Support Coordinator and an Integration Support Teacher, Kurzweil is often underused to support exceptional learners in this school district.

As teachers attempt to differentiate instruction and meet the needs of the wide range of learners in today's diverse classrooms, a tool such as Kurzweil can not only support learners, but it also has the potential to assist teachers with differentiating instruction to meet the needs of all learners.

The purpose of this exploratory survey was to (a) review the research on Kurzweil 3000 and assistive technology in general, and (b) investigate if teachers required any supports in order to include Kurzweil when planning for and teaching students with learning disabilities (LD).

Background of the Project

Exceptional learners demonstrate varying degrees of differences in physical, intellectual, communication, social, emotional, or a combination of these behaviours (Winzer, 2008). Individuals with learning disabilities are described as having average or higher cognitive abilities but who experience deficits in attention, memory, achievement, or a mixture of the three (Winzer, 2008). Students with learning disabilities (LD) are the most commonly encountered exceptional learners in BC public and independent schools (BC Ministry of Education, 2013).

Today's teachers are faced with meeting the needs of a wider range of student abilities. Classroom dynamics vary greatly as each learner is unique, and since the BC liberal government's creation of Bill 22, the Education Improvement Act, the maximum number of exceptional learners permitted in BC classrooms is no longer capped at three (BCTF, 2012). BC teachers can no longer advocate for improved classroom composition for their students, despite teaching and learning concerns.

Differentiated instruction is a current and popular term used in education.

Differentiated instruction means teaching in different ways to meet the needs of all learners in today's classrooms, including exceptional learners. Assistive technology is recommended as one way to differentiate instruction in diverse and complex classrooms. Kurzweil assistive software is an educational tool that many school districts in BC have taken advantage of to support exceptional learners. Traditionally, students with learning disabilities have required support from a reader or scribe to complete school work. In the school district where this research took place, Kurzweil is an assistive technology option for both exceptional learners and individuals with LD. Kurzweil can be used to support students who have reading, writing

and/or planning difficulty. Once students learn to use the Kurzweil program independently, they no longer require a reader, scribe or as much assistance to complete assignments and tasks. Through the use of Kurzweil, students with learning disabilities may experience greater independence, increased engagement, academic success and improved self-esteem. Assistive software, such as Kurzweil, can better support classroom teachers to create an equal playing field and meet the needs of all learners in today's diverse classrooms (Kurzweil Education Systems, 2004).

However, differentiating instruction through the use of assistive technology requires teachers to learn how to use and integrate the technology. Typically teachers learn to use assistive technology through in-service. In-service in the district where this research was conducted is challenging for a number of reasons given (a) the difficult topography of this widespread amalgamated school district, timely direct support is not always possible, and (b) recent budget decisions have cut the District Technology Integration Support Coordinator position for the upcoming school year. Teachers in the district where this research was conducted have reported feeling exhausted by the challenging and diverse needs of their classrooms. They have also commented on the lack of time and energy to learn how to incorporate Kurzweil into their teaching practice. Most recently, technology support via remote access and Skype has been helpful, but does not appear to be sufficient enough to support classroom teachers' integration of Kurzweil into the existing classrooms with diverse learning needs.

As a Learning Support Teacher in the largest elementary school on the east side of our district, I have the opportunity to work with numerous teachers to support all learners. My position allows me to see the many benefits of Kurzweil assistive software with exceptional

learners, including those affected by LD. On my current caseload I have 10 students using Kurzweil, five of whom are diagnosed with having a learning disability. In our school, students with LD who use Kurzweil are gradually becoming more engaged, confident, and independent learners as they access and complete the same activities as their peers across the curriculum. These students are now able to access books at their age and interest level rather than avoiding reading or being limited to books well below grade level. With Kurzweil, the students with LD are able to produce a greater quality and quantity of writing material when compared to traditional pencil to paper tasks.

Although the newest edition of Kurzweil is version 13, our district's most current version of Kurzweil is the previous web based edition requiring Internet access, version 12 (v12). As I looked for resources for Kurzweil v12 to assist with learning and integrating the program, I was able to find two main sources of online support. One support was through Cambium Learning, the provider and technical support for Kurzweil. The second source of support which appeared only in 2012 were web resources developed by Special Education Technology BC (SET BC). Cambium Learning included online support tools built right into the Kurzweil software. Default settings in Kurzweil automatically display a tip of the day each time users log on to the v12 edition of the program. Kurzweil v12 users can also access how-to video demonstrations and an online manual through the program itself. Online help resources in v12 demonstrate and explain Kurzweil's many tools and features. Unfortunately as the software receives monthly updates the manual and video tutorials are not always up-to-date and accurate. At the time this research project report was written, Kurzweil v12 had already undergone 28 updates. SET BC's website offers an online self-directed course for those implementing the program in a school setting (SET-BC, n.d.).

Given the challenges to both meet the needs of learners in today's diverse classrooms, and support the classroom teachers who educate them, the need for this exploratory research survey was recognized. This research project investigated the type and level of support teachers in one BC school district required to initiate and continue to use Kurzweil as a teaching and learning tool in diverse classrooms that include students with LD.

Research Questions to be Investigated

With the complex and diverse needs in BC classrooms and given both the lack of additional targeted Ministry funding for students with diagnosed learning disabilities and the increasing caseload demands on Learning Support Teachers, I had two questions. Firstly, (a) Do teachers require support(s) of any kind in order to include Kurzweil in their daily teaching of students with learning disabilities? And (b) If teachers require support(s) to make Kurzweil part of their planning for and teaching of students with learning disabilities, what are the specific supports BC teachers require?

Rationale

In public and independent classrooms in British Columbia (BC), students with learning disabilities (LD) make up 3.3% of the population (BC Ministry of Education, 2013). According to the BC Ministry of Education's data for 2012-2013, there were 18,392 public school students identified as having a learning disability (BC Ministry of Education, 2013). The LD category comprises more exceptional learners than any other special needs category recognized by the BC Ministry of Education. The BC Teachers' Federation reports, since 2001, "the Special Education program experienced the greatest reduction in FTE learning specialist teachers, with an overall loss of 737.686 FTE teaching positions" (BCTF, 2011, p. 19). The relatively large number of students with learning disabilities (LD) in BC classrooms

and the reduction of specialist teachers have resulted in fewer supports to both classroom teachers and learners with disabilities. Fewer supports for exceptional learners have made teaching and learning conditions challenging in many BC classrooms.

In order to improve the support for educators and their students with disabilities, assistive technology can be used. Previous research (Chiang & Liu, 2011) has demonstrated assistive software is considered a cost-effective way to increase independent learning opportunities for students with learning disabilities. As students become more independent through the use of assistive software, they require less adult support from educational assistants, classroom teachers/learning support or other specialist teachers' support.

This research queries what British Columbia teachers might need in order to incorporate Kurzweil into their diverse classrooms that include students with LD.

At the elementary school where I am employed as a Learning Support Teacher, there are five intermediate students identified through psychological testing who are recognized by the Ministry of Education as having LD. The five students are in four different classrooms and three different grades. We currently have a number of other students who are waitlisted for testing by the district school psychologist to rule out or to confirm possible learning disabilities. Working with intermediate teachers and students, I see a need for Kurzweil to be used in classrooms where students have LD. In our school, traditionally teachers have depended on peer helpers or Teacher Assistants to support students with LD. Although peer and adult supports get students through curriculum, these supports may not build skills, independence, or self-esteem for individuals with LD. Helping students through elementary programs using peer or adult supports does not create independent learners prepared to face provincial exams in high school, where readers and scribes are generally not permitted (BC

Ministry of Education, 2012). In my experience at the elementary level, I have seen Kurzweil build skills, independence, authentic inclusiveness, confidence, and improved academic performance in individuals with learning disabilities (LD). Once learners know and are confident with Kurzweil, students with LD can potentially plan, read, and write more independently requiring minimal to no additional supports beyond the classroom teacher.

Operational Definitions

To ensure readers of this exploratory survey interpret the terminology as it was intended for the purposes of this survey, a list of definitions has been provided to clarify any uncertainty or ambiguity:

Assistive Technology - Technology used by individuals with disabilities to promote greater independence (Assistive technology, 2013).

Elementary School - A school educating children from Kindergarten to Grade 7.

Exceptional Learner - A student who is exceptional has learning and behaviour needs significantly different from the norm (Winzer, 2008). Exceptional learners require more assistance or instruction than is provided during regular whole class lessons.

Kurzweil 3000 (Kurzweil) - The multi-sensory software's tools are designed to be customized to meet the needs of each unique software user. A way to use software for students who struggle with printed text to access curriculum materials so they can keep up with assigned reading, learn critical study skills, and successfully complete writing projects and tests independently (Kurzweil, n.d.).

Learning Disability (LD) – According to Winzer (2008), individuals with LD are of average or higher cognitive abilities who experience deficits in attention, memory, achievement, or a mixture of the aforementioned deficits.

Middle School - A school in British Columbia educating children usually between Grade 6 and Grade 8.

Post-Secondary - For the purpose of this study, the term post-secondary refers to an educational setting where individuals attend after graduation from high school. Post-Secondary institutions may include vocational settings, colleges and/or universities.

Secondary School - For the purpose of this study, the term secondary school refers to a British Columbia school educating children between Grade 8 and Grade 12.

Supports - Physical resources such as books, computers, and related equipment or assistance from individuals like Educational Assistants, Administrators, Technicians, or specialists who can assist with ensuring educational program delivery goes as smoothly as possible.

Teacher - A British Columbia certified teacher. A classroom educator, learning support teacher or itinerant specialist, who is responsible for planning lessons, teaching, assessing and evaluating students' progress.

Chapter 2

Literature Review

Introduction

Assistive technology is often used to support individuals with various learning disabilities. Kurzweil is one assistive technology program found in numerous school districts across British Columbia. Before teachers begin to utilize Kurzweil as a teaching and learning tool in their classrooms with a wide range of needs, it is important to know more about both assistive technology in general and more specifically Kurzweil 3000.

The previous chapter introduced Kurzweil 3000 assistive software as support for individuals with planning, reading, and writing challenges. According to the BC Ministry of Education (2011), teachers are responsible for ensuring that all students' needs and objectives are met according to ministry guidelines and policies. Students with learning disabilities are no exception, and in fact make up the highest incident population of exceptional learners in British Columbia (BC Ministry of Education, 2013).

The focus of this chapter is to (a) introduce readers to issues related to assistive technology, (b) clarify some of the components of assistive technology found in Kurzweil, (c) look at what research has been said about Kurzweil in general, and (d) explore Kurzweil's effectiveness with learners affected by learning disabilities.

Assistive Technology

In this section, literature on assistive technology (AT) and more specifically Kurzweil 3000 software will be explored. Although this researcher was unable to locate Canadian research studies related to Kurzweil, North American studies are included in this chapter. According to the Alberta Ministry of Education (2013), assistive technology refers to devices

used in learning environments to overcome barriers for students with physical, sensory, cognitive, speech, learning or behavioural special needs to engage equally and actively in learning and to achieve their individual learning goals. Assistive technology levels the playing field for individuals with learning disabilities allowing them to access resources like their typical developing peers.

Brodwin, Star, and Cardoso (2004) described various components of computer systems and assistive technology (AT) which could be used to help individuals with different types of disabilities. The authors explored three areas of computer assistive technology (CAT): adaptations and alternate input devices, alternative input processing aids, and alternative output. Along with descriptions and definitions of many types of CAT, Brodwin et al. discussed the benefits of numerous adaptations and devices for supporting individuals with various disabilities. Included in the authors' research were features found in the Kurzweil program. Optical character recognition, word prediction, writing aids, and talking word processors were all discussed by the authors and are also features found in the Kurzweil assistive software program. All of the aforementioned features can be used to support individuals with planning, writing, and reading disabilities. Optical character recognition (OCR) was explained by the authors as scanned information which is converted to text through a software application. The converted text is then edited by the individual or an assistant to ensure it matches the original printed material. The text can then be word processed or read aloud. In Kurzweil it is possible to scan, import, or type in text documents for the OCR to recognize and read aloud, allowing individuals with vision or learning disabilities to access text despite their disability. Word prediction, another feature described by the authors, is used to decrease typing and increase performance time by predicting words and phrases based on the

first few letters typed. Word prediction software assists individuals with correct spelling, word recall, expanded vocabulary, and improved typing speed. For individuals with physical disabilities or written output disorders, conventional writing methods may be a barrier to independence. However, word prediction allows users to reduce keystrokes by selecting from suggested words without having to type full words. Individuals with language-based learning disabilities may also find word prediction helpful for proposing and defining vocabulary and grammatically correct options. Writing aids such as brainstorming, sequencing, outlining, and proof-reading were discussed in Brodwin et al.'s research as methods to support writing. Individuals who experience difficulty organizing their writing may appreciate Kurzweil's writing aids, namely the graphic organizers. Individuals with print-based learning disabilities often benefit from the use of graphic organizers and planning tools found in some assistive technology software programs such as Kurzweil. Talking word processors were clarified as providing individuals with visual and auditory support as material is read aloud helping individuals to read, organize, write, and edit. For those with reading disabilities, the option of having the material read aloud and highlighted simultaneously allows for independent access to print. Individuals with print-based learning disabilities are of at least average intelligence but are unable to access printed material at their level of understanding due to significant decoding weaknesses. Talking word processors remove the print barrier for individuals with reading disabilities. Brodwin et al. clearly defined many components of AT and CAT to help readers understand technology's commonplace terms and program features.

Brodwin et al. reviewed the research on abandonment rates of assistive technology, meaning how often technology users quit using their technology when they became frustrated. The researchers reported 30% to 40% as being the average rate of abandonment by assistive

technology users. However, Brodwin et al. suggest that CAT abandonment could be reduced by (a) involving the individual with the disabilities in the selection of CAT, (b) ensuring the CAT meets the needs of the user, (c) considering the ease of operation of the AT, and (d) ensuring thorough and ongoing education and support were available to rehabilitation professionals serving the individuals with disabilities. Additional research findings revealed that rehabilitation professionals requested ongoing training in technology and how to incorporate technology into programs for individuals with a variety of disabilities ranging from physical to learning disabilities.

A limitation of Brodwin et al.'s study relates to how quickly technology changes and new technology options become available which may result in some forms of CAT and AT being overlooked. In addition, the authors recognized the need for greater understanding of AT and how it can support individuals with disabilities. They did not provide suggestions on how to increase individuals' understanding beyond the descriptions they provided or how to support the growth of rehabilitation professionals' knowledge and skills to serve people with a range of disabilities better.

Kurzweil for Individuals with Disabilities

Kurzweil Reading Machines (KRM) were originally created to support individuals with visual impairments by scanning text, editing, and then using text-to-speech options to allow the user to listen to the printed materials. A study involving a survey of 50 academic libraries by Jahoda and Johnson (1987) investigated usage rates and issues related to KRM. Part of the research involved reviewing three of the most popular ways individuals with vision impairments access print; through the use of braille, spoken word recordings, and magnified printed text.

Jahoda and Johnson (1987) surveyed post-secondary librarians about their opinions and facts related to KRM. Although the first production model of the KRM was available in 1979, only 50 of the initial 103 academic libraries who responded had a KRM in their possession when surveyed by Jahoda and Johnson in 1985.

Research results from the authors' survey indicated only 29 of the 50 academic libraries with KRM were able to estimate the number of students with visual impairments in their academic institution who accessed the KRM. Of the 29 academic libraries able to estimate the number of visually impaired patrons, 76% reported locating the KRM in a separate room. Most libraries reported KRM improved services for students with visual impairments. However, these same libraries did not need to schedule KRM usage as the lack of demand did not warrant scheduling of the KRM. Three academic libraries commented that KRM also improved services for students with learning disabilities (Jahoda & Jonson, 1987). Although the manufacturer of the KRM suggested an approximate training time of 12 hours, depending on the individual, most librarians responded and agreed that the KRM could be learned with little difficulty. However, numerous libraries indicated patrons chose to use personal readers or magnified text more often than the KRM. Six libraries reported KRM could read most print, though more complex material found in legal, mathematical, and engineering literature proved to be less accurate and a challenge for the KRM.

Jahoda and Johnson (1987) attributed the low usage rate of the KRM in this study to three main causes; the relatively few students with vision impairments enrolled in post-secondary academic institutions, more need for instructional support using the KRM in academic libraries, and a need for identification and organization of potentially relevant documents to be prepared and placed on the KRM for use by patrons.

Jahoda and Johnson's (1987) study included various limitations including (a) the small number of academic librarians who participated in the study, used, and had an extensive understanding of the KRM, and (b) the research was based on a relatively small sample of visually impaired students in academic institutions. Another limitation is how dramatically and rapidly Kurzweil assistive technology has changed since Jahoda and Johnson's study was conducted. It is possible that in the 21st century there might be more students with identified vision and learning challenges attending academic institutions using assistive technology. Technology has rapidly evolved since the late 1980s and Kurzweil itself has changed significantly by today's standards since the first KRM made its debut.

In another study, Chiang & Liu (2011) looked at the use of technology to assist 15 Taiwanese high school students all diagnosed with a learning disability. In Taiwan, regardless of whether students have a disability, they are required to learn English in junior high (Chiang & Liu, 2011). The central learning objective for Taiwanese students with learning disabilities is to increase English language proficiency (Chiang & Liu, 2011).

According to Chiang and Liu (2011), the use of assistive technology by non-English speaking students with reading disabilities was limited. The 15 research participants in the authors' study were male high school students diagnosed with reading disabilities, who were also taking ESL classes. The purpose of the research was to explore the students' perceptions of the effectiveness of Kurzweil's software to improve their English skills and academic performance. A qualitative research methodology was employed to uncover students' views.

Taiwanese student participants were instructed on how to use Kurzweil and were given two weeks to familiarize themselves with the program. Semi-structured individual interviews were used to determine the participants' perceptions of the software's benefits.

Interviews were recorded and transcribed verbatim. Data were coded and analyzed using NVivo 8. Results suggested Kurzweil had a positive impact on all learners (Chiang & Liu, 2011). A major finding of the study was noted in the improvements of English word recognition (Chiang & Liu, 2011). Students reported better performance when using Kurzweil for reading, writing, spelling, pronunciation and comprehension tasks. Additional benefits included Kurzweil's individualization options with reading speeds and repeated reading opportunities along with highlighters and sticky notes to have supported academic learning (Chiang & Liu, 2011).

A few limitations of this study included a short two-week time frame, which did not allow researchers to determine if there were widespread academic advantages for Kurzweil users. The English language-based tools in Kurzweil did not provide the option to look up words in students' native languages to strengthen their understanding of words and phrases. The limited sample size of 15 students was too small to generalize to the population. Self-reporting can also be a limitation as individuals may not have been completely honest and accurate in what they reported.

Kurzweil Use in North American Schools

In the United States, Epps (2007) investigated both the influence of assistive technology on students' Social Studies achievement and the effectiveness of using Kurzweil in classrooms collaboratively taught by a special education teacher and a social studies teacher. The American study took place in a high school in Georgia with seven male and five female students of mostly African-American descent. All 11 students were diagnosed as having LD in the area of reading. The student participants were part of three World History classes. The teachers collaborated to ensure all textbook pages, handouts, notes, and assessments were

scanned into Kurzweil. The students were given a brief Kurzweil tutorial and time to explore the program. The participants were provided with computer lab, Internet, and Kurzweil access for two weeks.

Pre- and post-test likert-scale student attitude surveys were themed in the final data analysis. Daily teacher observations on effectiveness of the software, student behaviour, student engagement, and interesting factors connected to the intervention were recorded. Teacher logs were analyzed to determine if the intervention was successful in influencing student achievement. Student assessment scores from coursework pre- and post-intervention were compared (Epps, 2007). Results indicated that students who were actively engaged in learning made academic improvements, whereas pupils who were not engaged did not make improvements. Attitude surveys completed by students suggested that students showed positive attitudes about Kurzweil after the intervention. Students felt hearing the material read to them by Kurzweil helped with achievement. Performance comparisons demonstrated achievement improvements, but because of the short study, the researcher could not definitively attribute academic gains to Kurzweil's intervention. Teachers felt team teaching and using Kurzweil helped meet learner needs but teachers had concerns about the amount of time needed to scan and prepare materials (Epps, 2007).

In an inner city public high school in Boston Massachusetts, researchers Chiang and Jacobs (2010) investigated computer based instruction (CBI) with Kurzweil 3000. Computer based instruction simply refers to teaching through computer programs like Kurzweil. Unlike the previous study that looked at Kurzweil use in Social Studies, the Chiang and Jacobs' study looked at Kurzweil use in language arts. Using a qualitative design and examination of themes, Chiang and Jacobs strived to understand high school special education teachers' and students'

perceptions of Kurzweil. Sixteen grade 9 English students from the school's special education program participated in the 6 month survey using K3000 to read assignments for their English Language Arts program. Students used Kurzweil at least three times per week for over ten weeks. Fourteen of the sixteen special education students were coded and identified by the Boston Public School system as receiving 26-59% of their school day in a resource room while two of the student subjects received less than 26% of their school day in a resource room. Six educators teaching in the special education department who had experience integrating Kurzweil into their classes participated in the project. Four teachers used Kurzweil software in their teaching during the research project, while the other two teachers had used Kurzweil in the past.

Focus group interviews were conducted by Chiang and Jacobs (2010) to determine the advantages and disadvantages of Kurzweil and the factors affecting both teachers' use of CBI and student progress. Focus groups took place on school grounds, lasting 30 minutes for students and 30-50 minutes for teachers. Teachers were asked about their classroom experiences with Kurzweil, reasons why they used CBI in the classroom, and experiences related to student progress in reading comprehension, task performance, and motivation. Students were divided into four focus groups and asked four questions related to preferred reading environment, experiences with Kurzweil, examples of how Kurzweil helped with reading and with students' school performance.

Findings indicate that after regular use, students reported improvements in (a) their pronunciation, (b) the amount, (c) speed, and (d) quality of both their reading and comprehension abilities using the Kurzweil software. Students also reported improved

academic self-perception, and enhanced performance on functional tasks such as filling out a job application.

Feedback from Teachers on the Integration of Kurzweil

In Chiang and Jacob's (2010) focus group interviews, teachers reported positive student responses towards CBI and increased learner engagement. Teachers felt students with learning disabilities responded well to the CBI as Kurzweil highlighted the text while it read aloud, reducing the amount of decoding required by learners and improving their comprehension. However, teachers also reported insufficient access to computers, too much preparation, lack of human resources support, preference for traditional teaching, lack of familiarity toward technology, and difficulty managing classes as barriers to CBI with Kurzweil. Strengths of the Kurzweil program were described by teachers as providing individualized settings for learners, reading aloud, highlighting while reading, and instant access to word definitions. Teachers noted improvements were needed with Kurzweil's text-editing, unattractive and confusing layout, high price, robotic voices, and mispronunciations. According to authors, if CBI confuses or frustrates teachers, educators will stop integrating the technology into their teaching practice.

Chiang and Jacobs' (2010) recommended students use Kurzweil (a) during class but also for completing homework or other functional tasks, (b) teachers should use Kurzweil across the curriculum and for exams if accommodations are written into the student's Individualized Education Plan, (c) schools should provide tech support and that districts should encourage teachers to form technology user groups to learn from one another, (d) schools should be continually upgrading their version of Kurzweil to ensure they are accessing the most

current and improved edition, and (e) Kurzweil should be accessible in libraries for students to complete homework and functional tasks.

Suggestions for future research were to (a) conduct CBI studies regarding the effect of Kurzweil on individuals' functional tasks, (b) replicate this study with a larger sample, (c) include English as Second Language learners' performance using Kurzweil in a replicated study, (d) investigate Kurzweil users' speed of completing tasks, and (e) gain information about the self-perception of various Kurzweil user groups.

Kurzweil Use with Individuals Affected by Severe Reading and Emotional Disabilities

Hale et al.'s research (2005) investigated the effects of listening and listening-while-reading (LWR) on both comprehension levels and rates. Four male middle school students with emotional disorders were exposed to three experimental reading conditions. In the first scenario, LWR, students read silently alongside an experimenter who read aloud. In the second scenario, listening only, students listened to an experimenter read, but without visual material to accompany what they were hearing. The third scenario was the control group where students read silently. After each scenario, the students were given 10 comprehension questions, but were not permitted to refer back to any printed material used in the reading situations. Hale et al. reported LWR and listening produced superior comprehension scores than the silent reading control condition.

Schmitt (2009) extended Hale's (2005) research on LWR using parallel design procedures. Schmitt's research differed from Hale's by using Kurzweil assistive technology to overcome poor reading ability. Schmitt contributed to the literature on both assistive technology and Kurzweil by researching the effects of Kurzweil on participants' comprehension accuracy and rates in individuals with severe reading and emotional disabilities.

Schmitt's 10 day study took place over consecutive school mornings with four students from a private day school for individuals with severe behaviour difficulties. There were three males and one female student from middle school and high school who participated in the study. All students had multiple diagnoses which included Attention Deficit /Hyperactivity Disorder (ADHD); three students were diagnosed with ADHD combined type. Other participant diagnoses included two students with oppositional defiant disorder, two diagnoses of depression, and one diagnosis of psychotic disorder. All four students were recognized as reading well below expectations based on their general cognitive abilities.

Participants in Schmitt's (2009) study were exposed to three experimental conditions and were asked to read silently, listen to a passage read aloud, and listen while reading (LWR) in individually administered 20 minute sessions. All reading tasks incorporated the use of grade four text passages and comprehension questions from the Timed Readings in Literature program. A laptop computer with Kurzweil 3000 software was used for all experimental conditions. Silent reading sessions were done by reading onscreen. Listening sessions involved Kurzweil reading aloud with the laptop monitor turned off, so no visual information could be gained. LWR sessions involved Kurzweil reading the text aloud while simultaneously highlighting the words read. All sessions required participants to complete five factual and five inferential multiple choice questions which provided three answers from which to choose. All comprehension activities were completed using traditional pencil and paper format. Interscorer agreement on comprehension responses was 100%. Intervention sessions were counterbalanced for difficulty across each experimental condition, and students received the same instructions during each experimental condition. An independent observer found the experimenter conducted study procedures with 100% accuracy over the two days of

observations. A 12 point font was used across conditions to allow students access to the entire passage and eliminate the need for onscreen page scrolling. Participants were permitted to adjust the computer's volume. However, Kurzweil's default rate of speech was maintained at 125 words per minute for all participants. Students' participation was supported at the end of each session through the use of minor rewards as part of the school's reinforcement options program. At the conclusion of the study, participants completed intervention acceptability rating forms.

Students' comprehension accuracy was found to be highest in the LWR accommodation across all subjects. Individual differences in participants' responses to the various conditions were noted and were attributed to potential differences in learning styles. The acceptability questionnaire revealed 2 participants found the LWR accommodation enjoyable, 3 students reported they believed their comprehension improved as a result of LWR, 3 students reported a greater ability to decode unfamiliar text and 3 believed classmates would enjoy the LWR accommodation.

Limitations of Schmitt's (2009) research included both a small sample size and researchers did not ensure students read the text or were engaged in the intervention as participants were not required to read aloud. Researchers queried whether the LWR accommodation was too much information for one participant to process.

For future research, the authors suggested investigating (a) the use of the personalizing features in Kurzweil such as rate of speech and selection of voices, (b) use Kurzweil to read comprehension questions and answers aloud to rule out decoding challenges, and (c) examine the impact text to speech has on an individuals' ability to read correct words per minute.

Their findings suggest that some individuals with emotional and reading disorders may comprehend more material with the use of the LWR accommodation afforded by Kurzweil more than just listening alone or silent reading.

Summary

Chapter 2 was comprised of six different research studies related to both assistive technology and Kurzweil. Some common themes across the studies were: (a) reasons for abandonment of the assistive technology, and (b) the student and staff perceptions regarding the effectiveness of Kurzweil in academic settings.

Kurzweil assistive software has been and continues to be used by individuals with various disabilities around the world and across British Columbia. Although more research is needed in the area of assistive technology and Kurzweil in particular, the research presented above speaks to the potential of Kurzweil assistive software to support the self confidence, motivation, and learning of individuals with learning disabilities.

In the following chapter I will discuss the methodology used in this exploratory survey of BC teachers in one school district.

Chapter 3

Methodology

In this section I will include (a) the purpose of the study, (b) research questions, (c) information on participants, (d) research procedures, (e) instrumentation and data collection, and (f) data analysis.

Purpose of the Study

The purpose of this study was to contribute to the knowledge on students with learning disabilities and the use of assistive software, in order to support students, teachers and school districts using Kurzweil 3000 assistive software.

Research Questions

With the complex and diverse needs in BC classrooms and given both the lack of additional targeted Ministry funding for students with diagnosed learning disabilities and the increasing caseload demands on Learning Support Teachers, I had two questions. First, do teachers require support(s) of any kind in order to include Kurzweil in their daily teaching of students with learning disabilities? And second, if teachers require support(s) to make Kurzweil part of their planning for and teaching of students with learning disabilities, what are the specific supports BC teachers require?

Participants

The participants in this research study were all certified teachers. For the purposes of this study when I refer to participants or teachers I am referring to BC certified teachers. Participants included classroom teachers, specialists such as Integration Support Teachers, Teachers of the Visually Impaired, and Learning Support Teachers. Administrators with teaching duties also participated in this study. All participants were employed by the same

south eastern BC school district. Since females make up most of BC's teaching population (Steffenhagen, 2013), it is not surprising that there were more females who participated in this study. Participants taught in various school settings including elementary, middle school, high school and distributed learning settings. Some participants were in small isolated multi-grade settings, while others were employed in larger urban areas. Survey results revealed that participants ranged in age and years of experience and included both new teachers to those approaching retirement (see Table 1-3).

Research Procedures

The researcher recruited a sample of 50 participants through convenience sampling. Convenience sampling was used as participants were willing and available to participate (Creswell, 2012). A participant invite was sent to 82 prospective participants via email. The sample size of 50 was determined by the number of willing participants I was able to obtain through the emails I had. Selecting as large a sample of participants as possible allowed for better representation of the teaching population in the district where this research was conducted (Creswell, 2012).

The survey was developed by the researcher. Questions were created based on the information I was seeking. A sample of the participant consent form and survey is included as Appendix 1.

To reduce measurement error, my survey was created using clear, unambiguous questions and response options (Creswell, 2012) after being pilot tested by friends and family and revamped accordingly. The web-based survey was designed to target my specific demographic, BC teachers in one school district using a web-based version of Kurzweil 3000.

The survey was distributed to participants via FluidSurveys, allowing for effective and economical surveying (Creswell, 2012).

The Canadian company, FluidSurveys, was selected as the survey tool as all information gathered through this service is stored on a secure Canadian server. The use of the popular SurveyMonkey web-service was considered, but information gathered through SurveyMonkey is stored on American servers and is subject to the USA Patriot Act of 2001 (Patriot Act, n.d.). To protect participants' privacy of their responses, I chose to use the Canadian service, FluidSurveys. Using FluidSurveys, participants' responses would not be potentially monitored by the American government, as they can be with the popular SurveyMonkey web-service.

Once participants completed the survey, results were available to me for analysis. The survey focussed on participant demographics, perceptions related to Kurzweil, and an optional section to share strategies and resources for working with individuals affected by learning disabilities. Demographics included participants' gender, age, years of teaching experience, type of school(s) in which participants were employed, and both caseload sizes and estimates.

After participants completed the survey, a hard copy of their responses was printed and stored in a binder in my home office in a locked secure filing cabinet. The FluidSurveys account allowed the researcher to track which participants completed the questionnaires. A follow-up friendly reminder email was sent out before the deadline to those individuals who had not completed the survey. An electronic version of the completed survey was saved to a thumb drive.

Instrumentation and Data Collection

For this exploratory research project, a qualitative approach was used to gain a greater understanding of participants' perceptions (Berg, 2009). A survey research design was selected because (a) it is popular in education and has been used for many years, (b) surveys can describe trends, participants' beliefs, and opinions, (c) electronic surveys via the Internet have become increasingly more common and popular for collecting data, and (d) surveys can gather extensive data quickly with their tested survey question forms (Creswell, 2012). My online survey was developed to determine teachers' experiences with Kurzweil across one school district and to determine if teachers required supports when learning to use Kurzweil as a teaching and learning tool within the classroom setting. Being a large and topographically diverse school district separated by a mountain pass, a large lake with a ferry crossing along two different time zones for the majority of the year, made face-to-face interviews impossible. Consequently, this study used an online survey of BC teachers in one school district who use, have used, or were interested in using Kurzweil in their classrooms.

Data Analysis

Analysis of the results was completed through the FluidSurveys website using primarily descriptive statistics. Permission was granted by participants to share the data from this survey to school districts' planning for successful classroom use and implementation of Kurzweil 3000.

After the study was complete, the hard copies of respondents' surveys were shredded and burned. Materials on the thumb drive were deleted, and the computer's recycle bin emptied.

Chapter 4

Findings

Introduction

The Kurzweil exploratory survey (see appendix 1) was made available through an email link to 82 individuals from one BC school district. Invitations for participants went out January 2, 2013. A total of 176 invitations and reminders were sent out while the survey was live on FluidSurveys until January 31, 2013. The response rate was 38% (completed surveys/number of invites sent). This chapter will share participants’ demographics and responses.

Results

Participant [N=47] demographics of the exploratory survey indicated 38% of respondents were male (n=18) and 62% were (n=29) female. The age-group with the largest number of participants was 51-60 years (see Table 1).

Table 1

Frequency Distribution by Age-Groups

Age-Groups	Frequency	N	Percent
20-35	10	47	21%
36-40	5	47	11%
41-45	7	47	15%
46-50	10	47	21%
51-60	12	47	26%
60+	3	47	6%

The frequency distribution by years of experience teaching students with learning disabilities can be found in Table 2. Most teachers (n=15) had at least six or more years of experience teaching students with learning disabilities.

Table 2
Frequency Distribution by Years of Experience Teaching Students with Learning Disabilities

Years of Experience	Frequency	N	Percent
Less than 1 year	2	47	4%
1-5 years	6	47	13%
6-10 years	15	47	32%
11-20 years	11	47	23%
More than 20 years	13	47	28%

In Table 3, participants reported the type of school or schools in which they were employed and have or had access to Kurzweil. The majority of participants (n=34) revealed they worked in an elementary school setting, with secondary schools coming in second (n=14), and middle schools (n=9) trailing last.

Table 3
Type of Schools Where Kurzweil is Accessible

School Type	Frequency	N	Percent
Elementary School	34	47	72%
Middle School	9	47	19%
Secondary School	14	47	30%

When asked how many students with diagnosed learning disabilities (LD) were on participants’ caseloads, the majority of participants indicated having four or more of these exceptional learners. Table 4 indicates the frequency distribution of responses to this particular question.

Table 4

Frequency Distribution by Number of Students with LD on Participants’ Caseloads

Students with LD	Frequency	N	Percent
1	8	46	17%
2	10	46	22%
3	10	46	22%
4 or more	18	46	39%

When asked how many students were on participants’ caseloads with suspected but undiagnosed learning disabilities (LD), 60% of participants (n=28) indicated having 1-3 additional students, whereas 40% (n=19)suspected they had 4 or more students with undiagnosed LD on their caseload.

Regarding how many participants have or had school access to Kurzweil, 91% (n= 43) of participants reported either having current access or access in the past. Table 5 represents how long participants have had access.

Table 5

Frequency Distribution by Number of Years Participants Have Had Access to Kurzweil in Their School(s)

Number of Years	Frequency	N	Percent
Less than one year	7	46	15%
1-2 years	11	46	24%
More than 2 years	16	46	35%
More than 5 years	8	46	17%
More than 10 years	4	46	9%

Question nine of the survey asked participants in which subjects they use or would use Kurzweil in their classroom. An overwhelming 96% (n=45) responded they use, have used, or would use Kurzweil in Language Arts/ English/ Humanities. See Table 6 for the frequency distribution of participants' responses. When given the option to select "other" as a subject area and provide additional information, four individuals added Social Studies as another school subject they use, would use, or have used Kurzweil in their teaching.

Table 6

Frequency Distribution by Subject Areas Supported by Kurzweil in Participants' School(s)

Subject	Frequency	N
Language Arts/ English/ Humanities	45	47
Science	30	47
French/Spanish/ELL	2	47
Mathematics	11	47
Other	4	47

Question number ten on the exploratory survey asked participants in which grades they have used or would use Kurzweil in their teaching. Table 7 reflects participants' responses. Most participants indicated having used or potentially using Kurzweil in their teaching in elementary school more often than in either high school or post secondary settings. Grades 5 and 6 were the most popular grades participants indicated for incorporating Kurzweil into their teaching.

Table 7

Frequency Distribution by Grade Level Participants Have Used or Would Use Kurzweil in Their Teaching

Grades	Frequency	N
Kindergarten-Grade3	12	43
Grade 4	23	43
Grade 5	26	43
Grade 6	27	43
Grade 7	22	43
Grades 8-12	20	43
Post-Secondary Education	4	43

When asked how many of the participants' students have used, or would use Kurzweil, the majority of responses (n=34) indicated 0-5 students. Table 8 summarizes participants' responses to question 11 from the survey, regarding the number of students using Kurzweil. Clearly the majority of participants envision a small number of students using Kurzweil, rather than integrating the technology for either a whole class or half a class.

Table 8

Frequency Distribution of Students Who Have Used, or Would Use Kurzweil

Number of Students	Frequency	N	Percent
0-5	34	43	79%
6-10	4	43	9%
11-20	2	43	5%
More than 20	3	43	7%

To determine how often participants have used, or would use Kurzweil in their planning for lessons, the question was posed on the survey as question twelve. Table 9 represents the participants’ responses. An overwhelming majority of participants have or would consider incorporating Kurzweil into their lessons for 1-5 lessons per week. This information indicates participants do not currently use or envision Kurzweil as being integrated into the majority of each school day for LD students’ reading, writing and planning support. The data indicates few participants are using or would consider using Kurzweil even twice a day for lessons.

Table 9

Frequency Distribution by How Often Participants Have/Are/Would Incorporate Kurzweil into Their Lessons

Number of lessons per week	Frequency	N	Percent
1-5 lessons	37	43	86%
6-10 lessons	4	43	9%
11-20 lessons	2	43	5%
More than 20 lessons	0	43	0%

Question 13 on the survey was open-ended, asking what challenges people have had or would anticipate when using Kurzweil with students. Responses to this question were printed, themed and tallied by how often statements were made. Three broad themes were noted, (a)

challenges at the school level, (b) challenges at the student level, and (c) challenges with the Kurzweil program.

Table 10 represents participants' comments about challenges at the school level. The most reported concern (n=16) was regarding the time required to scan and edit materials in preparation for students' lessons. Teachers reported the extra time required to get materials Kurzweil ready for students when glitches occur or they are not able to figure things out.

The second most commonly reported concern (n=12) related to the need for ongoing training to support teachers in their learning of Kurzweil. Teachers had various comments about how frustrating and time consuming it was trying to learn Kurzweil and prep materials when attempting to incorporate the program into various lessons and subjects.

Outdated computers that take too long to boot up or run Kurzweil was the third most commonly reported concern (n=8) at the school level. Teachers reported wasting too much time waiting for outdated computers to start up and run Kurzweil. Frustrations regarding slow technology were reported to create a lack of commitment to the program by both teachers and students. Teachers constrained by timetables reported wasting too much time waiting for Kurzweil on old computers, and being unable to take extra time to accommodate the slow technology. Again, computer time lags, and finite available class time resulted in some teachers not including Kurzweil in their teaching repertoire.

Table 10

Frequency Distribution by Participants' Comments about Challenges at the School Level

Supports	Frequency	N
Time Related		
Scanning/editing materials	16	43
Fast rate at which materials are consumed	1	43
Training		
Ongoing staff support needed to learn Kurzweil	12	43
Access to Computers/Technology		
Many classrooms have no computer	2	43
Students can only access in pullout sessions	2	43
Need more access to computers/Kurzweil	9	43
Using iPads and apps instead of Kurzweil	1	43
Printing/Saving issues	2	43
No scanner available	1	43
Computer/Internet Challenges		
Unreliable/limited Internet access	5	43
Computer issues, tech support needed	6	43
Old computers take too long	8	43
Staffing		
Need Kurzweil trained EAs	2	43
Can't teach my class and Kurzweil students	3	43
Classroom teacher won't allow Kurzweil	1	43
Kurzweil is too much work	2	43
Physical Space		
Need more space/outlets for charging	2	43

Table 11 represents comments regarding Kurzweil challenges at the student level. The most frequent comments (n= 10) were connected to students' fears of being teased or perceived by peers as being different. Included under this umbrella of perceptions were comments regarding students fearing being stigmatized because they had to leave the class in order to access Kurzweil in a resource room. Currently in the school district involved in this study, classroom laptop use is not the norm for most learners. The lack of access to laptops was reported to be mainly a financial issue. However, when laptops are prioritized for student use

in our school, they are loaned to students with exceptionalities before being offered to the general student population.

The second most commonly reported concern (n=3) at the student level was the length of time it takes students, particularly with learning disabilities, to become independent using Kurzweil. Comments from participants relating to how difficult it is to teach a class and simultaneously instruct a few students on Kurzweil arose more than once.

Table 11

Frequency Distribution by Participants' Comments about Challenges at the Student Level

Supports	Frequency	N
Students need foundational computer skills	1	43
Students need to become Kurzweil independent	3	43
LD students need assistance, but no EA time	1	43
Students fear teasing/viewed as different	10	43
Time needed for students to learn Kurzweil	2	43
Older students reluctant to use Kurzweil	1	43
Students need organization support	1	43
Costs to facilitate for distributed learning	1	43

Table 12 represents challenges related specifically to the Kurzweil program. Although these factors are beyond users' control, the author of this study will share participants' program concerns with Cambium Learning Technology. Hopefully Cambium Learning will address teachers' concerns in the future.

The poor quality of some of the Kurzweil voices was the most frequent (n=4) comment by participants. Teachers' feedback in this study is consistent with teachers' feedback in Chiang and Jacobs (2010) study where teachers had similar complaints about Kurzweil's robotic voices. Keeping up with the number of updates and changes within the program was

the next most frequent participant feedback (n=2). Extra time required to search and ensure users were using the most current version of Kurzweil was noted by participants. Kurzweil does not automatically alert users to updates, the way Microsoft Windows’ updates occur.

Table 12

Frequency Distribution by Participants’ Comments about Challenges with the Kurzweil Program

Supports	Frequency	N
Glitches with formatting in Kurzweil	1	43
Frequent updates/changes	2	43
Kurzweil does not work well with math	1	43
Flexibility of product is a challenge	1	43
Ease of use of program is a challenge	1	43
Poor quality of some Kurzweil voices	4	43

When asked how participants learned or would learn to use Kurzweil, the most frequent response (n=26) was self-taught. The second most frequent response (n=25) was learning through a specialist teacher. Learning through workshops trailed closely behind in participant responses (n= 21). Participants also had the opportunity to provide additional comments regarding ways they learned or would learn to use Kurzweil. YouTube, learning through Learning Support Teachers, and learning from students were additional comments made.

Table 13

How Participants Learned or Would Learn Kurzweil

Support for Learning Kurzweil	Frequency	N
Specialist Teacher	25	43
School Level Support	15	43
Self-Taught	26	43
Online Support	4	43
Workshop(s)	21	43
In-service from SET-BC	13	43
School District support	13	43
Other (please explain)	6	43

Participants were asked to list what they needed or may need to help support the use of Kurzweil with students who have learning disabilities. The 43 responses to this question were printed, coded, and themed. The main response themes were Time and Support, with three subthemes under support; Support for Teachers, Support for Students and Families, and Supports from the Kurzweil program itself. Table 14 represents the themes, comments, and frequency of participants’ comments.

Table 14

Participant Suggested Supports for Using Kurzweil with Students Who Have Learning Disabilities

Supports	Frequency	N
Time		
Learn Kurzweil/Edit Materials	15	43
Collaboration with other Kurzweil users	3	43
Supports for Teachers		
More training	9	43
Accessible support for questions	6	43
Access to tech support for staff/students	12	43
Better computers/technology needed	11	43
More space for technology	1	43
Supports for Learners & Families		
Adult support for learners is needed	12	43
In-service for parents to support kids at home	1	43
Introduce Kurzweil in elementary school	1	43
More district licenses needed	1	43
Kurzweil Program Suggestions		
More user friendly	1	43
More affordable, versions for iPad/iPod	2	43

The most frequent suggestion (n=15) for support was for time to learn and edit Kurzweil materials. The second and third most frequent suggestions (n=12) for supports needed when working with students affected by LD were, (a) improved access to tech support, and (b) having adult support for students learning Kurzweil. Chiang and Jacobs (2010) would support these findings in that schools should provide tech support and that districts should encourage teachers to form technology user groups to learn from one another.

The next most frequently suggested support (n=11) in this exploratory research study was the need for better computers to run Kurzweil.

When asked whether a teacher-friendly Kurzweil handbook would assist educators learning to integrate Kurzweil into their planning and teaching, 88% (n=38) of the participants responded “Yes”, and 12% (n=5) responded “No”. Some participants (n=11) elaborated in the optional other section about what specific information would be helpful to include in a Kurzweil teacher handbook (Table 15). Specific participant comments included requests for (a) contact information when participants needed help, (b) a list of resources already available in Kurzweil format, (c) links to helpful YouTube clips, and (d) a frequently asked questions section.

Table 15

Frequency Distribution by Information Participants Felt Would be Helpful in a Kurzweil Teacher Handbook

Response	Frequency	N
Who the program can help/why teachers may use Kurzweil	28	43
Where and how to begin using the program in planning/teaching	36	43
Teaching progression for introducing students to the program	34	43
Examples of how some teachers use Kurzweil with commonly used programs/resources (e.g. reading textbooks, provincial exams, Writing Power etc.)	37	43
Other (please explain)	11	43

When asked about the type of teaching situations participants(N=43) would use Kurzweil in, 91% (n=39) of survey participants were in favour of using Kurzweil in a team

teaching situation either a Learning Support or other Teacher. Conversely, 9% (n=4) of participants were not in favour of using Kurzweil in a team teaching environment.

An overwhelming majority of participants (N=43), (n=39) were concerned about the time involved to scan and/or edit materials for Kurzweil. Clearly, a concern related to the amount of time involved in preparing lesson materials is an issue for many participants.

The Accessible Resource Centre–British Columbia (ARC-BC) is a resource for Kurzweil ready novels, textbooks, and materials. When participants (N=43) were asked if they had access to ARC-BC, 72% (n=31) had access, 7% (n=3) did not, and 21% (n=9) did not know what ARC-BC was.

Seventeen participants requested a copy of the results from this exploratory research survey. Additional feedback from participants on the topic of Kurzweil is listed in Appendix 2.

For additional feedback from participants (N=19) related to specific resources they find most helpful when working with students with Learning Disabilities, see Appendix 3.

In the following chapter, I will provide an overview and summary of the study. Limitations, contributions to knowledge, implications for practice, and areas for further research will also be included in the upcoming and final chapter.

Chapter 5

Discussion

This last chapter begins by restating the purpose of the study. It is followed by a discussion of the key elements that focus on the current challenges teachers encounter with Kurzweil. This is followed by an examination of some of the limitations which may have influenced the findings. This discussion continues by indicating the study's contribution to scholarly knowledge and implications for practice. It concludes by proposing areas for further research.

Overview of the Study

The purpose of this exploratory survey was to determine if certified BC teachers required support(s) to include Kurzweil when planning for and teaching students with learning disabilities. As a learning support teacher working with elementary students and teachers, I was interested in conducting this research to improve supports for both students with learning disabilities and their teachers. My two research questions were: Do teachers require support(s) of any kind in order to include Kurzweil in their daily teaching of students with learning disabilities? And if teachers require support(s) to make Kurzweil part of their planning for and teaching of students with learning disabilities, what are the specific supports BC teachers require? This research study consisted of an online survey of 50 certified teachers in one school district in southern BC who use, have used, or have access to Kurzweil assistive software. The following section presents some of the key findings of this study which are interpreted and discussed.

Key Elements of the Study

Through the participants' responses and feedback reported in the previous chapter, I was able to determine the participants from one BC school district did need supports to integrate Kurzweil when planning for and teaching students with learning disabilities. Through feedback on the survey, I was also able to (a) determine the current challenges these teachers are encountering with Kurzweil and (b) the specific supports participants required.

Challenges were reported at three levels, (a) school level challenges, (b) student level challenges, and (c) Kurzweil program challenges. Overall, the majority of participants' concerns (n=75) were related to support challenges at the school level. Comparatively, concerns at the student level (n=20) and challenges related to the Kurzweil program (n=10) were few when compared to school level challenges.

School level challenges. At the school level the three most frequently reported issues were (a) the time it takes to scan and edit materials for students (n=16), (b) the need for ongoing support for training staff (n=12), and (c) slow, outdated computers that take too long to use with Kurzweil (n=8). Respondents shared frustrations about not having enough time to make materials Kurzweil ready for students with learning disabilities on top of their many other regular classroom responsibilities. They also shared frustrations about the lack of timely support when they got stuck using Kurzweil, noting periodic workshops were not enough support. Numerous respondents referred to slow computers that either took too long to run Kurzweil or had glitches, discouraging both teachers and students from using Kurzweil.

Student level challenges. Students' perceived stigma of appearing different from peers when using Kurzweil, or being teased, were the most frequently reported challenges at the student level (n=10). The long length of time it takes students to become independent using

the Kurzweil program was the next most frequently reported concern at the student level (n=3). There were 20 comments about challenges at the student level, considerably less than the 75 comments reporting challenges at the school level. However, if students are concerned about being stigmatized, respondents reported reluctance on the student's part to buy in and use Kurzweil for support.

Kurzweil program challenges. The poor quality of some Kurzweil voices was the most frequent complaint about the Kurzweil program (n=4). The frequent but not automatic updates and changes to the Kurzweil program was the second most reported challenge with the Kurzweil program (n=2). Overall, the 10 comments made about challenges at the program level seem minor comparatively. However, poor voice quality and both time consuming and frequent updates interfere with users maximizing Kurzweil's use in education.

By far, most of the challenges (n=75) were reported to be at the school level. The challenges were related to (a) too much time required for editing/ preparing Kurzweil ready student materials, (b) the need for ongoing training and troubleshooting support for both staff and students, (c) the need for increased access to better computers, (d) increased and more timely tech support for computer/Internet challenges, (e) the need for more Learning Support Teacher and Educational Assistant support at the school level to support using Kurzweil in classrooms with LD students, and (f) the need for sufficient physical space for using, charging and storing Kurzweil accessible computers.

As mentioned in Chapter 2, Brodwin, Star, and Cardoso (2004) explored the abandonment rates of assistive technology, reporting rates as high as 40%. Abandonment rates refer to when individuals quit using technology due to frustrations or difficulties. Brodwin, Star, and Cardoso made suggestions regarding how to reduce computer assisted

technology (CAT) abandonment. The suggestions included: (a) involving individuals with disabilities in the selection of CAT, (b) ensuring the CAT meets the needs of the user, (c) considering the ease of operation of the AT, and (d) ensuring thorough and ongoing education and support were available to professionals serving the individuals with disabilities. Ongoing training in technology and how to incorporate technology into programs for individuals with disabilities were other recommendations mentioned by Brodwin, Star, and Cardoso.

Recognizing the challenges teachers in this study faced, and knowing Brodwin, Star, and Cardoso's (2004) suggestions to avoid CAT abandonment, the district in which this study was conducted may want to consider how best to avoid teachers abandoning Kurzweil assistive software.

Recommendations

Assistive technology is used to support individuals with various disabilities, leveling the playing field and allowing individuals to access learning opportunities more fully. Kurzweil is an assistive technology tool which can support individuals with learning disabilities to overcome barriers in their learning environments, achieving their learning potential and meeting their individualized education goals (Alberta Ministry of Education, 2013). When Kurzweil highlights text while reading it aloud, the amount of decoding required by learners is decreased allowing for improved comprehension (Chiang & Jacobs, 2010). Kurzweil can support academics as well as engagement for students affected by learning disabilities (Epps, 2007). Increased student engagement and motivation are essential components of academic success, providing positive reinforcement to encourage continued use of Kurzweil's technology (Chiang & Jacobs, 2010). Features of Kurzweil including optical character recognition, word prediction, writing aids and talking word processors are

just some of the key helpful features for individuals affected by learning disabilities (Chiang & Liu, 2011).

If the suggestions above by Brodwin, Star, and Cardoso (2004) are applied to this research study to address challenges and decrease abandonment rates, then (a) students should be involved in the selection of CAT such as Kurzweil, (b) the personalization features of Kurzweil should be utilized to allow users to support their learning and meet their needs, (c) when considering the ease of operation of Kurzweil, students' toolbars could be expanded or hidden to simplify or enhance accessible tools for students, (d) teachers could control the rate at which Kurzweil tools are introduced to students so as not to overwhelm or bore learners.

The school district where this study took place has the capacity to address many of the concerns and needed supports identified in this study. Through collaborative efforts between district staff, the district can offer ongoing thorough education and support to both the professionals and paraprofessionals serving individuals with learning disabilities. Some suggestions include (a) releasing staff to create and develop a district Kurzweil committee to address challenges and supports outlined in this study, (b) connecting Kurzweil using staff, students, and parents potentially to each other and to current resources and tips through a possible district blog, (c) providing release time to staff to maintain and regularly update printable resources for troubleshooting tips and frequently asked questions, and teaching suggestions, (c) ensuring staff and students are aware of the Kurzweil district library for accessing and contributing to Kurzweil ready-made materials.

Limitations

The participants in this study represent the views, experiences, and opinions in one British Columbia (BC) school district. Since the target population was not randomly

sampled, inferences to the general population may not be drawn (Creswell, 2012).

Furthermore, only 43 of the 50 participants completed the entire survey. For these reasons, generalization to other school districts in BC cannot be made based on the results from this exploratory study.

Question nine of the survey asked participants in which subjects they use or would use Kurzweil. To maximize the precision and validity of this study, these two conditions should have been asked and reported on separately to get a clearer picture of current practice and anticipated practice. Similarly, separating the speculation of “would you” from the experience of Kurzweil users should have also been applied to questions 10, 11, 12, 13, 14, 15, 18, 19 of this survey.

More elementary (n=34) than secondary (n=14) teachers participated in this research. Although it is not known why more elementary than secondary teachers participated, speculation is Kurzweil is integrated into more elementary school programs than secondary school classes. The assumption is in high school students may be expected to be more independent, and are focused on learning content, rather than also learning assistive technology such as Kurzweil.

When reviewing the literature on Kurzweil, no Canadian studies were located. Although there were studies conducted in North America, this researcher was unable to locate any Kurzweil studies which occurred in Canada.

Similarly, when looking for a definition of assistive technology this researcher was unable to find a clear definition from a BC source. Instead, a definition from the Alberta Ministry of Education was used. The lack of clarity for terminology used in the BC education system and the lack of BC and Canadian research studies related to Kurzweil were

disappointing. The need for clear and consistent terminology in the BC education system, and the need for more BC or Canadian research studies support the rationale for this research project.

Contributions to Knowledge

It appears from this survey that educators in one BC school district require additional support(s) in order to effectively and consistently include Kurzweil when planning for and teaching students with learning disabilities. Information from this study could be used by this school district to guide district and school budgets, future technology plans, the focus for student services' capacity days, a potential district Professional Learning Community (PLC), and Professional Development (Pro-D) opportunities. An additional benefit of this study was the sharing out of additional resources educators have found effective when working with students affected by learning disabilities. These additional resources may be helpful to readers of this study.

The opportunity for participants to express their views and be heard is another contribution of this study. More than one participant thanked me for the opportunity to speak out about their successes and needs.

Personally as a result of my inquiry I have a better understanding of the needs of teachers using Kurzweil in our district and beyond the walls of the school in which I teach. This information can also be used to facilitate collaboration within both our school staff and family of schools in our geographically diverse district. Through collaboration and discussion comes the opportunity to connect with, learn from, and support my colleagues.

Implications for Practice

I hope that school district personnel including the Superintendent, Director of Special Education, Director of Student Learning, Principals, Learning Assistance teachers, technology support services, school board members, and interested staff will work together to look at improving supports for students with learning disabilities and the educators who teach them.

As mentioned earlier in the recommendation section of this chapter, it is possible following Brodwin, Star, and Cardoso's (2004) recommendations to improve the Kurzweil teaching and learning experiences in the school district where this research was conducted.

Areas for Further Research

This research reviews and expands on research related to Kurzweil, students with learning disabilities, and experiences of BC teachers using Kurzweil. Should future research build on or replicate this study, more specific questions should be developed to separate the knowledge and experience of participants familiar with Kurzweil from the speculation of those who have not used the program. For instance, instead of asking in which grades have you or would you use Kurzweil in your teaching? A researcher could break the question into two parts asking: (a) in which grades have you used Kurzweil in your teaching? And (b) in which grades would you use Kurzweil in your teaching? By breaking the question into two parts the researcher will have a clearer picture of current practice and anticipated practice, making the research results more valid and reliable.

Future considerations could also include measuring the effects of Kurzweil on both students' academic performance and self-perceptions. Although research has indicated Kurzweil is effective at supporting students' academics, it would be interesting to measure this locally through pre and post Kurzweil tests to try and determine the effectiveness of the

intervention. Students' self-perception is also important to academic success. If a student believes they cannot succeed, they likely will not try their best, believing success is beyond their locus of control, and in turn will not be successful. Again by using pre- and post-tests to determine students' beliefs both before and after an intervention such as Kurzweil, it would be interesting to determine if Kurzweil changed students' beliefs and self-perceptions. Although this researcher is unfamiliar with the best tools one would use to measure academic success and self-perceptions, I am confident that such tools could be either located, or created locally.

It is my hope that in the future this exploratory study will be replicated on a larger scale to get a clearer picture of teachers' needs to support students with learning disabilities. Perhaps the finding of future provincial trends will create new opportunities for supporting students with learning disabilities and the educators who teach them.

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Appendix 1

Survey for Teachers

Teachers' Kurzweil Experiences

Part I Participant Information and Consent

Dear Colleague,

I'm a BC Learning Support Teacher interested in supporting both my colleagues and BC's students. Over the last few years I have worked to incorporate the web-based edition of Kurzweil with applicable staff and students. As I am interested in finding out if BC teachers require support(s) in order to incorporate Kurzweil into their teaching of students with learning disabilities, I would greatly appreciate your responses on this short 15 minute survey.

As a Master's of Special Education student, through the University of Northern British Columbia (UNBC) in Prince George, the purpose of my research is to explore if BC teachers require support(s) in order to incorporate Kurzweil into their teaching of students with learning disabilities, and what specific supports may be required. Possible benefits from this study may include future projects to ensure BC teachers receive necessary supports. There are no known risks to participating in this study.

You were chosen through convenience sampling to participate in this research project because of your access to and/or experience with Kurzweil. Your participation in this research is voluntary, and your confidentiality in the gathering of data and anonymity in the reporting of findings are assured. You have the right to withdraw from this study at any time and if you choose to withdraw your information will also be removed.

Checking the appropriate box below is your consent to allow your responses to be compiled with other responses. Reporting of survey findings will be done using descriptive statistics such as mean, median and mode and will not identify specific individuals, schools, or school districts. Only my supervisor, Dr. Cloutier, and I will have access to your personal information and responses. Should your responses be printed and compiled in an appendix of the research, any identifying information will be blacked out to ensure confidentiality and anonymity.

Your responses will be stored on FluidSurveys, a personal memory stick, and a hard copy of all responses will be printed and stored in a locked filing cabinet until the research process is complete in April 2013. At the conclusion of my research any electronic data will be deleted and recycle bins emptied. Printed material will be shredded and burned to ensure confidentiality. If you would like a copy of the research results, you have the option to request a copy at the end of the survey, or by emailing me at your convenience. Should you have any questions or concerns you can reach me or Dr. Cloutier, my project supervisor, through the contact information provided. If you have complaints you may contact UNBC's Research Ethics Board through the contact information listed below.

Thank you for your time, I appreciate your participation in this research project and ask that you please complete the survey by January 31, 2013. Thank you again, I am most appreciative.

Sincerely,
Tina Harms
Master's of Education Student
University of Northern British Columbia (UNBC), Prince George BC
250-428-3088 (home)

Dr. Yvon Cloutier, Assistant Professor and BEd Coordinator UNBC Prince George
3333 University Way, Prince George, BC V2N 4Z9 CANADA
Office: TAL Building room 4038 Phone: 250-960-5926

UNBC Office of Research
3333 University Way, Prince George, BC V2N 4Z9 CANADA
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Checking a box below indicates that you have read and understood the information listed above about the survey. Please Note: You must check the "Yes" button below in order to proceed with the survey; otherwise you will be directed to the end of the survey.

- ☐ Yes, I have read and understood the information above and am willing to participate in the survey.
- ☐ No, I do not wish to participate in the survey.

Part II Participant Demographics

1) Gender:

- ☐ Female
- ☐ Male

2) Age:

- ☐ 20-35
- ☐ 36-40
- ☐ 41-45
- ☐ 46-50
- ☐ 51-60
- ☐ 60+

3) Approximate years of experience teaching students with learning disabilities:

- ☐ less than one year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-20 years
- ☐ more than 20 years

4) Type of school(s) in which you are teaching and have access to Kurzweil (check all that apply)

- ☐ Elementary School
- ☐ Middle School
- ☐ Secondary School
- ☐ Other (please specify) _____

5) How many students with diagnosed learning disabilities are in your class(es) or on your caseload?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4 or more

6) How many students in your class(es) or on your caseload do you suspect may have an undiagnosed learning disability?

- ☐ 1-3
- ☐ 4 or more

Part III Kurzweil Related Information

7) Do you have or have you ever had access to Kurzweil?

- ☐ Yes
- ☐ No

8) If you answered Yes to the previous question, how long have you had access to Kurzweil?

- ☐ less than one year
- ☐ 1-2 years
- ☐ more than 2 years
- ☐ more than 5 years
- ☐ more than 10 years

9) In which subject areas have you used or would you use Kurzweil in your teaching? (check all that apply)

- ☐ Language Arts/English/Humanities
- ☐ Science
- ☐ French/Spanish/Second Language Teaching
- ☐ Mathematics
- ☐ other (please specify) _____

10) In which grades have you or would you use Kurzweil in your teaching? (check all that apply)

- ☐ Kindergarten-Grade 3
- ☐ Grade 4
- ☐ Grade 5
- ☐ Grade 6
- ☐ Grade 7

- ☐ Grade 8-12
- ☐ Post-Secondary Education

11) Approximately how many of your students have used or would use Kurzweil?

- ☐ 0-5
- ☐ 6-10
- ☐ 11-20
- ☐ more than 20

12) Approximately how many times per week have you or would you plan lessons incorporating Kurzweil?

- ☐ 1-5 lessons per week
- ☐ 6-10 lessons per week
- ☐ 11-20 lessons per week
- ☐ more than 20 lessons per week

13) What challenges have you had or would you anticipate when using Kurzweil with your students?

14) How have you learned or would you learn to use Kurzweil in your teaching? (check all that apply)

- ☐ Specialist Teacher support
- ☐ School Level Support
- ☐ Self- taught
- ☐ Online support
- ☐ Workshop(s) on Kurzweil
- ☐ In-service from Set-BC
- ☐ School District support
- ☐ Other (please explain) _____

15) Please list what you need or may need to help support your use of Kurzweil with students who have learning disabilities.

16) Do you think a teacher-friendly Kurzweil handbook would assist educators learning to integrate Kurzweil into their planning and teaching?

- ☐ Yes
- ☐ No

17) If you answered Yes to question 16 above, what information do you think would be helpful to include in a Kurzweil teacher handbook? (check all that apply)

- ☐ who the program can help/why teachers may use Kurzweil
- ☐ where and how to begin using the program in your planning/teaching
- ☐ teaching progression for introducing students to the program
- ☐ examples of how some teachers use Kurzweil with commonly used programs/resources (e.g. reading textbooks, provincial exams, Writing Power etc.)
- ☐ Other (please explain) _____

18) Do you or would you use Kurzweil in a team teaching situation with a Learning Support Teacher or another Teacher?

- ☐ Yes
- ☐ No

19) Do you or would you have concerns about the time involved to scan and/or edit materials for Kurzweil?

- ☐ Yes
- ☐ No

20) Do you currently have access to Accessible Resource Centre- British Columbia's (ARC-BC's) resources?

- ☐ Yes
- ☐ No
- ☐ I am not sure what ARC-BC is.

21) If you would like to receive a copy of the findings from this survey when they are available please include your email below.

Part IV Optional Participant Feedback

Please share any additional comments or feedback related to this topic below.

Which resources and/or strategies do you find are most effective when working with students who have learning disabilities?

Thank you for taking the time to complete this survey. Your confidentiality and anonymity are assured.

Appendix 2

Additional Participant Feedback Regarding Kurzweil

Responses

- Offer workshops for parents as students who use Kurzweil often require additional time
 - A teacher handbook would be helpful but more ongoing support/feedback and increased learning support teacher (LST) time is needed.
 - Kurzweil helps LD student, they should be taught in the manner in which they learn.
 - Kurzweil feels pushed on us, but is not backed with support for delivery or implementation. Don't sell it if you can't service it.
 - IT supports are needed for kids with LD, it's frustrating when things don't work properly, things need to work and be efficient, and a large amount of time gets wasted trying to get things working.
 - Our district is poor at in-servicing technology when the focus is supposed to be incorporating technology.
 - Teachers are busy, editing and time required to get the program up and get passwords for new students complicates matters.
 - If high school classroom teachers were open to learning about and using Kurzweil in the classroom, more students might be willing to do so.
 - Technology capabilities in our school are preventing us from using Kurzweil as effectively as it could be.
 - Kurzweil takes a lot of added time to download books and articles.
 - Districts should take advantage of students who already use Kurzweil on a daily basis. These are the real experts, they can teach other students and teachers alike.
 - Having Kurzweil on the iPad (Firefly) is important as many students bring iProducts (iPod, iPhone, iPad) to school. The cost to upgrade to version 13 may be keeping districts from taking this step.
 - In high school students will not take laptops into classrooms to access Kurzweil, they don't want other students to know they need it. However, they will utilize it in the Learning Assistance Room.
 - Other people's reviews of resources they have used would be helpful.
 - The key to kids using technology for print disabilities is using it where and when they want it, to avoid perceived stigma.
 - More students without diagnosed learning disabilities are appearing in classrooms and do not have access to programs and services like Kurzweil and LA support. We are at risk of reducing services to students as a district money saving strategy.
-

Appendix 3

Resources Participants Felt Were Helpful for Working with LD Students

Responses

-
- Technology based resources increase students' interest in trying new strategies
 - An up to date and resourceful Special Education Teacher is extremely valuable.
 - Resources that look like what others are doing. Strategies that make the student become independent.
 - Adequate psycho educational assessment. Too many times assessment are completed and then ignored.
 - I have had fabulous success with brain remapping and the teaching of appropriate compensatory skills.
 - Kurzweil, Classroom Suite, adapted lessons, small group activities, independent projects with specific and guided criteria.
 - Having a manageable class size and time to prepare and do things more effectively.
 - A TA that stays in the room for the lesson then takes a small group out. Staying in the room is too disruptive and unproductive for everyone.
 - Lack of TA is too difficult for reaching extreme struggling learners. Making and delivering IEPs without support is not realistic.
 - Offering a novel or text to have it read to a student for them to participate in the discussion and class work is really important.
 - Relationships, observing students strengths and needs. Technology.
 - Providing a carrot to encourage students to use technology. The testimonial of students who have used it.
 - [http:// www.setbc.org /setbc/access/kurzweil_group1.html](http://www.setbc.org/setbc/access/kurzweil_group1.html); YouTube search #Kurzweil; other teachers who know how to use Kurzweil; BC Vision Teachers' Yammer group; asking Teachers of the Visually Impaired, Steve Barclay at Aroga Technologies in Vancouver; assessment to ensure students understand what they are listening to; Teachers using Kurzweil as UDL; use of assessment to determine if fluency is improving due to the highlighting and read aloud tool; take small steps teaching navigation of the program; making the tool available at all times through the web version of Kurzweil; providing students time to explore Kurzweil program; ensure typing skills are being developed/ daily typing practice; using Kurzweil in a functional way in the regular classroom setting; student hears only positive things about the program even if it is frustrating for the adult(s).
 - Time with classroom teacher built into the day to plan appropriately.
 - Time with students.
 - iPad apps
 - Fast ForWord program, iPod touch, Apple apps
 - Graphic Organizers, Dragon Naturally Speaking, word prediction software for writing, adaptation strategies to prepare student prior to reading or writing.
 - Time spent with EA and LA is effective. Adjusting criteria to meet students' skill level. Parents who understand their child's abilities and partner with teacher's expectations.
-

Appendix 4

Research Ethics Board Approval Letter

UNIVERSITY OF NORTHERN BRITISH COLUMBIA

RESEARCH ETHICS BOARD

MEMORANDUM

To: Tina Harms
CC: Yvon Cloutier

From: Michael Murphy, Chair
Research Ethics Board

Date: December 21, 2012

Re: E2012.0920.117.00
An Exploratory Survey of Teachers' Use of Kurzweil Assistive Software with Students

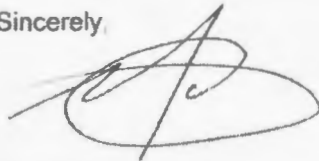
Thank you for submitting revisions to the REB regarding the above-noted proposal to the Research Ethics Board. Your revisions have been approved.

We are pleased to issue approval for the above named study for a period of 12 months from the date of this letter. Continuation beyond that date will require further review and renewal of REB approval. Any changes or amendments to the protocol or consent form must be approved by the Research Ethics Board.

If you have any questions on the above or require further clarification please feel free to contact Rheanna Robinson at reb@unbc.ca in the Office of Research.

Good luck with your research.

Sincerely,



Dr. Michael Murphy
Chair, Research Ethics Board