TECHNOLOGY INTEGRATION WITH EXCEPTIONAL STUDENTS

TEACHERS’ BELIEFS AND TEACHING PRACTICES REGARDING STUDENTS WITH EXCEPTIONALITIES THROUGH THE USE OF TECHNOLOGY AND ASSISTIVE TECHNOLOGY IN MAINSTREAM CLASSROOMS

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Abstract

The present study examined teachers’ experiences with integrating technology devices in Canadian classrooms to support the learning of exceptional students. A large quantity of existing research speaks to technology integration, the benefits and outcomes that it has on all children. This study aimed to learn the specific technology devices including assistive technologies that are being integrated in today’s classrooms, the challenges that teachers face with technology integration and how they surpass them. This qualitative study was guided by the following question: How is a sample of elementary school teachers utilizing technology devices, including AT devices, in meaningful ways in their classroom to support children with exceptionalities?

Overarching themes include the use of communicative and academic technology for students who are non-verbal, and that technology integration is best supported by a collaborative school community. Ultimately, as a beginning teacher, I anticipate to discover the learning practices and learning opportunities that I can create with technology integration, to promote an inclusive classroom regardless of the exceptionality that a student may have.
Acknowledgements

As I conclude this thesis project, it is undeniably overwhelming to think of everyone who has influenced me throughout this journey of completing my thesis. As I begin to reflect upon this research study I must give thanks to God first, for his guidance and blessings throughout my twenty three years of life and education. My family are next to whom I want to express my gratitude towards because without their constant support and positivity that they have shown me I would not have been able to get through the challenges that I have encountered in life and when I most doubted myself. As I finish this thesis, I think back to all the important qualities that my family has surrounded me with including love, endless support, positivity, and perseverance. This has made me a fortunate human-being and is a major factor to influencing me in being successful as a student and extremely content with the person that I am becoming. On a more personal note, my grandmother faced breast cancer in December, to say the least this has been an extremely and disheartening event for my family. My grandmother’s positivity and good spirit has surpassed the illness and she is now cancer- free. I am very thankful for her strength and for upbringing me with this instrumental quality. This section would be incomplete without extending an immense gratitude for my MTRP advisors, Angela and Sarah. My instructors have provided me with on-going patience, and advice throughout this entire process. Lastly, I would like to give many thanks to the participating schools that allowed me time to interview their staff and to the participants who took the time to share their experiences and beliefs with me. I would like to conclude this section with expressing how proud I am of myself that I have completed yet another goal in my life.
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CHAPTER 1: INTRODUCTION

1.0 Introduction to the Research Study

Twenty first-century technology has played a significant role in the daily lives of children within different environments including children’s home and school. There has been a huge shift in school systems due to technology being integrated in classrooms as it enhances the learning needs of students (Hasselbring & Glaser, 2000). In 2014, Ontario’s $150 million technology and learning fund began further enriching classroom experiences for students by preparing them for global success through tablets, netbooks, cameras and software (Ontario Ministry of Education, 2015). The recent report from People for Education (2014) agree that all elementary and high school classrooms should be supported with technology tools as it has the ability to engage students, give them ownership of their learning, and supports them in developing proficient skills related to critical thinking, problem solving, communication, collaboration, and social skills.

With this in mind technology integration is optimizing the teacher’s ability to differentiate their teaching (Brackenreed, 2011). As a result Means (2010) discusses that technology devices enhances student education in relation to their achievement and success as it allows teachers to modify, enrich, and scaffold students’ learning. Through current research, it is evident that the integration of technology in classrooms aids teachers in supporting a large spectrum of learners. School leaders, teachers and parent/guardians from 40 schools across Canada reported that when integrating technology into their teaching over the course of one year, it improved their students’ skills development as well as it being evident that students were more engaged and interested in their education (The Learning Partnership, 2015). The comparative results of the pre-technology and post-technology surveys demonstrate an overall improvement in a wide range of students’ skill
development especially in communication and self-expression (68% to 85%); creativity and innovation (57% to 82%); and critical thinking (55% to 72%) (ibid, 2015).

Inclusive classrooms and schools are the vision of Canadian School Boards, and also worldwide (Ministry of Education, 2009). An essential factor to the development of inclusive classrooms is the integration of technology (Brackenreed, 2011). When technology devices are integrated appropriately in classrooms, the classrooms alter from general education to inclusive classrooms as teachers shift their pedagogy. An evident teaching practice is teacher’s catering to the needs of all children through interconnecting the curriculum and technology to provide diverse learning opportunities (Starcic, 2010). Thus, when this approach is used intentionally and appropriately, it improves the access and participation of all students including exceptional students (ibid, 2015).

While technology integration improves the learning outcomes of students, it also optimizes the academic achievement of students with exceptionalities (Alnahdi, 2014). Roblyer (2003) elucidates that all students either being identified with an exceptionality or not benefit from digital devices such as iPads and computers as it excels their understanding in different curriculum concepts. In contrast, Hasselbring and Williams (2000) clarify that assistive technologies are the specific type of technology device that supports the learning of a student identified with an exceptionality. There are a variety of assistive technology (AT) devices that excel the learning of students with an exceptionality including alternative software of text-to-speech, voice recognition, screen reading, alternative keyboards, and communication aids. With the support of assistive technology devices, low functioning and high-functioning learners not only proceed in their daily living skills, but also gain independence, self-confidence and reach their fullest (Simpson, McBride, Spencer, Lowdermilk, & Lynch, 2009). Therefore, with the diversity of classrooms, a
wide range of technology including assistive technology can maximize the educational needs and academic performance of students with an exceptionality.

1.1 Research Problem

Despite what is known from existing research on the potential use of technology supporting students with exceptionalities, teachers still face a variety of barriers surrounding technology integration (Hasselbring & Glaser, 2000). As the educational system is being challenged to provide higher quality education for all students, elementary and high schools in Ontario are being supported through government funds for teachers to use technology as a tool to meet students’ diverse needs (Kitchen & Dean 2010; Ministry of Education, 2010). The major factors that have been known to inhibit technology integration in classrooms are: lack of appropriate staff training in the use of technology devices, lack of funding for technology in low-income communities, lack of equipment, teachers perceptions towards technology integration, and teacher-centred use of technology (Barseghian, 2012; Moore-Hayes, 2011). It is fundamental to break down these factors impeding successful technology integration in classrooms as it will improve teachers’ confidence, preparation, and engagement with a range of technology devices, and thus elevate the learning outcomes of students with exceptionalities (Barseghian 2012; Machado & Chung, 2015; Ontario Ministry of Education 2010).

The lack of full-time educational assistant (EA) support that teachers obtain in their classroom is the most recent conversation occurring with Ontario Principals and elementary school teachers surrounding assistive technology integration (People for Education, 2015). This is problematic, as teachers hold the ultimate responsibility to differentiate their instruction towards the different learning needs of students. Therefore, with the absence of a full-time EA in the
classroom, teachers are most likely to not use AT devices in meaningful ways as they are not as prepared with AT devices as EAs are (People for Education, 2015). Teachers of students with exceptionalities are required to demonstrate some knowledge with using and integrating AT devices into their students’ educational program, after participating in training in this area (Dell, Newton, & Petroff, 2008). Nonetheless, teachers are most likely to appropriately use AT devices with exceptional students when they have the support of a full-time EA in their classroom as EAs are highly mandated to extensive training and skills towards implementing AT devices with exceptional students as they work one-on-one with students (DeRoche, 2013). When teachers do not have support from an EA in their classroom, it often leads to teachers not integrating AT devices in meaningful ways to students’ education program which consequently minimizes the learning opportunities for students with exceptionalities (People for Education, 2015).

1.2 Research Purpose

The purpose of this research was to investigate teachers’ experiences with integrating technology, including AT devices, in the classroom to support the learning of children with exceptionalities. I also aimed to identify the specific technology devices that support the learning outcomes of students with exceptionalities, the challenges these teachers face when integrating technology into their classrooms and how they overcome these, in order to enhance my understanding of how I can meaningfully support my students through technology integration.

1.3 Research Questions

The main question guiding this investigation is: How is a sample of elementary school teachers utilizing technology devices, including AT devices, in meaningful ways in their classroom
to support children with exceptionalities? This central research question is underpinned by the following subsidiary question:

- What are the technology devices that teachers use in their classroom to support learners with exceptionalities and why?
- How, if at all, have specific technology devices improved the academic achievement of students with exceptionalities?
- What challenges do teachers face when utilizing technology and how do they respond to these challenges?
- Why do these teachers believe it is important to integrate technology to support students with exceptionalities?
- What factors and resources support these teachers in this work? What experiences contributed to developing these teachers’ interest and competence in this work?

1.4 Reflexive Positioning Statement

My interest in pursuing this research topic was influenced by my past experiences involving diverse learners, and students with exceptionalities. My first experience took place as an intern for an organization called “The Shining through Centre,” whose goal was to educate students on the autism spectrum. It was through this experience were I first developed my appreciation and respect for students on the autism spectrum, but also to value and respect all diverse learners. In the summer of 2015, I had the opportunity to go to Ecuador where I volunteered at a camp with students who had a range of exceptionalities including: physical disabilities, behavior disorders, and communication impairments. Through this experience I learned that as educators we are not the only ones with knowledge, children with exceptionalities are also brilliant, and everyone can
learn from them. It was through this remarkable experience that my patience elevated, I learned how to appreciate the little things in life, and most importantly I learned that my attitude and support can really make a difference in the learning of students with exceptionalities.

I understand the need to constantly use technology as I have grown up with it, as it is present everywhere in society, however I believe that technology can support everyone with significant learning. I had the opportunity to be placed in two practicums where there were learners on the autism spectrum, and a learner with a physical disability. In one of my practicums I noticed how the teacher had support through her fulltime EA were the EA would have a one-on-one instruction with the classroom teacher. Through this approach, the teacher learned how to use adaptive switch generating device to help the student with verbally communicating and also learned how to effectively integrate it to the student’s learning. I observed how due to the collaboration between the EA and the classroom teacher, the student had gained some independency as he would press the switch when he wanted to request something, and it was also meeting his learning needs in all subjects of the curriculum. However, in the second placement, I observed how technology integration was not meaningful. This then focused my attention towards how the support of an EA in the classroom can impact the classroom teacher on how to meaningfully integrate assistive technology.

As a teacher candidate, I have not had much experience within education technology, or assistive technologies that enhance learning for students with exceptionalities. However, I am aware that it is an essential component to teaching because as a future teacher I will have classrooms with diverse needs in which I will have to differentiate my instruction through the integration of technology.
1.5 Preview of the Whole

To respond to the qualitative research questions, I conducted a qualitative research study using purposeful sampling. Through this sampling I interviewed 3 teachers on how they integrate technology to support learners with in their classroom. In Chapter 2, I conducted a literature review within the areas of: conceptualizing ideas of the terminology of special needs, defining the five categories of exceptionalities, placement of students with an identified exceptionality, inclusive education, technology and education, and the outcomes of specific technologies with exceptional students. Next, in Chapter 3 I elaborate on the research design. In Chapter 4, I report my research findings and discuss their significance in light of the existing research literature. In Chapter 5, I identify the implications of the research findings for my own teacher identity, and practice, and for the educational research community more broadly. I conclude by articulating a series of questions raised by the research findings, and point to areas for future research.
CHAPTER 2: THE LITERATURE REVIEW

2.0 Introduction

With the ever-growing changes in education a vast amount of research has been conducted towards inclusive education. In this chapter, I reviewed the literature in the areas of: defining special needs, the categories of exceptionalities, placement of students with an identified exceptionality, statistics of children with exceptionalities, the evolution of segregated classrooms, technology and education, assistive technology, challenges of integrating assistive technology in classrooms, and outcomes of specific types of technologies with exceptionalities. I began by reviewing the literature of how terminology towards students with exceptionalities has been misused and I specifically focus on each exceptionality category and I consider the most updated research on each category. Next, I review research on the placement of students with exceptionalities in order to understand where these learners are educated in the school setting. From there, I review the literature in the area of segregated classrooms in order to understand how the development of inclusive education began. Additionally, I review research on Inclusive education in order to understand how this pedagogy of education meets the learning needs of exceptional students and the barriers to this approach. Finally, I review the literature in the area of technology education in order to understand how educational technology supports the learning needs of all students, more specifically I review themes related to how assistive technologies support students with exceptionalities, as well as the specific assistive technologies that support academic achievement for exceptional students.
2.1 Theorists Conceptualizing Ideas of the Terminology Special Needs

The terms used for people with disabilities and special needs all too frequently perpetuate stereotypes and false ideas. Often people in society misuse the terminology, this action can result in being offensive and may reinforce prejudice and discriminatory attitudes (Halfon, Houtrow, Larson, & Newacheck, 2012). The most difficult barrier experienced from pupils with special needs are people’s negative attitudes towards them as well as the exclusion they receive in school settings by their peers (Kitchen & Dean, 2010). For this reason, it is crucial to understand the significant meanings and differences of these terms to shift our attitudes and terminology towards them. Disability is an impairment and limitation that can be manifested in physical, cognitive, mental, sensory, emotional, developmental, or can be a combination of these (Halfon, Houtrow, Larson, & Newacheck, 2012). Greek and Roman theorists developed similar philosophies and attitudes towards the term disability. Plato, a Greek philosopher believed that those with a disability were deformed and should be put in some ‘mysterious unknown places’ (ibid, 2010).

Greek philosopher Aristotle, had similar views that people who were deaf/blind were incapable of reasoning (Dang & Michelle, 2010). In medieval times that people who had intellectual or behavioral disabilities should be regarded as demonic possession and be ‘put away,’ in segregated settings (Kitchen & Dean, 2010). This perception also led early educational theorists Freud, Frobel, Montessori, and Piaget to ignore children who fell outside the cultural, ethnic and physical norm (Elkind, 1998). It was not until the 20th century that segregated institutions were established to meet the needs of people and children with a disability (Kitchen & Dean, 2010). However, Dang & Michelle (2010) disagree that the needs of people with disabilities were being met as they report people who had intellectual or behavioral disabilities were often harshly treated in asylums. Advocate parents and educators who were dissatisfied with the educational opportunities for students with disabilities were a huge influence to developing the Individuals
with Special Needs Education Act (1997) and the Bill 82 (1980), in the United States and in Ontario (Kitchen & Dean, 2010). The word *special needs* is an educational term that is utilized for particular students with educational requirements resulting from learning difficulties, physical disability, or emotional and behavioral difficulties. The Bill 82 law is focused on the responsibility of teachers providing remedial academic instruction at each student’s level through programming, placements, and curriculum (ibid, 2010).

### 2.2 Defining Exceptionality

*Exceptionality* is the legal education term used in Ontario to identify students who have strengths and needs. According to the Education Act section 170 (1) an ‘exceptional pupil,’ is defined as a student whose behavioral, communicational, intellectual, physical or multiple exceptionalities are such that he or she is considered to need placement in a special education program (Ontario Ministry of Education, 2001). Exceptional students are recognized in the following five categories under the Ministry of Education: Behavior, Communication, Intellectual, Physical, and Multiple Exceptionalities (Ministry of Education, 2001). These categories were established to disclose the different characteristics that can affect a student’s capacity to learn. This will aid in understanding the obstacles that individual students with an exceptionality face in their daily lives, and in their education. Therefore, for this study I will be referring to the word *exceptional or exceptionality* to describe children who have behaviour problems, communication impairments, learning disabilities, and/or intellectual ability/intellectual disability. All children including those with an exceptionality are able to learn to their fullest potential and positively contribute to society if they obtain a variety of support systems including differentiated instruction, appropriate integration of technology devices, and an inclusive classroom environment (Kitchen
& Dean, 2010). In the following section, I describe it will be necessary to describe a range of exceptionalities to further comprehend the complexity that teachers respond to in teaching and learning.

2.2.1 Behavior

This type of exceptionality contains a variety of disorders including: Attention Deficit Disorder (ADHD), Emotional Behavior Disorder, Oppositional Defiant Disorder (ODD), anxiety, Obsessive-Compulsive Disorder, and Conduct Disorder (Children’s Mental Health Ontario, 2016). Up to date research indicates that conduct disorder is an extreme behaviour condition affecting 4% of school-aged children (Ercan, Somer, Amado, & Thompson, 2015). Although there is a wide range of behavior exceptionalities, the most common behavior disorder in each elementary classroom is ODD with 15 % of students “acting out” and “misbehaving” (Ercan et al, 2015). Therefore, the Ministry of Education (2000), characterizes this exceptionality as a learning disorder as it affects educational performance. Behavioural exceptionality may be accompanied by one or more triggers: an inability to build or maintain relationships, excessive fears, a tendency to compulsive reactions, and an inability to learn that cannot be traced to intellectual, sensory or health factors (Ministry of Education, 2000).

2.2.2 Communication

Communication exceptionality is defined as an impairment in the ability to receive, send, process and comprehend concepts that are verbal or nonverbal (American Speech Language, 2016). This wide range of exceptionality includes: Autism Spectrum Disorder (ASD), Deaf and Hard-of-Hearing, Language Impairment, Speech Impairment, and Learning Disability (Ontario Ministry of Education, 2001). Although, there is a range of disabilities and impairments in this
exceptionality, The Public Health Agency of Canada (2012) informs that studies in Asia, Europe, and North America have identified the prevalence of ASD rising in children and being the most common disorder in elementary classrooms. However in the years 2013-2014, Ontario District school boards reported that 41% of exceptional students were identified as having a learning disability (Ministry of Education, Special Education, 2015). Learning disabilities are the most common exceptionality in school-aged students as Statistics Canada (2015) indicates that the number of students identified with a learning disability has increased to 59.8%. This increase of communication exceptionality in children is concerning as it not only affects academic potential for students but also their social perception/interaction.

2.2.3 Intellectual

The Intellectual exceptionality is identified under three subcategories: Giftedness, Mild Intellectual Disability, and Developmental Disability. Gifted students are described as demonstrating an advanced degree in intellectual ability, and excel in all subject areas of the curriculum (Kitchen & Dean, 2010). Although differentiated teaching is a common strategy that teachers utilize in their practice to support the learning of all students, VanTassel-Baska (2007) argues that teachers should continue developing their professional development to improve in their differentiated instruction practices. On-going professional development in teachers is vital as developmental disability is the most severe disorder in this range of exceptionality that is increasing in Ontario elementary schools (Ontario Ministry of Education, 2001). Consequently, professional development increases potential academic learning and independent social adjustment for these learners.
2.2.4 Physical

The Ministry of Education (2000) recognizes the physical exceptionality as having two subcategories which are as follows: Physical disability and blind and low vision. Physical disability is described as a severe physical condition that limits a student’s educational achievement if they are not supported with special assistance (Weiserbs & Gottlieb, 1995). This wide range of exceptionality contains other serious conditions which include: Muscular Dystrophies, acquired brain and spinal injuries, Spina Bifida, and Cerebral Palsy. In the year 2006, Statistics Canada reported that 70,000 children under the age of 13 were identified with a physical disability (Statistics Canada, 2006). It is apparent through up-to-date research that the most common physical disability affecting children is Cerebral Palsy (Tseng, Chen, Shieh, & Huang, 2015). When students who have a partial or total impairment of sight or vision and are supported through the appropriate aids and assistive technology devices, they are able to participate more fully in society and in their education. Simpson, et al., (2009) state that 78.5% of students who suffer from a physical exceptionality benefit from assistive technology devices, accommodations in their learning environment, and supportive service as they argue it has a widespread impact on student’s social, language, and in acquiring independent skills.

2.2.5 Multiple exceptionalities

Multiple Exceptionalities is defined as a combination of learning or other disorders, impairments, or physical abilities that require support services that are appropriate for educational achievement (Ontario Ministry of Education, 2010). The most recent figures of TDSB exhibit that in 2010, 2,312 students were identified as having multiple exceptionalities, with 78% of students having the same frequency pattern of exceptionality: Learning Disability, Behavioural, Autism, Mild Intellectual Disability and Developmental Disability (Toronto District School Board, 2010).
As students with multiple exceptionalities have the right to be placed in a general education classroom, it is vital for teachers to know how to support these learners across a number of skill areas. Multiple Exceptionalities is the most difficult exceptionality for general education teachers to meet students’ educational needs as they rarely have the training in this area. This is concerning as it is the teachers’ ultimate role to develop appropriate education programs, work collaboratively with the student’s parents, principal, therapists and or psychologists to optimize the students’ learning and their potential for inclusion in the school community and in society (Higgins & Pierce, 2002).

2.3 The History and Evolution of Segregated Classrooms

In the 16th century children who had a disorder were treated as a group apart and separate from the ‘norm.’ As a result residential schools were established globally as eugenics supporters were successful in implying a policy that focused on segregating students who had a disorder (Elkind, 1998). Until the 1970’s, students who had a disorder were denied access to any education if their school board claimed an inability to accommodate their needs. Education Amendment Act, also known as Bill 82, was signed into law in the province of Ontario in 1980 (Ontario Ministry of Education, 2001). This bill requires boards of education to provide special education services to students who are identified as exceptional (Ontario Ministry of Education, 2001). Special education is defined as an educational program that is modified by the results of a continuous assessment and evaluation of the pupil; it includes an Individual Education Plan (IEP) containing specific objectives and an outline of the educational services that meets the needs of the exceptional pupil (Ontario Ministry of Education, 2015). Even with this legislation being enacted in Canada, students with an exceptionality were educated in segregated classrooms. As
schools became more diverse, teaching became more challenging, and consequently separating students according to their specific needs was a way to make it easier for school boards, principals and teachers (Ferri & Connor, 2005).

2.3.1 Placement of students with an identified exceptionality

Many developed countries including Canada and the United States have stable regulations that demonstrate the rights that students with an exceptionality are entitled to. The Education Act Regulation 298, section 31, of Ontario was created for the purpose of controlling the identification and appropriate placement of students with an exceptionality (Ministry of Education, 2001). The Education Act empowers students with exceptionalities as this regulation implies special education, special education programs/services, and a range of placements that are in the best interest for the student (Ministry of Education, 2001). Fish (2008) deliberates the importance of special education programs for students with exceptionalities as having the right to an accommodating learning environment in the classroom, where students are tailored with differentiated instruction, and assessment to their individual needs. In Ontario, students with an exceptionality have the legal right to be supported in their educational environment. A legal written plan titled IEP outlines the individual special education program/services, accommodations/modifications based on a thorough assessment of the student’s strengths and needs that affect the student’s ability to learn (Ministry of Education, 2001).

The results of a 2008 study that was conducted in the United States with 51 parents of students with an exceptionality from JK-grade 8, reveal that 80% of parents were satisfied with their child’s IEP as their child acquired academic potential and independent skills that were perceived in the home (Fish, 2008). Although, the research study exposed the success that IEP has
for children with exceptionalities, 54% of parents declared that their level of involvement in their child’s IEP was minimal (Fish, 2008). It is known that family-school partnerships play a critical role in preparing, planning, and collaborating IEP’s for students, therefore Moody (2011) argues that school districts must increase parental involvement in the IEP process, as there is a lack of ensuring family satisfaction with the IEP process.

2.4 Global Statistics of Children with an Exceptionality

Globally, there has been a major upsurge in the number of children identified with a disability however there is inaccuracy in relation to how much of the population is receiving special education programs. In the year 2013, United Nations Children’s Fund (UNICEF) reported that 93 million children were identified with a disability (UNICEF, 2013). However, a recent update from World Report on Disability (2015) confirms that 150 million children are identified with a moderate to severe disability. In regards to Ontario, the Ontario Ministry of Education (2013) confirm that more than 191,600 students were identified as exceptional pupils in the school year of 2010-2011. However, current research from the Ontario School Information System (ONSIS) discloses that the population of students in Ontario with an exceptionality has gradually increased in the years 2013-2014 as 334,312 students from grades one to twelve received special education programs/services (Ontario Ministry of Education, 2015). The statistics of (ONSIS) demonstrate high demand for special education programs, while Bennet (2009) clarifies that when students and youth are supported with a special education program their possibilities of achieving academic achievement increase significantly.

Evidently, disability will be a greater issue as World Bank confirmed that in the year 2011, there were one billion people who experienced some form of disability. World Health Organization
(WHO) and World Bank estimates that the number of people with a disability will significantly rise before 2020 (WHO, 2015). As a result, WHO and World Bank have urged governments of all countries to further invest in specialized programs for children to have access to them, as it is critical to their development and learning needs (WHO, 2015). Even with 150 countries committed to remove barriers that permit children and youth to participate fully in society, there are no effective policies for interventions or special education programs for children needs in low-income countries (UNESCO, 2015; World Report on Disability, 2015). 80% of children and youth living in developing countries suffer from disabilities (World Report on Disability, 2015). This is problematic as UNICEFF (2015), expounds that in the year 2015, 90% of children with disabilities in developing countries, did not attend school.

2.5 A Shift to Inclusive Education

While students with exceptionalness had the right to special education in 1980, the newest philosophy of special education in inclusive classrooms emerged in Ontario in the 1990’s. At first special education in 1979, stressed education for students with exceptionalities in the least restrictive learning environments, while the term mainstreaming (1980’s) promoted the placement of high functioning students in regular classrooms (Andrew & Lupart, 2000). This belief was both supported as well as opposed by different advocacy groups. Those in favor of segregated classrooms stressed the importance of providing individualized attention to promote learning (Elkind, 1998). On the contrary many educators, advocacy groups, and parents disagreed
suggesting that inclusion was a clarion call to reshape and discard much of traditional special education (Brackenreed, 2011; Winzer & Mazurek, 2011). Inclusion is a global education trend were students with special education needs are now included in regular classrooms in many developed countries (Elkind, 1998). In specific, inclusion has become the norm in Canada and the United States since 1991. The term inclusion, ratifies all students including children with exceptionalities to be placed in a regular classroom where all students have the right to be included in the full range of academic and social interactions (Kitchen & Dean, 2010). The inclusive model aims to educate as many exceptional pupils by providing them with appropriate support to their needs through curriculum modification, accommodation, instructional materials, teaching strategies, classroom environment and technology devices (Kitchen & Dean, 2010; Oltz, 2006). For inclusion to be successful, general classroom teachers must combine general and special education strategies so that each student regardless of his or her abilities is fully supported in their learning (UNESCO, 2006). Teachers who successfully implement inclusion include students with exceptionalities in the main work of the classroom, adapting their instructional presentations and the format by which their needs respond, often in ways that are invisible to other students (Ajuwon, 2008; DeRoche, 2013). “Inclusive education is central to the achievement of high-quality education for all learners and the development of more inclusive societies” (UNESCO, 2008, p.5).

2.5.1 Barriers to inclusive education

For inclusion to be successful, regular classrooms teachers need extensive professional development in order to shift their teaching methods and support students who require special education services (Kitchen & Dean, 2010). It is evident through current research that teachers still require support through extensive professional development as teachers claim to be inadequately
prepared to teach exceptional students (Winzer & Mazurek, 2011). Teachers are supportive of the concept of inclusion however the Canadian Teachers’ Associations claims that teachers perceive their major barriers to inclusion being: class size, lack of parental involvement, lack of preparation, training and professional development (Winzer et al, 2011). A similar result from an international survey conducted with education teachers from Kindergarten-grade 6 in the United States, Turkey, and Hong Kong confirm that less than half (37%) felt well prepared to adequately meet special education students (Lee, Tracey, Barker, Fan, & Yeung, 2014). When exceptional students are exposed to inclusive practices, students obtain substantial benefits in both academic, social, and self- determination skills (Brackenreed, 2011; Kurth & Shogren 2015). It is apparent that the growth in inclusive classrooms in Ontario are being supportive of exceptional students’ needs, as only 2% of all students spend the majority of their day in a special education classroom (Ontario Ministry of Education, 2013; People for Education, 2014). Although Ontario schools have augmented their pedagogy towards inclusive education, almost half of elementary principals’ report to having recommended students with special education needs to not attend school for the full day as they have concerns about safety and lack of adequate resources (Globe Education, 2014). Under the Education Act, students from the age of 6- 18 are required to attend school ‘unless excused’ (Ministry of Education, 2001). In this case however, principals have a duty to refuse to admit students whose presence in the school would be detrimental to the physical or mental well- being of the pupils. Principals state that their decision to recommend students to stay home is based whether there is no EA substitution and if the school is unable to provide adequate care or safety provisions (Globe Education, 2014, p.10). In the eyes of advocates for inclusive education and parents of students with exceptionalities “There needs to be more support available
to ensure that my child can attend school as it is their right” (People for Education, 2014, p.6). Thus, dramatic changes have to be made to the existing education of Ontario in order to bring further improvement to the lives of many school students with exceptionalities.

As inclusivity is at the heart of the vision, mission, and collective commitments of many schools in Ontario today, there is hope of developing inclusive schools globally as well. In specific to improving inclusive school environments, Ontario must adapt the approach from the Knowledge Development Schools from the United States. The present observation of these schools indicate that this is the true vision of what inclusive education is as exceptional students receive extensive support through educational technology from co-teachers, paraeducators, and classroom volunteers in the general classroom instead of other school settings (Kurth & Shogren 2015). In a one year study conducted from Kurth et al (2015), 15 identified students with exceptionalities between the ages of 6-12 increased their independent skills by 50%, improved student’s literacy and math concepts by 43% with an interdisciplinary team supporting students in the classroom.

2.6 Technology and Education

Technology plays an important role in the lives of children as technology advances and it becomes more accessible for children to use. Due to the newest student generation growing up surrounded by digital media and technologies, the pedagogy in education has adapted to a new learning theory for the digital age in the 21st century (Tucker, 2014). This new learning theory in education is recognized as educational technology. For the purpose of this study I will be referring to the term educational technology and not technology education, as it has an official curriculum. Educational technology is a term that is used to identify any technological tool for the purpose of learning in education (Jones, Bunting, & de Vries, 2013). This includes mainstream technology,
instructional technology, assistive technology, and ICT (information and communication technologies) that delivers learning not just for typical students but also for exceptional students. The integration of technology into regular classrooms has both potential to support the learning of typical students and exceptional students if implemented appropriately by teachers as it has a strong and positive impact on student achievement (Jones, Bunting, & De Vries, 2013).

2.6.1 Technology in inclusive classrooms

Technology has changed the life of schools teaching and learning in the 21st century. ICT is the most common form of technology that is used in Ontario inclusive classrooms as it supports students in participating in the economic, political, and social aspects of society (People for Education, 2014). ICT is defined as any technology used to record information, broadcast information, and/or communicate through voice, sound, or images. Internet applications, educational games, video technology, and computer software are ICT's examples that have become key tools in teaching and learning in today’s classrooms. The most current survey of the availability of technology in Ontario elementary and high school report that 99% of Ontario schools have computers in classrooms starting from Kindergarten (People for Education, 2014). This enables teachers to facilitate real-world problems and make it a part of students’ learning at a younger age (People for Education, 2014). Although over-use of technology limits students from sensory and motor development there are many benefits to educational technology. Educational technology aids teachers in differentiating their instruction to a larger number of students. People for Education, 2014; Rabah, (2015) shed light on educational technology as it allows learners more autonomy, more cooperative learning, support for teachers on individualizing information, and resources related to the student’s needs and interests which has increased in higher student
engagement. More specifically, ICT in the classroom gives teachers the opportunity to develop their lessons plans by focusing on inquiry-based, project-based or collaborative-based to meet the needs of their learners. However, a new report from the Organization for Economic Co-operation and Development (OECD’s) contradicts the constructive impact that educational technology has on students as the organization is cautioning governments not to view technology devices as an education solution. Instead (Glowacki, 2015) reports that there is poorer student performance as reading skills from Canadian elementary school students declined between 2000 and 2012 due to computer use in the classroom. Since teachers are the authoritative figure and responsible for their classroom students, they must learn how to appropriately employ educational technology in order to create meaningful learning for their students, however they must be careful to not make educational technology teacher-centred but instead student- centered (Wang&Reeves, 2003; Machado & Chung, 2015).

2.6.2 Assistive technology in inclusive classrooms

As students with exceptionalities have the right to be a part of an inclusive classroom, they are encouraged to reach their fullest potential with the support of assistive technologies (AT). AT are specialized technology that is focused to assist those with an exceptionality/ exceptionalities in their learning to make their environment more accessible, to enhance their independence, and help improve their quality of life (Sze, 2009). There is a broad spectrum of AT that are utilized to support optimal student achievement which include: aids for hearing impaired, aids for vision impaired, augmentative and alternative communication, computer access aids, and mobility aids. More specifically hearing aids, visual and tactile alerting, magnifiers, speech output devices, large print screens, braille, large print screens,
communication boards, speech recognition software, and switches activate by pressure sound, voice/ and or touch screens are utilized in special educational settings but also in inclusive classrooms. When exceptional students have access to the appropriate AT for their needs they become more successful in not only achieving academic success but also in self-worth and productivity (Alnahdi, 2014; Maor, Currie, & Drewry 2011). Even with the gains of AT, consistent research findings demonstrate high abandonment of AT devices in inclusive classrooms which robs the students from meeting their maximum potential (Maor, Currie, & Drewry 2011).

2.6.3 Challenges of integrating assistive technology into inclusive classrooms

Educational technology has made a considerable difference in the lives of students including students with special education needs. On the downfall side, research affirms a variety of challenges with integrating AT devices into classrooms. A number of principals inform that AT has produced significant gains for students with exceptionalities, specifically iPad technology to assist students with developmental disabilities, and students on the Autism Spectrum (People for Education, 2014). At the same time, Ontario teachers have identified cost, limits of equipment, and the need for training for teachers as the major barriers hindering the use of AT devices in classrooms (Hasselbring & Williams, 2000). A study conducted with 165 elementary teachers in the United States asserted that due to the lack of expertise that they obtained with AT devices, teachers were unsuccessful on educating students who had a visual impairment on the function of their required AT tools (Simpson et al., 2009).

A more current research impels the support of full-time EAs in classrooms as it is the most recent barrier for teachers to engage with AT devices in their classrooms. In Ontario, a survey of
elementary schools in 2014 indicate the average ratio of 37 students with special education needs per special education teacher and the ratio of 58 students to 1 EA (People for Education, 2014). Continuous report from principals express that the ratio for students with special education needs to the number of EAs is insufficient for exceptional students to be supported with AT devices (People for Education 2014). EAs play a vital role in the education of children with exceptionalities as they must obtain sufficient skills and training including in AT devices as exceptional students from K-Grade 12 have a legal right to AT tools (Ontario Ministry of Education, 2010). Due to EA’s being qualified to work and meet the learning needs of exceptional students, they work closely with the classroom teacher to integrate AT tools to the education program and learning of the student (Ontario Ministry of Education, 2010). However, the lack of full-time EAs in classrooms is problematic as the role of teachers is to differentiate their instruction towards all learners (Kirkey, 2005). Although, teachers of student with exceptionalities are impelled with high demands to integrate technology in the education of students, they are most efficient when integrating AT devices to students’ education programs with the support of an EA. According to a report from Toronto District School Board, teachers expressed, “meeting the needs of students is overwhelming especially as classrooms are now more diverse, we require fulltime EAs in our classrooms as we need support in successfully using AT devices in order to meet the needs of our special education students” (Globe Education, 2015). Executive Director, Annie Kidder of People for Education (2015) shares a similar perspective to full-time EAs in classrooms as she affirms that Ontario has made extraordinary progress in the desire for full inclusion of students, however there are gaps to be filled, one of them being the lack of full-time EAs in Ontario classrooms.
2.6.4 Potential outcomes of specific types of technologies with exceptionalities

Research today has found different forms of technology in having this potential to support students with such a range of special needs or exceptionalities. Specifically, a great amount of research has been conducted on the topic of the gains that students with ASD have obtained from iPad devices. For the purpose of this study I compared study outcomes to give a sense of the types of AT devices that have been the most effective towards specific exceptionalities. In a study conducted with ten students who were either identified with a physical disability, learning disability, or mild intellectual impairment, the AT device that was utilized with these learners were Co: Writer. Co:Writer, is designed to provide spelling and writing assistance, and its primary function is word prediction (Maor, Currie, & Drewry, 2011). Results demonstrated that the use of Co: Writer increased typing speed for the four students who had physical disabilities that were affected in hand use, however it did not increase the typing rates and spelling accuracy of the students with learning disability or mild intellectual impairment (Maor, Currie, & Drewry, 2011). In sum, Co: Writer had a positive impact on the writing quality of all the learners in comparison with handwriting and word processing (Maor, Currie, & Drewry, 2011). Coleman 2011; Peterson-Karlan, Hourcade, & Parette (2008) recognize that Co: Writer, spell checkers, speech recognition, and text-to-speech have positive impacts on the spelling and writing outcomes of students with physical disabilities, however Coleman’s study takes a closer look at how the switch use, computer use, and mobility devices support students with physical disabilities but also students with multiple exceptionalities. More specifically the results of his study indicated that out of the 42 student’s age’s 7-13 with physical or multiple exceptionalities 82% of the learners drastically enhanced their skills that contributed to the curriculum with the support of augmentative and alternative communication devices. However, Simpson, et al (2009) argues that there is a need for
augmentative and alternative communication devices to be utilized in educational settings with these learners as they are often misused and instead self-care and mobility devices are utilized. In regards to students with a behavior disorder, specific AT tools are needed as these learners experience frustration, off-task behavior, and aggression. The most recent studies confirm that students with behavior disorders benefit from word processors, graphic organizers, and speech recognition. More precisely, (Parette, Crowley & Wojcik, 2007, p. 67) indicate through their research that 93% of 18 elementary school students identified with a behavioral disorder enhanced their reading and writing skills through AT including: Read Please, Aspire Reader, Type & Talk, Write: Outlououd, Intellitalk, and DraftBuilder, as students were supported in organizing their thoughts, while minimizing the students’ cognitive effort. Mulrine (2007) deliberates that often teachers forget that AT devices can also support the learning needs of gifted learners. Teachers can enhance learning concepts of different subjects through educational online games such as: Math Bingo and Wacky Wordplay at Education World’s Online Games Archives. A study by Mulrine (2007) investigated how these educational online games impacted gifted learners. The results of this study indicated that teachers who supported gifted learners with computer educational games stimulated and challenged their learning needs. Moreover, specific outcomes of AT tools supporting exceptionalities, is an area that needs to be further examined.

2.7 Conclusion

In this literature review my focused areas of research were inclusive education, technology education, challenges in relation to integrating technology/AT devices in classrooms, and specific outcomes of specific types of technologies with exceptionalities. This review elucidates the extent that attention has to be paid to the impact that a full-time EA can have on classroom teachers
effectively integrating AT devices to the education programs for exceptional students, and the specific AT devices that teachers can promote optimal learning for students with exceptionalities. It also raises questions about teachers who do not have EAs in their classroom, how do they effectively incorporate technology/AT integration to create meaningful and intentional learning for students with exceptionalities? What are other ways do teachers differentiate their instruction if they are not prepared with the integration of technology/AT with exceptional learners? These questions point to the need for further research on the specific training that teachers need with assistive technology devices, in specific workshops/learning strategies that develop teachers’ competence to meaningfully integrate AT devices to students learning on their own. In light of this, the purpose of my research was to learn about teachers’ experiences with integrating technology/AT devices in their classrooms and how these devices support the learning needs of exceptional learners. In addition to the barriers that teachers face in their classroom that limits their integration of technology/AT with their students, and the diverse AT devices that support the learning success of students with different exceptionalities.
CHAPTER 3: RESEARCH METHODOLOGY

3.0 Introduction

In this chapter I describe the research methodology, identify the various methodological decisions that I have made, and my rationale for them, given the research purpose and questions. Before describing the main instrument of data collection, I introduce the research approach and procedure. Next, I identify the participants of the study, the sampling criteria, the sampling procedures, and outlining some information on the participants of this study. I also describe how I analyzed and interpreted the data before analyzing ethical issues that have been considered. Finally, I outline some of the methodological limitations of qualitative research while also speaking to the strengths of this approach.

3.1 Research Approach and Procedures

The words “quantitative” and “qualitative” are used in education for example, to portray two distinct and diverse approaches to doing research. For the purpose of this research study I facilitated this study by utilizing a qualitative approach involving semi-structured face-to-face interviews with three teachers. By utilizing the qualitative approach as the methodology it attempts to understand the meaning to one’s behavior and actions (Nastasi & Schensul, 2005). Leech and Onwuegbuzie (2007) argue that neither quantitative nor qualitative research is superior to the other as they both perform different purposes. Qualitative research and quantitative research differ from each other in particular forms. Several approaches to qualitative research have been identified as biography of the participants, in-depth study of one or more examples that represent a particular phenomenon or theme, derivation of theory from experiences and perspectives of participants (Nastasi et al, 2005). Qualitative research uses in depth-studies of small groups to guide and
support the behavior and the perceptions of the participants rather than of the researcher (Ponterotto & Grieger 2007).

Though quantitative methods are still very much used, qualitative research has gradually become more important. Yilmaz (2013) argues that through the process of qualitative research, meaning is constructed when human beings have a social interaction which enables fixed predetermined biases from occurring. Rather than looking at the problem, theme, or hypothesis through numerical data, or statistics from a large population as quantitative research attempts to comprehend, qualitative research is concerned with making conclusions of how participants feel about their experiences within a specific context. Unlike, in quantitative research, where the researcher has to rely on numerical data, statistics, and questions that do not provide in-depth answers from participants, qualitative research provides in-depth responses that reflect the participant’s experiences, beliefs, and suggestions (Ercikan & Roth, 2006). Therefore, given my research purpose and the questions that I constructed, a qualitative research study was an appropriate approach for me as it provides me with an insight of the experiences from a small sample of teachers. Furthermore, qualitative research answers ‘how?’, ‘why?’, and ‘what?’ questions that are suitable to this study as I will specifically be looking not only at the AT devices that teachers utilize in their classroom with exceptional students but also how teachers are experiencing and responding to the lack of support from EA’s in their classrooms.

3.2 Instruments of Data Collection

Various tools for collecting data in qualitative research include interviews, focus groups, observations, and documents/material culture (Onwuegbuzie, Leech, & Collins, 2010).
Depending on the research study, Jacob & Furgerson (2012) propose that all or a few particular frameworks may be used as the best source(s) to answer research questions. This statement is reinforced as Leech & Onwuegbuzie (2007) suggest that the use of more than one method can optimize the research findings. Given the parameters of this research study, the method that is most suitable for the purpose of collecting data is through an in depth-semi structured interview.

Semi-structured interviews allow more flexibility and responsiveness between the researcher and the participants. The protocol of semi-structured interviews are more than a list of interview questions, it extends to the procedural level of interviewing which includes a script of what the interviewer will say before the interview, prompts for the interviewer for ethical purposes and a set of pre-determined questions, but that also allow additional questions to raise during the dialogue (Brewer & Hunter, 1989). Furthermore, semi-structured is one of the most suitable methods for qualitative research as it focuses on capturing authentically the lived experiences of the participants. This promotes the idea that the interview process represent a contextual story that is not co-constructed by the participants and interviewer, but that instead reflects an active and meaningful collaboration between the researcher and participants (Anyan, 2013). As I am most interested in teachers’ experiences of using technology including AT devices in mainstream classrooms with exceptional students, semi-structured interviews established the most relevant and appropriate information. Lastly, although semi-structured interviews can be conducted with a group of participants, I chose different times outside of everyday events to interview each participant. In doing so, it allowed me to go in-depth with gaining insight and understanding of each participant’s experiences (McKillip, 1987). The interview questions that are developed for this area of study are open-ended questions that are focused on understanding and reflecting on the phenomenon of the research. I organized my protocol (located in Appendix B) into four
sections including the participant’s background, followed by questions about their experiences and beliefs about technology, AT devices, and concluding with questions regarding supports with AT devices for exceptional students, challenges, and possible solutions to barriers. Examples of questions include:

- What drew you to demonstrate leadership in commitment to exceptional students?
- How do you believe children with exceptionalities learn best?
- What are your views on the use of technology, assistive technology in your classroom?

### 3.3 Participants

The study sample of participants share commonalities and are selected based on the sampling criteria, as following the sampling criteria in the next section will yield in finding participants that can best inform the research questions and enhance understanding of the phenomenon (McKillip, 1987). In this section, I review the sampling criteria I established for participant eligibility, and I review a range of statement criteria’s for teacher eligibility. I have also included a section where I will introduce each of the participants and their background information.

#### 3.3.1 Sampling criteria

The following criteria was applied to teacher participants:

1. Teachers will have to obtain a minimum of 5 years of teaching in a full-time position.
2. Teachers have to have a minimum 3 years’ experience with working with exceptional students in mainstream classrooms.
3. All teachers must show leadership in commitment to supporting students with exceptionalities.
4. Teachers need to have demonstrated leadership in the area of technology integration

In order to address the main research question, the participants that I interviewed had to obtain a minimum of 5 years of teaching experience in a full-time position. This is because the first few years of a new teacher in their profession is where he/she is creating their pedagogy of teaching, and finding who they are as a teacher. Also, teachers with less than 5 years of teaching experience face more daily challenges, and do not have sufficient experience in their practice (Humphrey, 2003). A following reason includes that full-time teaching position allows to view the consistency of teacher practice. Furthermore, to explore the variety of AT devices that there are, teachers will have experienced working with exceptional students. This is because, in today’s classrooms all learners are diverse and exceptional students have the right to be a part of a classroom. Therefore, if teachers fit the minimum of teaching experience then it is most likely that they have experienced at least one exceptional student in their classroom per year. Also, by having experienced exceptional students in their classroom, there is a greater possibility that the participants have used AT devices with their students. Teachers had to demonstrate a leadership commitment to students with exceptionalities. Due to one of the main areas of this research study being AT devices and exceptional students, this allotted time allows to learn from the different experiences, successes, barriers and devices that participants may have experienced in their leadership towards students with exceptionalities.

3.3.2 Sampling procedures/recruitment

A wide range of options in regards to sampling exists in the qualitative research approach. Random sampling as Hoy (2010) argues will not be the most effective approach to this study as it will impede the researcher from understanding how the human behavior of specific participants relates to the research question. As a result, convenience, purposeful and snowball sampling are
most suitable methods for this study. Smeyers (2008) clarifies that combining sampling strategies may be more appropriate to the aims of this implementation research. Convenience sampling is one of the most common sampling techniques as it is fast, easy, and simple (Hoy, 2010). Convenience sampling refers to selecting the most accessible participants to recruit (Hoy, 2010). Purposeful sampling instead is widely used for the identification and selection of information-rich cases related to the phenomenon of interest. Also, this sampling involves identifying and selecting individuals or groups of individuals that are specifically knowledgeable and or experienced with a phenomenon of interest (Greenfield, Greene, & Johanson, 2007). Lastly, snowball sampling refers to participants who the researcher has made contact with, these participants can access their social networks to refer the researcher to other people who could potentially participate in the study (Smeyers, 2008). Given the methodological parameters of my research study, I combined convenient, purposeful and snowball sampling. In regards to the sampling procedure, purposeful sampling was utilized as the small sample of participants had to meet the set criteria in order to provide meaningful and rich data. I employed convenient sampling as participants obtained through existing connections with teachers within the region. Lastly, I utilized snowball sampling as a form of recruiting my participants, as I asked my participants to recommend other teachers who may have been interested and who met the criteria to take part in the study.

### 3.3.3 Participant bios

For the purpose of this research study, a small size of three participants from different educational institutions were sampled through purposeful sampling. Two of the participants being from a Catholic elementary school and the third interviewee from a University/Postsecondary institution. Pseudonyms were used to protect confidentiality of participants.
Two grade six teachers were selected for the interview. The first participant, Kelly has been teaching for eight years in a Public School system in grades Kindergarten to grade 8. Kelly demonstrated leadership in technology and to exceptional students as she holds Additional Qualifications in Special Education Part one and two as well as Integration of Information and Computer Technology in Instruction, Part one. Kelly, has a class of students in grade six which are identified with exceptionalities including: 3 students with a Learning Disability, a student with an emotional behavior disorder, and a student with a hearing impairment. The second participant Lisa, has been an elementary school teacher for twenty seven years and a special education teacher for three years. Within her current grade six class she has a student with cerebral palsy, two students on the Autism Spectrum Disorder (ASD), and one student with a Learning Disability. The last participant, Jane was an elementary school teacher from Kindergarten to 8 for 15 years, then became a principal for ten years and now is a professor teaching Special Education.

3.4 Data Analysis

As part of the research process, data analysis is a fundamental strategy by which Anyan (2013) refers to it as one of the significant steps in a qualitative study. There are two fundamental approaches to analyzing qualitative data- the deductive approach and the inductive approach. Essentially, in the deductive approach the researcher imposes their own theories on the data and finally utilizes these to analyze the interview transcripts (Jacob & Furgerson, 2012). This approach is useful in research studies where researchers are probable to responses from their participants. However, Yilmaz (2013) argues that inductive approach is often utilized in qualitative studies, where researchers analyze data with little or no predetermined theory or framework and instead uses the data itself to derive the structure of the analysis.
The qualitative analysis involves aiming to understand the phenomenon of the study through interpreting the meanings that can be derived from the data (Hoy, 2010). Specifically, interpreting the phenomenon of the study by considering the connections, theorizing how these connections appear and then re-contextualizing is an imperative aspect of this process (Ponterotto & Grieger, 2007). Data analysis occurs concurrently in conjunction with data collection, allowing the research to better inform the interview sample and protocol as the researcher is given the opportunity in this process to understand the research questions (Jacob & Furgerson, 2012). A critical component of this process involves the researcher acknowledging and accepting that the processes of data analysis is not always aligned with the data collected (Leech & Onwuegbuzie, 2007).

During data analysis, the researcher must read through the entire set of data first. The following process includes the researcher choosing a unit of data such as a word or phrase, which is then compared to other units of data, while looking for similar patterns throughout the information (Merriam, 2002). Constant comparison analysis also known as coding is the most common used type of analysis for qualitative data. Coding is established once these common patterns are present, followed by categorizing codes by similarity (Leech et al, 2007). Some researchers look for cohesive categories upon which to organize findings, to identify some common threads running through each participant’s stories that tie them together (Anyan, 2013). Next, synthesizing themes where appropriate will be based on reading the categories and themes beside one another and identifying and documenting based on each grouping (Leech et al, 2007). During my analysis I followed this framework in response to meaning-making process. I have transcribed interviews, coded the data and found themes within my data as it interconnects with my research purpose and questions.
3.5 Ethical Review Procedures

Ethical dilemmas are consecutively evident in any form of research (Larossa, Bennett, & Gelles 1981). Ethical issues are more present and complex in qualitative study than quantitative as it draws on more personal methods, more intrusive- into the everyday world of the participants and greater role for the researcher - relationship during the interview process (Haverkamp, 2005). In order to minimize the ethical dilemmas specifically in the interview process, Haverkamp (2005) elaborates on securing participant information, decreasing possible exploitation or harm, and appropriately informing the participants about the purpose of the study that they are being asked to take part in. A part from minimizing ethical issues in research studies, Greenfield, Greene and Johanson (2007) elucidates that researchers should produce direct and immediate benefits to participants themselves. However these benefits do not include compensation for participating in the research study but indeed research studies have the potential to benefit the teaching field and professional practice of teachers (Larossa, Bennett, & Gelles, 1981).

Given the topic of exceptional students and technology guiding the research questions, it was possible that the questions may have produced vulnerable responses from the participants. In order to ensure that ethical practices were followed and met I provided the participants with a sample of questions. Next, I informed the participants that they had the right to refuse to answer any of the interview questions and may withdraw from the interview process at any time without any explanation or penalties. Effective interview process entails a safe, trustworthiness environment where participants feel comfortable sharing their personal experiences (Maruyama & Deno, 1992). However the participant’s personal information must be anonymous and confidential as it can jeopardize their position in their work system (Haverkamp, 2005). As a result, I ensured confidentiality of the participant identity and their educational institution information by
not including it in the research findings. Participants name and affiliated educational institution were removed from all documents and were replaced with a pseudonym. The master list of names and pseudonyms are kept in a separate secure file. All data (audio recordings) are stored on my password protected phone that are only accessible to the researcher, however my course instructor Angela MacDonald-Vemic was the only one that had access to the research data that will be destroyed after 5 years following completion of the study. Finally, participants were appropriately informed of the study in written documentation. Participants were asked to sign a consent letter (Appendix A) granting their consent to be interviewed as well as audio-recorded. This consent letter outlines an overview of the study, addresses ethical implications, and specifies expectations of participation.

3.6 Methodological Limitations and Strengths

Despite the usefulness of qualitative research techniques, there are some limitations to its use. First qualitative research focuses on the experiences of a few individuals and on the interpretation of these experiences by one or a few researchers (Greenfield, Greene, & Johanson, 2007). Given the parameter of the small sample size that is limited to just teachers, the data will not be generalizable to the population that this research study targets due to the limited number of participants (Nastasi & Schensul, 2005). However, the strength of this methodology allows for a deeper understanding of the subject of exceptional students and AT devices than a survey could allow for. These interviews can validate teacher voice and experience and are an opportunity to speak to what matters most to them given the research topic. In this way, interviews validate teacher voice and experience and are an opportunity for them to make meaning from their lived experiences. A second limitation to this methodology is that although a researcher plays a critical
role in the qualitative study Griffin, (n.d) argues that there is more room for potential biases to arise during collection and interpretation of the data. Also, another limitation to consider in qualitative methodology is the relationship between the researcher and the participants, as the researcher can potentially lose awareness of being the researcher and relate their experiences to their participants’ experiences (Haverkamp, 2005). The risks were minimized as I conducted a short 45-60 minute interviews within a specific time that was convenient for the participant and a location that was separate from the participant’s daily activities.

3.7 Conclusion

This chapter explains the research methodology in depth. First I began discussing the research approach and procedure, examining the meaning and implications of qualitative research and highlighting the difference between qualitative and quantitative research. I then delved into identifying the various methods of interviews conducted in qualitative research, and highlighted semi-structured interviews as the primary source of data. Next, I spoke to the leadership in educational technology and special education that teachers were to be experienced in, to participate in this study. I also described the recruitment process which entails purposeful sampling, convenient and snowball sampling. I then continued to describe how I analyzed the data through an inductive approach which allowed me to compare themes to new emerging data. The main data analysis phase were transpired as I reviewed how the themes fit together and add to answering the research question. A few ethical issues were possible while completing this research study. Consent from participants, risks of participants, the right to withdraw, data protection, and potential ways to minimize these ethical issues were addressed. Lastly, I recognized the methodological limitations of the study as possible biases of the researcher arising. On the
con-try, I also spoke to the strengths of this study which includes learning firsthand from the interviewee’s experiences. In the following chapter, I reported the findings and themes within the research.
CHAPTER 4: RESEARCH FINDINGS

4.0 Introduction to the Chapter

In this chapter, I present the findings from three face-to-face interviews with teachers from different Elementary schools. Following the analysis of data, five themes emerged. These themes seek to achieve valuable insight to contribute to the central research question of this study: How is a sample of elementary school teachers utilizing technology devices, including Assistive technology devices, in meaningful ways in their classroom to support children with exceptionalities? To highlight additional meaning and complexities embedded in the data, the five themes were refined into multiple sub themes. Each theme and subtheme, are supported by excerpts from the participants. The five central themes are the following:

1. Communicative and Academic technology devices are considered to be the most implemented technology devices by teachers to support students who are verbal and nonverbal.

2. *Co-Writer, Dragon Naturally Speaking, Proloquo 2 go* and *SGD* devices contribute to the academic improvement of students who are non-verbal and with a Learning disability.

3. Teachers indicated that educational technologies can improve the autonomy and engagement of exceptional students in a mainstream classroom.

4. The integration of technology is supported in a mainstream classroom by a collaborative school community and teachers’ professional experience in Special Education.

5. Teacher and student resistance are major barriers to the use of educational technology, and teachers must advocate for themselves to overcome these barriers.
4.1 Communicative and Academic Technology Devices are Considered to be the Most Implemented Technology Devices by Teachers to Support Students who are Verbal and Non-Verbal.

A variety of technology devices are intended to assist children with exceptionalities, predominantly those who are afflicted with conditions that affect their vision, hearing, speech and/or mobility. All three participants confirmed that students with an exceptionality require from AT devices and educational technology as it aids them in their deficits. Particularly, participants recognized that AT devices are an imperative tool in supporting students’ who are verbal and non-verbal in a mainstream classroom. Participants noted that Augmentative and Alternative Communication (ACC) devices including Proloquo2go and Ability switch - speech generating devices (SGD) have been effective communication devices for students in their classroom who are on the autism spectrum disorder (ASD) and with cerebral palsy as it supports their speech difficulty. Proloquo2go serves to promote language development and grow communication skills through the use of symbol-support. SGD are portable devices that provide speech output, either synthetic (computer-generated speech) or recorded human speech. SGD devices use a variety of graphic symbols, text and/or pictures to represent personalized messages for individuals who use their hands or other body parts.

Participants of this study, also informed that students with a learning disability (LD) require specific technology devices to aid them with expressing their learning. The participants successfully integrated two common education technology devices called Co-Writer and Dragon NaturallySpeaking with their students who have a LD. Co-Writer and Dragon NaturallySpeaking are a word prediction and a speech recognition software that can be downloaded on computers, IPads or netbooks with the primary goal of assisting students with expressing their ideas on paper.
All participants highly spoke about these AT and educational technology devices as huge supports that are not limited to accessing student voice but reassures students that they are capable of learning in their own way. Thus with communication and academic technology devices, three sub themes emerge: Communicative technology devices support the self-confidence of students who struggle with verbalizing their thoughts. The second theme focuses on Communicative technology devices to support individualized academic achievement of students with a learning disability by accessing their knowledge/communication. The last sub theme emphasises is ‘Communicative technology can support students in developing friendships.’

4.1.1 Communicative technology devices support the self-confidence of students who struggle with verbalizing their thoughts

Both participants Jane and Lisa noticed the need for children with autism and cerebral palsy to develop self-confidence. Jane noted that when students with autism observe the verbal interaction between peers, they at times become reluctant to communicating as they do not respond to the teacher or to their peers. She stated

Just because a student is exceptional it doesn’t mean that they don’t think, that they don’t have things to share, of course they do, but it’s almost impossible for them without devices like Proloquo2go and SGD in their everyday lives.

Similarly, Lisa shared that she has experienced similar events with her students as she identifies that all students want to be heard and understood however admits that speech is a barrier. Lisa referred to this speech barrier as affecting a students’ “self-confidence.”

She believes that communicative technology devices builds the self-confidence of students with autism and with cerebral palsy as students are happier and willing to learn from their peers.
and teachers when there is an alternative to communication. The interviewees also spoke to the importance of successfully integrating technology including Prol quo2go and SGD devices to not solely support them in academic purposes but also in social aspects of their lives.

The development of self-confidence with the support of communicative technology was a common finding throughout the literature on AT devices in inclusive classrooms. Alnahdi and Maor (2011) exemplify that when students who have a speech barrier are supported with the appropriate AT for their needs, their success is not limited to solely academic purposes but also in uplifting their confidence. Thus, it can be inferred that when appropriate AT devices are assigned to students with a speech barrier, confidence in learners may be improved.

4.1.2 Communicative technology devices support the learning of students with a learning disability when they are integrated across the curriculum and provided with diverse learning opportunities.

All participants noticed the need to explicitly create in-class opportunities for students with a LD to have access to a broad range of educational technology, more specifically communicative technology devices that solely focused on accessing their knowledge and improving their academic success. Kelly referred to this as “inclusive learning” that encouraged students to share and scaffold their learning regardless of the difficulty that students had in writing and expressing their innovative ideas. Specifically, Kelly and Jane highlighted the unique achievements that software’s Co-W riter and Dragon NaturallySpeaking had on students with a LD. Jane distinctively shared that she has a class with two students who have a LD with whom she uses Co-W riter and Dragon NaturallySpeaking as it augments student performance by the technology accessing student communication. She expressed “my students are always eager to learn and share their learning,
these devices really do contribute to their academic success.” Kelly shared a related view as she directly stated “I think it is critical for students with a LD to access Co-Writer and Dragon NaturallySpeaking not exclusively in Language but through other subject areas as I have observed how their learning flourishes across.

While discoursing about academic technology devices Jane pointed out “for students to improve academically, we must create learning opportunities through these devices.” Both participants believe that this kind of purposeful technology contributes to scaffolding the learning of students with a LD while improving their learning across diverse subject areas. The academic improvement of LD students through the use of Co-Writer and Dragon NaturallySpeaking was a prominent theme amongst the literature. Communicative technology devices have the potential to improve the learning of exceptional students if implemented appropriately by teachers, as it has a positive impact on student achievement (Jones, Bunting & De Vries, 2013). The evidence of participant’s responses and the research statement argues that technology devices can in fact alter the academic improvement of exceptional students only when teachers create meaningful learning opportunities for students through the use of technology.

4.1.3 Communicative technology can support students in developing friendships.

Another commonly reported influence that technology has on exceptional students is an increase in establishing friendships. Besides the interactivity and engagement that student’s may experience with technology, all participants spoke highly about ACC devices contributing to forming friendships between students with and without exceptionalities. Lisa addressed how her student with cerebral palsy more frequently approached her peers during free-time in class and at
recess. The participant shared that it was surprising and shocking when she was able to first-hand observe it. From her observation she noted

During ‘snack- picnic style,’ the student with cerebral palsy used [her] SGD which in this case was an adaptive switch that was connected to a software called Discover: Kenx on an iPad. Because this student is non-verbal and has fine motor skill difficulties, the combination of hardware and software carried out her speech output by her just pressing on the switch and selecting prompts that supported her in engaging with other students.

The student engaged during snack time by using her SGD and asking questions like: “are you enjoying your snack today? How is your day going today?

Through the observations of Lisa with her student with cerebral palsy, she believes that communicative technology is not just committed to aiding with communication skills. Rather it also develops an on-going friendship were the student with the exceptionality and peers no longer engage only within the classroom but also invite the exceptional student to play for recess. Kelly also shared evidence of these developing friendships by discussing that communicative technology builds an inclusive community within the classroom and outside of the classroom. The participant explicated that each learner does not feel better or less than the other person and instead each find ways to connect and appreciate one another. The development of friendships through communicative technology was not a prominent theme among the literature however, People for Education (2014) exemplifies that technology fosters inclusive classrooms as it not only supports students in participating in the economic, political aspects of society but in social interactions.
4.2 

Co-Writer, Dragon Naturally Speaking, Proloquo 2 go and SGD Devices Contribute to the Academic Improvement of Students who are Non-Verbal and with a Learning Disability

A second theme that surfaced from the interview data was the belief that academic progress can be achieved by exceptional students when particular assistive technology is integrated in their learning. Similarly to the common ideology that technology is a priority resource for exceptional students, all three participants stressed that when non-verbal students and students with a LD are supported with the appropriate assistive technology, their learning flourishes. Two subthemes stemmed from this finding. The first subtheme relates to educational technology serving as a tool to access student knowledge. The second subtheme suggests that educational technology aids learners in accessing the curriculum while expanding their knowledge beyond the curriculum as well.

4.2.1 Educational technology serves as a tool for differentiating instruction

All three participants shared a similar belief that educational technology is a central factor to differentiating student instruction. Teachers agreed that a wide array of educational technologies such as computers, iPads, netbooks Co-Writer, Dragon Naturally Speaking, Proloquo2go and SGD aid exceptional students with rich and flexible media that give students diverse outlets to represent their learning. To specify, these educational technologies give students the choice to display their learning by verbal expression, writing, through innovative ideas that they capture while exploring the internet, PowerPoints, YouTube videos/media and applications that are preinstalled on the iPads.

Jane referred to educational technology as “a tool that is vital to differentiating student learning.” She added “these educational technologies aid students in proving to the world and to
themselves that they are capable of learning and presenting content in their individual way.” Similarly, Kelly strategically creates and implements opportunities through educational technology, for exceptional students to learn from where they actually are and not where the textbook or curriculum says they need to be. Kelly affirmed

I don’t just show students how to use the educational tool, the whole point is to meet them where they are in their learning and have them share in the way that they can. I have learned that you have to start easy and simple and so I always initiate conversations that will ignite interest in them and provoke them to share their input. The problem is if students are not given the appropriate technology tool, the student themselves and others can easily jump to conclusions and believe that they are incapable of learning. The truth is we are all capable of learning just in distinct ways.

This direct quote supports the literature within this study, as a variety of educational technology devices are intended to differentiate to fit the needs of the specific student. It is expressed that educational technology assists teachers in differentiating their instruction to a large spectrum of learners however, Means (2010) specifically recognizes that speech output devices, communication boards, speech recognition software, and switches activate by pressure sound, voice/ and or touch screens offer a students an avenue to accessing and spreading their learning in their individualized way.

4.2.2 Educational technology contributes to accessing lesson material and understanding of the material.

All participants reported relevant observations on specific educational technology tools as they achieve two goals: one being reducing the barriers to learning and also accessibility to the
curriculum. Lisa and Kelly attributed this to the affordance of technology to offer students a possibility to make meaning of their learning while making connections to the curriculum. In a classroom of students, with a learner on the autism spectrum and a student with cerebral palsy, technology has the potential to provide student-specific content and direct instruction as described by Lisa. She recounts a prime example when her students with an exceptionality constantly lose their place while reading due to hardships with ocular movement. “By using existing technology—Dragon NaturallySpeaking installed on iPads, these students were able to use the books like everybody else, follow along without losing their place and increasing their content comprehension of what was being taught.”

Given the specialized educational needs of students who are non-verbal and with a LD, Jane suggests that educational technology is not limited to enhancing the curriculum but it gives exceptional students a different perspective to their education. She stated

With 2 of my students with a LD, I integrated multitude educational technology tools including YouTube videos, Co-Writer and PowerPoint in my Science and Language units. Instead of students engaging in text-book learning, educational technology assisted them in connecting to the curriculum by expanding to their own experiences and to real world things. She believes that educational technology is beneficial to typical learners but critical to exceptional students. Kelly offers evidence of the imperativeness of educational technology by discussing the presentation opportunities that pupils are given to share in front of their school community and parent/guardians. The relationship between educational technology and accessing the curriculum was a common theme found in the literature as Roblyer (2003) extends that all students either with an exceptionality or not benefit from technology as it excels their understanding in diverse
curriculum concepts. Thus, it can be asserted that educational technology is vital to a large spectrum of learners however precise educational tools aid nonverbal and students with a LD in extending their learning to the curriculum.

**4.3 Teachers Indicated that Educational Technologies can Improve the Autonomy and Engagement of Exceptional Students in a Mainstream Classroom**

As previously mentioned, participants of this research study exemplified successful integration of technology for exceptional students in a mainstream classroom. Through the interview sessions, the participants continued to explore the overall improvement that technology portrays on exceptional students. Participant’s responses shifted from academic improvement to explicitly reflecting on other areas of enhancement that students showcased with the assistance of technology. One prominent subtheme emerged from this finding. This finding includes fostering student independence when technology is integrated in their education experience.

**4.3.1 Educational technology can foster student independence.**

All participants spoke of the need to explicitly create interactive opportunities with various educational technologies to offer students a preference of how they are most interested in sharing their learning. Allowing all pupils to reach out to diverse educational technology tools promotes decision making skills which are key to self-efficacy. Kelly established a classroom climate were students twice a week use an educational technology tool [of their choice] to exhibit their understanding of a concept in a specific subject. She expanded

In my most recent years of teaching I have allowed all learners to sign up on a sheet electing either a chrome book, SMART board or IPad and are given the free-choice of selecting an
application or a software that will aid them in presenting their skills. Prior to this, I make sure to modify the content for my exceptional students first. With my students who have an LD or whom are non-verbal I encourage them both to explore an educational tool that best fits their needs and that makes them comfortable when sharing to the whole group. Because my students with exceptionalities often use the same AT I do not want to limit their choices, instead I want them to direct how they chose to exhibit what they understand. I want to know how their brain thinks. Most importantly, I want to generate them to be independent thinkers.

Kelly believes that a major potential that technology plays in the lives of exceptional students exclusively is the development of independency not just within the school context but also as an active citizen in the community. Lisa also contributed a diverse example of her non-verbal students practicing independency through the use of Proloquo2go. “This software gives students the openness to select a variety of choices. They can chose what they want to communicate, what they want to eat, their feelings. It really does give students the independence to make daily life choices.”

The response that I received from both Kelly and Lisa is consistent throughout the literature as Simpson et al, (2009) acknowledges technology tools, considerably AT creates a more accessible environment, and it enhances student independence, their self-worth and their productivity in their daily lives. Not only is technology most favourable to elevating the educational needs of exceptional learners but both participants accentuate that it uplifts student’s autonomy.
4.4 The Integration of Technology is Supported in a Mainstream Classroom by a Collaborative School Community and Teachers’ Professional Experience in Special Education

The research setting for this study illustrated advantageous elements and successful technology integration for exceptional students in mainstream classrooms. Through the interview sessions, the participants from three different public elementary schools confirmed that the school community and the teacher experience in Special Education are major influences to the effectiveness of technology integration. Three subthemes that articulate the components that contribute to successful technology integration are teacher training in technology devices, parent involvement and collaboration with professionals in the school community.

4.4.1 Receiving training in the use of technology devices can help teachers feel better supported

In today’s 21st century, technology devices are most common in higher Social Economic Status (SES) schools. An enormous financial investment in technology for K-12 schools to aid in bridging the digital divide between high and low SES students, continues to be a process in Ontario schools (People for Education, 2014). Depending on whether teachers are comfortable and confident in using technology, they are most likely to be willing to integrate technology appropriately. On the other-hand when students on an IEP are required to use a particular technology device, teachers are expected to support the student with the specific technology as it is the students right. The process of learning how to use technology devices can be challenging especially if teachers have not have practice in this area. One of the interview protocol questions asked participants how they can feel better supported when using technology devices with exceptional students. Lisa had a dissimilar and negative experience when receiving training in
technology. She explained that students are given 3 days of training on how to use the AT and then she received notes on how to navigate the AT device. Lisa described the lack of training in AT devices that she received as “daunting and difficult” as she did not know how to use the device and could not invest herself in appropriately integrating the technology device with her exceptional student.

Distinctively, Jane and Kelly reported that they researched technology devices on their own time but they felt better supported and knowledgeable of how to function the technology device when they received training. Jane is grateful for the times she has received training in technology, she referred to these opportunities as ‘critical’ because not only did she learn about the device (s), how to utilize it but received guidance on how to appropriately integrate the technology device (s) in the everyday learning of students with exceptionalities. She added Teachers need to make sure to receive technology training because in these sessions we learn how to meet the learning needs of the student(s) based on the IEP goals. Training sessions are not just meant for teachers to ask how to use the device and the best way that the student can research for example. It is about asking the expert and learning how we can use the specific technology device to support the IEP of this student.

Both Jane and Kelly also believe that technology training not only builds teacher competence, confidence and engagement in technology. They shared that one-on-one sessions with experts from the School Boards are the most advantageous as they guide both the teacher and the exceptional student through step-by-step instructions on how to use and navigate the technology device. Both participants indicated the positive impact that receiving technology training ensures, however they also revealed that this is not the experience for all teachers.
As these two participants revealed affirmative technology training experiences, the positive experiences of participants was an uncommon theme found within the literature. Asselbring, et al (2000), affirms this as he indicates that the most popular factors that have been known to inherit technology integration in classrooms are lack of appropriate staff training in the use of technology devices. Yet, the improvements that technology training portrayed for participants, aligned with Ontario Ministry of Education (2010) as it stated that when teachers receive appropriate training in technology, it improves their confidence, preparation and engagement with successfully integrating technology and elevating the learning outcomes of students with exceptionalities.

4.4.2 Parent involvement and Parent fundraising promotes accessibility and availability of technology resources

There are many dynamics that influence the access and adaptation of technology in schools. All participants continuously spoke towards parent involvement and parent fundraising as a vital element to having access to a variety of technology devices in schools. Jane and Lisa noted that their schools had a very involved parent neighbourhood in which parents took the time and effort in approaching the school, the principal and teachers in actions that they could undertake to improve the accessibility of technology devices not only for their children but for the entire school as well. When describing this experience Jane happily stated

It makes me beyond pleased and grateful that parents see the benefits that technology has on the overall child and at the same time they show that they care and understand the importance for all learners in the school to have access to technology too.

In the two schools where Jane and Lisa work, the parent council consists of a large amount of parents who are committed to fundraising specifically for technology resources. The amount of
money that the parent council’s frequently receive has supported the schools with purchasing more iPads, chrome books and SGD devices that are imperative for particular students with exceptionalities.

Lisa reassured that all schools were not as lucky in receiving parent support as she recognized that there are schools in low-social economic communities that experience a lack of funding for technology, thus limiting students to the accessibility of a transformative learning with technology. The responses of the participants aligned with the literature as Asselbring et al., (2000) specify that there is a lack of funding for technology and equipment in schools of low-income communities.

**4.4.3 A supportive network of professionals in the school community helps teachers in their work and promotes students’ deeper understanding of technology use**

From the previous subthemes it is apparent that participants experienced a number of factors that supported the successful integration of technology with exceptional students. Participants also suggested that a network of professionals in the school community, including their own knowledge in Special Education aided them in technology use with students. Kelly defined her school as “a supportive and caring school community.” She elaborated

When you are a part of a school where the principal, educational assistants, resource teachers, the staff, the school psychologist, the speech and language pathologist and you are all in synced with the primary goal of effectively integrating technology with exceptional and non-exceptional students then together you can all contribute your knowledge, expertise, questions and concerns. The best feeling is knowing that you are not
alone in this process and that together you can grow and find the answers to best support the learning needs of all students through the use of technology.

Kelly distinguished “one of the powerful things that recently supported the school was bringing experts from companies called Learning Style into the school. Learning Style consists of experts in the use the technology who efficiently work with the student and teacher on a specific area of technology focus that the teacher may want to discuss or that the student needs further practice on.

The benefits of a supportive community in technology learning and integration, Jane explains “Is that eventually students become so in tuned with what they need and what works well for them that they walk away thinking or saying “I understand what I need.”

A common finding within this theme was the additional qualifications (AQ) 1 and 2 in Special Education that all participants had. They confidently explicated that their perspective and teaching practices towards students with exceptionalities shifted in a positive way. Through the AQ’s, the participants were able to understand and believe in the power that technology has in the lives of all students. In relation to this, Jane explicated “my knowledge in special education and technology aids me in understanding what my students need and how to get them there with the support of tech but also encourages me to spread my knowledge and experiences with the school community.”

It can be argued that the professional development of teachers in Special Education may or may not contribute to the school community developing appropriate technology practices with students, as this was not a common finding in my literature. The study of Kurth & Shogren (2015) provides insight on the benefits of having a supportive, collaborative school community. As well, it also illustrates how Kurth & Shogren (2015) study aligns with the participant findings of having a strong supportive community and the influence that this has on the accessibility of technology.
devices within the school. In their one year study, the researchers observed how the interdisciplinary school support in an elementary school in the United States, contributed to teachers increasing appropriate use of technology with exceptional students from ages 6-12. The school support that teachers experienced, reflected many areas of improvement including math and literacy skills of exceptional students.

4.5 Teacher and Student Resistance are Major Barriers to the Use of Educational Technology and Teachers Must Advocate for Themselves to Overcome These Barriers

This theme centres on what participants of the study believe are major barriers to the use of educational technology and what actions they must undertake in order to break down these barriers. Participants explained that there is an equal balance of teacher and student resistance in using educational technologies as they often feel hampered by a lack of collaborative learning in technology and the potential stigma that can arise from technology use. From this theme, three sub-themes have emerged. These themes are not limited to the barriers that both the student and teacher feel when using technology but also draw on how it is the responsibility of the teacher to seek for school support, in order to develop confidence in using technology with all pupils and in simultaneously transferring their confidence to the students too.

4.5.1 Lack of collaborative learning and the absence of a full-time educational assistant in the classroom, may lead teachers to feeling reluctant in integrating technology appropriately

As mentioned in the previous sub-theme the participants experienced a collaborative school community that enhanced their learning in technology as well as the students. However, when asked what are the key barriers that teachers face in accessing technology. All participants revealed
that the advancement of technology can be intimidating and scary and that sometimes they were hesitant and resistant in asking staff on how they could appropriately integrate technology in the education of pupils in their classroom. More frequently participants have observed how both beginning teachers and teachers that do not envision the endless possibilities of learning with the use of technology continue to be reluctant in approaching staff to collaborate on the topic of technology integration. Kelly described this practice as “teacher ignorance and selfishness because they choose to not seek for support and thus diminish the possibilities of meaningful student learning with technology.”

The absence of a full-time Educational Assistant (EA) in the classroom was also a key finding that participants voiced as an element that they believe leads to teachers feeling reluctant in integrating technology effectively. Lisa stated

We need more bodies in the classroom, we need EA’s to be a part of our classrooms full time because in every classroom there’s at least one student with an exceptionality. This would be a huge help to all teachers and beneficial for students as most EA’s have more experience with AT devices. This makes more sense as we would observe and learn how the EA supports the students with the technology device and also collaborate on learning opportunities that would best fit the child’s needs.

Without an extra support like an EA it can be very easy for teachers to disregard the learning needs of exceptional students as they are also concerned about teaching the rest of the classroom. All participants recognize that the possibilities of having an EA in the classroom full-time in every classroom is non-realistic due to the lack of funding. Regardless of this, participants believe that not having the extra support from an EA contributes to teacher’s unwillingness in using technology effectively with exceptional pupils. This finding is present in my literature as Ontario Ministry of
Education (2010) report that although teachers are pressured with high demands to integrate technology in the education of exceptional students, they are most efficient in developing education programs with the support of an EA, as they obtain extensive training with AT devices. Similarly, Globe Education (2015) notes Toronto District School Board teachers expressed being overwhelmed and thus require full-time EAs in the classroom to successfully use AT devices with exceptional pupils. In sum, teachers must advocate for themselves in order to appropriately integrate technology in the learning of students regardless of the barriers they face. To achieve this, teachers must be open in approaching the staff in their school and certainly believing that they can make a difference to their technology education.

**4.5.2 Technology can contribute to students experiencing stigma or to inclusive classrooms if implemented appropriately by the teacher**

The teacher’s role in technology integration is vital and therefore how they implement technology can either foster stigma toward exceptional students using a technology device or an inclusive classroom. All participants had relatively similar responses when asked how they reduce the stigma of using technology devices with exceptional students and shared the practices that they believe create inclusive classrooms. Jane explained that there is a higher stigma towards exceptional students who use technology devices while others do not in the junior/intermediate grades. Jane revealed that this has led her students with LD to be reluctant in using chrome books and in speech-recognition software at the beginning of the year because she did not use an inclusive approach when introducing the device to the student. Jane expanded

You have to build a rapport with students so that students know that sometimes it’s best for them to use the netbook or whatever else it may be. You have to remember to be honest
and clear to all students, talk to students about exceptionalities and inform them that it is not that the student is not intelligent it’s that for some students there is a better way, a more helpful way for them to learn and show what they know. When you express this to students, all students even the student with an exceptionality will grow to trust that what you are saying is true. However this process does take a long time… you have to be patient.

Lisa believes that as a teacher you must first develop a positive relationship with students not only through words but also through actions, such as in constantly creating opportunities for student’s differences to be respected and appreciated by everyone. Lisa also describes this as “opportunity for students to become fluent with technology.” Lisa provided an example for this practice:

I use technology with all students, not just students with exceptionalness, however if a specific student is entitled to a particular device I will group 2-3 students with the exceptional student and assign them a task to be completed with the device and of course I’m always circulating and supervising them.

Lisa recognized that this may not be the best practice however it has eliminated the stigma towards technology use in her classroom, as students had the opportunity to ask questions about the device, learn from it, navigate the device and interestingly enough they found the device to be cool as they were amazed at how technology could support the learning of their peer. Participants are enacting strategies that literature suggests, such as UNESCO (2006), stipulate that classroom teachers must combine general and special education strategies to fully support the abilities of a large spectrum of learners. Specifically Ajuwon (2008) explains that teachers who successfully implement inclusion, adapt practices that respond effectively to both exceptional and non- exceptional students when specific technology is used by pupils in the classroom.
4.6 Conclusion

In conclusion, this study found that teachers in general classrooms are effectively integrating a variety of AT devices and educational technology with exceptional students—primarily students who are non-verbal and with an LD, as this is the most frequent exceptionality that the participants experience within their classroom. As outlined in the Ontario Special Education program/services, exceptional students are protected with accommodations, modifications, strategies and AT devices that teachers must adapt to their teaching. However, AT devices are pointless if teachers do not see the power that it can have on the student’s education and thus fail to create meaningful learning opportunities for these pupils through the use of technology.

These findings make a significant contribution to the existing literature by focusing on the enhancements that technology has on a large spectrum of learners. Most of the literature addresses the benefits and barriers to accessing technology. Among the benefits in the findings of the study include student academic progress, communication, student independence and a collaborative school community. In reference to the barriers present throughout the findings, teacher and student resistance in using technology and lack of teacher training in technology are the most significant findings between participant’s responses. Once teachers, see the potential that technology gives exceptional students in reaching academic success and in being active citizens in the community, teachers can hopefully continue to break down barriers that continue to arise with the diversity in classrooms and the technology advancement. Through this action, teachers can promote inclusive practices in their own classrooms that support the learning needs and friendships between exceptional and non-exceptional students, through the use of technology. Next in Chapter 5, I
discuss broad and narrow implications for these findings, give recommendations and note potential areas of further research.
CHAPTER 5: DISCUSSION

5.0 Introduction

In this chapter, I discuss the overall implications and significance of this research study. I first review my key findings on how teachers support exceptional students through educational technology in a mainstream classroom. Then, I discuss the implication of the findings, both for the education community and my own practice as a beginning teacher. I make recommendations for various stakeholders in the educational community (e.g. teachers, administrators and teacher education programs. Finally, I pose questions and suggest areas that may benefit from further research and discussion.

5.1 Overview of Key Findings and Their Significance

As examined in the previous chapter of this study, teachers in mainstream classrooms integrate educational technology and AT devices for exceptional students in purposeful ways that enhance the learning and independence of exceptional students. Participants are most comfortable with integrating technology devices with students with a LD and who are nonverbal, as these are the most common exceptionalities present in today’s Ontario classrooms. Ontario District school boards reported that ASD is the most common disorder in elementary classrooms alongside with 59.8% of learners being identified with a LD (Ministry of Education, Special Education, 2015). Teachers’ professional development and additional qualifications in Special Education and Technology have supported them in developing positive relationships with their students. This action has encouraged learners to utilize technology, not solely in their academic learning, but also in their social life.
The participants’ personal understanding and commitment to exceptional students is reflected in the learning opportunities they offer students in their classroom. Firstly, their teaching practices are imbedded in the Ontario Special Education program/services which protect exceptional students through accommodations, modifications, strategies and technology devices that they are entitled to. Specific practices implemented by participants include: providing students with options to display their learning through innovative ways, verbally or writing through technology devices and differentiating instruction by giving them the choice to select a technology device that will aid them in presenting their skills. These strategies foster an inclusive classroom, as learning and communicating with peers becomes accessible through the strategies and technology devices that exceptional students are supported with. This finding is significant, as much of the literature speaks to the minimized learning opportunities that are offered by general classroom teachers due to the lack of expertise in educational technology and AT. Simpson (2009) found that due to the lack of teacher expertise with AT devices, teachers are unsuccessful in educating exceptional students. Additionally, the participants recognized a vast amount of barriers that may influence how technology devices are utilized with exceptional pupils. These include teacher and student resistance to utilizing technology and a lack of collaborative learning. Given the proven success of educational and AT devices in fostering academic learning and building relationships, the study’s findings are significant because they provide teachers with an understanding of the benefits that technology devices have on exceptional students when integrated appropriately.

5.2 Implications

In this section, I discuss the implications of my research findings. I begin by highlighting the broad implications for the educational community- including schools, educational
professionals and professional development. Next, I discuss the implications of my findings for me both as a teacher and as a researcher

5.2.1 The educational research community

The learning opportunities implemented in mainstream classrooms to effectively support exceptional students and facilitate inclusion are significant and can be adapted in Ontario general education classrooms. According to UNESCO (2006), schools in Ontario must continuously work towards fostering inclusive classrooms by combining general and special education strategies to fully aid a wide range of exceptionalities. This aligns with the teaching practices of all participants as they acknowledged that not all identified students with an exceptionality are supported appropriately through technology devices. Particularly they specified if teachers do not have a professional development within the area of special education, technology or an EA in the classroom, it may increase the possibility of teachers missing learning opportunities for them. As we understand how important inclusivity is, this demonstrates a need for this work to be widespread and not only occurring in classroom where teachers are confident in educating exceptional pupils.

Given the challenges with integrating technology for students with individual learning needs, having a strong network of professionals in the school community is an imperative determinant for effective technology integration. All participants noted that through professional collaboration they continue to be successful with integrating technology devices for all pupils. They work closely with other educational professionals—their principal, EA, resource teachers, psychologist, speech and language pathologist and staff—to express their concerns and their knowledge on how teachers can efficiently integrate technology education.
All participants forefronted the possibility of students feeling reluctant and feeling stigmatized by their peers if teachers are not successful in technology integration. This outcome witnessed by all participants highlights the possible effects of teachers not practising inclusivity and reaching their students’ highest potential. If teachers do not believe in these teaching practices then they are not providing the best opportunities for all learners to thrive. This implies the need for administration teams to educate teachers and principals about the exact ramifications of pupils not fostered with technology integration as well appropriate responses and actions of what can be done to maintain a collaborative school community. Thus, the findings of this study are notably significant to the educational community.

5.2.2 My professional identity and practice

Throughout my time at University of Toronto, I always gravitated towards interacting with exceptional students in my practicums. It is through these experiences that I have grown in my commitment towards inclusion. After conducting research on the relationship between special education and technology I am confident that it will influence my own pedagogy of technology integration. I am aware that when I have my own classroom, the class population will contain diverse needs, students who require educational technology or AT devices to optimize their learning. Thus, I will adapt many of the distinctive practices and strategies that the participants suggested, regardless of my expertise with technology.

It is evident that personal biases are nearly impossible to discard, this also applies to the teaching practices with technology as explicitly shared by participants. In my own professional development I will take additional qualifications in special education and technology to best support a wide range of learners. I will not give up on my students regardless of their needs, I will
delve into technology and education research and seek advice in my school community. I will not allow my self-confidence impede me from reaching out to professionals in the school and together question, discuss and challenge technology practices. Through this network, I will feel better suited and prepared to create inclusive classroom environments.

Considering this, as a teacher whose vision entails fostering inclusivity, I find it imperative to provide students with endless opportunities that will build friendships between a typical student and exceptional students. I recognize that having meaningful dialogues with the class about accepting each other’s differences can be an effective approach to creating inclusive environments, however it is also vital to create learning opportunities through technology, where typical and non-typical students engage. This practice alongside meaningful discussions about diverse needs and exceptionalities may diminish the stigma and the misconceptions towards this population of learners. I will embrace inclusion by introducing educational and AT devices to the entire class instead of just the exceptional pupil for the purpose of learning about the devices together. Through this practice, I hope to reduce bullying and marginalization of exceptional learners and instead create a safe inclusive classroom in which everyone is able to reach their highest potential. This practice can also aid learners in gearing more towards peers that they would not normally approach and feel comfort and enjoyment in fostering new friendships. It is the hope that students transfer these inclusive practices not solely in their school community but also towards the greater community.

5.3 Recommendations

Reflexivity in teaching practices and on-going professional development have been, in my experience, the best form to demonstrate commitment to student learning. With this in mind, the
findings brought forth by this study imply the need for teacher education programs and administrators to take action for teachers to suitably integrate technology practices with a wide range of learners.

A main suggestion is for special education to have a focus on technology integration in pre-service teacher education programs in Ontario, specifically with a focus on educational and AT devices that accommodate the needs of a variety of learners. Given that educational programs in Ontario include a practical component, teacher candidates should experience special education classrooms or should be placed at least once in mainstream classroom with multitude exceptionalities. Through this, pre-service teachers will obtain hands-on experiences with high needs students while becoming comfortable interacting with these students. Once teachers become comfortable engaging with exceptional students they may feel more confident in facilitating learning experiences for them. Furthermore, I believe this first-hand exposure will enhance teachers’ knowledge in technology integration and how devices are used to accommodate learning needs. I hope this study also motivates school principals to cultivate approaches to bring experienced staff, including EA’s, in leading workshops for current teachers who are not as knowledgeable in the topic of technology integration with exceptional learners. Through this approach, teachers can converse and develop action plans towards breaking down barriers associated with technology integration as well as share how they are connecting technology devices to student learning expectations. As there is a high demand for teachers to integrate technology in their practice for educational purposes, I suggest that teachers create a time period during each school day for exceptional students, alongside their technology device, to interact with peers. It became apparent through this study that some students experienced technology stigmatization when teachers did not discuss or allow the class to interact with various technology
devices that supported exceptional peers in the class. This established socialization period will aid teachers in developing inclusive classrooms where all learners feel confident and secure in their learning through technology while building relationships.

5.4 Areas for Further Research

In this section I specify the areas for further research based on my research findings and what I have learned as a teacher-researcher. Given that the maximum number of interviewing participants was three, the data analysis presented is very limited nonetheless valuable in learning how mainstream teachers are integrating technology with exceptional learners. However, due to the small sample size, this study’s findings cannot be generalized into a larger population. One area for further study would be to investigate how EAs can aid teachers with successfully integrating technology and fostering relationships amongst exceptional and non-exceptional students. Through my exploration of related literature and participants responses, it became clear that having an extra professional such as an EA in the classroom can maximize teachers’ ability to provide a wide range of learners with meaningful learning experiences through technology devices. I did learn about the importance of having a network of professionals in a school community to contribute their knowledge and expertise with technology integration. However, I believe that it would be valuable to gain a deeper understanding of how EAs or other professionals in the school can aid teachers in building friendships between exceptional and non-exceptional pupils through a technology approach. This is particularly significant as participants shared that, when technology for exceptional learners is embedded through an inclusive approach, it increases the interaction of all learners regardless of their ability.
Additionally, I believe that another area for research is investigating a rare exceptionality and educational technology or AT device(s) that can enhance the learning of this population. While conducting research and finalizing my literature, I recognized that a lot of the found literature highlighted LD and ASD to be the most common exceptionalities students experience in Ontario elementary schools. All participants spoke to how they feel most comfortable integrating educational and AT devices to support students who have LD and ASD as they are familiar with the devices due to each year experiencing at least one student with either exceptionality. As a result, I believe that further research should look at the technology devices that are specifically designed for rare exceptionalities, to further support teachers in feeling comfortable and confident in not solely integrating technology for common exceptionalities but to prepare them with multitude exceptionalities.

At last there is the need for schools and school boards to provide teachers with practical strategies and resources that can be implemented in classrooms. This may transcend to teachers feeling confident regardless of their professional development with special education and technology.

5.5 Concluding Comments

Educational technology and AT devices are an integral part of supporting various students as differentiated instruction may not be sufficient in supporting their learning needs. Technology devices offer an avenue through which students can successfully reach their highest potential. This research study revealed that teachers identify educational technology and AT devices as positive influences to students’ education. As well, the study suggested that teachers are successfully integrating technology devices in mainstream classrooms with exceptional students.
by making connections to the curriculum, but that the integration of technology often relies on the professional development in Special Education and technology and in a supportive school community. Teacher education programs, administrators and professional development need to help teachers feel and be more comfortable with integrating technology in mainstream classrooms through inclusive approaches. To teachers who are uncomfortable or unexperienced with technology integration, we must broaden our horizon and seek for support in our school communities. As teachers we must continue to be reflective and acknowledge that we are also life-long learners too.
References


doi:http://dx.doi.org/10.1016/j.ptsport.2006.11.002


Higgins, K., & Pierce, T. (2002). Collaborative partnerships among teachers of students who are gifted and have learning disabilities. *Intervention in School and Clinic, 38*(1), 36.


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APPENDICES

Appendix A: Letter of Consent for Interview

Date:

Dear ______________________________,

My Name is Anita Morales 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 teachers’ experiences with integrating technology (including assistive technologies) to support the learning of exceptional students. I am interested in interviewing teachers who have experience integrating technology to support the learning needs of exceptional students. I think that your knowledge and experience will provide insights into this topic.

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 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,

Anita Morales
Phone Number:
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 Anita Morales 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 Questions

Introductory Script: Thank you for agreeing to participate in this research study, and for making time to be interviewed today. This research study aims to learn how a sample of elementary teachers is integrating technology to support the learning needs of exceptional students.

The purpose of this requirement is to allow us to become familiar with a variety of ways to do research. This interview will last approximately 45-60 minutes, and I will ask you a series of questions focused on the use of technology with exceptional students. I want to remind you that you may refrain from answering any question, and you have the right to withdraw your participation from the study at any time. As I explained in the consent letter, this interview will be audio-recorded. Do you have any questions before we begin?

Background Information

1. What is your current position?
   a. What grades and subjects do you teach?
   b. Which have you previously taught?
   c. Do you fulfill any other roles in your school? (E.g. coach, advisor, resource support, etc.)

2. How many years of experience do you have in teaching?

3. Have you always for a public school board? Which boards have you worked with?

4. Can you tell me about your current school? (e.g. size, demographics, program priorities)
   a. Approximately what percentage of the students at your school are identified as students with exceptionalities?
   b. What range of exceptionalities is represented at your school?
   c. How does your school support students with exceptionalities? (E.g. resource teachers, spaces, inclusive classroom practices, assistive technologies etc.)

5. For how many years have you worked with students with exceptionalities?

6. What roles have you played supporting students with exceptionalities?

7. Can you tell me more about what experiences have contributed to developing your commitment to supporting students with exceptionalities, and your preparation for this work?
   a. Personal experiences? (friends, family, own experience)
   b. Educational experiences? (course work, teachers college, additional qualifications, professional development)
   c. Professional experiences? (e.g. employment positions, experience in schools and classrooms)
8. You have also identified as someone with leadership experience in the area of technology integration. What experiences have contributed to developing your interest in and preparation for this work?

9. Can you tell me more about your experience with assistive technologies and how you learned to use them?
   a. What assistive technologies do you have experience with?
   b. What technology and assistive technology is available to you and your students in your current school?

**Teacher Perspectives/Beliefs**

1. In your view, what are some of the key needs of students with exceptionalities?
2. From your perspective, how well are these needs typically met in schools and classrooms? Why do you think that is?
3. How do you think the needs of students with exceptionalities could be further met?
4. What role do you see technology playing in supporting the learning needs of students with exceptionalities? What are the benefits of access to technology for students with exceptionalities?
5. And what about assistive technologies in particular? How does assistive technology support the learning needs of students?
6. In your view, what are some of the key barriers in the way of utilizing technology and assistive technology to support the needs of students with exceptionalities?

**Teacher Practices**

1. Which types of technology and assistive technology devices do you use in your classroom, and why? With which students do you use them?
2. How do you access these technologies?
3. What kind of learning opportunities have you provided exceptional students with the use of technology devices? How do you use these technologies? Can you provide me with some examples of how you use technology, including assistive technologies, to support students with exceptionalities in your teaching?
   a. With whom were you working?
   b. What were your learning goals?
   c. What opportunities for learning did you create?
   d. What technologies did you implement and why?
   e. How did you student respond? What outcomes did you observe from them?
   f. What resources further supported this lesson? (e.g. particular apps, websites, songs, videos, tools)
4. In what ways has technology impacted your student(s) with exceptionalities? What range of outcomes have you observed from students?
5. What particular features of the technology that you implement do you feel supports students’ learning needs?
6. What are some of the considerations that you make when using technology and assistive technologies to support students with exceptionalities?

7. How, if at all, do you introduce these technologies to your classroom of students more broadly? What outcomes do you observe from your students more broadly speaking (not only from students with exceptionalities)?

**Supports and Challenges**

1. What challenges do you encounter integrating technology to support students with exceptionalities? How do you respond to these challenges?

4. What range of factors and resources support you in this work? (E.g. school with technological resources, parent support and fundraising, access to technology, access to physical space, leadership from admin and colleagues etc.)

**Next Steps**

1. In respect to the use of technology and assistive technology for students with exceptionalities, is there anything else you would like to include?

2. What advice, if any, do you have for a beginning teacher who is committed to supporting students with exceptionalities through technology integration?

Thank you for your participation in this research study.