Exploring Elementary School Teachers Perspectives on the use of Technology Integration in classrooms for Supporting Students with Exceptionalities

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Abstract

This qualitative research study investigates teachers’ perspectives of technology integration in regular education classrooms. The main research question of this study is: how are elementary school teachers integrating the use of technology into their classroom in meaningful ways to support students with exceptionalities? Data was collected from two in-depth semi structured interviews with two elementary school teachers. Results demonstrated that parent-teacher collaboration and shared decision making is helpful for technological integration. Participants acknowledged the importance of building a positive relationship with parents in order to successfully support students. Participants also highlighted the importance of ‘leveling the playing field’ in the classroom in order to extend student success. Technology integration can make information more accessible to students with exceptionalities and can promote positive academic outcomes. The implications of these findings suggest that teachers should develop on-going communication with parents through meetings or phone calls. This can allow both teachers and parents to develop a shared plan to assist students with exceptionalities through technology. Further research should explore parental perspectives of teacher-parent relationships in the classroom as it pertains to effective technology use.

Key words: exceptionalities, technology integration, mainstream classrooms, technological platforms, assistive technology, teacher perspectives, elementary education, elementary school teachers
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# Table of Contents

Abstract...........................................................................................................................................2

Acknowledgements.........................................................................................................................3

Chapter 1: Introduction....................................................................................................................7
  1.0 Introduction to Research ........................................................................................................7
  1.1 Purpose of the Study .............................................................................................................9
  1.2 Research Questions .............................................................................................................10
  1.3 Background of the Researcher ..........................................................................................11
  1.4 Overview .............................................................................................................................13

Chapter 2: Literature Review..........................................................................................................14
  2.0 Introduction ..........................................................................................................................14
  2.1 Historical Perspective .........................................................................................................14
  2.2 Types of Exceptionalities and Exceptional Learners in Ontario .....................................16
    2.2.1 Behaviour exceptionality ...............................................................................................17
    2.2.3 Intellectual exceptionality ............................................................................................17
    2.2.3 Communication exceptionality .....................................................................................18
    2.2.4 Physical exceptionality .................................................................................................19
    2.2.5 Multiple exceptionalities ..............................................................................................20
  2.3 Incidence of Students with Exceptionalities in Ontario .....................................................20
  2.4 Individual Education Plan ..................................................................................................21
  2.5 Technological Practices and the role of Educators .............................................................22
  2.6 Resistance, Perceptions and Challenges in Schools .............................................................24
  2.7 Parents as Educational Partners .........................................................................................25
  2.8 The Impact of Inclusive Education .....................................................................................26
  2.9 Twenty-First Century Classrooms .....................................................................................27
  2.10 iPads and Tablets .................................................................................................................27
    2.10.1 Exceptional students and the use of iPads ...............................................................28
  2.11 Smartphones and iPods ......................................................................................................29
    2.11.1 Exceptional students and the use of smartphones and iPods ....................................30
  2.12 Computers ..........................................................................................................................31
    2.12.1 Exceptional students and the use of Computers .......................................................31
  2.13 Smartboards .......................................................................................................................32
    2.13.1 Exceptional students and the use of smartboards .....................................................33
  2.14 Assistive Technology .........................................................................................................33
    2.14.1 Exceptional students and the use of assistive technology .........................................34
  2.15 Learning and Literacy Development ..................................................................................34
Chapter 3: Methodology .................................................................38
3.0 Introduction .................................................................38
3.1 Research Approach and Procedures ........................................38
3.2 Instruments of Data Collection ...............................................40
3.3 Participants .................................................................41
  3.3.1 Sampling criteria ......................................................42
  3.3.2 Sampling procedure/recruitment ....................................44
  3.3.3 Participant biographies ................................................45
3.4 Data Analysis .................................................................47
3.5 Ethical Review Procedures ..................................................48
3.6 Methodological Limitations and Strengths ...............................50
3.7 Conclusion ..................................................................51

Chapter 4: Findings .................................................................53
4.0 Introduction .................................................................53
4.1 Teachers Indicated That a Lack of Pedagogical and Community Support is a Key Barrier to Incorporating Technology to Support Students with Exceptionalities .................54
  4.1.1 Teachers recognize that a lack of parental assistance is a barrier ........54
  4.1.2 Teachers recognize that a lack of teacher training is a barrier ..........56
  4.1.3 Teachers recognize that a lack of funding and administrative support is a barrier .................................................................57
4.2 Teachers Indicated That Equality is a Key Factor to Consider when Integrating Technology to Successfully Support Students with Exceptionalities .................60
  4.2.1 Teachers acknowledge that technology levels the playing field for students 60
  4.2.2 Teachers acknowledge that technology can promote inclusion ..........63
4.3 Teachers Indicated That Technology Integration Promotes Positive Academic Outcomes That Enhance the Individual Learning Experience of Students with Exceptionalities in the Classroom .................................................................65
  4.3.1 Teachers recognize that students gain confidence and display a positive well-being when they participate in the use of technology .........................65
  4.3.2 Teachers recognize that students gain communication and learning skills ..........67
  4.3.3 Teachers recognize that students gain reading and writing skills ............69
4.4 Free Online Software was Considered to be More Effective Assistive Technology over Expensive Devices That Were Difficult to Use .................................................................70
  4.4.1 iPads were favoured for their ease of use, however participants felt they could be too distracting and expensive .................................................................71
  4.4.2 Kurzweil is considered a less effective software because it is difficult
to operate ........................................................................................................73
4.4.3 The Google platform was seen as highly effective as it meets a range of
learning needs and is freely accessible to all educators.................................74
4.4.4 Participants did not mention the Smart Board as an effective form of
assistive technology.........................................................................................76
4.5 Conclusion.................................................................................................76

Chapter 5: Conclusion...................................................................................79
  5.0 Introduction ............................................................................................79
  5.1 Overview of Key Findings and their Significance.................................79
  5.2 Implications............................................................................................81
    5.2.1 The educational community.........................................................81
    5.2.2 My professional identity and practice..........................................82
  5.3 Recommendations..................................................................................85
    5.3.1 Teachers.........................................................................................85
    5.3.2 School Boards..............................................................................86
    5.3.3 Administrators.............................................................................86
  5.4 Areas for Further Research.................................................................87
  5.5 Concluding Comments..........................................................................88

References ....................................................................................................90

Appendices ...................................................................................................98
  Appendix A: Letter of Consent for Interview...........................................98
  Appendix B: Interview Protocol.................................................................100
Chapter 1: Introduction

1.0 Introduction to the Research

Technology is constantly changing and acquiring popularity amongst elementary schools in Ontario. A recent report by the People for Education (2014), indicated based on 1,349 surveys, 99% of elementary schools in Ontario provide students with access to computers (Chen, Gallagher, & Kidder, 2014). Educators continuously play a positive role in integrating different categories of technology to assist teaching practices and enhance student learning (Price, 2011). In fact, the Ontario Ministry of Education has implemented $150 million technology funds to facilitate improved classroom experiences for students (Sandals, 2014). Technological devices offer exceptional students an opportunity to engage in exploratory, stimulations, and communication activities that meet their individual abilities and needs (Hasselbring, & Glaser, 2000). However, “72% of parents in the Grunwald survey reported that their children’s schools had policies preventing the use of family owned mobile devices at school. This is unfortunate because research indicates that students with disabilities benefit more than their peers without disabilities from technology-based tools” (Israel, Marino, Delisio, & Serianni, 2014, p.6). Since a large number of students have access to technology at home, it is relevant to employ this new age of technology rather than fight against it (Quick, 2014).

In the years 2010-2011 more than 191,600 students were identified by an Identification, Placement and Review Committee as exceptional pupils in Ontario (Ontario Ministry of Education, 2015). The literature is beginning to indicate that technology is a useful tool for students with exceptionalities and it enhances academic achievement (O’Malley, Lewis, Donehower & Stone, 2014). Research has shown that computer technology contributes a vast range of educa-
tional activities to meet a combination of needs for students with mild learning disorders (Hasselbring & Glaser, 2000). Similarly, Fernández-López, Rodríguez-Fórtiz, Rodríguez-Almendros, & Martínez-Segura (2013) indicated that computers and computing devices give assistance to capture the attention of students with exceptionalities and get them to focus on the tasks to be performed. The iPad has been found to be an effective device because it promotes academic skills and independence of students with developmental disabilities (O’Malley, Lewis, Donehower & Stone, 2014). Moreover, “Assistive technology can empower even those students with severe disabilities to become active learners in the classroom alongside their peers who do not have disabilities” (Hasselbring & Glaser, 2000, p.107).

The integration of technology can increase student’s motivation, attitudes, achievement, and interactions in the classrooms (Balmeo, Nimo, Pagal, Puga, Quiño, & Sanwen, 2014). Teachers aim to integrate technology in their classroom in order to foster student learning. A research study has found that technology is not always well-integrated into teaching and learning (Chen, Gallagher, & Kidder, 2014). Teacher’s personal perceptions can influence resistance in relation to the integration of technology. For instance, it can be demanding on teachers who are uncertain how to utilize technological devices effectively (Goodwin, 2012).

Despite all of the research done on technological devices to support students with exceptionalities, there are often misconceptions surrounding the role of the teacher and how their technological responsibilities are perceived in the classroom. Teacher’s perceptions toward technology influence the effectiveness of technology integration in the classroom to support student learning (Varank, & Tozoglu, 2006). Patter (2009) indicates that technology integration is described as being challenging for teachers to plan instruction. In addition, there is a lack of time,
lack of access to computers and software, lack of training and limited technical and administrative support. Similarly Hasselbring & Glaser (2000) suggests meeting the needs of students with disabilities within regular classrooms is difficult because all teachers lack training in how technology is used. Teachers are unaware of what they are trying to accommodate and how technology can help them achieve their goals (Hasselbring & Glaser, 2000). This has a strong impact on students because technology encourages students with exceptionalities to participate (Hasselbring & Glaser, 2000). Further research indicated that a wide range of teachers are not adequately trained how to use technology effectively in their classrooms (Balmeo et al., 2014). A report suggested that 20% of teachers feel very prepared to use technology within their teaching practice (Hasselbring & Glaser, 2000). Research suggests that there is lack of teacher training, successful training requires support from district leaders (Balmeo et al., 2014). Therefore, it can be challenging for teachers to successfully integrate technology without teacher training and support from administrators.

1.1 Purpose of the Study

The purpose of this study is to learn how elementary school teachers meaningfully integrate technology into their classroom environment to support students with exceptionalities. Students with exceptionalities are placed into five categories, which include behaviour, communication, intellectual, physical and multiple (Bennett, 2009). I discussed all five categories of exceptionalities throughout this study. I learned from teacher’s technological practices in order to use their strategies to support students with exceptionalities as a whole. In addition, I became familiarized on how the integration of technology can improve student’s learning and academic achievement. Technological practices in education are a crucial component to learning in today’s
society. Technological devices in classrooms include computers, iPads, smart phones, iPods, smart boards, and assistive technology. Throughout this study, I learned the benefits of specific technological devices that are useful for students with behaviour, communication, intellectual, physical and multiple exceptionalities. There are numerous ways for students with exceptionalities to feel included in their classroom environment. I acquired teacher’s first hand experience about the barriers that are affecting the integration of technology and how they can possibly be removed. I intend to share these findings with other elementary school teachers in order to support their practice with students, and I intend to share these finding with the educational research community. I will use the findings from this study in my future classroom as an elementary school teacher in order to support children with exceptionalities.

1.2 Research Questions

My main research question is how are elementary school teachers integrating the use of technology into their classroom in meaningful ways to support students with exceptionalities? The sub questions to further guide this investigation include:

1) What factors do elementary school teachers take into consideration when they independently allow students with exceptionalities to participate in the use of technology as a learning tool in a mainstream classroom? And why?

2) What barriers or challenges do elementary school teachers encounter when they incorporate technology into a mainstream classroom to support students with exceptionalities and how do they respond to these barriers or challenges?

3) What outcomes or achievements do students gain when they independently participate in the use of technology in a mainstream classroom?
4) What are some technological devices, softwares and platforms elementary school teachers consider to be the most and least effective when teaching students with exceptional abilities in a mainstream classroom? Why do they feel these devices, softwares and platforms are the most/least effective?

1.3 Background of the Researcher

My interest in this area of research developed through a few past experiences that relates to individuals with exceptionalities. My brother was a student with a speech and language disorder which makes this topic immensely significant to me. My brother went to school in Ontario, and he was offered speech and language services during class time. Also, my cousin was diagnosed with Down Syndrome. My cousin has many needs as she experiences difficulties with fine motor, gross motor and communication skills. She used assistive technology devices in school which was beneficial to her. An experience that I gained was during my undergraduate degree in the year 2014-2015. I took a course named ‘Children with Exceptionalities’, which gave me an insightful view of how I can support these students. During 2014-2015 I volunteered at a charity named ‘Reach for the Rainbow’ MLSE foundation. This foundation raised funds to support children with physical and developmental disabilities. Additionally, being an Early Childhood Educator who worked in a daycare setting, I’ve had multiple opportunities to support students with Autism Spectrum Disorder. I integrated iPad’s into my classroom in order to support these students. All of my experiences inspired me to value inclusivity and to support students with exceptionalities.

As an individual who has had the opportunity to use technology in a classroom environment while I was a student in elementary school, this allowed me to understand the importance
of using technology to better support teaching and learning. As a student growing up, I had an opportunity to use computers in the classroom; however technology did not revolve widely in classrooms during this time period. I found the use of computers very engaging as a student as it made me appreciate learning, and I was much more eager to complete assignments on the computer. I remember my most favourite part of the school day was when I had an opportunity to do my school work on the computer, and when I was able to take part in educational activities on the computer. Based on my childhood experiences, I developed a strong interest in learning how I can better support my future students with exceptionalities through technological practices.

I’ve had opportunities to work collaboratively with elementary school teachers and I’ve noticed that the use of technology increased in classrooms. Throughout my practicum experiences as a teacher candidate, I had the opportunity to teach lessons on a Smart Board which I used for the very first time. My associate teacher taught me how to use the Smart Board and encouraged me to experiment with the device to teach my lessons. As I taught my lessons using the smart board, I found that students with/without exceptionalities were engaged and eager to participate. Also, when I looked around the classroom at practicum there was devices such as iPads and iPods that were accessible to students. These devices were meaningful to students and the students enjoyed using educational applications. As a teacher candidate, I have minimal experience with technology. However, I want to learn how technology can support students with exceptionalities. These devices have a lot to offer in twenty-first century classrooms, and I am willing to use these devices in my practice as a soon-to-be teacher. Especially since technology is accessible and used regularly by students within this generation.
In 2013-2015 during my undergraduate degree, I had an opportunity to conduct research on an Early Childhood Educator’s perspective of children's technology consumption. I was able to examine how the use of technology can impact young children if they consumed and co-viewed technology at home. I want to use my prior knowledge to conduct research on a different area of interest that I had which is how elementary school teachers integrate the use of technology in their classroom and how can this support children with exceptionalities. This research project made me extremely curious on how technology can support students with exceptionalities in Elementary schools across Ontario. Moreover, this will allow me to further my research in the area of technology.

1.4 Overview

This study responds to the research questions I conducted using a qualitative research approach. I interviewed three teachers about how they integrate technology to support students with exceptionalities. I used purposeful sampling and a semi-structured interview throughout the process of gathering data from three participants in the study. In Chapter 2, I reviewed the literature in relation to types of exceptionalities and assistive technological devices, individual education plan, and the role of educators. Also, I reviewed the literature in relation to technological practices in education, 21st century classrooms, academic achievement, literacy development and the impact of inclusion. Next, in Chapter 3 I elaborated on the research design in relation to the participants. In Chapter 4, I reported my research findings and discussed their importance in relation to the research literature. In Chapter 5, I identified the implications of the research findings for my own teacher identify and practice. I also articulated a series of questions raised by the research findings, and pointed to areas for future research.
Chapter 2: Literature Review

2.0 Introduction

In this chapter I reviewed the literature in the areas of useful technological practices in elementary education and the role of teachers in education. More specifically I reviewed themes related to historical perspectives, twenty-first century classrooms, resistance, perceptions and challenges. I started by reviewing the literature in the area of exceptional learners and types of exceptionalities in Ontario. Next, I reviewed research on iPads, iPods, smart boards, computers and assistive technology. I reviewed these areas in order to identify through the research which technological device is beneficial for each type of exceptionality. Finally, I examined the role of technological devices within academic achievement and literacy development.

2.1 Historical Perspective

There is a wide range of research that outlines the historical perspective of exceptionalities. Aristotle, a Greek philosopher from the fourth century had a completely different view of how exceptional students should live. He mentioned, “As to the exposure and rearing of children, let their be a law that no deformed children should live” (Hardman, Drew, & Egan, 2013, p.9). Aristotle’s proclamation is unrealistic to a twenty-first century world. During the fourth century children with exceptionalities were defenseless to practices such as physical abuse, slavery, abandonment and infanticide. Ancient cultures recognized infanticide as mandatory because it was established that only the strongest individuals survived in societies that relied on living off the land. Early cultures viewed “deformed children” as an indication of weakness and humiliation on civilizations (Hardman et al., 2013). Individuals with exceptionalities were placed in hospitals, asylums, or other institutions that provided an inadequate amount of education (Shy-
man, 2013). Moreover, an individual with an exceptionality was unable to approach sacred places.

Plato, also a Greek philosopher, believed that individuals with exceptionalities were seen to be a past sin or an indication that society was unholy. This was known to be a belief within ancient Greek culture (Shyman, 2013). Tremblay & Tivat (2007) mentioned in ancient Greek culture exceptionalities was known to be a “punishment of the gods” or an “evil sign” and fathers had the right to terminate their child’s life. During this era, students with exceptionalities received a limited amount of attention and they didn’t have a right to be part of society. This connects to technology because teachers can support students through the use of technological devices during the twenty-first century. This allows students to be part of society and feel included in classrooms.

During 1774 to 1838 a French physician and educator named Jean Marc Gaspard Itard argued that teaching strategies could be effective in educating children with exceptionalities. This influenced a French psychologist named Eduard Seguin to develop a guideline in order to educate children with special needs. He understood the importance of providing exceptional students with a mixture of intellectual and physical activities (Shyman, 2013). Eventually, Maria Montessori established educational practices in 1952. Her philosophy indicated that education builds on the self-construction of a student, and the environment is a crucial component in order to facilitate exploration (Tremblay et al., 2007). During the twentieth century education for exceptional students were becoming more attainable. Schools offered special education classes for students with exceptionalities (Nagle, 2006).
2.2 Types of Exceptionalities and Exceptional Learners in Ontario

Children are unique individuals who learn at different rates. Therefore “Teachers are not too concerned about a student who is a little behind or ahead. They do not expect every student to be the exact same; instead they ensure learning needs and abilities are met within their classroom” (Santrock, Woloshyn, Gallagher, Petta, & Marini, 2010, p.199). Students with exceptionalities demonstrate differences in relation to their behaviour, communication and academic ability. These differences affect learning and are generally mild, severe, chronic or pervasive (Bennett, 2009, p.2).

In Ontario, students with exceptionalities are organized into five categories. These five categories include behaviour, communication, intellectual, physical disability and multiple (Bennett, 2009, p.2). According to the Education Act, “An exceptional pupil is defined as a pupil whose behavioural, communicational, intellectual, physical or multiple exceptionalities are such that he or she is considered to need placement in a special education program” (Kitchen & Dean, 2010, p.226). Most frequently the term exceptionality corresponds to special education and disability (Santrock et al., p.166). These categories of exceptionalities allow one to comprehend the variety of conditions that may affect a pupil’s educational achievement. Students with exceptionalities are divergent from the ordinary student in relation to some areas of functioning. However, children with exceptionalities do not differ completely from their ordinarily developing peers (Ontario Teachers Federation, 2015).

Throughout this study the four terminologies ‘exceptionality’, ‘disability’, ‘impairment’ and ‘special needs’ are used interchangeably. It is critical to separate the meaning of these terms because they are frequently used in a misleadingly way. The term ‘Special needs’ refers to a stu-
dent who is in need of special education (Santrock, 2010). The term ‘Disability’ is an ‘impairment’ that may be physical, cognitive, intellectual, mental, sensory, developmental or a combination of these circumstances that generates limitations of an individual’s capacity (Degener, 2004). I use the term ‘Exceptionalities’ most often because it indicates that all students can learn and progress alongside their peers. This is attainable within an inclusive mainstream classroom and with effective teacher support. The term ‘Exceptionalities’ refers to children with physical, behavioural, and communication difficulties. Additionally, it refers to children with sensory impairments and intellectually gifted abilities (Santrock, 2010).

2.2.1 Behaviour exceptionality

The Ontario Ministry of Education (2001) categorizes exceptionalities into five sub-groups. Behaviour exceptionality is a learning disorder that leads to specific behaviour complications over a period of time and it can affect educational performance. Behaviour exceptionalities contain a lack of ability to maintain interpersonal relationships, excessive fears or anxieties; a tendency to compulsive reaction. Also, a lack of ability to learn that cannot be traced to intellectual, sensory or other health factors. Santrock (2010) also defines students with behaviour exceptionalities as becoming involved in complications such as aggression, pervasive relationships and fears associated with school. In Canada, 6 to 10 percent of school aged children are identified with behavioural disorders (Santrock et al., 2010, p.174).

2.2.2 Intellectual exceptionality

Intellectual exceptionalities refers to giftedness which is an intellectual ability that necessitate differentiated learning experiences exceeding those ordinarily provided in regular school programs (Ontario Ministry of Education, 2014). This relates to Gardner’s theory of multiple
intelligence as educators are precisely able to identify and measure gifted behaviour amongst students. The model of intelligence identifies seven different areas such as linguistic, logical-mathematical, spatial, bodily kinaesthetic, musical, interpersonal intelligence and interpersonal intelligence (Gardner & Hatch, 1989). Gifted students have been recognized as outstanding in the areas logical-mathematical and linguistic. According to Gardner, it has been identified that gifted students show developmental patterns that go beyond their classmates in one or multiple intelligences (Gardner & Hatch, 1989). Gifted students have been recognized using intelligence measures and standardized tests. The theorist Renzulli created a model for understanding giftedness which suggests that students who are gifted learn in divergent ways than other children and process information quicker. Renzulli’s three-ring concept of giftedness has assisted educators in order to identify students with potential (Plucker & Renzulli, 1999). An estimation in Canadian schools resulted in gifted students encompass between 3 to 5 percent (Santrock et al., 2010, p. 186). Furthermore, other forms of intellectual exceptionalities include mild intellectual disability and developmental disability (Ontario Ministry of Education, 2014).

2.2.3 Communication exceptionality

Communication exceptionalities include Autism Spectrum Disorder which is a long-term developmental disorder that impact children’s social interaction, language and behaviours. A small quantity of children with autism never learns to speak, and other children show communication and social irregularities (Santrock et al., 2010, p.175). Kitchen & Dean (2010) similarly defines communication exceptionalities in relation to Autism Spectrum Disorder as well. It is characterized by a severe learning disorder that result in interference such as the ability to relate to environment, rate of educational development, mobility, perception, speech and language. Ad-
ditionally, “Students with Autism Spectrum Disorder have impaired sensory input. They over process sensory information or under process it. For instance, a student is so distracted with the font that he/she can’t concentrate on the letters” (Price, 2011, p.31).

According to Ontario Ministry of Education (2014), approximately 17,600 students identified with Autism Spectrum Disorder have received extra support by the publicly funded school system. In Canada, Autism Spectrum Disorder affects approximately 1 in 150 children each year (McEwen, 2014). Secondly, deaf and hard-of-hearing is an impairment characterized by deficits in speech and language development of an insufficient auditory response to sound. Communication exceptionalities also include language impairment, speech impairment and learning disability (Ontario Ministry of Education, 2014).

2.2.4 Physical exceptionality

The Ontario Ministry of Education (2014) defines physical exceptionalities as a particular condition of severe physical limitation and deficiency that require special support in learning. Blind and low vision is a circumstance of partial or total impairment of sight or vision that impacts educational performance. For instance, some students may be completely blind and other students may be partially blind. Impairment can vary from mild to severe, some students experience impairment which largely affects their daily tasks, and other student’s experience minor affects within their daily tasks from impairment (Kitchen & Dean, 2010, p.236). There are six conditions within the physical exceptionality category. These conditions include cerebral palsy, spina bifida, muscular dystrophy, acquired brain injury, epilepsy, and Tourette syndrome. Students who experience these conditions will be under the care of a health professional (Hutchinson, 2013). It is critical for educators to become aware of the students background in order to meet the stu-
dent’s individual needs. Physical exceptionalities include characteristics such as involuntary
movement, poor coordination, developmental delays, cognitive difficulties, speech & language
complications, and skeletal muscle weakness (Hutchinson, 2013).

2.2.5 Multiple exceptionalities

Furthermore, the Ontario Ministry of Education (2014) defines multiple exceptionalities
as “a combination of learning or other disorders, impairments or physical disability that is such a
nature as to require, for educational achievement, the services of one or more teachers holding
qualifications in special education and the provision of support services appropriate for such dis-
orders, impairments or disabilities” (Ontario Ministry of Education, 2014). Multiple exceptional-
ities are more complex and more common in children who have, for instance, mobility complica-
tions, since this is often accompanied by a hearing difficulty (Moon & Dillon, 1995).

2.3 Incidence of Students with Exceptionalities in Ontario

In Ontario, 300,000 students are in need of special education intervention (Bennett,
2009). Educators have an obligation to provide inclusive schooling for exceptional learners.
Also, regular classroom teachers will need substantial professional development in order for in-
clusion to be effective (Kitchen & Dean, 2010). “Thinking and teaching methods are shifted in
order to support the 15 percent of students who require special education services. In 2007 there
were 191,902 students identified as exceptional in Ontario’s publicly funded school system who
were receiving special education services, and another 98,823 not formally identified but still
receiving services” (Kitchen et al., 2010, p.225).

Statistics Canada (1999) estimates that 1 in every 10 elementary-school children obtains
some form of special education, and two-thirds of these students are male (Santrock et al., 2010).
Approximately 59 percent of children who acquire special education spend majority of the school day in a regular education classroom (Santrock et al., 2010). This estimation is comparable to a 2009 study conducted by The Ontario Ministry of Education. The study confirmed that over 80 percent of students spend more than half of their day in a standard classroom environment (Bennett, 2009). Furthermore, this determined that the extensiveness rates are gradually increasing over the years. For instance, from 1999 to 2009 the percentage increased by 21 percent.

A small number of students (approximately 8 percent) with exceptionalities are withdrawn from full-time classrooms or take part in residential schools. “In Canada the number of children recognized with a learning disabilities has increased to 198 percent over the recent years” (Santrock et al., 2010). According to the Ontario Ministry of Education (2014) more than 42% of exceptional students have a learning disability. Students with learning disabilities are unlikely to attend school as they face minimal opportunities (World Report on Disability, 2011).

2.4 Individual Education Plans

The Education Act defines a special education program as a program that provides constant assessment and evaluation. An Individual Education Plan meets the needs of the exceptional pupil, and it is a written plan that outlines specific expectations, services and progress corresponding to the pupil (Ontario Ministry of Education, 2015). Educators realize that it is beneficial to adapt their teaching strategies in order to meet the needs of students in their classroom, rather than focusing on specific curriculum documents (Kitchen & Dean, 2010). All students with learning needs are eligible for suitable accommodations such as special education programs and services (Ontario Ministry of Education, 2014). The Individual Education Plan include level
of functioning, long-term goals, short-term goals, detailed strategies or supports, timelines, participants roles and responsibilities and evaluation procedure (Santrock et al., 2010). Regulation 181/98 instruct educators to develop an Individual Educational Plan as soon as a student has been identified as exceptional, and revise their lesson plans in order to accommodate exceptional students (Kitchen & Dean, 2010, p.239).

2.5 Technological Practices and the Role of Educators

A regular classroom teacher is accountable for providing a valuable education for children with exceptionalities. Educators could use a variation of instructional methods in order to include divergent aspects of learning. For instance, observing the classroom environment from a wide range of perspectives, and respond to external stimuli such as physical space, hearing and sight (Bennett, 2009). Additionally, educators are able to support students more easily if they are educated in relation to their student’s exceptionalities, and when they collaborate with other educators in order to implement beneficial programming. Educators have a critical role in order to help other students appreciate and accept students with exceptionalities. This occurs through interaction and co-operative learning experiences within the classroom (Santrock et al., 2010).

Moreover, students with exceptionalities are frequently less powerful. It is crucial as educators to give these students an opportunity to make choices and have their own opinions Unfortunately there has been a lack of training amongst teachers in the education system (Santrock et al., 2010). Students with mild learning disabilities spend a small part of their day in a regular education classroom, although it is difficult for these students to keep up with their peers. Research has found that teachers find it challenging to provide individual attention to students as it is time consuming (Hasselbring, & Glaser, 2000).
The resource teacher provides services available for students with exceptionalities. Frequently, students with exceptionalities spend most of their day in a regular education classroom and a small amount of time in a resource room where a resource teacher assists them. Resource teachers and regular classroom teachers collaborate in order to follow-up with how students are performing between both classrooms (Santrock et al., 2010).

Bennett (2009) identifies a special education teacher as a teacher who has ample training in special education. Children with exceptionalities spend part of their day with a special education teacher. The special education teacher assists the regular classroom teacher with programs for students with exceptionalities. Research indicates that school administrators take on a central role for promoting inclusion amongst schools (Santrock et al., 2010).

Technology is a crucial component that corresponds to teaching students in a classroom. Research has found that teachers are not provided with enough assistance that exceeds learning technological skills (Parmeter, 2012). Teachers who are unfamiliar with specific technological device are inclined to disregard these tools within their practice (Parmeter, 2012). However, technology improves teaching only if barriers were removed, for instance personal teaching beliefs can influence technology integration. Additionally, research has found that every teacher is different and has different personal beliefs, this impacts the way technology is used in a classroom (Kim, Kim, Lee, Spector, & DeMeester, 2013).

Technology allows a teacher to take on the role of the facilitator and promotes student-centered educational environments (Varank, & Tozoglu, 2006). Teacher’s can communicate with smart boards while teaching a lesson and this allows all of the students to remain involved (Parmeter, 2012). “Teachers have found that technological transformation can help level the
playing field for students with exceptionalities and enable these students to succeed in a regular classroom” (Hasselbring, & Glaser, 2000). Furthermore, teachers need to incorporate technology into their classroom more often, especially in a generation where technology is available to students (Quick, 2014).

2.6 Resistance, Perceptions and Challenges in Schools

According to research, teachers felt as if iPads are easier to use compared to picture boards (Quick, 2014). Minimal technical training is required for teachers to implement iPads in their classroom. In addition, teachers are doubtful about computer use in their classroom (Goodwin, 2012). There was a survey of 2,500 American teachers who established that they were positive about technology, but they had concerns about mobile devices and the internet (Clarke, & Svanaes, 2014). Technology integration is perceived as a challenging course of action by teachers. However, as teachers become more knowledgeable on educational technology, they are able to see the usefulness of technology integration (Varank, & Tozoglu, 2006). Research has found that teachers resist technology in their classroom if it is a sudden change from their accustomed role that they have been implementing for years (Varank, & Tozoglu, 2006). Additionally, teachers use their own methods because it makes them feel confident, and they disregard technology because it was not used in the past. Technology is ignored by teachers if they are unsure how to use it. Teachers are influenced to disregard technology if there colleagues are not using it as well. Additionally, in a classroom environment educators can reduce resistance if they receive funds to pay for the cost of technology in their classroom environment. Allowing teachers to participate in training programs and workshops that discuss the benefits of technology in today’s digital generation, and how to effectively use it can reduce resistance (Koksal, 2015). According to Clarke &
Svanaes (2014) the requirement for adequate teacher training has been identified through research. Giving teachers an iPad device to use and become familiar with has been seen to reduce resistance. A study demonstrated that teachers who lacked familiarity with technology reported feeling insecure with implementation (Clarke & Svanaes, 2014).

Teacher’s beliefs are typically structured through personal experiences starting as a student and later as a teacher. They need to be provided with substitute visions of what teaching with technology looks like and a chance to experience it. Although teachers have enthusiastic attitudes towards technology and want to enhance their teaching through technology, they are unable to do this. They lack knowledge on how to use technological devices and they haven’t received appropriate training. A study indicated “between 40-50% of teachers avoided using computers because they lacked confidence, felt uncomfortable, and were threatened and intimidated by computers. Teachers beliefs about technology can determine their behaviour towards technology use” (Varank, & Tozoglu, 2006, p.200).

2.7 Parents as Educational Partners

It is crucial for teachers and parents to collaboratively guide the learning of students with exceptionalities. “Teachers are experts about learning, but parents are experts about their own children. Working together creates the best environment for student learning” (Santrock et al., 2010, p.196). Research has proven that parent involvement largely contributes to improved student outcomes (Hedeen, Moses, & Peter, 2011). Collaborative discussions between a parent and educator provide shared responsibilities in decision making and planning. For example, educators tend to create beneficial alternatives to educational approaches for students. When parents and educators have discussions, a wide range of exceptional students have an opportunity to re-
main in a regular education classroom. The regular education teacher becomes involved in a plan that is suitable for the student’s educational needs (Santrock et al., 2010). Armon & Terr (2015) mentioned that parental involvement may not consist of the parent remaining in the classroom. Instead, they typically contact the teacher through the phone or respond to the teacher through email. Parental collaboration can be positive if parents are involved and are constantly communicating with the teacher. However, parental involvement could be challenging if parents disagree with supports that are offered by the educator and if parents refuse assistance for their child.

2.8 The Impact of Inclusive Education

According to Tremblay & Tivat (2007) inclusion is defined as an appropriate educational program for every student. Everyone is accepted and supported in a regular education classroom. Despite limited research in this area, inclusion gives students with exceptionalities an opportunity to attend typical schools. It is essential that support services are brought to students and that student’s benefit from attending class (Tremblay & Tivat, 2007). The Charter of Rights and Freedoms, Section 15.1 outlines a legislation that has an impact on education in Canada. This legislation is “Every individual is equal before and under the law and has the right to equal protection and equal benefit without discrimination and, in particular, without discrimination based on race, national or ethnic origin, colour, religion, sex, age or mental or physical disability” (Perry, Winne & Woolfolk, 2016, p.129). An inclusive classroom allows students with exceptionalities to feel a sense of belonging within their classroom. Students are provided with an understanding of how to accept others (Santrock et al., 2010). Full inclusion classroom gives all students an opportunity to be in a regular education classroom full-time, regardless of their condition or exceptionality. Inclusion supporters believe that students should always begin in a regular classroom environ-
ment, and be removed only when suitable services cannot be provided in a regular classroom. Education systems are designed to meet diversities among students. Inclusive education means that all students have the right to quality education in a class that is suitable to their age. The term ‘Normalization’ is important because it means that individuals with exceptionalities are treated as normal as possible (Tremblay & Tivat, 2007).

### 2.9 Twenty-First Century Classrooms

Today’s children are the first generation of the “digital age” in which technological devices contribute quicker communication (Hasselbring, & Glaser, 2000). Effective use of technology is a crucial element of student learning in 21st century classrooms. Students are immersed in technological activities and they live in an era where technology is continuously changing. Software’s and hardware’s are cheaper and easier to use (Goodwin, 2012). In previous years before the internet came about, the central source of technology communication were writing letters, telephone and face-to-face discussions. However, in today’s society technology is a central aspect and widely revolves around classroom settings. It changes how teachers implement teaching and learning (Parmeter, 2012).

### 2.10 iPads and Tablets

Johnson (2013) identifies a tablet as a single panel computer with a touch screen as the input mechanism. iPads can be used as a form of assistive technology because students can download applications that support visual, tactile and auditory learning (Quick, 2014). iPads offer many features such as voiceover, large font, zoom, voice control, and mono audio (SENnet, 2014). According to Apple technologies, “1.5 million iPads are used in educational institutions, with over 1000 schools having one-to-one iPad programs. Also, over 20,000 educational applica-
tions are specifically made for the device” (Goodwin, 2012). iPads were not always established as educational tools; however the device rapidly progressed and moved into schools. It is promoted as particularly useful for children with exceptionalities and disabilities. The first edition of the iPad became available in 2010 and multiple applications have been initiated to teach a wide range of skills to students with exceptionalities. It has been identified as easy to use with its immense touch screen and swipe controls (Chai, Vail, C, & Ayres, 2015). Price (2011) similarly mentioned that the iPads light weight portability, immense touch screen, voice over, speakers and cognitive easiness makes it an attainable device for students with exceptionalities. The iPad is used for a variety of purposes such as a writing tool, a communication device and a book (Fan, 2012). There are approximately 5,400 educational applications accessible for download on the iPad (Arthanat, Curtin, & Knotak, 2013).

2.10.1 Exceptional students and the use of iPads

Research indicated that students with intellectual and motor skills impairments found an obstacle between themselves and the curriculum (Miller, Krockover, & Doughty, 2013). However, the touch device of the iPad allowed the students to connect with the objects and texts on the display instead of a mouse (Miller, Krockover, & Doughty, 2013). Johnson (2013) similarly indicated that iPads were used in a school setting by students with intellectual impairments. The iPads encouraged self-directed learning, individualized learning, and enhancement of learning. Also, it encouraged accessibility, improved social interaction and engagement. A study indicated that three students with behavioural disorder demonstrated increased time on-task when they used an iPad. The student’s time on-task increased to 80% when they used an iPad device (Flower, 2014). Research has found that students with behavioural disorders and attentional dif-
difficulties improved from tasks that showed them instant feedback (Quick, 2014). Also, these students are more likely to respond to academic tasks using an iPad device because it allowed them to see if they are doing their work correctly (Quick, 2014).

Since the iPad has a large touch screen feature it allows students with motor control complications to use it as a replacement device. The iPad is useful for students with fine motor limitations and students who need multi sensory input. A study indicated that students with Autism Spectrum Disorder demonstrated increased task completion and enhanced learning when using an iPad. Also 4% of grade four students with disabilities performed above the skillful level in mathematics using an iPad (O’Malley, Lewis, & Donehower, 2013).

iPads offer inclusivity within a classroom as it allows students to become closer to their classmates. Students gain a sense of accomplishment as they learn identical material as other students. iPad devices can substitute for assistive technologies because it operates the same way, it has the exact same features and it is less expensive. For instance, students with Autism Spectrum Disorder or speech disorder can use a communication application on an iPad rather than a communication board that is frequently used on an Assistive Technology device. Students with visual impairment benefit from an iPad because there are applications such as ‘Braille Touch’ which teaches students how to type, read and write (SENnet, 2014). In addition, conflicting research mentioned that the iPad is not useful for students with exceptionalities because it increases social isolation and addiction (Johnson, 2013).

2.11 Smartphones and iPods

Smartphone’s include similar functions of a computer device. These functions include access to the internet and access to a variety of applications (Fernandez-Lopez, Rodriguez-Fortiz,
Rodriguez-Almendros, & Martinez-Segura, 2013). The Toronto District School Board banned cellphone use from 560 public schools during the years 2007-2011 (Kiedrowski, Smale, & Gounko, 2009). However, recent research has found that smart phones increase learning in students (Fernandez-Lopez et al., 2013) Smartphone applications guide students with disabilities through their day-to-day activities. For instance, students with visual impairments are able to benefit from screen magnifiers; which enlarges texts and images on the smart phone (Fernandez-Lopez et al., 2013). iPods are miniature computer devices that can be used to play music, watch videos and view photos (McEwen, 2014).

2.11.1 Exceptional students and the use of smartphones and iPods

Students with disabilities from Kindergarten to grade twelve participated in a Grunwald survey. The results of the survey stated, “43% of students with disabilities used a smart phone, most on daily basis” (Israel, Marino, Delisio, & Serianni, 2014). Additionally, smart phones are flexible for students with exceptionalities because they can access applications in different locations. Stimulative, communicative and exploration activities are available on a smart phone and are equivalent to individual abilities and needs. Mobile technology captures student’s attention, especially those who often have complications focusing on specific stimulus. Students with impairments experience communication difficulties and activities are individualized in order to meet their needs. These difficulties can be resolved through a smart phone because students can access sounds through a recorded or text-to-speech option (Fernandez-Lopez et al., 2013). Mobile technology gives students an option to learn and it increases their interest in activities.

In Canada, research has found that students with Autism Spectrum Disorder displayed enhancement in communication skills when using an iPod touch device (McEwen, 2014). The
data suggested that when students with Autism Spectrum Disorder used the iPod touch device they were more motivated, they communicated with others, and they had a longer attention span (McEwen, 2014).

2.12 Computers

Computer devices process and stores information, this is useful in a classroom context (Deters, 2001). Research has found that the use of computer technology can increase an exceptional student’s collection of skills and knowledge when the computer is used as a form of instruction (Hasselbring, & Glaser, 2000). Many computer applications such as the Internet and media presentations can demonstrate opportunities for real-world situations (Hasselbring, & Glaser, 2000). Computers are useful for communication purposes and the internet can extend the learning atmosphere.

2.12.1 Exceptional students and the use of computers

Students with exceptionalities can retrieve and send information to their peers. “Research has shown that students with disabilities learn more when they are involved in such knowledge construction activities. Research has also demonstrated different types of discourse have been associated with different levels of thinking processes” (Hasselbring, & Glaser, 2000, p.107). Computers can help meet the social needs of students with disabilities. For instance, a teacher found that students with behaviour exceptionalities interacted with other students through email because their exceptionality “vanished” within these communication environments (Bramlett, Ayres, Cihak, & Douglas, 2011). Communication technologies can strengthen social learning by associating student’s one to one (Hasselbring, & Glaser, 2000). A study was conducted to evaluate computer based instruction in a classroom environment (Bramlett, Ayres, Cihak, & Douglas,
The results of the study showed that computers are a valuable tool to teach practical skills and classroom instruction (Bramlett, Ayres, Cihak, & Douglas, 2011).

Word Processing can assist students who struggle with fine motor skills that reduce their ability to write. Additionally, Word Prediction software’s on a computer device is a useful tool for students with learning disabilities as it constructs written documents. This program minimizes the amount of keystrokes that are necessary to type words and provides support with spelling for students of assorted abilities. For instance, students can choose from a list of words that appears on their computer screen and insert it into the written text. The computer reads the words out aloud as well. Students with communication deficiencies typically avoid the use of long complex words. Word Prediction software’s on a computer allows students with learning disabilities, communication impairments and motor impairments to communicate their thoughts in a regular classroom setting (Hasselbring, & Glaser, 2000).

2.13 Smart Boards

Smart Boards are considered to be a form of assistive technology in classroom settings. A Smart board is a “touch-sensitive screen that works in conjunction with a computer and a projector, the first interactive smart board was manufactured by SMART technologies in 1991” (Interactive Whiteboards and Learning, 2006). Additionally, it is a device for collaboration, enhancing student learning results and is an essential tool for lesson planning. Smart boards are an excellent way for students to connect with digital content and communicative media in a classroom environment (Parmeter, 2012). Smart board learning activities consist of creating notes in digital ink, viewing websites as a large group, controlling texts or images, writing over documents, gen-
erating digital lesson templates or activities, viewing educational video clips and presentations (Parmeter, 2012).

### 2.13.1 Exceptional students and the use of smart boards

Parmeter (2012) mentioned that smart boards are beneficial for students with exceptionalities. Deaf and hearing impaired learners depend on visual learning. Smart boards display visual objects with the use of sign language. Visually impaired students operate objects and use immense texts. Special needs students with learning complications such as physical and behaviour complications, for instance Attention Deficit Disorder find big interactive screens useful. Also, touch sensitivity promotes learning as well (Interactive Whiteboards and Learning, 2006).

### 2.14 Assistive Technology

Assistive technology is defined as “any item, piece of equipment or system that helps people bypass, work around or compensate for learning difficulties. Assistive Technology is an umbrella term, which can be divided into two main groups: hardware and software. Hardware refers to equipment such as tape recorders and calculators. Software refers to the programs that run on computers, telling the computer what to do” (Raskind, 2000, p.4). Israel, Marino, Delisio, & Serianni (2014) and Fan (2012) defined assistive technology as “any item, piece of equipment, or product system, whether commercially acquired off the shelf, modified, or customized, that is used to increase, maintain or improve the functional capabilities of a child with a disability. An example of an assistive technological device is reading machines. This device is operated through a computerized voice that read books out loud to assist students with reading difficulties (Raskind, 2000). Moreover, ‘Speech to Text’ is a specific software that transforms words that are spoken out loud to electronic written text. The ‘Speech to text’ program is a type of assistive
technology that students can use on a computer, tablet, laptop, or cellular phone (Ontario Teachers Federation, 2015).

In Ontario, teachers use a variety of assistive technology tools in order to support learning and differentiate instruction. This form of technology is known to increase student’s ability to accomplish tasks independently (Sider & Maich, 2014). According to the Ontario Ministry of Education, assistive technology can help students with exceptionalities obtain motivation, improve academic achievement, finish educational tasks independently, and establish individual strengths (York Region District School Board, 2012).

2.14.1 Exceptional students and the use of assistive technology

Assistive Technology helps students with learning differences reach their full capabilities. Assistive technology can be used alongside students who have a cognitive or physical disability to assist them with daily living skills or communication. Research has found children with autism undertake visual information more effectively than auditory information (Fan, 2012). Therefore, assistive technology devices are used with students with autism to encourage their strongest processing modality, which can encompass visual cues and schedules (Fan, 2012).

2.15 Learning and Literacy Development

The iPad trial report (2011) indicated, “There are many benefits of using iPads in the classroom to engage students with multiple impairments in learning. These included the ability to break tasks down into achievable parts, light weight, comfortable size, ease of use, and a vast range of apps” (iPads in Special Education, 2012, p.9). Parmeter (2012) suggested that smart boards increase social learning as students engage in active learning through writing, reading and discussing. Additionally, social learning promotes constructivism as students with exceptionali-
ties construct meaning through data, and whole-class teaching brings students together. The learning that exceptional students exhibit through smart boards relate to Vygotsky’s social constructivism theory. Vygotsky mentioned that learning should be interactive and collaborative. Technology supports social constructivist teaching and learning because the internet provides a means for dialogue and discussion (Hirtle, 1996). Writing programs provide collaborative writing, and stimulations can make learning significant (Hirtle, 1996).

Another study was conducted in order to identify if iPad applications can encourage early literacy development in children with disabilities (Chai et al., 2015). The students were given an iPad with an interactive application named ‘Touch Sound’. The researcher observed three participants who were kindergarten students for the purpose of this study. The students listened to the instructions on the iPad and touched the correct words. For instance, ‘Touch the word that begins with the same sound as bee’. The results indicated that all three students progressed over a span of three weeks, and they all showed preciseness of 83% to 100% in relation to their correct responses (Chai et al., 2015). It was evident that students became more assured with reading and learning activities in the classroom. It was a substantial way for students to learn phonological awareness and sounds (Chai et al., 2015).

Students in elementary school with autism spectrum disorder participated in a study that suggested that iPads enhanced comprehension skills (Price, 2011). When using the iPad the students demonstrated improvements with information acquisition and were motivated to use the iPad. “The rate of increase in comprehension when using the iPad was 21 percent in students in elementary school grades and it went up to 50 percent” (Price, 2011).
2.15.1 Academic achievement

Learning outcomes are completely different depending on a student’s ability in correspondence with the use of learning applications. Throughout a study it has been indicated that students academic scores improved by 30 to 60 percent (Arthanat, Curtin, & Knotak, 2013). Four students with developmental disabilities were given an iPad and computer device to use. The study stated that the students were eager to investigate other applications and games rather than proceeding with the task. However, the student’s academic capabilities largely increased during the use of iPads and computers (Arthanat, Curtin, & Knotak, 2013). It is important to integrate computers into a classroom atmosphere as it gives exceptional students an opportunity to work collaboratively with their peers. For example, students with learning disabilities can work with their peers to generate new ideas and this can potentially increase their academic learning (Has-selbring, & Glaser, 2000).

2.16 Conclusion

In this literature review I examined research on the role of educators and useful technology practices to support exceptional students. This review elucidated the extent that attention has been paid to the role of educators and how perceptions and challenges influence technological practices. Additionally, the review clarified the extent to which attention has been paid to technology and which device is the best for a few types of exceptional student. It also raised questions about the perceptions of teachers, and points to the need for further research in the areas of funding and twenty-first century classrooms. Minimal research attention has been focused on which technological devices are ultimately the best for each type of exceptional student. In light of this, the purpose of my research is to learn how elementary school teachers can support stu-
dents with exceptionalities through technology use so that teachers can incorporate this research into their practice.
Chapter 3: Methodology

3.0 Introduction

In this chapter I described the research methodology and I began by identifying specific research approaches that I used within the research study. I provided an explanation for the choices that I made in relation to the approaches and procedures. Afterwards, I reviewed the data collection instruments in order to establish an appropriate instrument that corresponds to my research. I identified participants of the study, sampling criteria and recruitment, and described how I analyzed the data through specific procedures. Throughout this process, I considered ethical issues that are relevant to my study. I addressed a variety of methodological limitations, and strengths of the research study. Lastly, I provided a rationale for the decisions that I made throughout the entire process.

3.1 Research Approach and Procedures

This research study is being conducted using a phenomenological qualitative research approach, including an existing literature review relevant to the research questions and purpose of the study. A phenomenological qualitative approach is being used to examine how a small sample of teachers are integrating technological practices in regular education classrooms, and the observed impact that this has on students with exceptionalities. Throughout this approach, participants were asked open-ended questions during a semi-structured and face-to-face interview. Data was collected from two interviews with participants who met the required criteria. The phenomenological approach authorized the researcher to “understand the experiences through a descriptive lived phenomenon. Studying individuals who have shared the experience through interviews” (Creswell, 2013, p.104).
This approach gave me an opportunity to further investigate teacher’s experiences in a regular education classroom in order to formulate meanings. The phenomenological approach was appropriate for this study because it focused directly on similar experiences of the participants, and judgements were eliminated through ‘bracketing’ lived experiences. Through the open-ended interviews which were transcribed, common themes emerged through the findings, this contributed to encoding the participants responses (Creswell, 2013). Additionally, the open-ended questions were suitable in order to collect data that related to the participants experiences.

Throughout the research study, the qualitative paradigm was appropriate because it connected to the social world in which the researcher lived in. Also, it explored real life experiences of other individuals. This is crucial in order to gain an understanding of the participants views, beliefs, opinions and practices (Hancock, Ockleford, & Windridge, 1998). As a researcher, I am aware that qualitative research aims to ask ‘why’ and ‘how’ questions. It connected the opinions, feelings and experiences of participants in order to construct subjective data (Mack, Woodsong, MacQueen, Guest, & Namey, 2005). Whereas, in quantitative research, the researcher focused on numerical data representations and observations in order to delineate phenomena (Bryman, 2006). Therefore, based on my research purpose and questions that I formulated, a qualitative research approach is suitable for me. It provided me with data that connects to teachers lived experiences, beliefs, perceptions and practices in the classroom. Furthermore, as a researcher, this gave me an in-depth understanding of how a small sample of regular education classroom teachers use technological devices, and how they responded to students with exceptionalities.
3.2 Instruments of Data Collection

The central source of data collection used in this study is the semi-structured interview protocol. According to Edwards & Holland (2013) a semi-structured interview is an interactional interchange of conversation between two or more participants, and includes a face-to-face structure in order to collect data. It incorporates a flexible structure, in which the interviewer prepares an interview that addresses the research purpose and relevant pre-determined questions (Edwards & Holland, 2013). However, during the interview the participants had an opportunity to expand on altered areas that needed to be addressed which allowed flexibility for the interviewee. As a researcher, this is crucial because further questions came up that I did not intend on. Therefore, I was willingly ready to transition from the planned interview protocol, and I was open-minded in order to construct new knowledge as an interviewer. Semi-structured interviews are essential for a qualitative research study because asking appropriate open-ended questions allowed participants to discuss meaning from their lived experiences (Creswell, 2013). This source of data collection is appropriate and reliable in relation to my research purpose and questions. As a researcher, I gained an understanding of teacher’s experiences through an interview format, which allowed participants to further elaborate on specific areas.

The semi-structured interviews involved two individual teachers who had experience working in an Elementary school. The participants had additional experience working with students with exceptionalities and had a technological background. The interviews took place in the Greater Toronto Area. The interview included forty-three questions, and lasted for a duration of sixty minutes. Both of the interviews provided open-ended questions and were audio recorded.
using an iPhone, with informed consent from the participants. Afterwards, the audio recording was manually transcribed and emailed to the participants to ensure validity and accuracy.

I explained to the participants that the purpose of the study is to learn how a small sample of elementary school teachers integrate technology in order to support students with exceptionalities. I further explained to the interviewees that the information will remain confidential, and any information that identifies their school or students will also be excluded. Also, they were free to decline or answer any questions during the interview. In addition, they were free to withdraw even after they have consented to participate (See Appendix A). I organized my interview protocol into five categories (See Appendix B). The five categories consist of background information, teacher perspective/beliefs, teacher practices, support/challenges and next steps. A few example of questions included:

1. In what ways does technology integration support students with exceptionalities in your classroom?

2. What challenges have you encountered when incorporating technology in your classroom and how do you respond to these challenges?

3. What is your perspective in relation to the use of technology in your classroom?

(See Appendix B for the entire interview protocol)

### 3.3 Participants

Throughout this section, I reviewed the sampling criteria that corresponded to the participant recruitment that I established. I determined a variety of methods for teacher recruitment. The following sample of participants connected to the research purpose and the research questions. Furthermore, I introduced each of the participants that were apart of the study.
3.3.1 Sampling criteria

The following criteria will be applied to teacher participants:

1) Teachers will have a minimum of 3 years teaching experience in an Elementary school setting.

2) Teachers will have current or prior experience working with exceptional students in a regular education classroom.

3) Teachers will have experience using educational technological devices in a regular education classroom to support students with exceptionalities.

4) Teachers will have demonstrated a leadership role or expertise pertaining to technology and support for students with exceptionalities.

5) Teachers will be working in the Greater Toronto Area.

In order to participate in this study there are a few criteria that the participants needed to fulfill. Firstly, teachers had a minimum of 3 years teaching experience in an Elementary school setting. This specific criteria is relevant to the purpose of the research study. As a researcher, I located participants who had a minimum of 3-years experience because I was interested in learning about current technological experiences that these teachers may have had in the field. In order to explore current practices, teachers had at least 3 years of experience, and they had recent teaching experience that revolved around technology. Also, as a researcher I am aware that a minimum of three years of experience is a reliable amount of time. This offered the participants an opportunity to share an adequate amount of experience from their expertise and profession. Also, teachers had experience teaching in an Elementary school setting, anywhere from Kinder-
garten to grade 8. This was relevant because the research study focused specifically on Elementary school teachers.

Secondly, teachers had current or prior experience working with exceptional students in a regular education classroom. This criteria’s relevant because the research study focuses specifically on students with exceptionalities in a regular education classrooms. This is the main reason why teachers needed to fulfill the requirement of having experience with exceptional students in a regular education classroom. Teachers had additional working experience in both a regular education classroom and a special education classroom. However, it was not mandatory to have working experience in a special education classroom for the purpose of this study. Also, teachers had either current or prior experience. This gave participants an opportunity to talk about students that they may have had in the past or classrooms that they may have taught in. However, participants had current experiences as well. As a researcher, I learned about possible changes within their experience.

Thirdly, teachers had experience using educational technological devices in a regular education classroom to support students with exceptionalities. This was relevant to the purpose of the research study. The research study focused on integrating technology which is the reason why teachers had experience using technological devices in a classroom. Fourthly, teachers had demonstrated a leadership role or expertise pertaining to technology and students with exceptionalities. As a researcher, I learned about the participants experiences, which is formed through their expertise in a specific subject. This expertise or knowledge arose from qualifications, professional development, graduate degree’s or curriculum material. Fifthly, teachers worked in the Greater Toronto Area, in order to maintain a similar location within the study.
3.3.2 Sampling procedures/recruitment

The recruitment of participants occurred by contacting individuals within a school board. Specifically, I contacted teachers and principals that were previously known to me, and I provided them with a brief overview of my research study. Also, I provided my contact information and the participant criteria that I established. This allowed principals and teachers to become aware of participants that potentially met the criteria for my study. However, I provided my information instead of asking principals and teachers to provide me with participant contact information of who they think would be suitable. My strategy of recruitment ensured that teachers are volunteering to take part in my study rather than feel obligated to participate.

Based on the methodological parameters of my research study, I have chosen a sampling procedure. I utilized three sampling strategies which are purposeful sampling, convenience sampling and snowball sampling. Purposeful sampling is an approach that is used in qualitative research. The researcher chooses individuals for the study because they can purposefully communicate an understanding of the research problem and main phenomenon of the study (Creswell, 2013). The purposeful sampling strategy provided extensive detail and understanding of a situation, “This involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest. Also, selecting participants who demonstrated willingness to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner” (Palinkas, Horwitz, Green, Wisdom, Duan, & Hoagwood, 2015, p.2). I adopted purposeful sampling in my study in order to gain an understanding of the research problem through participants experiences and knowledge. The participants met a specific criteria in order to provide relevant data.
Convenience sampling is an approach that is used in qualitative research. Researchers choose participants that are readily available and easily reachable (Farrokhi, & Mahmoudi-Hamidabad, 2012). The convenience sampling strategy was used because I was immersed in a community of teacher colleagues and mentor teachers. I connected with existing contacts in order to recruit participants within the Greater Toronto Area. Furthermore, snowball sampling is a strategy that allowed participants to nominate other individuals who were interested in the research study (Creswell, 2013). I used the snowball sampling strategy by asking participants to recommend other individuals who are interested to participate in the study. I gave participants my contact information in order to transfer my information to other individuals who were interested. I ensured that the recommended individuals are volunteering to take part in the study rather than feel obligated to participate.

3.3.3 Participant biographies

Both participants are professionals in the field of education. They both have experience working in an elementary school as a classroom teacher. Pseudonyms are used to maintain anonymity throughout the study.

Ashley has been a teacher for seventeen years. She currently teaches rotary intermediate math and science. The students that she currently teaches are twelve to fourteen years old. Ashley’s focus has been in the intermediate division for approximately the past seven years. However, Ashley has taught kindergarten to Grade Ten throughout her entire career. The demographics of the school that she currently works in is a diverse student population. Historically it’s an affluent area but the demographics is decreasing in size. It has five hundred students but five years ago it had seven hundred and fifty students. Ashley has previously worked in a duo-track gifted
school as well. The school that she currently works in has Special Education Resource Teachers per a division. Two of Ashley’s own children has an exceptionality and has given her more of an insight into the learning needs of students. Her youngest son with Attention Deficit Hyperactivity Disorder gave her a different view of children with this disorder. She understood how to support them and how to adapt various learning styles on a yearly basis in her classroom. Also, it gave her a personal connection in order to really understand children with exceptionalities beyond the classroom. Ashley felt that a lot of children don't need to be identified in order to understand the diversity of learning needs. Ashley believed that some of her professional development that she did with the board helped to prepare her for this work. However, she had two students with Autism Spectrum Disorder in her classroom and it gave her a new perspective of working with these children as well. Ashley attended teachers college twenty years ago and realized that there wasn't any work done in relation to supporting students with exceptionalities. Also, she has additional qualifications in special education. However, it didn’t prepare her for working with students with exceptionalities because the course is theory based. She felt as if the experience that she gained working with the kids assisted her instead.

Megan currently works in a teacher training position. However, she also worked in a public school position teaching computers to elementary school students, and mentoring teachers in the use of technology. She previously taught students from kindergarten to Grade Seven. She taught every subject area in an elementary school. She integrated technology across the core curriculum in math, social studies, science, language and art. The school that Megan worked in had one to two students with exceptionalities in each class. The school was a demographically middle class area with a range of people who represented different cultural backgrounds. Since Megan
started teaching she always had a student in her class with an exceptionality. Something that prepared Megan for this job was she connected with parents and asked them what challenges they encountered. Also, she gained experience by teaching students with exceptionalities and getting to know who they are. Megan didn’t complete teacher training on special education, however she gained experience while working with students. An experience that she recalled is teaching students with Autism Spectrum Disorder. Megan attended a University fifteen years ago and completed a doctorate degree. Also, she completed her undergraduate degree in fine arts, and did not take any special education courses.

3.4 Data Analysis

Data analysis in qualitative research consists of constructing and organizing the data (Creswell, 2013). Throughout the analysis procedure, qualitative data was gathered through individual semi-structured interviews with two teachers. Patton & Cochran (2002) indicated that it is important to read the transcript thoroughly in order to immerse in the details of the interview before dividing it further. I began the analysis procedure by manually transcribing the interviews, which gave me an opportunity to analyze the data within the transcription. Afterwards, I minimized the data by coding the transcriptions, as it aligned with my research questions. During the process of coding two individual transcripts, I highlighted central information, and I wrote notes in the margins in order to identify categories of data. Next, I reduced codes into common themes by recognizing frequent patterns (Creswell, 2013). This enabled me to read both the themes and categories together, in order to synthesize appropriate themes. Lastly, I displayed the data by identifying the importance of the themes, and its relevance to the existing research that has been found. The themes and codes were displayed in a data table, and I included quotes for each cate-
Moreover, I recognized null data in the research and I expanded on the significance of this data.

3.5 Ethical Review Procedures

During the process of designing a qualitative research study, researchers review ethical issues that may emerge and plan how to address these ethical issues. These ethical issues arise during various stages of the research process such as the conducting the study, collecting data, analyzing data, reporting data and publishing the study (Creswell, 2013). Therefore, it is important to consider ethical review procedures in order to eliminate these issues.

Before implementing this research study, it has been reviewed and approved by the University of Toronto Research Ethics Board (REB). The Research Ethics Board approval is an important process because one revises ethical procedures (Warusznski, 2002). Afterwards, I contacted participants who were interested to participate in the study, and I gave them an overview of the purpose of the study (Creswell, 2013). I mentioned that there are no known risks to participation in this study, which is also stated in the consent form (See Appendix A).

As a researcher, it is important to be aware of potential risks and avoid disclosing information that will harm participants while reporting data (Ritchie, Lewis, Nicholls, & Ormston, 2013). The participants were not asked sensitive questions that will trigger an emotional response. I re-stated during the interview that they have the right to withdraw from participation. Also, the participants were able to refuse to partake in the study without explanation or penalty. I obtained appropriate consent by giving adult participants a consent form to read and sign. Participants gave their consent to be interviewed and audio-taped. This consent form discussed the purpose of the study, ethical implications, and specifies expectations of participation such as 45-
60 minute semi-structured interview (See Appendix A). The consent form stated that all participants will be assigned a pseudonym and they will be notified of their right to withdraw from participation in the study at any stage of the research study. Also, all identities remained confidential and any identifying markers related to their schools or students were excluded (See Appendix A). This statement is important because it allowed participants to be aware that their personal identification and their names remained confidential. Also, they had the right to choose to not answer any question.

The interviews were conducted outside of school space. Throughout qualitative research, it is important to gain “respectful relationships without stereotyping and using labels that participants do not embrace; acknowledging whose voices will be represented in our final study; and writing ourselves into the study by reflecting who we are and the people we study” (Creswell, 2013, p.56). Therefore, I built respectful relationships and maintained trustworthiness with the participants by excluding judgements. I told the participants that the interview data will be stored on my password-protected computer and the only person who will have access to the research data will be my course instructor Dr. Angela MacDonald-Vemic. Also, I told the participants that I will destroy the audio recording after the paper has been presented and/or published, which may take up to a maximum of five years after the data has been collected (See Appendix A). This ensured valid and reliable research, it is important to protect information (Miller, Birch, Mauthner, & Jessop, 2012).

3.6 Methodological Limitations and Strengths

There are a few limitations in the research study. Firstly, the scope of the research is a limitation because there is a small sample size. The findings are consequently not generalizable
to the larger population. I had an opportunity to interview two participants in a time frame of two years. This was approved by the ethical parameters of the Master of Teaching Research Project. However, a larger sample size expands the range of possible data and forms a better visual for analysis (Israel, 1992). As a researcher, I am aware that the findings can inform the topic, however additional teacher participants could more readily allow the researcher to generalize the experience of teachers. Also, an extended time frame would give me an opportunity to gather data over a longer period of time. The time frame is not longitudinal, instead it is a short period of time (Creswell, 2013).

Additionally, the ethical parameters of the Master of Teaching Research Project provided approval to conduct interviews with teacher participants only. I was not permitted to interviewing other potential participants such as students, administrators and parents. This is a drawback to the research study because having a wide range of participants offer’s the researcher an opportunity to see different perspectives of the study (Israel, 1992). Lastly, the ethical parameters of the Master of Teaching Research Project provided approval to conduct interviews only. I did not have an opportunity to conduct surveys or classroom observations. Creswell (2013) indicated that observations are an important tool in qualitative research as it allows the researcher to watch the setting, participants, interactions and conversations.

There are strengths in the research study. Firstly, the face-to-face interviews were crucial because I learned about the teachers lived experiences, and what matters most in relation to the research topic. It is evident that teachers are able to make meaning from their own lived experiences through a phenomenological qualitative approach (Creswell, 2013). I accumulated deeper first-hand understandings. Throughout the interviews, the teachers were able to reflect on how
they conceptualized technological practices in their classroom in order to support students with exceptionalities. An interview is more reliable than a survey because it provided more depth in relation to the research topic. Furthermore, a small scale qualitative approach was appropriate for this study because it provided in-depth experiences from two teachers.

3.7 Conclusion

In this chapter I described and examined the research methodology. I began by identifying specific approaches and procedures, such as phenomenological qualitative research. This approach was appropriate for this study as it focused directly on experiences of the participants. Afterwards, I described the instruments of data collection. I determined that the semi-structured interview protocol was the most suitable for this study. This form of data collection was suitable because it involved creating pre-determined questions, and it gave the interviewee an opportunity to expand on several unforeseen areas of the research. Next, I identified participants of the study by listing five specific criteria. For instance, I mentioned that teachers had a minimum of 3 years teaching experience in an Elementary school setting. Afterwards, I provided a detailed rationale for each specific criteria. I determined a recruitment procedure, and I utilized three sampling strategies which are purposeful sampling, convenience sampling and snowball sampling. Next, I described how I analyzed the data through specific procedures. I analyzed the data by transcribing the interviews, coding transcripts, creating themes and reviewing the findings. I considered ethical issues that are relevant to my study. These ethical issues consist of consent, risks of participation, member checks, and data storage. Lastly, I addressed a variety of methodological limitations such as a small sample size within the study. Also, I addressed strengths of the research
study such as face-to-face interviews. I provided a rationale for the decisions that I made throughout the entire process. Next, in chapter four, I report the research findings.
Chapter 4: Findings

4.0 Introduction

In this chapter, I discussed the findings that resulted from two face-to-face interviews with elementary school teachers. Both of these teachers gained experience and worked alongside students with exceptionalities in a mainstream classroom. Four themes emerged throughout the process and directly aligned to the central research question: how are elementary school teachers integrating the use of technology into their classroom in meaningful ways to support students with exceptionalities? Throughout the discussion, I connected the participants’ perceptions and the research provided in the Chapter Two literature review. I explored four main themes which align with my sub-questions that further assisted the research investigation. The findings are organized into four following themes:

1) Teachers indicated that a lack of pedagogical and community support is a key barrier to incorporating technology to support students with exceptionalities.

2) Teachers indicated that equality is a key factor to consider when integrating technology to successfully support students with exceptionalities.

3) Teachers indicated that technology integration promotes positive academic outcomes that enhance the individual learning experience of students with exceptionalities in the classroom.

4) Free online software was considered to be more effective assistive technology over expensive devices that were difficult to use.
4.1 Teachers Indicated That a Lack of Pedagogical and Community Support is a Key Barrier to Incorporating Technology to Support Students with Exceptionalities

Both participants acknowledged the importance of developing support from the school community in order to effectively integrate technology and further support students with exceptionalities. However, they both viewed community support as a main barrier throughout their own experiences. Participants indicated that community and pedagogical support is critical because it gives educators an opportunity to successfully integrate technology and support students. In terms of barriers, three sub-themes emerged: lack of parental assistance, lack of teacher training and a lack of funding.

4.1.1 Teachers recognize that a lack of parental assistance is a barrier

Parental support and involvement is critical in a classroom because it allows students to succeed. Participants indicated that if parents willingly collaborate with teachers this allows successful technology integration in the classroom. Both participants noted the importance of educating parents. Ashley stated that some parents don't understand the value of technology for students with exceptionalities. They are unable to envision the wide range of benefits that it possesses. Most often, parents have divergent beliefs that challenge teachers. Megan affirmed:

If you have a student who has some written output issues by always allowing that student to use the computer it means that the student isn't practicing handwriting or printing skills and so that student just falls further behind because the fine motor development isn't being focused on. Parents use pushback and they say that they don't want their kids to use technology because they want their kids to work on there handwriting skills.
Based on Megan’s experience of listening to a parent’s contrasting beliefs of technology integration, she confirmed that parental assistance is a barrier if parents use pushback in relation to technology integration in the classroom. It is critical to incorporate a balance of both fine motor activities and technological devices in the classroom to support students with exceptionalities. Ashley declared that some parents want to learn how to support their kids and some parents don’t believe in using technology at school. She believed that it is essential to educate the parent population on how to support and advocate for their children’s use of technology. Megan stressed that there are more positive aspects to allowing students to use an iPod device rather than disadvantages. She mentioned, “When students are in the classroom they can fully engage in technology and when they are outside they can practice fine motor skill.” As Megan emphasized parents often have differing beliefs and may not fully accept a teacher’s plan which can make it challenging to successfully incorporate technological devices.

In order to successfully build better support, Megan suggested that teachers learn to develop on-going communication with parents. Megan mentioned that one way to do this is to, “Connect with parents in order to ask them what challenges they have with their own children.” She believed that parents know their children best and it becomes challenging to support students with exceptionalities in technology use without a meaningful parent-teacher relationship. This has been confirmed within research, “Teachers are experts about learning, but parents are experts about their own children. Working together creates the best environment for student learning” (Santrock et al., 2010, p. 196).

Armon & Terr (2015) outlined that parental collaboration can be positive if parents are involved and are constantly communicating with the teacher. However, the participants indicated
that parental involvement could be challenging if parents disagree with supports that are offered by the educator and if parents refuse assistance for their child. Research suggested that parental involvement largely contributes to improved student outcomes (Hedeen, Moses, & Peter, 2011). According to Santrock et al. (2010), collaborative discussions between a parent and educator promote shared responsibilities in decision making and planning, and this shared collaboration might also be seen as helpful to technology use as well. For example, educators tend to create beneficial alternatives to educational approaches for students when parents are involved in the process (Santrock et al., 2010). However, my findings indicate a possible limitation in this research. Therefore, the participants suggested through research that parent-teacher collaboration and shared decision making is helpful for technological integration. Both Megan and Ashley acknowledged the importance of building a positive relationship with parents regardless of their contrasting beliefs.

4.1.2 Teachers recognize that a lack of teacher training is a barrier

Both participants reported that there wasn't any special education courses offered in teachers college twelve to fifteen years ago. Ashley proclaimed that she learned how to support students with exceptionalities five years after teaching. Similarly, Megan affirmed that she learned how to support students with exceptionalities during her experiences of teaching. She said, “Teacher training is a major issue because looking back I don't remember training in special education, and if there was a course it couldn’t have been that great because I don't remember it.” Both participants claimed that they acquired their skills for teaching students with exceptionalities on the job, either through direct experience with students or professional development, instead of learning these skills during formal teacher training programs.
Ashley suggested that teacher training might amount to “teacher willingness” because teachers should ask for assistance if they don't know how to use technological devices in order to support students with exceptionalities. A lot of teachers aren't willing to integrate technology and learn how to use new technological devices. Ashley emphasized that a wide range of teachers don't know how to support students in using technology. Megan similarly stated that, “Some teachers don't feel comfortable using technology so they’re not going to bring out a computer.” Meeting the needs of students with exceptionalities within regular classrooms is difficult because teachers lack training in how technology is used. Teachers are unaware of how technology can help them achieve their goals. Research suggested that only 20% of teachers feel very prepared to use technology within their teaching practice (Hasselbring & Glaser, 2000). This has a strong impact on students because technology encourages students with exceptionalities to participate (Hasselbring & Glaser, 2000). Further research indicated that a wide range of teachers are not adequately trained on how to use technology effectively in their classrooms (Balmeo et al., 2014). Allowing teachers to participate in training programs that discuss the benefits of technology in today’s digital generation, and how to effectively use it can reduce teacher resistance (Koksal, 2015).

4.1.3 Teachers recognize that a lack of funding and administrative support is a barrier

Both participants acknowledged the importance of funding and administrative support in order to successfully integrate technology in classrooms to support students with exceptionalities. Both Ashley and Megan reflected on their experiences of technology funds within schools. Megan discussed that money is an issue for students because the school system does not spend money on technological equipment unless students have an Individual Education Plan. She said,
“I think if you don’t have an Individual Education Plan the school system won’t provide money for an iPad or the equipment that a student needs which is an issue. I think the education system is more interested in saving money than supporting students.” For Megan, funding was a barrier for providing support for students with exceptionalities. Similarly, Ashley pointed out how funding impacts some schools disproportionately. She mentioned in some schools every student has a personal device and they bring it to school everyday. However, in some schools a large number of students are not able to bring a personal device to school because it is unaffordable. She emphasized:

Access to technology is very diverse in the board. You’ve got schools that are in a one to two ratio for their school. There are schools that have two laptop carts in the entire school for five hundred students. Also, if the administration supports teachers going out to learn or supports buying technology more will happen. As a teacher you are already overwhelmed with so much to do that if you don’t feel supported it makes your job difficult. There are some people in the school who are responsible for writing grants like people on the school councils such as parents. They will try to get as much money in technological donations as possible and then there are some schools that don’t for whatever reasons. At my current school things like that did not happen because of the parent population were perhaps not comfortable writing grants.

Both Ashley and Megan mentioned that the education system fails to provide resources in schools and fails to support students with exceptionalities. Ashley expressed disappointment that a lack of funding prevents students from learning digital skills that the education system wants
them to learn. She realized in order for this to occur the education system needed to increase funding and put enough technology for a one-to-one ratio in schools.

The importance of administrative support was a common finding throughout the literature. However, my findings indicate a possible limitation within literature because there was a limited amount of research on the availability and dispersal of funding. School leadership and administration can make a huge difference in terms of providing technological funds to support students with exceptionalities. The Ontario Ministry of Education has implemented $150 million technology funds to facilitate improved classroom experiences for students (Sandals, 2014). However, there is still a limited amount of technological devices in some schools. In a classroom environment educators can reduce resistance to technology if they receive funds to pay for the cost of technology (Koksal, 2015). The research contradicts the participants’ perceptions of funding and administrative support in schools. The participants mentioned that they noticed that the education system does not spend money on technological devices unless a student has an Individual Education Plan. This demonstrates that both research and the participants’ perceptions differ because research suggests that funding has been implemented in schools, and the participants stated that schools do not provide funding at all unless a student has an Individual Education Plan. A similar connection between the participants’ perspective and research is that there is a limited amount of technological devices in classrooms. Furthermore, the participants insisted that increased funding would give them an opportunity to fully support students with exceptionalities in the classroom.
4.2 Teachers Indicated That Equality is a Key Factor to Consider when Integrating Technology to Successfully Support Students with Exceptionalities

Another theme that emerged from the interview was the consideration that technology can successfully give students equal opportunities in the classroom. It is critical to ensure that students with exceptionalities are given the same opportunities as every other student in the classroom because this allows them to successfully flourish. Both participants revealed that technology integration doesn't exclude students with exceptionalities. Instead, technology integration can successfully include students with exceptionalities. Two sub-themes emerged from this finding. The first sub-theme is teachers’ acknowledgement that technology levels the playing field for students with exceptionalities. The second sub-theme is teachers acknowledge that technology promotes inclusion.

4.2.1 Teachers acknowledge that technology levels the playing field for students

Interestingly, both participants highlighted the importance of leveling the playing field for students with exceptionalities. Both participants described the term “leveling the playing field” as developing equal opportunities in the classroom in order to increase student success. Ashley believed that technology makes information more accessible to students with exceptionalities. She elaborated by mentioning that printed texts could be difficult for students on a variety of levels, especially if you give them a piece of paper with a large amount of words on it. She pointed out, “I’ve had students with dyslexia who are fourteen years old and cannot read a text on a page. The Google Read platform reads the text to them and assists them with their comprehension.” Like Ashley, Megan made reference to the idea that technology is beneficial because it
could be used as a remedial or an extension tool that levels the playing field for students with exceptionalities.

Ashley reported that technology engages students and allows students to become interested in tasks. She noticed that students have an opportunity to explore the world beyond the classroom. Ashley reflected that it helps to level the playing field for students who cannot handle pencil and paper tasks or students who could not read a text in a book. She confidently stated that technology supports the needs of all students and can meet their individual learning needs.

Megan discussed the importance of giving students a voice through technology in order to encourage fairness in the classroom. Giving students a voice is essential because it allows them to gain acceptance by their peers in the classroom, and it motivates them to participate. Megan enthusiastically illustrated this by mentioning:

Leveling the playing field allows students to work at the same pace as other students. It is important that students can keep up with the other students in the class. You know that they have the right to education and through technology we can really give them a voice and allow them to fully participate in the learning.

Based on the perception of both participants it is evident that Ashley describes leveling the playing field as making the curriculum accessible to the students and making the task accessible to the students as well. This allows students with exceptionalities to feel as if they are able to independently produce the same amount of work that everyone else is doing. Megan described leveling the playing field by sharing the importance of giving students a voice and allowing them to take part in given tasks.
According to research, teachers have found that technological transformation can help level the playing field for students with exceptionalities and enable these students to succeed in a regular classroom (Hasselbring, & Glaser, 2000). Also, “Every individual is equal before and under the law and has the right to equal protection and equal benefit without discrimination and, in particular, without discrimination based on race, national or ethnic origin, colour, religion, sex, age or mental or physical disability” (Constitution Act,1982). This equality right from the Canadian Charter of Rights and Freedoms allows students with exceptionalities to have equal protection without discrimination of their identity in the classroom. This connects to the use of technology in classrooms because students with exceptionalities should have an equal opportunity to use technological devices alongside their peers regardless of their identity and exceptionality. Therefore, research suggested that providing equitable opportunities that correspond to technology is essential. Students with exceptionalities have a right to be a part of a classroom that offers equal opportunities through technological integration. The research connects to the participants’ perceptions of equality. Research suggested that technology can level the playing field in order to allow students to succeed. Similarly, both Ashley and Megan referenced the importance of leveling the playing field for students with exceptionalities because it increases academic achievement, and allows them to work independently on tasks. Additionally, it encourages students to gain acceptance by their peers and become interested in tasks. Research aligns with the participants’ views because students can succeed through equal technological opportunities in the classroom. Both participants acknowledged the importance of equal rights in the classroom by making technology accessible to students with exceptionalities.
4.2.2 Teachers acknowledge that technology can promote inclusion

An inclusive classroom environment can give students with exceptionalities an opportunity to feel accepted by their peers. It encourages students to develop meaningful relationships and work alongside other students. Megan emphasized that her goal was to fully include students in the learning setting and encourage them to partake in classroom activities. She observed students using word processing software to collaborate. Megan noted a past experience where word processing software allowed students to collaborate with other students in her classroom. This is significant because students had an opportunity to feel included and accepted through the use of word processing software. This demonstrates that word processing software can promote inclusion among students because they can exchange ideas and communicate through the software.

Ashley spoke to the importance of Google platforms. She suggested that social ostracizing occurs when students realize that other students aren't doing the same work, and they typically believe that these students aren't as smart as they are. Ashley allowed students to work on similar tasks which demonstrated that all students have the ability to do the same work. She asserted that Google platforms allow for collaborative work amongst students. Based on Ashley’s prior experience, she noticed that students with exceptionalities can access Google Read and write in order to work on the same materials as those students in a group setting. This platform assists students if they need to listen to the text or if they need the text to be written for them. Ashley mentioned, “The other students wouldn't necessarily know that students with exceptionalities are using this platform, but it could help students kind of feel as if they are able to do the work that everyone else is doing.” As a result, students feel more capable when they are doing the exact same work as other students in the classroom. Similarly, Megan elaborated that she integrated
technology into every subject area. She encouraged students to be supportive towards their group members and fostered a high degree of collaboration. This experience highlights that Megan’s main goal was for her students to never stick out or feel as if they were different.

Megan similarly shared that the iPad application named *Verbally* supports social inclusion and allows students with exceptionalities to gain a sense of belonging in the classroom. Like Ashley, Megan noticed while using this application that it “enables students with no verbal skills to communicate with people.” This outcome is significant because through technology students can communicate and collaborate with their peers in order to feel included in the classroom. When students have an opportunity to communicate and work together it allows them to feel included in the classroom. Megan enthusiastically reported that students can communicate what they are trying to say and share their learning to the world around them.

Through the literature it became evident that the use of iPads can offer inclusivity within a classroom as it can allow students to become closer to their classmates. Tremblay & Tivat (2007) mentioned that every student should be accepted and supported in a regular education classroom. Inclusion gives students with exceptionalities an opportunity to attend typical schools. It is essential that support services are brought to students and that students benefit from attending class (Tremblay & Tivat, 2007). Further research indicated that an inclusive classroom allows students with exceptionalities to feel a sense of belonging within their classroom. Students are provided with an understanding of how to accept others (Santrock et al., 2010). The participants’ perceptions directly aligned with the literature because they recognized the importance of creating an inclusive classroom in order to give students with exceptionalities an opportunity to partake in identical tasks. Megan used the iPad in order to promote inclusion and col-
laboration, whereas, Ashley found that the Google platforms allow students to do identical work in the classroom.

4.3 Teachers Indicated That Technology Integration Promotes Positive Academic Outcomes That Enhance the Individual Learning Experience of Students with Exceptionalities in the Classroom

Both participants spoke about the importance of integrating technology in order to increase academic outcomes in the classroom. They indicated that when students receive positive academic outcomes this encourages them to continue participating in classroom activities. Three sub-themes became visible from this finding. The first sub-theme is teachers recognize that students gain confidence and display a positive well-being. The second sub-theme is teachers recognize that students gain communication and learning skills. The third sub-theme is teachers recognize that students gain reading and writing skills.

4.3.1 Teachers recognize that students gain confidence and display a positive well-being when they participate in the use of technology

Participants indicated that technological devices and platforms are a crucial aspect of any classroom environment. They have boosted students’ overall confidence and well-being. Megan expressed that some of her main outcomes were from parents. Megan elaborated:

Parents would tell me how happy the students were and that’s how they measured the success of their child. They would ask themselves if their child is happy, if their child is acting up at home and if their child wants to come to school. That was a huge success indicator for parents. Also, changes in behaviour was another example. One student, for example, that I am thinking of, he use to throw things in
the classroom, he was so angry. But when he started to use technology he had some kind of control over his learning and he was fully participating. I didn’t see him throw things again, it was really like a different child. Also, the students were meeting the outcomes of the learning at hand. They were keeping up with my learning goal and exceeding my expectations.

It is evident through Megan’s experience that technology can positively reflect on a student’s behaviour, mood, confidence, well-being and overall learning. Ashley pointed out that students with exceptionalities who are in intermediate grade levels often feel that they are different and less smart. Additionally, students often feel as if they cannot do the exact same work as other students, which lowers their self-esteem. Ashley said, “You have to really work hard to build a sense of community in your classroom and talk about exceptionalities in a positive way. Students need to develop confidence and advocacy skills.” It is important to demonstrate that having an exceptionality does not make a student different from the typical student. Both participants commented that technology use can assist students who have a low self-esteem because they are able to complete the same exact work in the classroom. Megan stressed that her goal is to ensure that every student is able to meet their full potential. She believes that well-being and security are extremely important. When students are learning and they feel included their self-esteem increases. In contrast, when students are displaying inappropriate behaviours there might develop more problems, as Megan perceived. She affirmed, “You know they are probably acting out at home, feeling really crummy, and feeling unsuccessful because they are being written off in life.” Educators can make a considerable difference in a student’s life through the use of technology.
Ashley stressed the importance of allowing students to feel positive about their level of achievement. She worries about students’ self-concept and ensures that they feel good about themselves. She states that getting to know their exceptionality and helping them realize all of their strengths is crucial. Students need to have fun and feel good about the work that they created. Ashley integrated technological platforms and observed positive outcomes from students. As a result, students were proud and confident when they presented the same information other students were presenting. Students with exceptionalities could see that their work looked similar, and it made them feel as if they were able to do the same work as other students, Ashley proclaimed.

Research also suggested that, while using iPad devices, students gained a sense of accomplishment as they learned identical material as other students (SENnet, 2014). As Ashley previously mentioned, when students with exceptionalities work on similar tasks they have an opportunity to build confidence and feel as if they’re capable of doing the same work. Therefore, it can be argued that iPad devices extend students’ overall confidence in the classroom. Although research indicated that iPad devices were most effective in order to boost confidence (SENnet, 2014), both of my participants claimed that all types of technological devices, platforms and software can enhance student’s confidence.

4.3.2 Teachers recognize that students gain communication and learning skills

Both participants reflected on students’ improved communication and learning skills through the use of technology. Megan asserted through her experiences that students with Autism Spectrum Disorder most often have a difficult time presenting their ideas in front of the class. “Communication exceptionalities include Autism Spectrum Disorder which is a long-term devel-
opmental disorder that impacts children’s social interaction, language and behaviours. A small quantity of children with autism never learn to speak, and other children show communication and social irregularities” (Santrock et al., 2010, p.175). Megan reported if educators give students an animation or video presentation they can present their ideas on powerpoint slides instead of presenting in person. This gives students an opportunity to gain both communication skills and learning skills through technology.

Interestingly, both participants discussed that word processing programs can support students with fine motor complications. Ashley noted that word processing supports students’ communication skills and helps to organize their ideas and thinking. Similarly, Megan described the benefit of using word processing software as “allowing students who are non-verbal to communicate their own ideas.”

As indicated through the literature, word prediction softwares on a computer allow students with learning disabilities, communication impairments and motor impairments to communicate their thoughts in a regular classroom setting. Technological devices offer exceptional students an opportunity to engage in exploratory, simulations and communication activities that meet their individual abilities and needs (Hasselbring, & Glaser, 2000). Megan pointed out that she used iPad applications in order to support students with exceptionalities and meet a wide range of learning styles. Research has found that students with Autism Spectrum Disorder displayed enhancement in communication skills when using an iPod touch device (McEwen, 2014).
4.3.3 Teachers recognize that students gain reading and writing skills

Students with exceptionalities gained both reading and writing skills when they used technology in the classroom. Megan spoke to the importance of speech-to-text softwares, and reading or writing aids. She stated:

Speech-to-text softwares and reading or writing aids I find very successful especially in primary grades. We also know that kids that are in older grades sometimes have not learned basic phonic instruction or phonemic instruction and they can benefit from these things. Also, word processing programs such as Word or Google docs. These all support students with word production.

As shared by Megan she found that speech-to-text softwares and reading or writing aids are useful. Speech-to-text is a specific software that transforms words that are spoken out loud to electronic written text. Similarly, Ashley discussed that students can learn spelling patterns from using the software named WordCue. Ashley elaborated, “You know students listen to text rather than having to read it. Sometimes they forgot what they’ve read and they go back and get frustrated.” This demonstrates that WordCue can support students’ reading skills with options that allow them to listen to the text being read out loud. Then, they don’t have to write down their ideas and can listen to it through the software.

Ashley mentioned that Google Platform writes words for students and reads words to students which is helpful. Also, she believed that using digital textbooks on Google Drive is beneficial because it reads to the students online as well. Ashley specified, “If students are given a three hundred page book and they struggle with reading they are more likely not going to read it.” This is the reason why she provided other options such as Google Drive for students who
struggled with comprehension. Students had an opportunity to use Google Dictionary to look up words on the computer and access Google Draw if they had fine motor issues. Ashley gave students who struggled with spelling an opportunity to play spelling games on an iPad in her classroom. This supports students’ reading and writing skills because they can become familiar with words when they play spelling games on the iPad. In addition, students can become familiarized with words on Google Dictionary which can assist both their reading and writing skills. Moreover, students can gain reading skills on Google Drive because they can have the words read to them.

Students in elementary school with Autism Spectrum Disorder participated in a study that considered the skills that students gain from the use of iPad devices (Price, 2011). Research suggested that the iPad devices could increase students’ spelling and comprehension skills. Through the literature, word processing can assist students who struggle with fine motor skills that reduce their ability to write. Also, word prediction softwares on a computer device are a useful tool for students with learning disabilities as they construct written documents (Hasselbring, & Glaser, 2000). Therefore, it can be argued that word processing softwares are beneficial for students’ reading and writing skills. Both participants used modes of technology similar to those suggested by research.

4.4 Free Online Software was Considered to be More Effective Assistive Technology over Expensive Devices That Were Difficult to Use

Another theme that emerged from the interview was the consideration that some types of technology such as iPad devices and Google platforms are more effective for students with exceptionalities to use. Other types of technology such as the software named Kurzweil and iPad
devices were viewed as ineffective for students with exceptionalities. It is critical to examine particular types of technology in order to identify usefulness. Both participants demonstrated conflicting perceptions of the effectiveness of iPad devices. The first sub-theme that emerged was Kurzweil is considered a less effective software because it is challenging to operate. The second sub-theme that emerged was iPads were favoured for their ease of use, however participants felt that they could be too distracting or expensive. The third sub-theme that emerged was Google Platform was seen as highly effective because it meets a range of learning needs. The fourth sub-theme discusses that the participants did not mention that the Smart Board was an effective source of technology, as was expected due to the literature review.

4.4.1 iPads were favoured for their ease of use, however participants felt they could be too distracting and expensive

Both participants discussed the use of iPad devices for students with exceptionalities, however had conflicting opinions of its effectiveness. Megan outlined that there are a wide range of free iPad applications that educators can integrate in their classroom. She supported students with Autism Spectrum Disorder and mild behavioural complications through the use of iPads. She illustrated:

I did not purchase any applications. Most applications that I used was for free and was accessible. It’s really not rocket science it is an easy thing for everyone to integrate right now. I think people think that they need to have two hundred dollar applications. Educators can get started right away with just a simple iPad application.
This statement suggests that educators can easily integrate iPads into their classroom in order to support students with exceptionalities. Ashley similarly shared that she used iPad application games to support students who struggled with spelling in her classroom. Throughout the interview it became apparent through interpretation that Ashley preferred to use different types of technological devices in her classroom. However, she did not disapprove the importance of iPads; instead she found that other types of technology were also extremely successful on a daily basis in her classroom. Megan, on the other hand found positive and negative approaches in relation to iPads. She mentioned that she rarely used drawing programs on her iPad because it became distracting. She believed that it didn’t keep the students on task. Also, Megan emphasized that a wide range of applications are free, but the iPad device itself is expensive.

Through research, teachers who lacked familiarity with technology reported feeling insecure with implementation. For this reason, it is suggested to give teachers an iPad device to use and become familiar with in order to reduce resistance (Clarke & Svanaes, 2014). Studies also point to the value of iPad use in the classroom. One study indicated that students with behavioural disorder demonstrated an 80% increase in time on-task when they used an iPad (Flower, 2014). Also, iPad devices can substitute for assistive technologies because they operate the same way, they have the exact same features and are less expensive (SENnet, 2014). Further research suggested that, “There are many benefits of using iPads in the classroom to engage students with multiple impairments in learning. These included the ability to break tasks down into achievable parts, light weight, comfortable size, ease of use, and a vast range of apps” (iPads in Special Education, 2012, p. 9). Megan’s opinions connect to the research because she mentioned that the iPad has a wide range of applications and it is easy to use. Research also indicated that the iPad
is comfortable and light weight which the participants did not mention. There was also an area of contradiction between the research and participants’ perspectives (iPads in Special Education, 2012). Megan mentioned that the iPad is an expensive device, whereas research suggested that the iPad is less expensive than assistive technologies (SENet, 2014).

4.4.2 Kurzweil is considered a less effective software because it is difficult to operate

The participant considered that some softwares such as Kurzweil are ineffective. Ashley noted based on her experiences that, Kurzweil text-to-speech reader software is ineffective. Ashley reported:

Kurzweil is okay for students as soon as they become familiar with it. However, I would say Kurzweil is the least effective form of technology just because I don't think its user friendly. The kids need a lot more training and there's actually trainers that come into schools and will do a one hour session with them. These are kids who struggle with working memory and retention. They come and do a one hour session and then kids have no idea the next day what to do. Students need more time to learn how to use Kurzweil.

Based on Ashley’s experiences she realized that the Kurzweil software is difficult for students to instantly grasp and it takes students a long time to learn how to use it. Also, she believed that educators were moving away from Kurzweil. She mentioned that Kurzweil used to be a popular software for students to use. However, it is not as popular at this moment because there are other forms of technological devices that operate more efficiently.

Although there is a limited amount of research on Kurzweil, research on similar speech-to-text technology can be extended to understand the effectiveness of Kurzweil. Speech-to-text is a specific software that transforms words that are spoken out loud to electronic written text. The
Speech-to-text program is a type of assistive technology that students can use on a computer, tablet, laptop, or cellular phone (Ontario Teachers Federation, 2015). The research findings oppose the participants’ perception of technological softwares because speech-to-text softwares are supposed to easily transform words into written text. This demonstrates that the speech-to-text software is easy to use. This challenges the software Kurzweil because Ashley mentioned that it is challenging for students to instantly grasp.

4.4.3 The Google platform was seen as highly effective as it meets a range of learning needs and is freely accessible to all educators

The participant considered that technological devices such as Google Platform is effective. Ashley stated that the Google platform is free of cost and includes the same features as the software Kurzweil. She recognized that students can read and highlight text on Google Platform which is useful. Ashley mainly used the Google Classroom platform and the Google Read&Write platform where students were able to access tasks. She used Google slides to support students with Autism Spectrum Disorder. She outlined, “I would have questions posted on different slides and the links for students to find the information. They would create pictures and word associations with the questions that I gave them.” Moreover, Ashley emphasized that the Google platform promotes student-centred learning, and students have an opportunity to work collaboratively on shared documents with other students in the classroom. This encourages students to continually use the Google platform because they have an opportunity to work on tasks together.

Although there is a limited amount of research on the use of Google in the classroom, research on similar assistive technology can be extended to understand the effectiveness of the
Google platforms. Assistive technology is any item, equipment or system that can increase the functional capabilities of children with exceptionalities (Fan, 2012). This form of technology is known to increase student’s ability to accomplish tasks independently (Sider & Maich, 2014). According to the Ontario Ministry of Education, assistive technology can assist students with exceptionalities to obtain motivation, improve academic achievement, finish educational tasks independently and establish individual strengths (York Region District School Board, 2012). Additionally, research suggested that assistive technology devices are used with students with autism to encourage their strongest processing modality, which can encompass visual cues and schedules (Fan, 2012). The research findings are similar to the participants’ perceptions of the Google platform. Both assistive technologies and the Google tools are similarly useful for students with Autism Spectrum Disorder. Google tools allow student with Autism Spectrum Disorder to create picture and word associations, whereas, assistive technology is used to encompass visual cues and schedules (Fan, 2012). Therefore, both the Google platforms and assistive technology assist with visual cues and visual representations. Also, the research findings oppose the participants’ perception of the Google platform because assistive technology allows students to work independently on tasks, whereas the Google platform allows students to work collaboratively on tasks (Sider & Maich, 2014). In sum, the Google platform is shown to be highly effective based on the participants’ perceptions since it meets the learning needs of students and is accessible to all educators.
4.4.4 Participants did not mention the Smart Board as an effective form of assistive technology

Despite significant amount of research on Smart Boards, the participants did not mention this form of technology as part of their use. There is a large amount of research on this topic that demonstrates the usefulness of Smart Boards. Smart Board is an interactive whiteboard that allows for collaboration and enhancing student learning results and is commonly presented in research as an essential tool for lesson planning. Smart Boards are an excellent way for students to connect with digital content and communicative media in a classroom environment (Parmeter, 2012). Additionally, Smart Boards are beneficial for students with exceptionalities. For example, for deaf and hearing-impaired learners who depend on visual learning, the Smart Board can display visual objects with the use of sign language. Special needs students with learning complications such as physical and behaviour complications, for instance Attention Deficit Disorder, find big interactive screens useful (Interactive Whiteboards and Learning, 2006). Also, its touch sensitivity can promote more interactive learning (Interactive Whiteboards and Learning, 2006). The research may still be valid even though it was not mentioned in the interviews. It is possible the participants did not mention the Smart Board because they didn't have this form of technology in their school and could not learn how to use it.

4.5 Conclusion

Throughout the study, I discussed the findings that resulted from two face-to-face interviews with elementary school teachers. During the investigation process four main themes emerged. Firstly, the importance of developing a positive relationship with parents and administrators lead to successful technology integration. Throughout the discussion it became evident
that some parents use a pushback response to teachers. However if parents willingly collaborate with teachers this allows successful technology integration in the classroom. The findings show that a wide range of teachers aren't willing to integrate and learn how to use technology. Moreover, some school systems don't provide enough funds for technology integration. More research needs to be done in the area of parental beliefs in order to gain an understanding of their perceptions. Also, more research needs to be done on funding in order to make technology more accessible to teachers.

Secondly, technology was described as leveling the playing field for students with exceptionalities because they have an opportunity to gain equal rights in the classroom. The participants mentioned that students have equal opportunities because they can independently produce the same amount of work as their peers in the classroom. Additionally, technology promotes inclusion by allowing students to feel accepted by their peers. These positive benefits should motivate teachers to integrate technology in order to support students with exceptionalities.

Thirdly, technology integration allows students to gain confidence and a wide range of skills, including communication, reading, writing and learning skills. Students were said to feel included and good about themselves when they are given an opportunity to work on similar tasks through the use of technology. The participants noted through the findings that word prediction softwares gave students an opportunity to gain communicate skills. The participants perceptions align with existing research because word prediction softwares on a computer allow students with learning disabilities, communication impairments and motor impairments to communicate their thoughts in a regular education classroom (Hasselbring, & Glaser, 2000). These positive
benefits should encourage teachers to integrate technology in order to support students with exceptionalities.

Fourthly, particular types of technological softwares were considered to be more effective because they were easy to use and they were inexpensive. Through the findings, the various Google platforms and iPad devices were considered effective for students with exceptionalities. iPads were favoured for their ease of use, however they were disliked because they could be too distracting and expensive. Kurzweil was considered a less effective software because it is difficult for students to use. Next in Chapter 5, I discuss the implications for these findings and I indicate possible areas of further research.
Chapter 5: Conclusion

5.0 Introduction

In this chapter, I discussed the implications of my research study. I began by providing an overview of my key findings on how teachers integrate technology in order to support students with exceptionalities. Afterwards, I discussed the implications of these findings for the educational community as well as for my own practice as a teacher and researcher. Then, I made relevant recommendations which may be utilized by educational professionals such as teachers, administrators, and school boards. Finally, I concluded by discussing my findings and pinpointing important areas that can benefit from additional research.

5.1 Overview of Key Findings and their Significance

I structured my findings into four main themes. My first theme is, teachers indicated that a lack of pedagogical and community support is a key barrier to incorporating technology to support students with exceptionalities. The participants spoke about a lack of parental involvement which was a barrier. Megan believed that parents know their children best and it becomes challenging to support students with exceptionalities without a meaningful parent-teacher relationship. Additionally, both participants recognized that parents use pushback because they have differing beliefs about the use of technology. Another barrier that the participants discussed was a lack of teacher training. Both participants mentioned that meeting the needs of students with exceptionalities is difficult because teachers lack technological training.

Participants outlined that technology can successfully give students equal opportunities in the classroom. Ashley believed that technology makes information more accessible to students with exceptionalities. Similarly, Megan spoke to the importance of giving students a voice
through technology in order to encourage fairness. Another outcome that participants acknowledged was that technology can promote inclusion in the classroom. When students with exceptionalities are given a voice in the classroom it was seen as increasing peer acceptance and encouraging students to develop meaningful relationships. Ashley indicated that students don't feel excluded when they have an opportunity to complete the same work alongside their peers in the classroom.

Teachers indicated that technology integration promotes positive academic outcomes. Both participants claimed that the first positive outcome that students can gain is confidence. Ashley mentioned that students with exceptionalities were given an opportunity to present the same information as their peers in the classroom. This made them feel as if they were able to do the same work through technology. Another positive outcome that students can gain through technology are communication and learning skills. Megan spoke to the importance of integrating video presentations and word processing softwares for students with Autism Spectrum Disorder. Video presentations can encourage students to present their ideas and gain communication skills. Lastly, another positive outcome that students can gain through technology are reading and writing skills. Both participants spoke to the importance of the software WordCue, through which students can learn spelling patterns which can support reading skills.

Teachers recognized that free online software was considered to be more effective assistive technology than more expensive devices that were difficult to use. iPads were favoured for their ease of use, however participants felt they could be too distracting and expensive. Ashley did not disapprove the importance of iPads, instead she found that other types of technology were also extremely successful on a daily basis in her classroom. Megan mentioned that she
rarely used drawing programs on her iPad because they became distracting and didn’t keep the
students on task. The participants claimed that Kurzweil is considered a less effective software
because it take students a long time to learn how to use it. Lastly, the participants mentioned that
Google Platform is effective because students have an opportunity to work collaboratively on
shared documents and it is free of cost.

There was a wide range of research on Smart Boards throughout the literature. However,
the participants did not discuss this type of technology as part of their use. Research suggested
that Smart Boards are beneficial for students with exceptionalities, for example, for deaf and
hearing impaired learners who may benefit from Smart Board’s visual display of sign language
(Interactive Whiteboards and Learning, 2006). Although Smart Boards were not specifically
mentioned by the participants, the research on its benefits seems to still be accurate.

5.2 Implications

In this section, I outlined the implications of my research findings. First, I discussed the
implications for the educational community. Next, I discussed implications that align with my
professional identity as a teacher and researcher.

5.2.1 The educational community

Both the participants perceptions and the research findings accentuate the importance of
implementing in-service teacher education in order to successfully integrate technology. Both
participants highlighted the significance of teacher-training programs. However, technological
training needs to be considered by the larger educational community in order to make it compul-
sory. Research mentioned that teachers are not properly trained on how to use technology effec-
tively in their classrooms. Therefore, it is important for school boards and administrators to pro-
vide practical and effective technological teacher-training. This can encourage teachers to integrate technology frequently. Also, it can encourage teachers to feel confident when using technology, and meet the diverse needs of students in the classroom.

Both participants highlighted the lack of parental support and involvement in the classroom. Megan believed that it becomes challenging to support students with exceptionalities without a meaningful parent-teacher relationship. Although some parents have different beliefs about the use of technology and may not fully accept a teacher’s plan. Research suggests that teachers are experts about learning, and parents are experts about their own children (Santrock et al., 2010). Working together creates the best environment for student learning (Santrock et al., 2010, p. 196). Despite push-back from parents, it is critical to discuss strengths and challenges in order to further support students. Moreover, if teachers and parents work collaboratively, they can successfully support students with exceptionalities through the use of technology.

Both participants highlighted the lack of funding and administrative support in schools. Megan mentioned that money is an issue for students because the school system does not spend money on technological equipment unless students have an Individual Education Plan. If school boards fail to provide students with technological equipment this can prevent teachers from meeting students’ individual needs through technology. Funding can impact schools disproportionately because some schools have technological devices, whereas some schools don't have any technological devices.

5.2.2 My professional identity and practice

Through the research findings, I have gained an in-depth understanding of how to support students with exceptionalities through the use of technology. As a future educator, I am certain
that I will have students with exceptionalities in my classroom. I want to effectively support 
these students in every possible way so that they can reach their full potential. I have considered 
the challenges that interfere with the integration of technology in my future practice. These chal-
lenges include push-back from parents, teacher-training, a lack of funding and administrative 
support. However, I am committed to including many of the technological devices that teachers 
use in my own classroom.

Ashley and Megan spoke to the importance of building a positive teacher-parent relation-
ship in order to support students with exceptionalities. In terms of my own practice, I became 
aware that it is critical to have parents on my team as an educator. Parents know their children 
best and it becomes challenging to support them without a meaningful relationship. Therefore, I 
will strive to maintain a positive teacher-parent relationship and be open-minded in terms of par-
ents perspectives of technology. I understand that parents have different beliefs, values and per-
spectives of technology. However, it is my responsibility to acknowledge their perspective and 
partake in decision making through collaborative discussions in order to support students.

As a future teacher, I am dedicated to increase my knowledge of technology through 
workshops, professional development, tutorials, research, and teacher-training. I have experience 
using technology in my current teacher-training program. However, I acknowledged that I still 
have a lot to learn about technology. I recognize that there is a lack of teacher-training in schools. 
However, it is my responsibility as an educator to demonstrate willingness, and learn how to use 
technology. I will ask teacher-colleagues and administrators for support if I am unsure how to 
use technological devices or softwares. This will allow me to feel confident and comfortable 
when implementing technology in my classroom to support students with exceptionalities.
I learned that providing students with a variety of technological devices in my classroom will allow students to develop equal opportunities, gain confidence, and feel included in the classroom. Also it will allow students to gain communication, learning, reading and writing skills. I believe that it is important for me to consider a wide range of technological devices that have been shown to be effective, practical, and accessible in my classroom. With this being said, I will concentrate on providing a student-centred technological platform, such as the various Google tools, which can make information accessible to students and assist students with comprehension. In terms of my own practice, I want to include this specific technological platform in my classroom because it allows students to work independently on similar tasks and work alongside their peers.

I learned that iPad applications such as Verbally can support social inclusion because it enables students with no verbal skills to communicate with individuals. If I gain access to iPads in the school, then I will integrate this technological device into my classroom. I believe that iPads are extremely effective because there are application games that can support students with spelling and comprehension. I am aware that iPad devices cost money and I can only implement this into my classroom if I receive funding from the school board. Another software that I would integrate in my classroom is both speech-to-text and word processing softwares. I learned from my participants that both of these softwares can support students’ communication skills and helps to organize their ideas and thinking. Lastly, I hope to integrate video presentations in my classroom for students with Autism Spectrum Disorder. I became aware through my participants’ experiences that these students have a difficult time presenting information in front of the class. I
want students to have an opportunity to present their ideas through video presentations in my classroom.

5.3 Recommendations

In this section, I made recommendations based on my research findings to ensure that training, funding, and policies are being implemented. It is important to create changes and develop an ongoing commitment in order to meet the needs of students with exceptionalities in schools. I have structured my recommendations into three areas: teachers, school boards and administrators.

5.3.1 Teachers

- It is important that teachers develop on-going communication with parents through meetings or phone calls. This can allow both teachers and parents to develop a shared plan to assist students with exceptionalities. Teacher-parent relationships can make a huge difference because it increases collaboration and it allows students with exceptionalities to reach their full potential.

- Create newsletters and workshops to inform parents about the benefits of technology for students with exceptionalities. This can allow parents to recognize the positive benefits that technology offers.

- Demonstrate willingness in order to learn how to effectively implement and operate technological devices through workshops, professional development or teacher-training.

- It is critical for teachers extend their knowledge. Teachers can do this by learning more about each students exceptionality in order to provide appropriate technological supports in the classroom. This can benefit students overall achievement.
- Ensure that a wide range of technological devices, platforms and softwares are being implemented in the classroom in order to support students with exceptionalities.

- Reflect on teaching practice in order to acknowledge which technological devices are useful for individual students.

- Teachers can talk to administrators about their determination for an extensive teacher-training on technology in order to improve their practice.

- Talk to administrators about accessing technological devices in order to support students with exceptionalities in the classroom. In order to resolve this issue, it is important to discuss funding with administrators as well.

- It is critical for teachers to create awareness and promote a positive community in the classroom. Students with exceptionalities are typically ostracized by other students.

**5.3.2 School Boards**

- It is important for school boards to provide additional funding for technological equipment in all schools in order to support students with exceptionalities.

- It is essential for school boards to create mandatory teacher-training or professional development sessions in schools in order to increase teachers knowledge.

**5.3.3 Administrators**

- It is critical for administrators to hold staff meetings regularly in order to discuss technological integration as a school-wide initiative. This can give educators an opportunity to exchange ideas or experiences about technology integration.

- As a leader of the school, administrators can incorporate technology training or workshops in order to support teachers professional practice.
Administrators can meet with teachers individually in order to have conversations about what types of technology they integrated and how successful it was for students.

5.4 Areas for Further Research

An area that required further research is parental beliefs on technological integration. Although the participants discussed their beliefs on technology integration, further research on parental beliefs would capture both perspectives. Both participants mentioned that parents use push-back in relation to technology integration because they don't believe in the use of technology. It would have been helpful to incorporate the perspective of parents in order to thoroughly understand the difference between the teachers and parents' beliefs. Another area that required further investigation was parental perspectives of teacher-parent relationships in the classroom as it pertains to effective technology use. Both participants mentioned that teachers need to build positive parent-teacher relationships in order to support students. Further research should be done in order to understand parents' perspective of building a relationship with teachers. A question that I would pose is: What is the difference between teachers' and parents' perspective of technology integration?

Funding was another area that required further research. Megan and Ashley both mentioned that they noticed that the education system does not spend money on technological devices unless a student has an Individual Education Plan. However, research indicated that the Ontario Ministry of Education implemented $150 million technology funds (Koksal, 2015). As a result, I believe that further research should look at funding for students with an Individual Education Plan and funding for students without an Individual Plan. Also, further research should look at school board approaches to funding.
During the interview, Ashley mentioned that Kurzweil is the least effective form of technology because it is challenging for students to use. She claimed that the Google platform is the most effective form of technology because it promotes student-centred learning, and students have an opportunity to work collaboratively on shared documents with other students in the classroom. There wasn't any research on Kurzweil or the Google platform to connect to the participant perceptions. Further research needs to look at the usefulness of Kurzweil and the Google platform. Two questions that I would pose are: Does the Google platform meet a range of learning needs and is easy to operate? Does Kurzweil meet a range of learning needs and is easy to operate?

5.5 Concluding Comments

In this chapter, I provided an overview of my key findings from Chapter 4. I discussed barriers that educators experience when integrating technology to support students with exceptionalities. Afterwards, I spoke to the importance of these barriers which include a lack of parental involvement, teacher-training and funding. Teachers understand that they can successfully support students with exceptionalities through parental collaboration. Other ways that teachers can support students is if they become knowledgeable of technology through professional development or teacher-training sessions. Through the findings, it became evident that technology successfully provides equal opportunities for students with exceptionalities because students can complete work alongside their peers in the classroom.

Through the implications, I highlighted important findings for the education community. Technological training needs to be considered by the larger educational community in order to make it mandatory. This can encourage teachers to integrate technology frequently, and it can
allow teachers to feel confident when using technology. Another consideration is teachers need to develop ongoing communication with parents in order to support students with exceptionalities.

Through the implications, I highlighted my own professional identity and practice as a new teacher. This includes maintaining a positive teacher-parent relationship, and be open-minded in terms of parents perspectives of technology. As an educator, I realized that it is my duty to acknowledge parents’ perspective and participate in decision making through collaborative conversations. Additionally, as a future educator I want to include a wide range of technological devices, platforms and softwares in my classroom that has been outlined throughout the study. With this in mind, I am determined to increase my understanding of technology through workshops or professional development.

Finally, I highlighted significant recommendations for teachers, school boards and administrators. Firstly, teachers can develop on-going communication with parents in order to support students with exceptionalities. With this being said, it is critical for teachers to ensure that a wide range of technological devices, platforms and softwares are being implemented in the classroom. School boards can provide additional funding for technological equipment and provide mandatory teacher-training. Furthermore, administrators can hold staff meetings frequently in order to discuss technological integration.
References


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Appendix A: Letter of Consent for Interview

Date:

Dear ______________________________,

My Name is Khristine Somai and I am a student in the Master of Teaching program at the Ontario Institute for Studies in Education at the University of Toronto (OISE/UT). A component of this degree program involves conducting a small-scale qualitative research study. My research will focus on elementary school teachers’ perspectives on the use of technology integration in classrooms for supporting students with exceptionalities. I am interested in interviewing teachers who have a minimum of three years teaching experience in an Elementary school setting. Also, teachers who have experience working with exceptional students and using technological devices in a regular education classroom. Lastly, I am interested in interviewing teachers who demonstrated a leadership role pertaining to technology support for students with exceptionalities.

Your participation in this research will involve one 45-60 minute interview, which will be transcribed and audio-recorded. I would be grateful if you would allow me to interview you at a place and time convenient for you, outside of school time. The contents of this interview will be used for my research project, which will include a final paper, as well as informal presentations to my classmates. I may also present my research findings via conference presentations and/or through publication. You will be assigned a pseudonym to maintain your anonymity and I will not use your name or any other content that might identify you in my written work, oral presentations, or publications. This information will remain confidential. Any information that identifies your school or students will also be excluded. The interview data will be stored on my password-protected computer and the only person who will have access to the research data will be my course instructor Dr. Angela MacDonald-Vemic. You are free to change your mind about your participation at any time, and to withdraw even after you have consented to participate. You may also choose to decline to answer any specific question during the interview. I will destroy the audio recording after the paper has been presented and/or published, which may take up to a maximum of five years after the data has been collected. There are no known risks to participation, and I will share a copy of the transcript with you shortly after the interview to ensure accuracy.

Please sign this consent form, if you agree to be interviewed. The second copy is for your records. I am very grateful for your participation.

Sincerely,
Researcher Name: Khristine Somai

Course Instructor’s Name: Dr. Angela MacDonald-Vemic

Contact Info: angela.macdonald@utoronto.ca

**Consent Form**

I acknowledge that the topic of this interview has been explained to me and that any questions that I have asked have been answered to my satisfaction. I understand that I can withdraw from this research study at any time without penalty.

I have read the letter provided to me by Khristine Somai and agree to participate in an interview for the purposes described. I agree to have the interview audio-recorded.

Signature: ____________________________________________

Name: (printed) ____________________________________________

Date: ____________________________________________
Appendix B: Interview Protocol

Thank you for participating in my research study. The purpose of my research is to learn how a small sample of elementary school teachers are integrating technology in order to support students with exceptionalities. This interview will take 45-60 minutes. The interview protocol has been organized into five categories such as background information, teacher perspective/beliefs, teacher practices, support/challenges and next steps. You can choose to decline to answer any specific question during the interview. I want to remind you that you may also choose to withdraw from the study at any time. As indicated in the letter of consent, this interview will be audio-recorded.

Do you have any questions before we begin?

Background Information:

1. How long have you worked as an Elementary School Teacher?

2. What is your current position?
   - What grades and subject areas do you currently teach?
   - How old are the students that you currently work with in your classroom? Have you taught students of different age groups?
   - What grades and subject areas have you taught in the past?

3. Can you tell me more about the school you currently work in? (e.g. size, demographics, program priorities)
   - Is there a large number of students with exceptionalities at your school?
   - What kinds of supports are available at your school to support students with exceptionalities?
   - How long have you been teaching students with exceptionalities?
   - What experiences have contributed to developing your interest in supporting students with exceptionalities? Which have helped prepare you for this work?
     - Personal experiences?
     - Educational experiences? (e.g. university course work, teachers college, additional qualifications, professional development)
     - Professional experience? (e.g. jobs, teaching experience)
Teacher Perspectives/Beliefs:

1. What do you believe is the role of technology in education?
2. What range of benefits does technology have for learning?
3. In your view, what is the role of technology in supporting students with exceptionalities, in particular?
4. What are some of the advantages of incorporating technology for students with exceptionalities that you have seen in your experience?
5. How do you understand the term “students with exceptionalities”? What kinds of exceptionalities do you consider when you hear this term?
6. In your experience, what are some of the key needs of students with exceptionalities, and what range of barriers do they tend to confront in schools?
7. In your view, how can technology be used to enhance the academic achievement of students with exceptionalities?
8. How can it be used to enhance the social inclusion of students with exceptionalities? How are children with exceptionalities able to feel a sense of belonging and feel included through technology in the classroom?
9. In your experience, what are some of the disadvantages of incorporating technology for students with exceptionalities? And why?
10. In your experience, what are some of the barriers that get in the way of integrating technology to support students with exceptionalities?

Teacher Practices:

1. What range of exceptionalities do you have in your classroom / have you supported in your experience?
2. What types of technology do you integrate into your classroom teaching and why?
3. Do you integrate particular kinds of technology for students with and without particular kinds of exceptionalities? Please explain.
4. Can you provide me with some examples of how you have integrated technology and assistive technologies into your teaching to support students with exceptionalities?
   1. Who were your students, and what made them exceptional?
   2. What were your learning goals when working with these students?
   3. What opportunities for learning with technology did you create for them and why?
   4. How did your students respond? What outcomes did you observe from them?
5. How, if at all, does technology factor into your assessment and evaluation practices for students with exceptionalities?
6. In your experience, what form of technology or assistive technology is the most effective way to enhance children with particular exceptional abilities learning and why?

7. In your experience, what form of technology is the least effective way to enhance the learning of children with exceptional abilities and why?

8. Which curriculum areas do you tend to integrate technology into for students with exceptionalities and why?

9. What factors do you take into consideration before integrating technology for use by students with exceptionalities?

10. Broadly speaking, in what ways does technology integration support students with exceptionalities in your classroom?

Support and Challenges:
1. What range of factors and resources support your integration of technology for students with exceptionalities? (e.g. school climate, access to technology, parent support, school leadership, donations etc.)

2. How does the education system support technology integration in your classroom?

3. What challenges have you encountered when integrating technology to support students with exceptionalities? How have you responded to these challenges? How could the education system further support you in meeting these kinds of challenges?

Next Steps:
1. What are your professional goals in relation to technology integration and support for students with exceptionalities?

2. What advice might you give a new teacher who is committed to using technology integration to support exceptional students?

Thank you for your participation in this research study.