Development of Reading Comprehension Skills Among Students With Intellectual Disabilities Using Technologically-Based Reading Programs

Ella Macklin

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DEVELOPMENT OF READING COMPREHENSION SKILLS AMONG STUDENTS WITH INTELLECTUAL DISABILITIES USING TECHNOLOGICALLY-BASED READING PROGRAMS

A Dissertation
Submitted to the School of Education

Duquesne University

In partial fulfillment of the requirements for
the degree of Doctor of Education

By
Ella M. Macklin, M.Ed.

December 2016
Dissertation

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DEVELOPMENT OF READING COMPREHENSION SKILLS AMONG STUDENTS WITH
INTELLECTUAL DISABILITIES USING TECHNOLOGICALLY-BASED READING
PROGRAMS

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ABSTRACT

DEVELOPMENT OF READING COMPREHENSION SKILLS AMONG STUDENTS WITH INTELLECTUAL DISABILITIES USING TECHNOLOGICALLY-BASED READING PROGRAMS

By

Ella M. Macklin

December 2016

Dissertation supervised by Deborah Scigliano, Ed.D

This research paper reported the results from research conducted regarding technologically-based reading comprehension programs for students who have intellectual disabilities. It provided evidence-based research and theoretical bases for learning (i.e. Zone of Generativity, Constructivism, Self-Efficacy) on the issue of these students not being adequately prepared to academically compete with their non-disabled peers in the classroom in a technologically-based world which requires proficient reading skills. This paper addressed low reading comprehension skills development at the foundational elementary level for basic reading comprehension skills. This paper examined the students’ academic performance and integrated commentary from educational leaders and other stakeholders. Data were collected via surveys from stakeholders to inform the work of education focus groups, curriculum developers and technologically-based reading comprehension program designers. It offered a design for action
using an Improvement Science Model to address the issue which will culminate in a discussion for a student-centered technologically-based reading comprehension curriculum that integrates reading comprehension skills development and technological skills. The investigation concluded with recommendations for implementing the plan to improve reading comprehension instruction for students with intellectual disabilities through improvement inquiry in the field of Educational Leadership.
DEDICATION

I dedicate this work to my former students in Special Education and their families whose courage and determination to learn inspired me and continue to do so to this day. I admire current educators for their dedication and hard work in classrooms everywhere and students with intellectual disabilities who strive to meet the challenges set before them.
ACKNOWLEDGEMENTS

I thank Dr. Deborah Scigliano for serving as my Chair and Dr. Rick McCown and Dr. Connie Moss as committee members. I am forever grateful to my parents, Mr. & Mrs. James (Shirley) Macklin and grandmother, Mrs. Ella Copeland for their love (and my love to them always). I am indebted to my former Professor Dr. Louise Kaczmarek who taught me about working with students with special needs and advocating for their educational needs alongside their families. Much respect goes to my former colleague, Dr. Robert H. Connamacher for our instructional collaborations in my classroom. My profound appreciation goes to Rev. Jetson B. Dent for being an important spiritual advisor as I sought to use this project to search for deeper meaning through contributing what I hope will be lasting generative impacts to the field of education. My gratitude goes to the members of the Monumental Baptist Church for their continuous prayers. I am beholden to the educators who were study participants who provided valuable insights for my study. I am honored to have friends and classmates from Cohorts 1, 2, and 3 with whom I’ve shared conversations about issues in education and comradery in my program of study. My highest praises to the Holy Trinity for strength to see this study to completion.
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>iv</td>
</tr>
<tr>
<td>Dedication</td>
<td>vi</td>
</tr>
<tr>
<td>Acknowledgement</td>
<td>vii</td>
</tr>
<tr>
<td>Chapter 1</td>
<td></td>
</tr>
<tr>
<td>An Interest in Reading Comprehension Skills Development, Social Justice</td>
<td>1</td>
</tr>
<tr>
<td>and the Instruction of Students with Intellectual Disabilities</td>
<td></td>
</tr>
<tr>
<td>The Current Struggles Faced by Students Encountering this Issue</td>
<td>4</td>
</tr>
<tr>
<td>The Direction of Study: A Roadmap for Investigating, Addressing,</td>
<td>7</td>
</tr>
<tr>
<td>Engaging and Creating Generative Impacts and Analyzing Reading</td>
<td></td>
</tr>
<tr>
<td>Comprehension Skills Development and Students with Intellectual</td>
<td></td>
</tr>
<tr>
<td>Disabilities</td>
<td></td>
</tr>
<tr>
<td>Defining the Issue of Reading Comprehension and Students with</td>
<td>10</td>
</tr>
<tr>
<td>Intellectual Disabilities</td>
<td></td>
</tr>
<tr>
<td>The Significance of Conducting this Study</td>
<td>16</td>
</tr>
<tr>
<td>The Social Justice Implications Derived from this Study</td>
<td>22</td>
</tr>
<tr>
<td>The Reasons for Solving an Ongoing Problem</td>
<td>24</td>
</tr>
<tr>
<td>My Professional Experience and Contribution to Addressing the Issue</td>
<td>26</td>
</tr>
<tr>
<td>A Discussion on the Convergence and Divergence of Scholarly Thought on</td>
<td>27</td>
</tr>
<tr>
<td>Meeting the Needs of Students with Intellectual Disabilities</td>
<td></td>
</tr>
<tr>
<td>Chapter 2</td>
<td></td>
</tr>
<tr>
<td>Defining the Issue</td>
<td>30</td>
</tr>
<tr>
<td>Past Research Studies On the Effects of Low Reading Comprehension Skills</td>
<td>30</td>
</tr>
</tbody>
</table>
Chapter 4

Findings and Implications

Responses from Survey Question 1

Responses from Survey Question 2

Responses from Survey Question 3

Responses from Survey Question 4

Summary Survey Question 1

Summary Survey Question 2

Summary Survey Question 3

Summary Survey Question 4

Emergent Theme from Responses

Summary of Findings

Limitations

Implications

References

Appendix A Informed Consent Form
Chapter 1

Introduction

An Interest in Reading Comprehension Skills Development, Social Justice and the Instruction of Students with Intellectual Disabilities

“To understand their world we must be willing to immerse ourselves in that world. We must embrace the new digital reality. If we can’t relate, if we don’t get it, we won’t be able to make schools relevant to the current and future needs of the digital generation.” – Ian Jukes (2010, p.3)

This quote speaks to the urgency of helping all students successfully integrate into the use of technology. Technology can be utilized to help students who have intellectual disabilities become good readers and develop good reading comprehension skills. My dissertation included research that was conducted regarding technologically-based reading comprehension programs for students who have intellectual disabilities. Some examples of genetic conditions that cause intellectual disabilities are Down Syndrome, Fragile X, and Fetal Alcohol Syndrome. My dissertation provided evidence-based research on the issues for these students and whether they are being adequately prepared academically to compete with their non-disabled peers in the classroom in a technologically-based world that requires proficient reading skills. An intellectual disability is defined as “a disability characterized by significant limitations both in intellectual functioning (reasoning, learning, problem solving) and in adaptive behavior, which covers a range of everyday social and practical skills. This disability originates before the age of 18” (Diagnostic and Statistical Manual of Mental Disorders V, 2013 p.31).

This dissertation addressed low reading comprehension skill development at the foundational elementary level for basic reading skills. It examined the students with intellectual
disabilities academic performance and integrated commentary from educational leaders and other stakeholders. It offered a design for action to address the issue and culminated in a discussion for student-centered technologically-based reading comprehension curricula that integrated reading comprehension skill development and technological skills.

In addition, I introduced the subject of technologically-based reading programs and developing reading comprehension skills development, my investigation of it, my personal narrative, and the proposed roadmap for the problem. My personal narrative discussed parts of the pertinent ideas that made up my study. The narrative was part of my experiences as a professional educator. I integrated my educational studies, my personal narrative and relevant professional experiences that definitely shaped my opinions on the issue of reading comprehension skills development for students with intellectual disabilities. My reflection on providing reading instruction led to how I designed ways to provide experiences for educators to understand and subsequently address ways to improve technologically-based reading comprehension programs. Of course, all of this would coincide with the input of educators. First, I offered my personal narrative. Second, I expounded on technologically-based reading programs and developing reading comprehension skills development. Finally, I included my roadmap for comprehending how reading instruction is implemented in classrooms. The roadmap showed how reading instruction in relation to teaching students with intellectual disabilities can be evaluated and improved.

My personal narrative as an educator and as a doctoral student continued me on the journey of being an advocate for individuals who have intellectual disabilities. I believe in the relationship between teachers as learners themselves in order to help these students who are entrusted to their instruction. I discovered that there are current obstacles in the field of education
that educators must jettison in order to benefit this marginalized group of learners. Utilizing my decade of working in a special education department that offered a plethora of services (i.e. learning support; scholars support; gifted support; instructional support; speech therapy; occupational therapy; physical therapy; behavioral support; psychological/learning evaluations) has enabled me to observe the interconnection of student learning and self-perception. My years in a public charter school exposed me to working with a population that would be considered marginalized by many others.

My learning as a student again, this time in a doctoral program, has been enlightening for me, as a former social worker and teacher. I discovered a social justice lens that addressed problems in schools, from the perspective of the academy. Reflecting upon my practice in the classroom and researching the issue of reading comprehension skills development and students with intellectual disabilities has resulted in my comprehension of different theoretical frameworks, a productive research methodology, and a myriad of educational policies. I believe that a reflective practitioner is the best educator in the classroom.

My relationship to the community is unique in the sense that my past experiences as a community organizer (social worker) shapes my view of student and family needs outside of the classroom. Family issues greatly impact the education of students with disabilities. My knowledge of growing up as one who lived in public housing and worked with residents who did also, allowed me to see the other side of the importance of community stakeholders in assisting families to improve living conditions. My background allowed me to have a perspective that I carried into a careful observation of what students in special education experience at the present time.
The Current Struggles Faced by Students Encountering this Issue

I witnessed the difficulties that students who have intellectual disabilities face when using technologically-based reading programs. As a special education teacher in an inner city elementary charter school, I watched “Mrs. J’s” third grade class pour into the computer laboratory one humid morning for independent learning time. Wasting no time, each student took a seat in front of a computer. Sweating and squirming, giggling and anxious to log on, the students listened for the computer teacher “Ms. K’s” directions to proceed. Given the directives, the students entered their usernames and passwords and were greeted by the familiar sound of the online reading program as it came on. Minutes later, after the students had begun another sequence of computer instruction, I checked on my three students who receive daily learning support to see how they were faring.

Observing the quizzical looks on the faces of my students pretty much said it all. Looks turned into actual questions. “I can’t handle this! What am I supposed to do with this? Do I have to read this?” I verbally guided each one how to follow the story and language arts prompts for various activities. An otherwise good motivational and academic tool for learning, the online program purchased by the school was not serving in the best interests of my particular students’ needs. I want non-disabled individuals to imagine themselves as students with intellectual disabilities for just a moment to try and fully comprehend the situation. As the special educator, I could only provide minimal guidance to students because the problem was inherently in the program itself. Furthermore, the school’s instruction and assessment procedures mandated that these students complete the online program without assistance from teaching staff.

I have always been interested in helping students in special education learn how to self-regulate their learning experiences in the classroom as it is important for life-long goal setting
and achievement. Imparting the necessity of such is something that I, as an educator, strove daily to convey to my former students. I discussed an example of this in Psychology Applied to Teaching 14th edition (Snowman & McCown, 2015). In addition, when I taught students in special education how to use computers for researching subject material for writing required them to acquire good reading comprehension skills (Luskey & Wolfe, 2013). I expounded on this subject in The Poetic Classroom: A Collection of Lessons, Reflections and Poetry from Teachers and Students in Western Pennsylvania. These are examples of applying teacher inquiry (Bryke, Gomez, Grunow & LeMahieu, 2015). I am an advocate of professional self-reflection for advancing best teaching practices in the classroom through action research.

I believe that it is imperative for us as educators to help students who have intellectual disabilities inside of the classroom. Educators have the potential to improve students with intellectual disabilities reading comprehension skills, serving as both as an educational responsibility and as a matter of social justice. Similarly, there are also obstacles in community systems that one has to overcome just as there are in educational systems (Donovan, 2013). The key to dealing with problems in the educational system relies upon gaining knowledge of the foundational theories that are involved in creating and sustaining socio-political barriers (cf., Hargreaves, 1998). Bryk, Gomez, Grunow and LeMahieu’s improvement inquiry is a means of fixing what is wrong with the system of reading instruction through asking three questions:

What specifically are we trying to accomplish?

What change might we introduce and why?

How will we know that a change is actually an improvement?

(2015, p.114)
Therefore, it is imperative that educators understand that the application of this theory can benefit teachers as they seek to make positive changes in classroom instruction.

Social justice is an imperative part of looking at the technologically-based reading comprehension programs for students who have intellectual disabilities situation. As a doctoral student, I learned about the connection between social justice and education. The development of reading comprehension skills in technologically-based reading programs among students with intellectual disabilities is an important issue. This dissertation provided a guide for educators to eventually collaborate and move forward in addressing the possibility of using technologically-based reading programs to address some of the reading comprehension needs of students with intellectual disabilities.

My arguments, for the purpose of assisting educators, are based on a literature review of past research and my own research study in order to build a framework for addressing technologically-based reading programs to address some of the reading comprehension needs of students with intellectual disabilities. My dissertation in practice is a combination of a study of school, the academy and community through scholarship, as well as significant learning. The ultimate goal will be to discuss the findings of my study with the teachers involved. The feedback of educators, who use technologically-based reading instruction programs with students who have intellectual disabilities, will be able to inform the reading instruction practices in classrooms. Therefore, a critical review of previous researchers, combined with the results of my research, should yield information for educators to engage in a dialogue that could contribute to finding solutions to technologically-based reading programs to address some of the reading comprehension needs of students with intellectual disabilities.
My inclusion of the perspectives of multiple stakeholders showed the evolution of my study and will initiate dialogue among participating stakeholders. Significant learning among stakeholders is a part of the process. The personal narratives and anecdotes shared by educators yield assumptions that must be challenged to change the system if educators are to instruct students in an unbiased manner. In particular, my focus is to use my personal narrative and research-based studies to help other educators understand their responsibility in effecting positive changes in the classrooms of students with intellectual disabilities.

The purpose of this study is to produce generative impacts that will eventually improve the situation by evaluating technologically-based reading programs and use the results from such to improve computer-based reading instruction for students with intellectual disabilities in schools across the United States. I examined the issue of reading comprehension skills development through interviews with educators in Pittsburgh, PA. Some of the educators also teach in universities, colleges and community centers. Therefore, my study reached across the boundaries of school, academy, and community while drawing upon my background in special education to create a path of direction for studying this issue.

**The Direction of Study: A Roadmap for Investigating, Addressing, Engaging, and Creating Generative Impacts and Analyzing Reading Comprehension Skill Development and Students with Intellectual Disabilities**

Development of reading comprehension skills in technologically-based reading programs among students with intellectual disabilities here under study. My dissertation used the frameworks of: Self-Efficacy (Bandura, 1993) Constructivism (Piaget, 1983), and Knowledge as Power in the Zone of Generativity (Ball, 2012). The rest of the dissertation is organized in the following manner: Chapter 2 reports on the investigation of technologically-based reading
instruction programs with students who have intellectual disabilities. Chapter 3 talks about the opportunities that I have constructed for people to learn about the issue and address it, and Chapter 4 summarizes my work at the present time, the crucial next steps that are needed, the implications that resulted from my study, and the generative impacts that are expected in the field of Educational Leadership.

My overview of the rest of my dissertation is as follows: Chapter 1 discusses the investigation of technologically-based reading instruction programs with students who have intellectual disabilities, focusing on the development of reading comprehension skills. The investigation delves into the academic conditions that lead to and continue to include low reading scores. It also includes insights on educator attitudes regarding technologically-based reading instruction and students with intellectual disabilities. A review of online and software instructional technology and methods used in various studies is included. In addition, a critical analysis of the influence of professional development in teaching and learning is presented.

Chapter 2 also addresses the development of reading comprehension skills in online and software reading programs among students with intellectual disabilities. Addressing the educational needs of marginalized individuals is a matter of social justice by using more investigative methods to support instructional improvement in terms of theoretical viewpoints. Theoretical frameworks that will assist stakeholders in understanding the issue are included. The social justice framework suggested that designs for learning and action leading to generative impacts are necessary to remedy issues faced by marginalized groups. Students with intellectual disabilities are considered a marginalized group.

Chapter 3 centers on the opportunities that I crafted for educators to become involved in the process leading to the improvement of reading instruction. My designs for learning and action
provided ways for others to comprehend and address the development of reading comprehension skills in online and software reading programs among students with intellectual disabilities. The issue is viewed in terms of how to benefit learners with intellectual disabilities in relation to reading comprehension skill development. The designs for learning enable the school, academy, and community to form a partnership that challenges educator attitudes and examines technology from a different perspective. In addition, the designs work to change ineffective educator professional development and reading instruction for students with intellectual disabilities. Improvement cycles are based on understanding root causes. Potential solutions for dealing with the problem of low reading comprehension skill development for learners with intellectual disabilities are essential to establishing next steps in the process. More specifically, the next steps encompass testing the warranted claims of whether technologically-based reading comprehension programs are meeting the educational needs of learners with intellectual disabilities.

My survey data from educators was collected, and stakeholders will organize themselves into groups for improvement cycles after my study. The data will be employed to create useful frameworks within the classroom environment. Educators working in marginalized communities will use the data for the benefit of students with special needs. Educators, who acquire this data as evidence, can engender community support and ultimately act as advocates for the equality of learners with intellectual disabilities in classrooms across the nation.

Chapter 4 focuses on formulating my plan to create long-term generative impacts for students with intellectual disabilities. I utilize data from interviews to inform my future plans related to this work. In this section, I utilize improvement of science models by Langley et al. (2009) to show the possible generative impacts that emanate from my designs for learning and
action. Bryk et al. (2010) postulated networked improvement communities as a means of advancing the work through collaborative efforts. Any generative impacts from the designs for learning and action will be used to address educational problems at the individual, systemic, and leadership levels to assist learners with intellectual disabilities in American elementary schools.

In addition, Chapter 4 concludes my work with an analytical summary. I discuss the information that was gathered during my investigation of the development of reading comprehension skills in online and software reading programs among students with intellectual disabilities. I revealed what I learn and how the results should serve as a guide for stakeholders to use and improve the quality of technologically-based reading instruction for students who have intellectual disabilities. The results are intended to serve as generative impacts in elementary classrooms throughout the city of Pittsburgh and eventually, the entire United States. A definitive discussion of reading comprehension skills with students in special education is important to help educators gain a thorough understanding of the challenges inherent to students with intellectual disabilities.

**Defining the Issue of Reading Comprehension and Students with Intellectual Disabilities**

Development of reading comprehension skills in technologically-based reading programs among students with intellectual disabilities is the goal of this study. In order to build a good design for learning to address low reading test scores during reading comprehension skills development through technologically-based reading instruction, I must explain the parameters of several frameworks. An effective learning environment may consist of myriad frameworks. Students with intellectual disabilities struggle to succeed in school with regard to reading comprehension and do not enter into post-secondary schools at the same rates as their non-
disabled peers. These examples are just a part of the bigger picture of how technologically-based reading programs fail to prepare learners with intellectual disabilities.

Generating an understanding of how this problem came about and its impact is the focus of my dissertation. Research and history provided necessary background knowledge to use in evaluating the current situation. Azevedo and Cromley (2014) insisted that “although the integration of Internet use and other computer-mediated instruction in the K-12 classroom is increasing, the empirical evidence to support instructional strategies for using these technologies is just beginning to emerge” (p.28). Thus far, little research exists, on the issue which indicates that more attention needs to be focused on reading comprehension skills development for learners with intellectual disabilities. Eagleton and Dobler (2010) stated that “it is incumbent on teachers to incorporate this new technology into their classrooms as suits their particular instructional needs” (p.6). Eagleton and Dobler (2010) continued, “Our students are entering an age when knowledge of technology is a necessity and not a luxury, [and] as educators, we are obligated to prepare them for that reality” (p.6).

A good example of a technologically-based program is Joke City. Joke City is a program that helps elementary school age children understand the “complex and resource-demanding process of interpreting text” (Cartwright, 2008, p. 331). Cartwright stated that, “significant comprehension gains on standardized tests contrasting two different meanings by switching between two semantic representations requires cognitive flexibility” and learners with intellectual disabilities experience difficulty making the distinctions between each (2008, p. 332). For example, an interpretation of spotted leopard as in fur markings, versus spotted as seen can be a difficult comprehension concept for students with intellectual disabilities to understand. For students with intellectual disabilities, Leu et al. (2006) reflected on the importance of integrating
“technologies that link and expand concepts and modes of communication” as best practices and “preparation for 21st century” learning (p. 25). Reading comprehension is a part of the emphasis of the new literacies.

_New literacies_ are forms of literacy that are rooted in digital technology developments. David Buckingham (1993) discussed the term _new literacies_ in the field of literacy studies. Literacy is a continual and rapidly changing field as new technologies appear and new social practices for it emerge (Leu, 2000). The 21st century literacies for computer usage in the classroom are generally what researchers mean when educators focus on preparation for student reading instruction (Coiro et al., 2008). Leu, et al., (2009) explained _new literacies_ as largely psycholinguistic in nature and claimed that they allow one to comprehend and produce language for communication. Other scholars believed that _new literacies_ are sociocultural in nature, and these _new literacies_ focus on the social practice of accomplishing goals (Lankshear & Knobel, 2011). Therefore, an understanding of the implications and use of these _new literacies_ in helping students with intellectual disabilities acquire good reading comprehension skills through technologically-based instruction is important.

Researchers stated that there is an urgent need for educators to ensure that students grasp the _new literacies_ associated with present and future classroom instruction and learning. There are several reasons why the _new literacies_ of online research and comprehension are important to classroom reading programs. First of all, they focus directly on information use and learning, so these skills are central to education at all levels. Furthermore, the ability to read and use online information effectively to solve problems defines success in both life and work, but these _new literacies_ are not always included in literacy programs. Most importantly and unfortunately, “students appear to lack these skills” (Benett et al., 2008, p.346). I agree with these researchers
who asserted that the foundation of solid reading skills affects the productivity of students through the years. Some online programs are trying to meet the comprehension needs of learners with intellectual disabilities; however, that need is not being fully addressed in all areas of reading skills development.

More research attention needs to be given to the issue of technologically-based reading comprehension support instruction for students who have intellectual disabilities to ensure the proper development of reading comprehension skills (IstenicStarcic & Bagon, 2014). Universal design principles need to be applied in research and development of technological learning environments to enable students with intellectual disabilities to thrive in inclusive classrooms (IstenicStarcic et al., 2014). Some researchers have discussed intellectual disabilities and the neglect of good reading comprehension skill development for learners with intellectual disabilities (Mioduser et al., 2000; Shamir & Shlafer, 2011). A large problem involving teaching and learning for students with intellectual disabilities surrounded identification of reading comprehension skills, and the best curriculum design and technology for instruction (Norwich, 2008).

The use of technologically-based learning is becoming increasingly significant in addressing these issues (Ralph, 2006). Curriculum-authoring tools need to undergo a re-design (Bain & Parkes, 2006) and a re-structuring of learning management systems must occur (IstenicStarcic, 2010). Technologically-based instruction can make important contributions to differentiated instruction for learners with intellectual disabilities, while simultaneously establishing a more creative learning environment to support teachers in inclusive classrooms (IstenicStarcic, 2010; IstenicStarcic, Cotic & Zajc, 2013). As an educator, I know that creativity
adds more than just motivation for learning for students with intellectual disabilities. It also makes learning concepts easier and increases the retention of skills focused on in the classroom.

Technologically-based instruction can provide pedagogical and technological inclusion for students with intellectual disabilities in electronic classrooms. In fact, studies have been conducted to identify the requirements and solutions for assisting these students with intellectual disabilities in electronic classrooms (Luke, 2002). Educational initiatives pertaining to universal accessibility in web-based education systems generated concerns about the standards, development, and delivery of computer-based reading material to learners with intellectual disabilities (Iorio et al., 2006; Nevile & Treviranus, 2010). If more attention was paid to the development of universal accessibility for learners with intellectual disabilities, then the inequity found in many classrooms across America would not exist. Learners with intellectual disabilities would have more options with regard to reading comprehension instruction that would suit their individual learning needs.

Singleton and Simmons (2001) discussed a program entitled Wordshark, which is a multisensory drill-and-practice program for improving spelling and word recognition. It is used in both the primary and secondary education of students with intellectual disabilities as a means of stimulating motivation and improving their reading skills development. It is commendable that significant progress is being made with Wordshark at the elementary school level in the United States, but more is occurring in countries such as Britain and Canada. More progress needs to be made in terms of reading comprehension skills development for learners with intellectual disabilities in America.

The subsequent guiding claims examined the lack of access to adequate technology for learners with intellectual disabilities: low test scores, increased remediation at the middle and
high school levels, low to no participation of students with intellectual disabilities in post-secondary institutions, unemployment, poverty, and isolation. The rates of positive participation are low for this group in terms of access to post-secondary education. Great concern should be had about the future of students with intellectual disabilities applying to post-secondary institutions. “Over half of the community college entrants are lacking in basic skills,” (Hartman, 1987, p.41). Low test scores and increased remediation at the middle and high school levels are due to “slow initial progress, and acceleration will occur as the foundations for learning are laboriously laid down” (Hempenstall, 2012, p.4). Yet, a solid reading foundation does not happen in all schools, which means that low test scores and the need for increased remediation services continue for students with intellectual disabilities (Baker, 2008). Unemployment, poverty, and isolation are issues that students with intellectual disabilities face at a higher percentage than their nondisabled peers (Kleinert et al., 2012). Going in depth, the guiding claims showed how low reading skills impact America’s workforce and the future economy (Kozol, 2010). Learning how some educators think and relate to students and the systems in which they operate will be part of this dissertation.

My designs for learning as well as action allowed educators to discover and challenge assumptions in their personal narratives that impede reading instruction delivery for students. This helps all of the educators involved to obtain information by looking at the root causes of the problem that lead to what Bryk, Gomez and Grunow (2011) described as plan, do, study, and act cycles of improvement. Bryk et al. (2011) discussed this method as a means of identifying, testing and evaluating problems of practice. It is a way of constantly looking at what needs to be changed with current information obtained through classroom observations to lead to adjustments in instruction.
The goal for educators is to be able to understand the context in which technologically-based reading instruction programs with students who have intellectual disabilities, is significant then, they can identify how each educator may contribute ideas to improve the situation. The educators may experience a unique form of learning that can move from transmissive to learning (cf., Hargreaves, 1998). Theories of learning explained by Jonassen and Land (2012) asserted that learners understand the information that is presented to them and think about how they can actively contribute to the learning process of others. For example, teachers may look at their perceptions surrounding the instruction of students with intellectual disabilities, and consider whether they feel that these same students can succeed in terms of reading achievement. Positive or negative responses to this issue can greatly influence teaching reading comprehension skills to students with intellectual disabilities reading comprehension skills, which is why doing this study was imperative.

**The Significance of Conducting this Study**

The need for more progress in computer-based reading comprehension programs is important because improvement in reading instruction will positively affect future employment for students with intellectual disabilities all across America. The current instructional techniques and poor educator attitudes are not preparing learners with intellectual disabilities to develop to their fullest to enter the real world (Thomas et al., 2011). Explication of both instructional techniques and educator attitudes that surround the learning needs of students with intellectual disabilities and the design of online and software reading programs in America is imperative. These factors that impact learners with intellectual disabilities will be used as my basis for engaging people in the work of educational improvement for students with intellectual disabilities. Such engagement is important in order to establish better reading comprehension
skills instruction, better technologically-based reading program design and more student-centered classroom environments for intellectually-disabled learners (Azevedo & Cromley, 2014).

My goal is to empower educators who in turn, will provide insight to other stakeholders about reading comprehension instruction. Educators will learn about the origin of reading comprehension instruction, and collectively find solutions for more educational leaders to address the problem of insufficient technologically-based reading programs in their related contexts of school, academy, and community. In this manner, I intend to initiate numerous generative impacts to positively affect the education of students who have intellectual disabilities. Therefore, examining the various technological intervention strategies is necessary.

McClanahan, Williams, Kennedy and Tate (2012) discussed an iPad as the means for providing intervention strategies with a fifth-grade student diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) who is a struggling reader. The iPad helped the student’s focus become more metacognitive in his reading skill development. The comparisons of the pre- and post-assessments showed that the study participant gained one year's growth in reading within a six-week time period. The study participant gained confidence and a sense of being in control of his learning process. A generalization for other struggling readers with Attention Deficit Hyperactivity Disorder (ADHD) cannot be made, but the success this student experienced suggests that more elementary schools need to consider the use of this device and more research is needed in similar contexts for students with intellectual disabilities.

Students with other learning disabilities benefit from technologically-based reading instruction programs, the same should be said for students with intellectual disabilities. Allor, Mathes, Roberts, Cheatham, and Al Otaiba (2010) stated that “students with intellectual
disabilities require intensive practice across multiple years to become skilled readers” (p.446). The subsequent guiding claims examined the lack of access to adequate technology for learners with disabilities, low test scores, increased remediation at the middle and high school levels, and low to no participation of students with intellectual disabilities in post-secondary institutions, unemployment, poverty and isolation. The rates of positive participation are low for this group in terms of access to post-secondary education. Hartman stated that, “over half of the community college entrants are lacking in basic skills” (1987, p.41). Low test scores and increased remediation at the middle and high school levels are due to “slow initial progress and acceleration will occur as the foundations for learning are laboriously laid down” (Hempenstall, 2012, p.4). Yet, this does not happen in all schools, which means that low test scores and the need for increased remediation services continue for students with intellectual disabilities. Unemployment, poverty and isolation are issues that learners with intellectual disabilities face at a higher percentage than their nondisabled peers.

Educators need to understand the many aspects of computer-based reading comprehension programs as well as the instructional process of teaching reading comprehension skills to students with intellectual disabilities. Funding to support classroom instruction materials is first and foremost essential to enabling any necessary changes to classroom instruction. There is a direct correlation between low federal and state funding for technology for low socioeconomic schools in disadvantaged communities and low reading comprehension scores for students with intellectual disabilities. Sometimes, students with intellectual disabilities are most seriously affected by this issue as they are the individuals who are expected to use online reading curricula in general education classrooms without the proper adaptations for learning. Oftentimes, where I have worked, these students had been identified for special education services, but were not
provided with enough reading support instruction time. Additionally, not enough funds have been allotted for the staff to provide the time and instructional support for students with intellectual disabilities.

Classism is another major issue that affects students with intellectual disabilities. There is an inequitable structure of power between general education students (non-disabled) and students with special needs (disabled). The work of Bourdieu (1982) emphasized that the “ruling and intellectual classes” preserve societal privileges through “social reproduction” while upholding the myth of “equality of opportunity” and “high social mobility through education” (p.59). Thus, one can see the root of the problem; non-disabled students, not students with intellectual disabilities, are the ones who currently benefit the most from technologically-based education, not students with intellectual disabilities (Jeffs, 2001). If the barriers to education are removed more students with intellectual disabilities can move towards educational achievement in reading comprehension. In this case, the barrier of the inequality of instructional tools, such as the availability of technologically-based reading curricula, has to be removed.

Cultural dimensions of power, such as cultural capital (Bourdieu, 1982), are acquired more by non-disabled students through better exposure to technological advancements than the instruction that their peers who have intellectual disabilities receive. In my professional experience, special education teachers are concerned because it is our responsibility to provide specially-designed instruction to remediate reading skill deficits in students through learning support education. General education teachers are concerned because day after day they teach students who struggle in vain to keep up in reading lessons alongside their non-disabled peers. Parents are concerned because they see their children dislike reading because of their learning difficulties and the experience of bringing home failing grades.
Administrators are concerned because budgets for instructional software and online programs are not expansive, time restraints are evident, and there is great pressure to produce effective instruction despite all impediments. Community stakeholders are concerned for the future of workforce employees who will need stellar reading skills to compete well on a local, national and international level. Research showed that many educators are frustrated by the ineffectiveness of reading curricula for students with intellectual disabilities, and it is imperative that a solution be found to solve this dilemma in the current practice of education.

Accessibility is another vital factor. A society that is based upon fair practices for those who are considered “the least” should ensure that justice in society will be applied to any of us at any given moment when it is needed most (Bourdieu, 1982). Unfortunately, providing access to the equipment and curricula to address challenges faced by students with intellectual disabilities is limited by resources. It is also limited by human or social capital and by just-in-time access to scaffolded learning (Zone of Proximal Development) which was introduced by Vygotsky (1986). It explained that “children need the help of adults or more competent individuals to support or scaffold them as they are learning new things” (p.24). This is important, in that in general, students with intellectual disabilities require this type of support in the classroom in order to maximize learning opportunities for reading comprehension skills retention (Maccarelli, 2006). With regard to access to the right technology, limitations are experienced on a regular basis by teachers who instruct students from low economic areas (Katims, 2001). These teachers face more challenges when it comes to implementing technology into their classrooms (Katims, 2001).

The challenges of workplace readiness are different for learners with intellectual disabilities. Many years ago employers were more likely to rely on the collective skills and
knowledge of mostly adequately prepared non-disabled adults who came through the school system to create economic value on their jobs for communities. These non-disabled adults formed the basis of human capital and were seen as the products of a solid investment in education and training (Coleman, 1988). This would usually lead to promotions and the attainment of higher incomes for individuals who have intellectual disabilities. Growing up these employees, former students of public school systems, learned the necessary skills for success in society through “voluntary and spontaneous social organization” (Coleman, 1988, p. S118). In the past, skills training for all students existed at the high school level in preparation for entering the world of work the same cannot be easily said today, especially for students with intellectual disabilities.

From a historical perspective, students with intellectual disabilities have not been considered an important group of future contributors to the workforce. Now, schools must institute some type of “formal organization” to compensate as the major source of social capital available to students (Coleman, 1988, p. S118). Today’s students with intellectual disabilities need a network of social connections and to be taught the values and behaviors (cultural capital) that will enable them to eventually thrive. Students with intellectual disabilities from families living in poverty often attend schools that are severely underfunded by state and federal means and do not have access to the needed, highly-qualified staff and excellent technologically-based reading programs that will meet their educational needs (Coleman, 1988).

If educators are to further examine the problem, they should also consider statistics from the National Writing Project reported by the Pew Research Center. Reading comprehension through writing exercises using various forms of technology is one of the goals to support
classroom instruction; however, all students are not benefiting from the opportunity to learn with technology-based tools. The Pew Research Center stated,

52% of teachers of upper and upper-middle income students say their students use technology compared with 35% of teachers of the lowest income students; only 15% of the teachers surveyed whose students are from upper income households say their school is “behind the curve in effectively using digital tools in the learning process”; whereas, 39% of the teachers whose students are from low income households “describe their school as behind the curve”; 70% of the teachers in the survey of the highest income students say their school does a “good job” providing the resources needed to get more technology into the classroom; but compare that percentage to just 50% of educators working in low income areas; research also shows that 51% teachers of low income students are more than twice as likely as the 21% teachers of the high income students to report that their students’ lack of access to technology is a “major challenge to incorporating more digital tools into their teaching” (Purcell, Heaps, Buchanan & Friedrich, 2013, p.4).

Seeing the impact of technology in relation to socioeconomic status is key to comprehending the social justice aspect of my study.

**The Social Justice Implications Derived from this Study**

There are many social justice implications that impact the lives of individuals who have intellectual disabilities that must be addressed for students who have intellectual disabilities such as: inaccessibility to adequate technology in classrooms; low reading test scores; an increased need for remedial services after elementary school; low participation rates post high school;
increased poverty; unemployment rates and isolation from a community. Providing access to adequate technology in all elementary schools is critical (Agran et al., 2002). Demonstrating equality in the classroom for technologically-based reading instruction demonstrates fairness for all. Ending low elementary reading test scores leading to at least “proficiency” should be a top goal (Agran et al., 2002). Closing the gap for more remediation services at the middle/high school levels is achievable through intensive reading instruction at the elementary level.

Eradicating low to no participation in any post-secondary education will give students with intellectual disabilities educational empowerment (Thomas et al., 2011). Stopping unemployment will end poverty rates for learners with intellectual disabilities (Kleinert et al., 2012). With regard to advocating for students who have intellectual disabilities, educators have a responsibility to educate individuals with intellectual disabilities to end their isolation from communities, both intellectually and collectively, and to elevate the self-esteem of learners with intellectual disabilities (Kleinert et al., 2012). The demolition of classism through ending marginalization, labeling and disenfranchisement, is the right response to meeting the social justice needs of learners with intellectual disabilities. It is the responsibility of educators to provide free and appropriate education for all students. These goals have widespread generative impacts. A successful economic future of workforce development depends upon American citizens to compete with other countries.

As educators with a moral compass, we care about matters of social justice to aid students who are marginalized in society. It is imperative that educators take a closer look at the root causes of marginalization, using this information to affect positive changes in reading instruction for learners with intellectual disabilities. Students with intellectual disabilities need to receive good online and software reading instruction. Only 28% of learners with intellectual disabilities
received some post-secondary education. Therefore, young adults with intellectual disabilities are most likely to be unemployed and isolated from the community (Kleinert et al., 2012). A barrier that limits opportunities for individuals with intellectual disabilities to receive a post-secondary education is in the area of reading instruction (Thomas et al., 2011). When reading comprehension skills instruction improves in elementary classrooms, more students with intellectual disabilities will have a solid foundation to eventually enter post-secondary education institutions. As students with intellectual disabilities transition from school to work, a sense of urgency for their preparedness is eminent.

The Reasons for Solving an Ongoing Problem

If we do not solve the problem of low reading comprehension development through online reading programs, we will have further existing difficulties that will emanate from it. I believe if we do not demonstrate equality in classrooms with regard to computer-based reading instruction across America, then we are not giving examples of fair treatment for all students under the law demonstrating equality in the classroom. If we do not end low elementary reading test scores and assist students with intellectual disabilities in achieving at least proficiency status, then more remediation services at the middle and high school levels will be needed (Baker, 2008).

This dissertation included statistical information based on the comments of educators who work with learners who have intellectual disabilities and will require remedial services at the next level. If we do not eradicate low to no participation in post-secondary education for students with intellectual disabilities, then learners with intellectual disabilities will not have the opportunities that accompany the attainment of a higher education (Thomas et al., 2011). The focus of this paper is on the issue of a much needed foundation for better software and online reading instruction. My study established a means of examining reading instruction for learners
with disabilities to embark on a successful path of literacy that will positively impact students with intellectual disabilities in their subsequent lives and work. An examination of the present-day challenges that students with intellectual disabilities face is necessary to understand technologically-based reading comprehension skills development and students with intellectual disabilities.

According to Wright (2003) technologically-based “programs should have adjustable presentation characteristics such as changeable font style and size, highlighting of main concepts, or variable volume and speed controls” (p.1). These features can be helpful when used in the right manner for students who require them, but when these variable features are not part of a program, differently-abled students experience difficulty using it. Hasselbring and Glaser (2000) discussed the need to create multimedia environments that enable learners to “deepen students’ conceptual understandings by linking visual imagery and sound effects to information that is difficult to understand in text alone” (p.109). After all, the goal is to provide “temporary support or assistance, provided by a teacher, peer, parent, or computer that permits a learner to perform a complex task or process that she or he would be unable to do alone. The technique builds knowledge and skills until the learners can stand on their own, similar to scaffolding on a building” (ERIC Thesaurus, 2004). Technologically-based reading programs should have web site structures with a “consistent and predictable screen layout and an uncluttered appearance to be easily usable by students” (Bohman, 2004, p.1).

Rowland suggested that computer-based resources need to have the following features: left-aligned text instead of justified; narrowed column widths and wide side margins to facilitate easier scanning; short, simple sentences; short paragraphs; bullets or numbers rather than continuous prose when possible; boxes for emphasis or to highlight important text; either bold or
a colored background to emphasize keywords and concepts; and headings and titles for paragraphs that increase comprehension (2004, p.2). The presentation of information in this manner would help students with intellectual disabilities to thrive with regard to strengthening reading comprehension skills. I drew upon my professional background to discuss reading instruction needs in classrooms.

My Professional Experience and Contribution to Addressing the Issue

I have 10 years of professional experience as a Special Education Services Coordinator, Special Education Teacher and Special Education Assistant in a kindergarten through fifth grade elementary public charter school. I have taught learning support, scholars and gifted classes and I am very aware of the particular challenges that learners with intellectual disabilities face in the classroom. I led the Instructional Support Team to help at risk students outside of special education for reading difficulties. I also worked directly with each student who had the diagnosis of an intellectual disability and was part of the learning support classroom. As a special educator, I know that reading comprehension skills development is an integral part of overall reading competency. One of the goals of this dissertation is to examine frameworks that can help educators further understand how students learn and how educators can think of ways of transforming instruction in this area.

I received a Master of Education degree in Early Education of Disabled Students from the University of Pittsburgh, with a Pennsylvania Teacher Certification in Special Education (Mental & Physical Disabilities). From 2002 until 2012, I was responsible for adapting general education tests and providing specially-designed instruction for students (grades K-5) with learning and/or behavioral disabilities requiring learning support. I also implemented school-wide programs to
support student education throughout the building. I wanted to make a positive difference in the lives of all students regardless of whether they were in my special education classroom or not.

My professional experience outside of the classroom included work as a community organizer. My views on the traditions and issues in the educational system gave me a different perspective. I received a Master of Social Work degree with a specialization in Community Organizing, also from the University of Pittsburgh. My various past professional positions in the Human Services Field, to an extent, shape my view of the field of Educational Leadership and have established my frame of reference. My current focus is situated in the context of practice as it relates to the use of technology in the classroom for reading instructional purposes with students who have intellectual disabilities. Delving into points where scholars agree and disagree on instruction and learning can help further shape the conversation.

A Discussion on the Convergence and Divergence of Scholarly Thought on Meeting the Needs of Students with Intellectual Disabilities

In order to address the issue of technologically-based reading comprehension instruction for students with intellectual disabilities a collaborative effort is needed. Audiences such as educators, parents, technology experts, legislators and workforce employers need to be persuaded to become interested in solving this dilemma. How can we as the United States of America, compete in a global economic system if our students are ill-prepared in terms of overall reading skills development? Harold Miller (2012) states that students in countries such as Australia, Canada, China, Japan, Korea and Singapore are all scoring higher than U.S. students in reading. Enlisting the help of educators is crucial in this effort.

Educators in the school and community will utilize the theories set forth by Donovan
who states that, research and development issues are best addressed by “identifying the right problem, developing effective solutions and getting effective solutions to spread” (p.317). This takes into account the need for implementers of the designs to understand the underlying mindset of the affected subordinate group. Freire (2001) stated, “It is absolutely essential that the oppressed participate in the revolutionary process with an increasingly critical awareness of their role as Subjects of the Transformation” (p.127). Oppressed individuals often have an “oppressor within” (p.127). Learning takes root when students believe that they have had an active role in the process and will rightfully believe in their liberation from feeling barred from success by low reading comprehension skills. Consider the words of Freire (1998):

> As an educator I need to be constantly ‘reading’ the world inhabited by the grassroots with which I work, that world that is their immediate context and the wider world of which they are part. What I mean is that on no account may I make little of or ignore in my contact with such groups the knowledge they acquire from direct experience and out of which they live. Or their way of explaining the world, which involves their comprehension of their role and presence in it. These knowledges are explicit, suggested or hidden in what I call the decoding of the world, which in its turn always precedes the decoding of the word. (p.76)

When implementing technology to address comprehension issues educators should probably consider the large numbers of students in general education (dominant group) who have difficulty with reading comprehension along with the students in special education (subordinate group) who have related reading disorders.
Acknowledging inequities in classrooms, some studies show the potential to help students, but “future research needs to be conducted on a larger scale to replicate and extend the use of technologically-based instruction to increase content area learning and achievement in inclusive classrooms for both students with and without disabilities” (Boon, Burke, Fore, & Hagan-Burke, 2006, p.11). More studies must be conducted across a wider variety of age groups, grade levels, disability categories, content areas and instructional settings. This is imperative when researcher-practitioners discuss how to effectively meet the needs of students with intellectual disabilities. Taking a closer look at the issue of reading comprehension will enable educators to become informed about the influence of technology in the classroom.
Chapter 2

Literature Review

This chapter is going to discuss past research studies, technology and reading comprehension skills applications, vocabulary and technology use, technology and reading comprehension skills development in inclusive settings, demographics, statistics and the perspectives of stakeholders. It will also focus on societal consequences of not providing adequate reading instruction, theoretical frameworks, the consequences of not solving the problem, improvements through solving the problem, and the historical solutions involved. I include what I have done to address reading comprehension skills development in students with intellectual disabilities and how educators may be invited to find solutions. I conclude with notations of my advocacy and transformative actions to empower students with intellectual disabilities.

Defining the Issue

Researchers such as Haller, Child and Walberg (1988) and Rosenshine and Meister (1994) defined the problem of reading comprehension skill development for students with intellectual disabilities as one that can be addressed through the use of technologically-based reading programs. The following discussion focused on reading comprehension, technologically-based reading programs and students with intellectual disabilities.

Past Research Studies On the Effects of Low Reading Comprehension Skill Development

I found some viable historical solutions based on the work of many researchers that showed that this is an issue that affects students with special needs. Researchers have found that educators can solve these learners with intellectual disabilities issues with reading comprehension by directly teaching the metacognitive reading process using comparative reading and cognitive strategies during instruction (Haller, Child & Walberg, 1988; National...
Reading Panel, 2000; Rosenshine & Meister, 1994). This research showed that the best suggestion is cognitive strategy instruction, which is an explicit procedure that teaches students the cognitive processes required to perform a task with the awareness of planning, executing and monitoring during reading (Reid & Lienemann, 2006).

Researchers also found that struggling readers can improve reading comprehension by using cognitive strategies including: activating background knowledge prior to reading (Grant, 1993), monitoring comprehension during reading (Davey & McBride, 1986) and evaluating understanding after reading (Nelson, Smith & Dodd, 1992). Studies revealed the effects of cognitive strategy interventions that show a significant effect on school-age children with learning disabilities (Jitendra, Burgess & Garjria, 2011; National Reading Panel, 2000). The full impact of teaching cognitive reading comprehension strategies to young adults with intellectual disabilities is still somewhat unknown. It is possible that interventions benefit learners with intellectual disabilities because reading difficulties experienced by learners with and without intellectual disabilities respond similarly during instruction.

Another reading comprehension strategy that may work for students with intellectual disabilities is the paraphrasing strategy developed by Schumaker, Denton and Deshler (1984). A benefit of this strategy: it addressed reading comprehension for expository text (the most common type of text that learners are expected to comprehend at the post-secondary level). Researchers suggested that teaching students the cognitive process to monitor and evaluate comprehension during reading may help avoid and compensate for the cognitive deficits associated with intellectual disability (Hua, Henderson et al., 2012; Hua, Therrien et al., 2012). The paraphrasing strategy has been validated with children who struggle with reading at both elementary and
secondary levels (Hagaman, Casey & Reid, 2010; Hagaman & Reid, 2008; Katims & Harris, 1997; Lauterbach & Bender, 1995).

Furthermore, technologically-based reading comprehension programs for elementary students who have intellectual disabilities are not meeting their reading comprehension skill needs. Students need to be provided with early educational support to establish basic foundational reading skills and prevent students with intellectual disabilities from performing worse than their non-disabled peers (Hua, Woods-Groves, Kaldenberg & Scheidecker, 2013). Establishing early solid foundational skills early on for students with intellectual disabilities is an important goal for educators. Providing early reading instruction for all students is essential.

Hall, Cohen, Vue and Ganley (2015) discussed a study that involved Strategic Reader and students with learning disabilities. There is strong evidence that students with learning disabilities who use the online reading programs show significant growth in reading comprehension scores. The difference in score growth in the online versus reported offline conditions is very large for students with learning disabilities. The study showed some differences in terms of outcomes for students with intellectual disabilities. It is only in the online progress monitoring situation that students with learning disabilities experienced statistically significant score increases (Hall et al., 2015). Plus, students with learning disabilities were much more engaged by using Strategic Reader. Students with learning disabilities found many parts of the program differentially more helpful than their nondisabled peers.

In conclusion, the results provided a good direction for both curricular design and further research in the design of digital environments for students with intellectual disabilities. The Universal Design for Learning reading model for students with learning disabilities showed that they most often encounter obstacles when reading to learn, such as issues decoding or
comprehension of text content without sufficient background knowledge. These challenges cause many obstacles to academic performance and progress. Teachers are still trying to adapt curricula to meet the varied needs of their students with intellectual disabilities while devising creative ways to engage all students. I encountered this at times in the classroom when working with my students with intellectual disabilities and listened to my colleagues contend with the same problems. Educators need computer-based reading instruction that will make it possible to meet the educational needs of students with intellectual disabilities (Hall et al., 2015). Although some middle and high schools are using more technologically-based reading comprehension instruction with some success, there is question and concern as to why more elementary schools are not following suit. More integration of technology and reading applications appear to be needed.

Technology and Reading Comprehension Skills Development Applications

Many studies have shown the importance of using technology to remedy reading skill deficits in students who have intellectual disabilities. Shamir and Shlafer (2011) commented on the use of e-books to help students who are at risk for major reading difficulties. This study compared the effects of an educational e-book on improvements in Phonological Awareness (PA) and Concept About Print (CAP). The researchers studied 136 pre-school-aged children at risk for learning disabilities (ALD) and typically developing children (TD). The findings showed improvements in both experimental groups. The ALD group showed the most improvements in the area of CAP. The results showed that there is some effectiveness in terms of using the multimedia e-book especially for ALD.

Magnan and Ecalle (2006) and Mioduser, Tur-Kaspa and Leitner (2000) elaborated on computer-assisted reading instruction for learners with intellectual disabilities. The Magnan and
Escalle (2006) study tested the effectiveness of audio-visual training in the discrimination of the phonetic feature of voicing on the recognition of written words by 160 young children six years of age determined to be at risk for dyslexia. A second experiment was performed on children who have dyslexia to examine their phonological skills. The evidence yielded from this study showed the effectiveness of the computer-assisted instruction. The results of the study showed that the children who were at risk for dyslexia made some significant gains in word discrimination which impacted their overall phonological skill processing after 8 weeks of computer-based instruction.

The Mioduser et al. (2000) experiment studied the effectiveness of word recognition training in children with dyslexia who used computer-based programs at home on a daily basis. A traditional pre-test, training, post-test design included two comparison groups of sixty 7 year olds (experimental vs. control) and provided a base-line for assessing the training effects of the study. The intervention group showed higher increases in performances for phonological skills and phonological recoding than the control group did. The researchers showed the benefits of the audio-visual training. Overall, the results showed the impact of the audio-visual training for voicing on performances of children with reading difficulties. The study showed that this form of instruction enables children to make connections between print and phonology. The phonological representations through instruction involving both phonological and orthographic units help children best in a computerized remedial program. Educators must keep in mind the relationship between vocabulary expansion for reading comprehension skills development and instruction for learners with intellectual disabilities.
Vocabulary Focus and Technology Use for Reading Comprehension Skills Development

Wright and Anderson (1987) talked about vocabulary learning to support reading comprehension development. The researchers examined the impact of vocabulary learning to support reading comprehension development and literacy skills in beginning readers with special educational needs. The study involved first graders in which teachers and students were randomly assigned to different class types (small classes of 10–12 pupils vs. regular classes of 20–25 pupils). Overall, the findings revealed that the impact of vocabulary learning to support reading comprehension development has a small impact on the two basic literacy skills, reading (word recognition task) and spelling (word production task). Students with high literacy interest generally made more progress throughout the study than children with low literacy interest. The students with special needs in smaller computer-based reading classes improved their reading skills significantly more than the students with special needs who were assigned to larger computer-based reading classes. The use of computer-based reading vocabulary instruction enhanced reading comprehension skill development and simultaneously capitalized on the students with special needs’ high literacy interest. The setting and interest level of computer-based instruction were factors that elevated the reading comprehension skills of young students with special needs.

Technology and Reading Comprehension Skills Development in Inclusive Settings

Tan and Cheung (2008) promoted computer-supported collaborative work applications to help students who have special needs that impede reading comprehension skills development. The researchers investigated the effects of computer collaborative group work, facilitated by an adult teaching a 10-year-old boy with Attention Deficit Hyperactivity Disorder (ADHD). The goal was to determine if collaborative group work on a computer, with the facilitation of an
adult, would help improve reading comprehension skills development. Reading skills baseline data included pre- and post-computer group work sessions among students. During the adult-facilitated computer sessions, the facilitator reinforced positive responses to questions during computer-based reading instruction. The results indicated some improvements in the student’s reading comprehension skills on tests during post-computer work reading assessments. The addition of positive reinforcement and re-direction to computer tasks as a result of the adult present are factors that enabled the student with ADHD to make progress in terms of his reading comprehension skill development.

Abbott and Cribb (2001) stated that inclusion is better facilitated through reading instruction websites that improve and support students with intellectual disabilities. Researchers have shown that the rapid increase in Internet schools-use has not been replicated in special education as it should. Instruction technology coordinators and administrators in special schools indicate that there is a need for the design of special school reading instruction such as WWW homepages to improve and support students with intellectual disabilities. Data from a study with fourteen 9-year-olds who are in learning support indicated that there are issues surrounding inclusion that have been highlighted by this study. It showed that inclusion is better facilitated through reading instruction websites. Some significant improvements were shown when students with special needs are allowed to use specific websites that are geared toward meeting their reading comprehension skills deficits. Examining the evidence found by researchers can lead to an explanation of perspectives critical to developing future technologically-based reading comprehension programs.
Reality in Demographics, Statistics and Stakeholders’ Perspectives

Let us discuss reading comprehension, technologically-based reading programs and students with intellectual disabilities. Researchers conducted a study to focus on the problem with a group of struggling readers. The Hsu, Ho, Tsai, Hwang, Chu and Wang (2012) investigation examined how one program of computer-based instruction (CBI) called Kurzweil 3000 (K-3000) impacted the reading, functional task performance, and academic self-perception of high school students with special needs. The study participants, 16 students with special needs used K-3000. It is an assistive software program that provides students with reading support for six months. Students with special needs used K-3000 to read their assignments for their English/Language Arts class. Some applications of iPods and iPads in classroom intervention programs for individuals with intellectual disabilities work for certain students, but this is not a solution that is successful in every situation.

The study’s researchers recruited six teachers who had previous experience with utilizing K-3000 in their classes. Student participants and teachers composed a focus group and were interviewed for the study. There are advantages and disadvantages of K-3000. The advantages are that it increased the student users’ progress and positively affected the way that the teachers implemented computer-based instruction with their students with special needs. The study reported some improvement in the amount and speed of reading and increased academic self-perception, targeted to reading comprehension skill development and the pronunciation of words through the frequent use of K-3000. On the other hand, the study showed disadvantages of using the K-3000 program. Educators reported a lack of accessibility to technology, numerous time constraints with the utilization of the program for students who have special needs, and difficulties with the class management of learners with intellectual disabilities. Student
participants found that computer-based instruction was helpful in terms of improving their reading and writing skills. There was some progress made in the area of students pertaining to self-perception. The study provided strong evidence of the advantages of using K-3000 in special education high school classrooms. It is my opinion that a similar program design, after addressing the aforementioned disadvantages, could be implemented within the elementary school classrooms of students with intellectual disabilities. Noting the possible consequences of not having good, early reading instruction for students with intellectual disabilities can motivate educators to action.

**The Societal Consequences of Not Providing Adequate Reading Instruction**

Studies show that stopping unemployment will end isolation from one’s community and these are negative impacts on individuals and communities (Kleinert, Jones, Sheppard-Jones, Harp & Harrison, 2012). Isolation among individuals is more pervasive for those with intellectual disabilities, as employment is a means in which people socially bond and support themselves economically in society. Consequently, people with intellectual disabilities who are unemployed are subject to being categorized in a classist manner. Researchers also state that demolishing classism (i.e. marginalizing, labeling, and disenfranchisement) has to be a top priority otherwise low self-esteem will continue to be the result for this group of learners (Kleinert, Jones, Sheppard-Jones, Harp & Harrison, 2012). Demolishing classism can be achieved through the collaboration of educators who will start the process of instructing students with intellectual disabilities by improving reading comprehension skills early at the elementary foundational level in schools. It is the responsibility of educators to provide an appropriate education for students with intellectual disabilities. If this does not happen, parents and guardians will have the right to sue school districts that do not recognize provisions under the law for
special education students. Parents may especially recognize that their children with intellectual disabilities need highly specialized reading comprehension instruction at an early age to prepare them for future employment. Learners with intellectual disabilities are not being adequately prepared with sufficient reading comprehension skills for job readiness (Kleinert, Jones, Sheppard-Jones, Harp & Harrison, 2012). Researchers stress that the economic future of the American workforce will suffer because it is dependent upon the contributions of everyone.

As mentioned above, students with intellectual disabilities will require post-secondary training or they ultimately will not be able to thrive in the workforce due to the lack of reading comprehension skills (Friedman, 2005). Therefore, the lack of fully developed reading skills makes struggling to achieve success in classrooms a major issue for many learners with intellectual disabilities. Various researches indicated that existing technologically-based reading curricula for students with intellectual disabilities is ineffective in regular public school classrooms in the United States. Students with intellectual disabilities have lower reading achievement scores and require increased instruction for reading skills retention (Friedman, 2005).

Kozol (2010) has found that the level of functional literacy of an individual is proportional to her/his income level; there is also an increased risk of committing crimes. This study speaks to the problem of crime and functional illiteracy to illustrate the issue as it affects many individuals (2010). For example, this study reports:

…in developed countries, over 60% of adults in the US prison system read at or below the fourth grade level and up to 80% of adults in the US prison system are non-readers”. Other statistics speak to the problem of illiteracy. Florida Judge Charles Phillips stated, "Eighty percent of the new criminals who pass my desk would not be here if they had
graduated from high school and could read and write." From a recent census of prisoners more than twenty-five years of age, 75 percent are not high school graduates and 35–42 percent of them had not completed ninth grade, as compared to 38 percent of the total adult population who have not graduated high school. 85% of US juveniles appearing before the court are functionally illiterate. 31.2% of adults in the two lowest of five literacy levels lived below the poverty line, as opposed to 4.7% of those with the highest level of literacy. Those below the poverty line were more than twice as likely to be in poverty because of their illiteracy as for all other reasons combined and 44% of U.S. adults who were "Below Basic" in literacy tests, reported in February 2009, were in poverty as compared to 17% of the entire U.S. population in poverty (below the 2003 U.S. Census Bureau threshold poverty). The report listed 13% or thirty million U.S. adults as being in the below basic category, but did not show percentages or other facts about the basic, intermediate, or proficient categories, the other three literacy groupings. Two-thirds of students who cannot read proficiently by the fourth grade will end up in jail or on welfare. Three out of four individuals who receive food stamps read on the two lowest levels of literacy. 16-to-19-year-old girls at the poverty line and below with below-average reading skills are 6 times more likely to have out-of-wedlock children than their more literate counterparts (Kozol, 2010, p.17).

These statistics give crucial evidence and the disadvantages continue to impact our students with intellectual disabilities. It is a snowball effect of negative consequences later in life when students with intellectual disabilities lack the proper foundation for reading. Therefore, early literacy development at the elementary level is necessary.
If inadequate technologically-based reading comprehension programs persist for students with intellectual disabilities, then they will not have the same quality of reading education as their nondisabled peers (Katims, 2001). One issue is that they will not have access to the same opportunities in terms of future work (Kleinert et al., 2012). If this problem is addressed, then students with intellectual disabilities will have the same quality of reading education as their nondisabled peers (Katims, 2001). Therefore, students with intellectual disabilities will have access to the same opportunities in terms of work in the future (Kleinert et al., 2012). Scholars vary in their views on education and access to technologically-based reading comprehension instruction for students with intellectual disabilities. Let us examine the theoretical framework that supports the claims.

**Theoretical Framework**

The theory that frames the examination of the development of reading comprehension skills in technologically-based reading programs among students with intellectual disabilities is self-efficacy. Self-efficacy is at the core of Albert Bandura’s Social Cognitive Theory and defined as one's belief in her/his ability to succeed in specific situations (Bandura, 1993). Self-efficacy, as demonstrated in the learning process of students with intellectual disabilities, means that this group of individuals can have a sense of determination to overcome the challenges of low reading comprehension skills development. Students with intellectual disabilities need encouragement from their educators and consistent relevant reading instruction to increase reading comprehension skills retention.

Bandura “believed that the self-evaluative beliefs influence what activities students will choose and for how long they will persist at a given task” (1993, p.118). Students with a moderate to strong sense of self-efficacy will “persist at a task long enough to obtain the success
or corrective feedback that leads to expectations of future success” (Bandura, 1993, p.118). This persistence is imperative for student engagement and persistence in learning a task, particularly how to derive exact meanings from text.

Compeau and Higgins (2013) found that the role of individuals’ beliefs about their abilities to use computers (computer self-efficacy) exerts some influence in their success. Computer self-efficacy and outcome use has a significant influence on an individual’s expectations about any outcomes involving computer usage. Computer self-efficacy impacts how a person emotionally reacts to computers (affect and anxiety) and actual computer use. Therefore, self-efficacy and outcome use is also positively affected by the encouragement given by others and through observing the way other people use computers. Self-efficacy is a representation of an individual trait that influences encouragement and support on a person’s courage to use computers. So, it is important to understand the role of self-efficacy, in that it has implications for successfully training an individual.

Schunk and Zimmerman (2012) discussed self-regulated learning processes of goal setting and perceived self-efficacy among students. Generally, students begin learning activities with goals and self-efficacy for goal attainment in the classroom. From there, as students work on classroom tasks, students observe their own performances and learners evaluate their own goal progress. Self-observation, self-judgment, and self-reaction affect self-efficacy and goal setting. When students believe that they are making satisfactory goal progress, learners feel that they have the ability to improve their skills. Goal attainment and high self-efficacy enable students to set new goals. Educators are able to use research on self-efficacy to help students with goal properties (i.e. specificity, proximity, difficulty). Self-efficacy also includes self-set goals, progress feedback, contracts and conferences, and conceptions of ability (Schunk and
Zimmerman, 2012). Teachers are able to assist students as they set realistic goals and evaluate progress include establishing upper and lower goal limits and incorporating games, contracts, and conferences for learning in the classroom.

Graham and Harris (2014) discussed the self-instructional strategy training among learning disabled (LD) students and the deficiencies that resulted. Self-regulation and procedures and self-efficacy affected reading comprehension performance in 22 students with learning disabilities and 11 general education students in the 5th and 6th grades. Results from the study indicated that self-instructional strategy training produced meaningful and lasting effects on reading comprehension skills and a significantly elevated sense of self-efficacy. It was also discovered that explicit self-regulation procedures did not significantly change strategy-instruction effects for either reading performance or self-efficacy. Reading comprehension performance after computer instruction among students with learning disabilities did not differ significantly in terms of story grammar elements compared to the contrast group of learners without reading disorders. Bryk, Gomez, Grunow and LeMahieu’s (2015) improvement inquiry is a means of fixing what is wrong with the system of reading instruction by asking three questions:

What specifically are we trying to accomplish?
What change might we introduce and why?
How will we know that a change is actually an improvement? (p.114)

Therefore, it is imperative that educators understand that the application of this theory can benefit teachers as they seek to make positive changes in classroom instruction.

Students with intellectual disabilities need encouragement from their educators and consistent relevant reading instruction to increase reading comprehension skill retention. One's
sense of self-efficacy can play a major role in how one approaches goals, tasks, and challenges (Bandura, 1993). Having an understanding of self-efficacy informs my understanding of how students with intellectual disabilities think in relation to motivation to learning. An investigation into the future of students with intellectual disabilities if early technologically-based reading intervention is not implemented in classrooms serves a vital function in handling the problem of low reading comprehension skills development.

**A Glimpse into the Future: Consequences of Not Solving the Problem**

If the problem of inadequate technologically-based reading comprehension preparation continues, students with intellectual disabilities will not have the same quality reading education as their nondisabled peers (Katims, 2001). One issue is that they will not have access to the same opportunities in the future in terms of work (Kleinert et al., 2012). Researchers/stakeholders have found that the level of functional literacy of an individual is proportional to her/his income level (Kleinert et al., 2012). Kozol’s (2010) study spoke to the problem of crime and functional illiteracy to illustrate the issue as it affects many individuals. The study showed that there is also an increased risk of committing crimes among the population of individuals with intellectual disabilities.

For example, the research showed that “in developed countries, over 60% of adults in the US prison system read at or below the fourth grade level and up to 80% of adults in the US prison system are non-readers” (United States Department of Education, 2006, p.22). Other statistics addressed to the problem of illiteracy. Florida Judge Charles Phillips stated, "Eighty percent of the new criminals who pass my desk would not be here if they had graduated from high school and could read and write" (United States Department of Education, 2006, p.22). From a recent census of prisoners more than twenty-five years of age, 75 percent are not high
school graduates and 35–42 percent of them had not completed ninth grade, as compared to 38 percent of the total adult population who have not graduated high school. 85% of US juveniles appearing before the court are functionally illiterate. 31.2% of adults in the two lowest of five literacy levels lived below the poverty line, as opposed to 4.7% of those with the highest level of literacy. Those below the poverty line were more than twice as likely to be in poverty because of their illiteracy as for all other reasons combined and 44% of U.S. adults who were "Below Basic" in literacy tests, reported in February 2009, were in poverty as compared to 17% of the entire U.S. population in poverty (below the 2003 U.S. Census Bureau threshold poverty). The report listed 13% or thirty million U.S. adults as being in the below basic category, but did not show percentages or other facts about the basic, intermediate, or proficient categories, the other three literacy groupings. Two-thirds of students who cannot read proficiently by the fourth grade will end up in jail or on welfare. Three out of four individuals who receive food stamps read on the two lowest levels of literacy. 16-to-19-year-old girls at the poverty line and below with below-average reading skills are 6 times more likely to have out-of-wedlock children than their more literate counterparts. (Kozol, 2010, p.17). Imagining what can happen in the future once the issue is resolved gives hope for students with intellectual disabilities.

A Glimpse into the Future: Improvement Through Solving the Problem

If this problem is addressed then, students with intellectual disabilities will have the same quality reading education as their nondisabled peers (Katims, 2001). Students with intellectual disabilities will have access to the same future opportunities in terms of work (Kleinert et al., 2012). To address this issue one would need to involve more stakeholders. Involving a much larger group of stakeholders would require greater consideration of other factors. Educators need to establish an understanding of family backgrounds involving poverty, middle and upper class
narratives so that communication about instructional issues in classrooms will be clearly stated to each group. Educators must also understand politics involved at the state and federal levels in order to navigate the system on behalf of students with intellectual disabilities. There are inherent issues in technology design that influence reading instruction. Educators have many concerns pertaining to the overall educational practice of teaching learners with intellectual disabilities. The Individuals with Disabilities Act mandated that each state must provide each student with a free and appropriate education no matter the ability level present (Hasselbring& Williams, 2000). Ensuring reading comprehension skills development is supporting the educational needs of students with intellectual disabilities at the elementary school level is imperative.

Therefore, administrators and teachers have to consider what technology would be best suited to meet the individual student’s needs. Unfortunately, that doesn’t happen in every classroom. Similarly, the Technology-Related Assistance for Individuals with Disabilities Act enabled states to “conduct needs assessments, identify appropriate technology and provide assistive technologies for students to function at school and at home”, but school districts aren’t obligated to buy specific computer technology (Hasselbring& Williams, 2000, p.118). Most schools are forced to seek alternative funding to purchase technology-based reading programs that only, at best- help students with intellectual disabilities to practice their word recognition skills without focusing on the total development of reading comprehension skills. Instructional technology has been successful with these students, however it has been seen in a limited capacity over the past decade to build literacy skills (Jeffs, 2001). There are effective financial and safety reasons why students with intellectual disabilities need access to better reading
in the Zone of Generativity to explain further.

The influence of professional development for teachers was directly correlated to student achievement (Hargreaves, 1998). I discovered negative attitudes in past studies of some educators who do not believe in the learning potential of all students, especially those with intellectual disabilities. I also found information that showed an issue with educators expressing unpreparedness for utilizing online reading instruction in their classrooms (Baker, Carney, &
Cook, 2013). In addition, there are studies that questioned the online reading programs as viable curricula for teaching reading comprehension (Azevedo & Cromley, 2014). My dissertation also used the frameworks of Self-Efficacy and Constructivism. A more in-depth discussion of these theories will occur later in Chapter 2.

I fully understand the impact that a special educator has on students. To begin with, teacher attitudes are very critical to student success. Darling-Hammond (2006, 2010) and Ladson-Billings (2009) discussed the various concepts of content knowledge, pedagogy, and cultural competence as critical factors for educators in understanding their impacts on the success of each student. Teachers working with students who have intellectual disabilities need to remember that their professional development is only part of the recipe for student achievement. Teaching, as well as learning, also has emotional aspects connected to the discipline of educational pedagogy.

It is unacceptable that 45% of educators believe that students with intellectual disabilities cannot learn how to read (Argan, Alper & Wehmeyer, 2002). The specific emotional aspect of teacher development, examined by Hargreaves (cf., 1998), demonstrated this notion. Emotion is certainly a part of the basis of instruction and learning. Student achievement is most definitely influenced by the classroom relationship between an educator and the student. Every teacher has a responsibility to create a classroom environment in which students feel safe and empowered to learn. My experiences as a special educator, as well as earlier training as a counselor, still remind me of the significance of positive teacher-student relationships. I witnessed many times when increased learning took place during instruction because these students wanted to try harder in response to the caring attitude demonstrated by the educator.

As a special education teacher and services coordinator in a public charter school, I found that an influential relationship for learning exists between a teacher and the student (cf.,
Hargreaves, 1998). The influence of the interaction deemed positive or negative always continues in the minds of both long after the classroom interaction has concluded. It is always a joy to run into former students whom I taught directly or coordinated special education services for in the development of their individualized learning plans. Educators need to see that the teacher-student relationship is the foundation for learning (cf., Hargreaves, 1998). Learning is considered a reciprocal process in the relationship, because the teacher inevitably also learns from the student (cf., Hargreaves, 1998). That reciprocal process is the way in which teachers are able to adjust their teaching methods based on student assessment results. Freire (1998) talked about this equal reciprocal relationship of learning between teacher and student. Learning is natural and ongoing according to Freire (1998). Teachers who work with students who have intellectual disabilities need to remember that students will often strive to reach for goals set during reading instruction time, if they feel that educators believe in their ability to learn.

The parents of students with intellectual disabilities do not have a say in the selection of teachers which could improve the quality of their children’s education. Families with low incomes who have children who have special needs are often unable to navigate the social, political, and cultural systems existing in many school districts (Buchanan, 2014). Therefore, my study focused on how to bring people in the areas of school, academy, and community to collaboratively address the problem of inadequate technologically-based reading programs for students with intellectual disabilities. There are a number of factors that one has to consider when leading educators into a useful discussion on the topic of technologically-based reading programs and developing reading comprehension skills development.

In order to enable educators to understand the issue and their involvement, I looked to a theory that can speak to the need for using personal narratives in a meaningful way. The Zone of
Generativity (Ball, 2012) described some ways in which educators can use their personal narratives to help other educators understand issues and find motivation to solve an array of problems in American schools. As an advocate for students who have special needs, I remember certain experiences observing kids who got pulled out of the regular classroom by a teaching staff member for extra academic support. I can recall what it was like to be that young observer of students who struggled academically in the classroom, then experiencing what it was like to grow up and eventually lead a learning support classroom, and later on, an entire special education department. Seeing students struggle was uncomfortable, and I empathized with them, although I am sure I did not have a full grasp of the situation. I sat through many professional development sessions as a teacher and directed many training sessions as a coordinator. Working in special education means that one has to look at instruction and the impact that it has on students with disabilities in order to quickly adjust instruction to suit the instructional needs of learners with intellectual disabilities. The “knowing-doing gap” (Ball, 2012, p.284) is a continuous presence in the life of a special educator.

In addition, I have gained a sense of the history of past technologically-based reading programs. In past research (Azevedo & Cromley, 2014; Fitzgerald et al., 2008) it was explained why educators were unsuccessful in elevating student achievement in the United States. Also, researchers examined the attitudes of educators pertaining to reading instruction for students with intellectual disabilities (Allor et al., 2014; Fitzgerald et al., 2008). I believe that my experiences as an educator has allowed me to witness first-hand the issues that students with intellectual disabilities face and that there is evidence to support that a change in reading instruction is needed.
One of the crucial aspects of interrelated theories is that one has to understand that an educational system does not always work in favor of students. Educators must address this problem. Langley, Moen, Nolan, Nolan, Norman and Provost (2009) discussed the System of Profound Knowledge as a means of comprehending systems that explain what happens in the socio-political influences in schools among educators. The System of Profound Knowledge (Langley et al., 2009) state was a discourse on the theories of these types of systems, the elements of variation in systems, the actualization of power of knowledge, the psychological aspects of change, and how each of them interact together. If educators understand the concept of systems-thinking in order to examine the issue of technologically-based reading comprehension programs for students who have intellectual disabilities, then improvements may be made leading to generative impacts that help students with intellectual disabilities. Work needs to be done with regard to challenging educators’ assumptions, being introspective with others, debating the hard issues, acknowledging that privilege exists, and taking serious risks to solve technologically-based reading comprehension programs for students who have intellectual disabilities. If the components are in place that educators need to evaluate, then teachers could begin to collaboratively work within the educational system to make lasting positive changes that will affect students with intellectual disabilities.

The goal is to develop reading comprehension skills through technologically-based reading programs among students with intellectual disabilities. The initial claim focused on the lack of technologically-based reading support to meet the needs of students with intellectual disabilities at the elementary level. Although students with other learning disabilities benefit from technologically-based reading instruction programs, the same is questionable for students with intellectual disabilities. Allor, Mathes, Roberts, Cheatham and Al Otaiba (2014) stated that
“students with intellectual disabilities require intensive practice across multiple years to become skilled readers” (p.446). The subsequent guiding claims examined the lack of access to adequate technology for learners with intellectual disabilities: low test scores, increased remediation at the middle and high school levels, low to no participation of students with intellectual disabilities in post-secondary institutions, unemployment, poverty, and isolation. The rates of positive participation are low for this group in terms of access to post-secondary education. “Over half of the community college entrants are lacking in basic skills,” (Hartman, 1987, p.41). Low test scores and increased remediation at the middle and high school levels are due to “slow initial progress and acceleration will occur as the foundations for learning are laboriously laid down” (Hempenstall, 2012, p.4). Yet, this does not happen in all schools, which means that low test scores and the need for increased remediation services continue for students with intellectual disabilities (Baker, 2008). Unemployment, poverty, and isolation are issues that students with intellectual disabilities face at a higher percentage than their nondisabled peers (Kleinert et al., 2012). Going in depth, the guiding claims showed how low reading skills impact America’s workforce and the future economy (Kozol, 2010). Learning how some educators think and relate to students and the systems in which they operate will be part of this dissertation.

My designs for learning as well as action allowed the educators to discover and challenge assumptions in their personal narratives that impede reading instruction delivery for students. This helps all of the educators involved to obtain information by taking a look at the root causes of the problem that lead to what Bryk, Gomez and Grunow (2011) describe the as plan, do, study, and act cycles of improvement. Bryk et al. (2011) discussed this method as a means of identifying, testing and evaluating problems of practice. It is a way of constantly looking at what
needs to be changed with current information obtained through classroom observations to lead to adjustments in instruction.

The goal is for educators to understand the context in which technologically-based reading instruction programs with students who have intellectual disabilities, is significant then, they can identify how each may contribute ideas to improve the situation. The educators may experience a unique form of learning that can move from *transmissive* to *learning* (cf., Hargreaves, 1998). Theories of learning explained by Jonassen and Land (2012) asserted that learners understand the information that is presented to them and think about how they can actively contribute to the learning process of others. For example, teachers may look at their perceptions surrounding the instruction of students with intellectual disabilities, and consider whether they feel that these same students can succeed in terms of reading achievement. Positive or negative responses to this issue can greatly influence teaching reading comprehension skills to students with intellectual disabilities. Reviewing the ideas that were tried in the past helps to build upon the deficits in terms of research to speak to this issue of reading comprehension skills development, students with intellectual disabilities and technologically-based reading programs.

**Historical Solutions and My Past Contributions to Addressing Reading Comprehension Skills Development in Students with Intellectual Disabilities**

Studies show there is more work to be done in terms of improving the reading comprehension aspect of technologically-based programs for students with intellectual disabilities. Specifically, researchers outlined the problems that educators and students with intellectual disabilities have encountered while using technologically-based reading comprehension programs. Studies that focus on elementary school-age students with intellectual disabilities are not seen in large quantities. There are more studies that focus on students with
intellectual disabilities at the middle and high school levels. I brought attention to the subject of improving reading instruction for students with intellectual disabilities with my colleagues.

**Recruitment of Educators**

I included the studies conducted by researchers who have determined that there is a need for further investigation of the issue of using technologically-based programs for students with intellectual disabilities. I engaged my fellow educators in dialogues about necessary changes and received their responses as aids to improving technologically-based reading comprehension programs. I believe that many educators will become involved in remedying the issue of low reading comprehension skills development in students with intellectual disabilities. Educators simply need more research evidence to help them get fully invested in investigating how to better instruct students with intellectual disabilities with regard to reading comprehension skills development.

I have discussed the issue of improving technologically-based reading comprehension programs for students with intellectual disabilities with my colleagues in Education. While working with students with intellectual disabilities, I assisted students by making adaptations to the technologically-based reading comprehension programs that were in the computer lab. I taught other teachers how to make adaptations to their instructional techniques in technologically-based reading programs for use with their students with intellectual disabilities. I believe that other educators care about the issue of improving reading comprehension skills for students with intellectual disabilities and will follow through on their commitment to providing good instruction. There were factors that motivated me to research reading comprehension skills development and technology.
My Projected Advocate Leadership and Transformative Actions to Empower Students with Intellectual Disabilities

Moved to compassion by the heartbreaking stories of adults and witnessing the struggles of my students, I wanted to listen to other educators who shared the same concerns for students with intellectual disabilities. I conducted a survey among educators who have utilized technologically-based reading curricula in classrooms with students who have intellectual disabilities. Reading educators’ views and experiences with the use of technologically-based reading curricula with students, who have intellectual disabilities, can yield educational improvements for the benefit of students with intellectual disabilities in American public schools.

My leadership and action has enabled students with intellectual disabilities to use reading programs with assistance to gain some reading comprehension skills development. However, the goal, and the real issue is to allow for total independence for students who use technologically-based reading comprehension programs. If I can get other educators to collectively discuss their views, then reading comprehension instruction will be positively transformed for individuals with intellectual disabilities. Study participants included in my research project have considerable professional experience in classrooms that serve students with intellectual disabilities, considerable experience working with the other teachers across classrooms to design, implement, and/or assess professional development activities, and have recognized expertise in supporting the growth of reading comprehension skills for students with intellectual disabilities. Bryk, Gomez, Grunow and LeMahieu’s (2015) improvement inquiry is a means of fixing what is wrong with the system of reading instruction by asking three questions: What specifically are we trying to accomplish? What change might we introduce and why? How will we know that a
change is actually an improvement (p.114)? Therefore, it is imperative that educators understand that the application of this theory can benefit teachers as they seek to make positive changes in classroom instruction. It is through the influence of this theory that my study will serve as a basis for educators to make improvements in technologically-based reading comprehension programs for students with intellectual disabilities.

**A Discussion of Educators’ Views on Meeting the Needs of Students with Intellectual Disabilities**

Having followed years of research studies by one particular individual who has a background in special education and technology, I contacted one of the leading experts in the area of literacy instruction. Dr. Richard Allington states,

> I am still awaiting any reliable evidence indicating any computer-based reading programs especially comprehension focused programs. As far as I can tell the best reading intervention for LD kids remains expanding the amount of reading activity they engage in. My usual advice is focus on self-selected reading and help the kids find books they can actually read and books they really want to read. (personal communication, July 5, 2016)

Allington explained that computer-based reading instruction is not having a significant effect on teaching students with intellectual disabilities how to read in all skill areas. He is appalled that schools are spending billions of dollars on software. Research studies are not exhibiting conclusive enough results that technologically-based reading comprehension instruction in its current form must be utilized in classrooms unless there is change that reflects the educational needs of students with intellectual disabilities.
Author/ Education Consultant Dr. Peter DeWitt (2013) posited that many educators stood by their convictions that computer-based reading programs are working for students who have reading difficulties. Teachers use data from computer-based programs to justify rising Lexile scores and stated that there is an increase in reading comprehension skills development. The Lexile Framework for Reading is a tool used by educators to measure the reading ability of students in order to match children with leveled reading sources. Low scores indicate that the students have a lower reading ability. This framework used quantitative methods that are based on individual words and sentence lengths rather than fluency or reading comprehension skills development. Because the Lexile framework is a paper-based assessment not connected to the technologically-based reading instruction programs, it does not assess the same exact items used during computer-based reading instruction. Therefore, this presents a problem with consistency of evaluation of a student’s reading comprehension progress. A viable option would be for teachers to have access to computer-based assessment tools built into the technologically-based reading instruction programs that educators use with students on a daily basis for an accurate measurement of reading comprehension skills.

Reading comprehension skills need to be measured through factors such as multiple levels of meaning and maturity of themes. Some students find reading in this manner non-intimidating and read slightly more than they did before testing. As a result, DeWitt (2016) questioned whether students are really becoming better readers. I contacted Dr. DeWitt (2016) to see if he had any new information on the subject and he remains unchanged on the issue (P. DeWitt, personal communication, 2016). There is an ongoing concern that students with intellectual disabilities are not reaching their full potential as readers which is why technologically-based reading comprehension programs warrant further study of their effectiveness.
Many schools use technologically-based programs for reading instruction. A $10 million Federal study of educational software products by the U.S. Department of Education found little significant difference in the academic achievement of students who used technologically-based reading programs and students who used other reading instructional methods (Trotter, 2007). There are technologically-based reading programs that enable educators to teach classes the reading comprehension skills development needed in all subjects. The following developers or publishers of the studied software are well-known in K-12 education: PLATO Learning Inc., Carnegie Learning Inc., Houghton Mifflin Co., Scholastic Inc., iLearn, Leapfrog Schoolhouse, Autoskill International Inc., Pearson PLC, and Headsprout Inc. Teaching reading comprehension benefits all students while they learn all subjects. While these companies provide technologically-based services to classrooms, there are still instances when the software/online programs prove to be insufficient for reading instruction. As stated before, the Universal Design for Learning reading model for students with learning disabilities showed that students with intellectual disabilities most often encounter obstacles when reading to learn, such as issues decoding or comprehension of text content without sufficient background knowledge. These challenges cause a lot of obstacles to academic performance and progress and a system overhaul is necessary to remedy the problem of low reading comprehension scores.

When I taught students with intellectual disabilities in the learning support classroom my job was to prepare them as much as possible for the Pennsylvania State Standards Assessment Test (PSSA). One of the standards was based on reading comprehension skills, and word problems were often the test items that were the most difficult for students with intellectual disabilities to solve. Long passages of text were also very challenging for learners with intellectual disabilities. As a matter of fact, reading comprehension instruction was vital for test
preparation. It is an ongoing concern that I have to see that all students with intellectual
disabilities have a solid reading foundation at the elementary level that prepares them to achieve
at the middle and high school levels and subsequently, enter post-secondary institutions. I
included an example of a student with an intellectual disability who attained successful reading
comprehension skills and we must help more students with intellectual disabilities experience the
same.
Chapter 3

Methods

The research questions that are addressed in the study are:

- **Research Question 1**: What are the challenges/barriers in technologically-based reading comprehension programs for students with intellectual disabilities?
- **Research Question 2**: What improvements can be implemented to improve technologically-based reading comprehension programs to address the needs of students with intellectual disabilities?

This chapter is going to address the research design and methods by which the data were collected and analyzed. Included is a discussion of the research design, research questions, and study participants. The chapter concludes with data collection procedures and data analysis procedures.

**Research Design**

This investigation was designed as a qualitative study using a constant comparative analysis and a close reading of the responses of the perceptions and understandings of educational experts knowledgeable in the area of technologically-based reading comprehension programs for students with intellectual disabilities. The study was designed to collect critical information regarding the research questions from expert practitioners. By doing so, the study provided information that is not only contextually rich, but was also informed by effective instructional practice.

I conducted surveys via email and transcribed information from my surveys to code any discovered statements made by the study participants thus, conducting an emergent theme analysis. I analyzed all data and produced a written report. The results from my qualitative study
will provide educators a means of becoming collectively engaged with the work. My study only yielded data from educators in Pittsburgh, Pennsylvania included in my dissertation.

Included is a design for learning for educators and other stakeholders to engage in the work of improving online reading programs for students with intellectual disabilities. After I collect and analyze data from my project, I will inform educators of possible solutions to the problem of developing reading comprehension skills in students with intellectual disabilities. I revisited my research questions.

**Research Questions**

The purpose of the study is to examine the use and efficacy of technologically-based reading comprehension programs for students who have intellectual disabilities. The results gathered from the data will serve to inform educational leaders to address the effective use of technologically-based reading comprehension programs for students who have intellectual disabilities in their related contexts of school, academy and community.

The study is important because it affects students with intellectual disabilities who are not being adequately prepared to enter the real world (Thomas, Lakin, Carlson, Domzal, Austin & Boyd, 2011). It is critical to establish better reading comprehension instruction for learners with intellectual disabilities making classroom environments more student-centered (Azevedo & Cromley, 2014). My study sought to answer two research questions:

*Research Question 1:*

- What are the challenges/barriers in technologically-based reading comprehension programs for students with intellectual disabilities?
Research Question 2:

- What improvements can be implemented to improve technologically-based reading comprehension programs to address the needs of students with intellectual disabilities?

It was essential to my study to cultivate the input of qualified educators.

Participants

Participants in the study were carefully selected to bring appropriate experience and expertise as they responded to the open-ended survey. The professionals were in positions of directorship, mentoring, and/or coaching that provided them with the expertise that comes from understanding classrooms, curricula, and systems that serve reading achievement of students with intellectual disabilities. The selection criteria included positional responsibilities that ensured the following:

- considerable professional experience in classrooms that serve students with intellectual disabilities;
- considerable experience working with other teachers across classrooms to design, implement, and/or assess professional development activities;
- recognized expertise in supporting the growth of reading comprehension skills for students with intellectual disabilities.

After Duquesne University Institutional Review Board approval, I consulted with university faculty who have worked in and with practicing educational professionals. The criteria to recruit study participants for my research project were shared with qualified university faculty members in order to develop with the researcher a list of potential candidates to participate in the study.
Faculty members and I identified potential participants and/or recommended educational administrators who were able to identify potential participants.

Two educators responded who had experience teaching students with intellectual disabilities using reading technology. In order to increase the likelihood of finding the highly qualified educational professionals needed for the study, a snowball sampling procedure was employed. Two educators responded from fifteen contact made. Informed consent procedures were implemented (see Appendix A). Potential participants were contacted via email to determine if they were interested in receiving brief description of the study in script form and a consent form. During the initial email contact, potential participants were advised that their participation in the study was entirely voluntary and that they could elect to withdraw from the study at any time. I discussed the entire data collection process in the email. I followed the guidelines stipulated in my approved IRB proposal.

My study participants are a special education teacher (Participant A) who works in a private school in which the entire K-12 school population has special needs and a 4th grade general education teacher (Participant B) who works in a public charter school. The special education teacher (Participant A) uses Compass Learning for Math and Reading curriculum and Odyssey’s technologically-based reading comprehension instruction program. The 4th grade general education teacher (Participant B) uses Raz-kids (downloadable interactive e-books for guided reading and the administration of reading quizzes), Newsela (leveled news articles with Common Core aligned quizzes, nonfiction literacy and current events) and iTooch Elementary-eduPad (used for Math, Language Arts and Science Education employing US Common Core Standards).
Data Collection Procedures

In order to collect data required to address the research questions in a form that would enable the anticipated analysis, the following research procedures were implemented:

- A structured, open-ended survey was e-mailed to study participants.
- Participants were given a window of two weeks to respond.
- Participants were given researcher contact information in case participants wished to consult with the researcher for generating responses to the survey questions.
- In the event of such consultation, the researcher used the conversation with the participant to inform the study.
- Participants submitted their responses to the survey items directly to the researcher via return email.

I began the process of looking for themes and what they meant as I derived data from my study.

The only instrument employed in the study was an open-ended survey comprising four questions that I designed. The following are my survey questions:

1. How does the current technologically-based reading comprehension program(s) address specific reading comprehension skill deficits (i.e., vocabulary definitions, critical thinking) for students with intellectual disabilities in your school?

2. What is working/not working (i.e. following program instruction, interest level of stories, comprehension of questions, correction of mistakes, amount of practice time, progress reporting, meeting specific reading needs)?

3. What are the challenges and barriers that you have seen with technologically-based reading comprehension programs which are used with students who have intellectual disabilities?
4. What suggestions and/or improvements do you envision that current technologically-based reading comprehension programs can be implemented for students with intellectual disabilities to achieve the learning expectations you have for your students?

I emailed the survey questions to the study participants and also received responses (of which I deemed “confidential” for this study) back via email. Generally speaking, the questions were designed to elicit the perceptions and understandings of expert educational professionals. More specifically, I sought to gather expert perceptions and understandings in order to inform research design and development of technologically-based instruction and support of reading comprehension skills in children and youth with intellectual disabilities. My presentation of findings will reveal information that I believe will be pertinent to educators.

**Data Analysis Procedures**

As data were de-identified and, where required, redacted prior to the emergent theme analysis, the findings were confidential and not tied to any identifiable person. I employed close reading techniques to enable me to determine common themes as well as disagreements among the responses from the study participants. I read each of the participants’ comments (using comparative analysis) which helped me as I compared and contrasted the responses line by line under each survey question.

Data were collected via the open-ended form described in the instruments. Because the nature of the data were qualitative, an emergent theme analysis was performed to create a first-level data analysis. It was anticipated that the first-level themes that emerged would address the research questions. It was possible, however, that second-level themes might have emerged from the analysis and, if warranted, be pursued. As the data were de-identified and–where required–redacted prior to the emergent theme analysis, the findings were not to be tied to any particular
participant nor did the findings include any identifiable person. I proceeded to talk about the instrument selected for my study.

The responses to each survey question were organized by participant in order to facilitate the initial compare and contrast analysis via close reading. The results of the close reading yielded similarities and differences across the participants. The similarities and differences were then summarized for each survey question. With the responses organized, by survey question, into similarities and differences across the participants, an emergent theme analysis was undertaken.
Chapter 4

Findings and Implications

I am going to present the findings by each participant and survey questions noting agreements and disagreements. This chapter will include responses from Participants A and B for each of the survey questions. The summaries will be organized as follows: summary of agreements and disagreements for survey questions 1-4. The final presentation regarding the participants’ responses surrounds the themes that emerged from both participants with a summary of the findings (limitations and implications included). The rest of the chapter concludes with recommendations, a design for improvement, general impacts and future implications.

I planned to utilize my contacts within the education community to obtain relevant data for my study. I will share my findings from the literature review with educators as part of strengthening professional development to inform them of the problem and so they can receive further input from the surveys pertaining to technologically-based reading instruction for students with intellectual disabilities, enabling them to make improvements in the classroom. I plan to discuss the results of my study with other stakeholders in the community. My survey questions include the following: How does the current technologically-based reading comprehension program(s) address specific reading comprehension skill deficits (i.e. vocabulary definitions, critical thinking) for students with intellectual disabilities in your school? What is working/not working (i.e. following program instruction, interest level of stories, comprehension of questions, correction of mistakes, amount of practice time, progress reporting, meeting specific reading needs) in your classroom? What are the challenges and barriers that you have seen with technologically-based reading comprehension programs which are used with students who have intellectual disabilities? What suggestions and/or improvements do you envision that
current technologically-based reading comprehension programs can be implemented for students with intellectual disabilities to achieve the learning expectations you have for your students?

I recruited educators to help me find study participants. I have taken the initiative to address the problem and I surveyed educators to ascertain their input on the survey questions. This gave teachers a chance to state how they perceive the problem. The goal of my study was to assist participants to delve into educational techniques that are most beneficial to students with intellectual disabilities. I wanted them to think about the ways in which instruction typically occurs in classrooms as they give responses. Basically, temporary support to students should be provided by teachers and/or by computers to allow learners with intellectual disabilities to perform reading tasks independently that they ordinarily would be unable to do. Simultaneously, temporary support through scaffolding builds knowledge and skills each time students engage in the lesson in a manner comparable to the “scaffolding on a building” (O’Hanlon, 2005, p.334).

The long term goal is for students with intellectual disabilities to internalize the process of developing and mastering good reading comprehension skills. This idea came from one of Vygotsky’s (1986) theories that hypothesized that if students had “guided interactions with an adult or more capable peer then the students with assistance would be able to function at a higher level” (p.23). In this case, students with learning disabilities need access to technologically-trained teachers and online computer/software programs to elevate these students’ reading comprehension scores on standardized tests from below basic to proficient to advanced status (O’Hanlon, 2005). The purpose of the research questions was to see if educators felt that the online reading programs were indeed developing students with intellectual disabilities’ reading comprehension skills and moving them toward independent reading proficiency.
My methodology focused on eliciting information for future generative impacts that could help educators ponder the influence of online/software reading programs in a broader sense that extends beyond the classroom for these students. One must discuss this from the perspective of community because the individuals who are the focus of this issue will be members (hopefully, productive ones) much longer than they will be students in classrooms. Appeals for the involvement of stakeholders such as governmental leaders must be made, because they have the funds to support improvements in reading comprehension curricula. I found that current educators will see that there is a problem with technologically-based reading programs and developing reading comprehension skills instruction for students who have intellectual disabilities. I discovered crucial feedback from educators in order to improve technologically-based reading programs for learners with intellectual disabilities.

My intent was to understand the relationship between technologically-based reading instruction programs and reading comprehension skills development among students with intellectual disabilities. Emphasis was placed on how teachers viewed the learning experiences in the classroom utilizing technologically-based reading programs. In the following sections, I detailed two relevant and recurring themes throughout the data collection process. The findings are organized and illustrated with quotes from study participants (educators) from individual surveys.

Responses from Survey Question 1

I presented questions and answers from my survey and provided commentary from the literature review. The following findings are organized by survey question:
Survey Question 1. How does the current technologically-based reading comprehension program(s) address specific reading comprehension skill deficits (i.e., vocabulary definitions, critical thinking) for students with intellectual disabilities in your school?

Participant A stated,

“The school provides the students with Compass Learning for math and reading curriculum. The program is called Odyssey. The teachers are able to individualize the curriculum that each student completes based on their reading math level. It is very visual and individualized. Adaptations cannot be made for the students. Once we choose the grade and program we want for the child, there are not any other controls that the teacher has. The program does allow me to put the child on different grade levels based on their abilities for example if a 16 year-old is on a second grade reading level and 4th grade math, I am able to give them work that is on the 2nd grade reading level and 4th grade math. It then tracks their progress and provides assessments.”

Participant B stated,

“I think the programs are very helpful and keep the children engaged. We have Razz kids and the children love reading new stories each day. This program helps with decoding skills and comprehension. I also use Newsela which is also good for comprehension and allows kids an opportunity to decide which stories are most interesting to them. Another site kids use is Itooch. They like this site because they get points and there are different skills to work on each day.”

Researchers stated that the best way to teach reading comprehension skills to students with intellectual disabilities in classrooms is through specially-designed technologically-based means. Inclusion is better facilitated through reading instruction websites that improve and support students with intellectual disabilities (Abbott & Cribb, 2001). This is why Participant A was frustrated as she was not allowed to modify the technologically-based curriculum for her
students with intellectual disabilities. There is still a need for technologically-based reading programs that are implemented in all schools regardless of whether the school serves general and/or special needs students or, as in this case, a school that has an entire special needs population. Instruction technology coordinators and administrators in special schools advocated this need for special reading instruction, for example, website homepages as the best support for reading instruction for learners with intellectual disabilities. Again, inclusion works best with the use of reading instruction websites. While technologically-based reading comprehension programs are being implemented and finding success in other areas across the country, clearly and unfortunately this is not the case in Pittsburgh.

Responses from Survey Question 2
Survey Question 2. What is working/not working (i.e. following program instruction, interest level of stories, comprehension of questions, correction of mistakes, amount of practice time, progress reporting, meeting specific reading needs)?

Participant A stated,

“The program instruction is strong. The students are not able to move on to the next lesson until they pass without at least an 80% on the post-test from the first lesson. They are not allowed to move to a different unit until they passed all tests and the unit test from the last unit. The program instruction is engaging and based on the curriculum chosen by the teacher. The stories are not the most interesting, but they do the job. The students practice reading all different genres and different types of literature including magazines articles, books, and blogs. The practice time is at the pace of the child. The comprehension questions are only one version. They are not adaptable per the child. Progress reporting can be whenever the teacher wants whether it is daily, weekly, etc. The only thing that really is not working is that the program
cannot meet specific reading needs. The teacher has no control over that.”

Participant B stated,

“What is not working is some students are not engaged enough with the technology. The students have an issue with following program instructions which waste time. Also, some stories are not engaging enough for the students.”

Participant A reported that the technologically-based reading materials being used are not really that captivating, however they are motivating enough to accomplish some of the goals that she has for her students with intellectual disabilities. I was reminded of how Bandura (1993) states that one's sense of self-efficacy can play a major role in how one approaches goals, tasks, and challenges. Furthermore, we saw it in practice with Graham and Harris’ (2014) research which discussed the self-instructional strategy training among learning disabled (LD) students and the deficiencies that resulted. The results from the study indicated that self-instructional strategy training had meaningful and lasting effects on reading comprehension skills. It also significantly improved the self-efficacy of the students who were learning disabled (Graham & Harris, 2014). All students with intellectual disabilities need ongoing encouragement from their educators and consistent relevant reading instruction to increase reading comprehension skills retention.

**Responses from Survey Question 3**

3. What are the challenges and barriers that you have seen with technologically-based reading comprehension programs which are used with students who have intellectual disabilities?

Participant A stated,

“The main challenge I face is that I cannot edit any of the questions or make any modifications to help the child. The only thing I can do is choose a grade level that is appropriate to their level. Unfortunately, with that, the content may be too immature for the student. “
Participant B stated,

“The challenges I see is students not knowing how to use the technology properly. Some students can’t type and some students do not know how to work the programs. The other barriers are the equipment sometimes does not work properly. I feel that children should have to take intro computer courses starting in Kindergarten. I should not have to teach a child in the fourth grade how to turn on a computer or how to exit out of a program.”

Participant A is forced to use the technologically-based reading program bought by her school’s administrator. If not enough funding is secured for technology that allows for adjusting the reading levels for students with intellectual disabilities, then teachers are only able to meet some of the word recognition goals, but not goals for reading comprehension. Most schools are forced to seek alternative funding to purchase technologically-based reading programs. These programs at best, help students with intellectual disabilities practice their word recognition skills without focusing on the total development of reading comprehension skills. Still, according to Jeffs (2001) instructional technology has been viewed as successful with students with intellectual disabilities; however technologically-based reading instruction has been seen in a limited capacity over the past decade to build literacy skills. Educators need more options available to them in terms of technologically-based reading support programs as a means to correct reading comprehension skills deficiencies with learners who have intellectual disabilities.

Responses from Survey Question 4

4. What suggestions and/or improvements do you envision that current technologically-based reading comprehension programs can be implemented for students with intellectual disabilities to achieve the learning expectations you have for your students?

Participant A stated,
“The teachers should have more control over the assessments. They should be able to make edits to the assessment questions and answers. For example, I have a student who can only successfully answer multiple choice questions with 2 choices, 4 overwhelm him. A modification in his IEP is to provide him with 2-3 choices. I would like to be able to have this option in the program.”

Participant B stated,

“One improvement I feel can be made is that students can be given more training on how to use the programs. Another suggestion I can give is that students should be given more time to work on programs in school. Also, the programs they are working on need to be more engaging and offer more diversity in text selection.”

It remains true that with regard to computer-based reading instruction, the “programs should have adjustable presentation characteristics such as changeable font style and size, highlighting of main concepts, or variable volume and speed controls” among other features like the number of test item choices (Wright, 2003, p.1). When these variable features are not part of the program, learners with intellectual disabilities experience difficulty using technologically-based reading instruction. Teachers want options for modifying computer instruction that coincides with the modifications included in the Individualized Education Program (IEP) to better assist their learners with intellectual disabilities. Again, these technologically-based features can be beneficial when used in the right manner for students with intellectual disabilities who require them. As a Special Education Teacher I know the need for compliance with regard to Special Education laws. There are inconsistencies with instruction for students with intellectual disabilities. As Participant A implied, when the modifications that are specified in the IEP are not being enforced in all academic subject instruction and assessment, the rights of many learners with intellectual disabilities are being violated. It is not only a matter of social justice
that educators carry out what is written in IEPs to help students with intellectual disabilities learn reading; but there are also possible legal ramifications from parents of students with intellectual disabilities. A particular issue surrounded adaptations for students with intellectual disabilities.

**Summary Survey Question 1**

1. How does the current technologically-based reading comprehension program(s) address specific reading comprehension skill deficits (i.e. vocabulary definitions, critical thinking) for students with intellectual disabilities in your school?

Participants A and B agree that the teachers should have more control over the adjustments in the technologically-based reading programs that they use with students who have intellectual disabilities and that some of the stories are interesting. Participants A and B disagree with the levels of reading instruction offered and which programs are being used.

**Summary Survey Question 2**

2. What is working/not working (i.e. following program instruction, interest level of stories, comprehension of questions, correction of mistakes, amount of practice time, progress reporting, meeting specific reading needs)?

Participants A and B agree that the technologically-based programs allow the students to practice the reading skills that the students with intellectual disabilities need. Participants A and B disagree on whether the amount of practice time is sufficient.

**Summary Survey Question 3**

3. What are the challenges and barriers that you have seen with technologically-based reading comprehension programs which are used with students who have intellectual disabilities?
Participants A and B agree that the technologically-based reading programs should be used with students with intellectual disabilities. Participants A and B disagree that when choosing a grade level for reading instruction the material may be too immature for the age of the student and that students are not always technologically-astute to follow a technologically-based reading program.

Summary Survey Question 4

4. What suggestions and/or improvements do you envision that current technologically-based reading comprehension programs can be implemented for students with intellectual disabilities to achieve the learning expectations you have for your students?

Participants A and B agree that the technologically-based reading programs should be used with students with intellectual disabilities. Participants A and B disagree that making modifications should be given top priority in improving technologically-based reading programs and that more training is necessary for students with intellectual disabilities.

Emergent Themes from Responses

In the first theme, educators expressed concerns that they had no control over technologically-based reading program settings that would benefit in the best interest of students with intellectual disabilities. Participant B commented, “I cannot make adaptations for the students”. I read another survey and saw the deeper specifics of the problem unfold while parts collectively assembled in the study. Participant A stated, “Adaptations cannot be made for the students. The teachers should have more control over the assessments. They should be able to make edits to the assessment questions and answers. For example, I have a student who can only successfully answer multiple choice questions with 2 choices, 4 overwhelm him. A modification in his IEP is to provide him with 2-3 choices. I would like to be able to have this option in the
program.” It remains true that when it comes to computer-based reading instruction, the “programs should have adjustable presentation characteristics such as changeable font style and size, highlighting of main concepts, or variable volume and speed controls” among other features like the number of test item choices (Wright, 2003, p.1). When these variable features are not part of the program, learners with intellectual disabilities experience difficulty using technology-based reading instruction. Teachers want options for modifying computer instruction that coincides with the modifications included in the Individualized Education Program to better assist their learners with intellectual disabilities. Remember, these technology-based features can be beneficial when used in the right manner for students with intellectual disabilities who require them. As a Special Education Teacher I know the need for compliance with regard to Special Education laws. There are inconsistencies with instruction for students with intellectual disabilities. As the study participant implied, when the modifications that are specified in the IEP are not being enforced in all academic subject instruction and assessment, the rights of many learners with intellectual disabilities are being violated. It is not only a matter of social justice that educators carry out what is written in IEPs to help students with intellectual disabilities learn reading; but there are also possible legal ramifications from parents of students with intellectual disabilities. Through reading the surveys I was able to extrapolate that the first problem was that technology-based reading programs lack in adjustable features for instruction, assessment and legal compliance purposes for learners with intellectual disabilities. The next theme focuses on also increasing reading comprehension scores though interesting and diverse stories to motivate student learning.

This second theme showed how educators viewed the need for technology-based reading instruction to have engaging and appealing reading passages that make students with
intellectual disabilities consistently want to practice their reading skills. Participant A wrote, “The stories are not the most interesting…”, drawing a conclusion that there is a demand for better reading curricula texts. As I read the next survey, more pieces of this survey investigation came together to confirm the problem and furthermore, provide an explanation for a lack of student engagement. According to Participant B, “Also, some stories are not engaging enough for the students. Also, the programs they are working on need to be more engaging and offer more diversity in text selection”.

Darling-Hammond (2006, 2010) and Ladson-Billings (2009) discussed the various concepts of content knowledge, pedagogy, and cultural competence as critical factors for educators in understanding their impacts on the success of each student. These are factors that need to be taken into consideration when technologically-based reading program passages are designed for students who have intellectual disabilities.

**Summary of Findings**

Common themes that have emerged from the study participants are that modifications/adaptations cannot be made with the technologically-based programs and that the stories are not diverse/engaging enough. The fact that this educator in 2016 is still dealing with a technologically-based reading program that doesn’t fully meet the reading comprehension skills needs of her students with intellectual disabilities is totally unacceptable. We need to seek positive changes through a form of improvement inquiry, in doing so, improvement inquiry helps all educators to obtain information.

Taking a look at the root cause of the problem of technologically-based reading programs, that do not adequately support reading comprehension skills development, is what Bryk, Gomez and Grunow (2011) describe as the plan, do, study, and act cycles of improvement, and as a
means of identifying, testing and evaluating problems of practice (Bryk et al. 2011). Educators need a way of constantly looking at what needs to be changed with current information obtained through classroom observations during computer use with students who have intellectual disabilities to advocate for adjustments in technologically-based reading instruction.

The Universal Design for Learning reading model for students with learning disabilities showed that they most often encounter obstacles when reading to learn, such as issues decoding or comprehension of text content without sufficient background knowledge (IstenicStarcic et al., 2014). Having an understanding of the problems encountered by educators justifies the need for improving technologically-based reading instruction. This can lead to discussing implications and making recommendations for technologically-based reading comprehension skills instruction to teach learners with intellectual disabilities.

My study led to the following findings from common themes: there is a violation of students with intellectual disabilities’ educational rights. Both Participants A & B agreed: adaptations cannot be made for the students, teachers should have more control over the assessment controls, teachers should be able to make edits to the assessment questions and answer choices, modifications in IEPs should be able to be carried out in technologically-based reading programs, and teachers want the option of adjusting technologically-based reading programs. Also, computer-based reading instruction and assessment does not provide good teaching/accurate measurement of reading comprehension performance. Both Participants A & B agreed: some stories are not engaging enough for the students and the programs need to offer more diversity in text selection.
**Limitations**

The limitations noted are that the study uses data from educators in Pittsburgh, Pennsylvania only. The sample study size is small. The varying levels of education for the study participants are unknown. The ability of the questions to elicit more in-depth responses is also limited.

**Implications**

With regard to instruction for students with intellectual disabilities, technologically-based reading programs need many improvements. Educators reported that they are not allowed to put students on reading levels that are grade level appropriate to motivate older elementary school readers. As time permits, this study will become the basis for an expansive future study to ascertain data beyond the current limitations. The implications are that students with intellectual disabilities are bored with reading material that may be deemed as immature in nature.

Researchers IstenicStarcic, (2010); and IstenicStarcic, Cotic and Zajc (2013) promoted the use of computer-based instruction as a great means of providing differentiated instruction for learners with intellectual disabilities and simultaneously establishing a more creative learning environment to support teachers in inclusive classrooms. Yet, differentiated instruction is not occurring in all-inclusive classrooms for students with intellectual disabilities to receive differentiated instruction that takes into consideration their need to have appropriate motivating reading instructional technologically-based programs. Teachers described how technologically-based reading programs do not validly assess reading comprehension skills. The implications are that the reading comprehension skills of students with intellectual disabilities are not being accurately measured because the test scores do not truly reflect their current reading comprehension skills levels. Azevedo and Cromley (2014) were mentioned prior as researchers
who questioned reading programs as viable curricula for teaching reading comprehension. This is an example of why researchers are skeptical of whether or not assessment scores are indeed measuring what they are supposed to when teachers cannot set the program controls to ascertain factors associated with reading comprehension skills.

Educators commented that technologically-based programs are not offering multiple versions of reading comprehension questions. The implications are that educators cannot modify the questions to meet students with intellectual disabilities reading instructional needs. Recall that researchers stated that “it is incumbent on teachers to incorporate this new technology into their classrooms as suits their particular instructional needs” (Eagleton & Dobler, 2010, p.6). If educators are to incorporate computers then, technologically-based programs need to be adjusted with individual level vocabulary words so that students with intellectual disabilities can understand what they are being asked about the stories they read to demonstrate accurate reading comprehension skills. Eagleton and Dobler (2010) continued, “Our students are entering an age when knowledge of technology is a necessity and not a luxury, [and] as educators, we are obligated to prepare them for that reality” (p.6). This means that multiple versions of reading questions are necessary to assist students with intellectual disabilities to succeed in this highly technological society. Study participants conveyed that technologically-based reading programs are not meeting the specific reading comprehension skills needed by students with intellectual disabilities. The implications are that students with intellectual disabilities are not being adequately prepared with sufficient reading comprehension skills development, as are, their non-disabled peers in classrooms. As discussed in a previous chapter, Katims (2001) stressed that if inadequate technologically-based reading comprehension programs persist for students with intellectual disabilities, then they will not have the same quality of reading education as their
nondisabled peers. My research study findings showed that students with intellectual disabilities are not receiving the same educational opportunities in classrooms because the technologically-based reading comprehension programs are not fully addressing their reading comprehension skills needs.

Educators recalled that technologically-based reading programs do not allow teachers to edit any of the assessment questions. The implications are that students with intellectual disabilities are not able to understand text material of which they are being assessed. In addition, it was found that technologically based reading programs do not allow teachers to edit any of the instruction items. The implications are that students with intellectual disabilities are not able to understand what they are being taught. Considering the survey results, the findings further showed that technologically-based reading programs do not allow teachers to adjust the technical features. The implications are that students with intellectual disabilities have difficulty focusing on the test items during reading instruction. Bohman (2004) declared computer-based reading programs should have website structures that have a “consistent and predictable screen layout and an uncluttered appearance to be easily usable by students” (p.1).

Rowland (2004) suggested that computer-based resources need to have the following features: left-aligned text instead of justified; narrowed column widths and wide side margins to facilitate easier scanning; short, simple sentences; short paragraphs; bullets or numbers rather than continuous prose when possible; boxes for emphasis or to highlight important text; either bold or a colored background to emphasize keywords and concepts; and headings and titles for paragraphs that increase comprehension (p.2). Again, presenting information in this manner would help students with intellectual disabilities thrive when it comes to strengthening reading comprehension skills by having adjustable controls to help them follow the test items.
Educators communicated that they have no ability to make any modifications that are outlined in IEPs to computer-based reading instruction programs. The implications are that the educational rights of students with intellectual disabilities are being violated according to Special Education laws. Now that the implications from this research study have been identified I can begin to make recommendations based on my analysis to address the issue of technologically-based reading comprehension skills development among students with intellectual disabilities. Focusing on Knowledge as Power in the Zone of Generativity as explained as the “bridge (to) the gap between what is known through research and what education researchers can learn through further study” (Ball, 2012, p.285) will lead to my design for action will draw upon “reflection, introspection, critique and personal voice” to lead educators in discussing my problem of practice (Ball, 2012, p.285). Therefore, it will be possible to impact future generations of individuals with intellectual disabilities by providing access to adequate technology in all elementary schools demonstrating equality in the classroom with computer-based reading instruction, ending low elementary reading test scores and leading to “proficiency”, ending the need for more remediation services at the middle/high school levels, eradicating low to no participation in any post-secondary education, stopping unemployment, ending isolation from one’s community (i.e. negative impact on individuals and communities) and demolishing classism (i.e. marginalizing, labeling, disenfranchisement).


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