THE EFFECTS OF USING AN ONLINE READING PROGRAM TO IMPROVE LEARNING FOR SPECIAL EDUCATION STUDENTS

by

Ryan Scott Saxe

Liberty University

A Dissertation Proposal in Partial Fulfillment

Of the Requirements for the Degree

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APPROVED BY:

Gary Kuhne, Ed.D., Committee Chair

John C. Bartlett, Ed.D., Committee Member

ABSTRACT

Modern day instructional tools, such as technology and digital learning programs, have been created to assist teachers in differentiating instruction for struggling students and catching students up who are not proficient in reading. The Coronavirus 2020 Global Pandemic forced schools and classrooms across the world to move to remote and virtual forms of learning which potentially exacerbates the achievement gap between all students and students with identified learning disabilities. The purpose of this casual-comparative quantitative research study was to determine the extent to which a digital learning program improves learning outcomes in reading for 4th grade special education students from 32 elementary schools in two West Virginia school districts. For this study a convenience sample of 120 learning-disabled students was used which was comprised of 60 special education students that received one year of i-Ready instruction and 60 students that received no i-Ready instruction and instead used a non-digital teacher-led intervention program for instruction. To determine if there is a significant difference in reading achievement on the West Virginia General Summative Assessment of 4th grade special education students who use i-Ready as a reading intervention tool compared to 4th grade special education students who do not use i-Ready as a reading intervention tool, an independent *t* test was conducted. The independent sample *t* test determined that there is a significant difference between the means of special education students who received i-Ready instruction and special education students who did not receive i-Ready instruction program and instead used a teacher led intervention for instruction. The results of this study conclude that the i-Ready program is associated with improved reading scores for students with learning disabilities.

Keywords: special education, digital learning, reading achievement, differentiation, instructional strategy

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List of Abbreviations

American Institute for Research (AIR)

Adequate Yearly Progress (AYP)

Coronavirus Pandemic (COVID-19)

Common Core State Standards (CCSO)

Competency Based Learning (CBL)

Council of Chief State Officers (CCSO)

Dynamic Assessment Technique (DAT)

Elementary and Secondary Education Act (ESEA)

English Language Learner (ELL)

Every Student Succeeds Act (ESSA)

Individuals with Disabilities Act (IDEA)

International Association for K12 Online Learning (iNACOL)

Local Education Agency (LEA)

National Assessment of Educational Progress (NAEP)

No Child Left Behind Act (NCLB)

Ohio State Test (OST)

Professional Learning Community (PLC)

Response to Intervention (RtI)

School Year (SY)

Socio Economic Status (SES)

Standards Based Grading (SBG)

Science, Technology, Engineering and Math (STEM)

West Virginia Department of Education (WVDE)

West Virginia General Summative Assessment (WVGSA)

Zone of Proximal Development (ZPD)

CHAPTER ONE: INTRODUCTION

Overview

There is a plethora of research over the past two decades that has established the extent to which children achieve grade level reading mastery, especially by the third grade, is a strong indicator of student achievement, and success later in life (Johnston et.al., 2015). As a result, many school districts employ academic reading interventions to catch students up to expected grade level proficiency. However, while improving achievement of students without learning disabilities can be difficult, an even greater charge is to close the achievement gap and catch students with learning disabilities up with their peers so they can progress successfully to the next grade level. Chapter One will introduce information about a continuing national trend of low reading performance of 4th grade students. In addition, the chapter will identify the research problem, the purpose of the research and the research questions.

Background

According to a recent release of the 2019 National Assessment of Educational Progress (NAEP) results, only 35% of the Nation's fourth grade students scored proficient in reading and in West Virginia only 30% of fourth grade students scored proficient (U.S. Department of Education, 2019). With nearly two thirds of the nation's fourth grade students not reading on grade level many school districts across the country are scattering to find quick solutions to the pervasive issue of students not having fundamental reading skills by third grade.

Historical Context

Improving academic outcomes, especially in reading, has been a task many schools and districts have been battling for many years. After the passage of No Child Left Behind (NCLB) legislation in the early 2000's the race to improve academic outcomes for students across the

nation was in full swing mostly due to the level of accountability that was expected to rapidly improving school performance. While educators across the country have participated in a plethora of professional development offerings and training, designed to improve instructional practice, the achievement gap has widened and special education students have been arguably left behind (Edinger & Edinger, 2019). The Coronavirus Pandemic (COVID-19) that hit the United States in early 2020 will only widen this gap as schools across the country were forced to cease face-to-face traditional instruction and close schools. It is also argued that with the national teacher shortage facing states, the quality and preparedness of highly effective teachers in districts and schools is waning (Edinger & Edinger, 2019). Many schools struggle to get certified teachers in reading and as a result resort to hiring teachers that earn their credentials and certification while working as an educator. In these situations, the teacher is learning the craft of becoming an effective teacher while working with students (Edinger & Edinger, 2019).

According to Christodoulou et al. (2015) instruction delivered to students with the primary focus to master reading fluency can provide a better opportunity for students to improve their reading skills and catch them up to grade level expectations. Federal, state and district accountability measures require today's schools to ensure high quality instruction and learning is taking place (Edinger & Edinger, 2019). The capacity to teach content, especially reading, is a skillset that requires focused training and high quality professional development opportunities for educators (Christodoulou et al., 2015). The process in which students learn best must also be mastered. High quality instructional practices that ensure process, procedures, high level questioning, active student engagement, and quality cognitive learning takes place is a skill that takes time significant time to fully master (Edinger & Edinger, 2019).

One initiative that research has tied to high quality instructional practice is the implementation of a multi-tiered system of support (MTSS) to ensure all students' learning needs are being met (Lillenstein, 2015). Furthermore, the Mathew Effect, which suggests that "good readers improve their reading skills faster than poor readers over the years by taking advantage of their fluent and unobstructed exposure to reading" must be addressed as early as possible in the primary and intermediate grades (Protopapas, Sideridis, Mouzaki, & Simos, 2011, p. 402). Hayes and Lillenstein (2015) found that "MTSS creates a structure for the delivery of high-quality instruction and, when needed, additional supports and interventions varying intensity" (p. 4). The MTSS process, while a useful process to identify students for services, is not meant to be a special education program or required process. Rather, the MTSS process is a tool used to ensure preventative measures are used and to make certain all students are progressing towards mastery. In alignment with Vygotsky's Social Development Theory and Bandura's Social Learning Theory, Harris (2017) found that "effective learning can be facilitated through the application of Tier III interventions by specially-trained teachers/instructors" (p. 74). It is important to note that the complete effectiveness of the MTSS process is still being evaluated for effectiveness by school districts because empirical evidence on its effectiveness is somewhat limited (Dulaney, Hallam, & Wall, 2013). With the advent of MTSS process, instructional practices have evolved the traditional classroom from a room where students sit in neat and tidy rows to a room where students are grouped differently, during different times of the day, to allow for collaboration and differentiation based upon the already-acquired skills of students (Harris, 2017).

Social Context

Over the course of the past two decades, while teacher efficacy around implementing MTSS has gained momentum in classrooms, several other societal shifts have been taking place (Harris, 2017). As a result, educators are being pushed to improve the quality of their instruction delivery and instructional practice (Benner et al., 2013). Educators are finding it difficult to educate all students, especially with the increasing number of non-English speaking students entering U.S. classrooms (Benner et al., 2013). According to Kelly Watts, Assistant Superintendent for Instruction and Leadership Services for Cabell County Schools (personal communication, December 1, 2019) many educators will argue that today's students learn differently than students from a decade or two ago. One of the greatest differences from students of today to a student of the 1990's is that today's students have never experienced not having access to an electronic device of some sort (K. Watts, personal communication, December 1, 2019). Today's students "have grown to expect that the institutions designed to provide them a free and appropriate education will respond to their inquiries without delay" (Dumas, 2019, p. 1). In today's schools, computers and technology can be a positive role in personalizing education for students (Srisawasdi et al., 2012). However, schools are facing other cultural shifts like large increases in the number of students with learning disabilities due to societal issues, which include the opioid crises facing many communities across the nation (K. Watts, personal communication, December 1, 2019). Because of these societal shifts, the need to identify interventions that can close the achievement gap for students with learning disabilities is of paramount concern. According to Wiliam and Leahy (2015) society has already begun to impose new expectations in learning, and as a result, some schools are doing a better job providing opportunities for students to learn.

Accordingly, many school districts are turning to on-line instructional programs, like i-Ready, to provide MTSS reading interventions to students. “Curriculum Associates’ i-Ready Assessments and i-Ready Instruction combine valid and reliable assessments with sophisticated instructional resources targeted to each student’s specific academic needs” (Curriculum Associates, 2019, p. 11). Wiliam and Leahy (2015) found that one of the greatest impacts on learning occurs in a classroom where the teacher and students are extremely cognizant of the students’ progress through frequent formative assessments. Curriculum Associates (2019) asserts that through the use of an i-Ready Diagnostic students will be exposed to a personalized learning path through the web-based learning platform. “Once placed in i-Ready Instruction, students receive a unique lesson plan consisting of digital lessons designed to fill knowledge gaps and help all learners access grade-level content” (Curriculum Associates, 2019, p. 11). Dumas (2019) found that effective formative assessment is contingent on the actions of both the student and the teacher each day. Thus, an electronic platform that can provide high quality data to the learner and the teacher could be highly desirable. Wiliam and Leahy (2015) found that short-cycle formative assessments, which takes place anywhere from six seconds to ten minutes, has the greatest impact on student achievement.

Conceptual Framework

Vocabulary knowledge is critical to developing strong reading comprehension skills (Reutzel & Cooter, 2008). Further, Manyak et al., (2014) postulate that vocabulary can present an obstacle to long-term reading success. Therefore, the scaffolding of instruction for students around vocabulary word acquisition is fundamentally important to building strong readers. Bruner (1983) described scaffolding as a process to which learning for a child is made easier by increasing the complexity of learning material only after the child has shown enough skill to

demonstrate mastery. Marzono (2004) established the Six Step Vocabulary Building Process that has a multitude of research-based strategies to build word understanding. The MTSS process is a vehicle to help tier and scaffold instruction by affording educators the structure to use research-based interventions. Furthermore, Benner et al. (2013) establishes that an effective intervention system should have a structured data collection process for each tier of the MTSS process. In addition, the research by Mersand (2015) found that i-Ready was in closer alignment with the Common Core State Standards (CCSO) than three other reading assessment programs. Mersand's (2015) research also asserted that a data driven instructional focus affords districts and schools the opportunity to have accurate and reliable data so that instruction can be modified and improved.

Research indicates that a process of supporting learning needs of students, like the MTSS process, can be an effective tool to catch students up in learning (Dumas, 2019). The MTSS process coupled with online learning programs, such as i-Ready, have shown that they can be successful in improving students' academic outcomes (Curriculum Associates, 2015). However, because many schools across the country are shifting instruction to online and remote learning activities due to COVID-19 additional research on the effectiveness of online learning programs, and the extent to which students with learning disabilities are able to achieve on grade level reading proficiency, is warranted.

Problem Statement

According to the U.S. Department of Education (2019) a large percentage of students score below their reading grade level, especially when entering the 3rd grade, which creates multiple barriers to student achievement, success and graduation. Children with identified deficiencies in reading, especially students with learning disabilities, struggle to learn and retain

strategies to develop strong reading skills (Christodoulou et al., 2015). Traditional methods of teaching reading have proved to be less than effective for children with learning disabilities (Christodoulou et al., 2015). The needs of all learners is expansive and diverse with some students identified with learning disabilities, others with limited English proficiency, and in some cases both (Hanover, 2019).

Grade level reading mastery has been found to be a strong indicator of student achievement in later grades and in life (Johnston et al. 2015). There is extensive research in identifying systems that support remediating students with academic deficiencies (Christodoulou et al., 2015; Grimaldi & Robertson, 2011; Hanover, 2014; Hanover, 2019; Hunter et al., 2015). Christodoulou et al. (2015) found students with reading disabilities require additional opportunities to develop the skills needed to become proficient readers. However, school districts nationwide continue to struggle in closing the reading achievement gap while also ensuring all students can read by 3rd grade (Hanover, 2019).

It is extremely difficult for districts and schools to have a standalone intervention program that addresses the needs of all learners (Hayes & Lillenstein, 2015). While it is greatly understood that students with reading and learning disabilities require additional interventions, there is a gap in research around the success of online instructional programs, like i-Ready, and the impact these programs have on students with learning disabilities compared to their non-disabled peers (Hanover, 2019). Computer-based instructional programs like i-Ready have limited research on the effectiveness of their programs for all students. As such, it is important that educators know the extent to which students with disabilities are improving over the course of a typical school year on the i-Ready program. As schools look for programs that meet the needs of all learners, understanding the effectiveness of online intervention programs is an

important factor. The problem is that the literature has not addressed the effectiveness of the i-Ready program in addressing achievement gap for students with learning disabilities.

Purpose Statement

The purpose of this casual comparative quantitative research study was to determine the effect of i-Ready, the independent variable, on reading proficiency on 4th grade students with disabilities. In this causal-comparative study 4th grade special education students from 32 elementary schools were assessed on the extent to which they exhibited improved 4th grade West Virginia General Summative Assessment (WVGSA) reading scores when compared to their 3rd grade WVGSA reading scores. Within the study the independent variable is special education students' participation or nonparticipation of the i-Ready program and the dependent variable is student achievement. Special education students are defined as students who have an identified learning disability and have an active Individualized Educational Plan (IEP). Student achievement is defined as the WVGSA scale score for reading. Some of these students were exposed to the consistent usage of the i-Ready program during their 4th grade year. The WVGSA scores of special education students who used i-Ready as an instructional intervention will be compared to special education students who did not receive i-Ready instruction and instead used a non-digital teacher led intervention program. This comparison was used to determine the extent to which the i-Ready program improved special education student reading scores on the WVGSA.

Significance of the Study

The implications of this research are far reaching as this study contributes to the research for the effectiveness of online instructional program use for students with learning disabilities. In addition, identifying the effectiveness of online instructional programs and their ability to close

achievement gaps between regular education and special education students, especially at a time when school closures due to COVID-19 have potentially exacerbated the achievement gap, are extremely beneficial. Furthermore, this study addresses the gap in literature and research on the effectiveness of online learning programs for special education students. Prior to this study, there was limited research on the impact online programs have on closing the achievement gap for special education students in West Virginia. The West Virginia Department of Education indicates that instructional interventions must utilize multiple strategies and assessments to ensure students' mastery of the content standards (West Virginia Department of Education, 2018). In addition, the West Virginia Department of Education (2018) has indicated the strong need for effective interventions to be implemented in the early grades. The results of this study will be of great significance to elementary educators if the research indicates online academic support programs, like i-Ready, can be used as a school-wide academic support program. The empirical significance of evidence that indicates an effective school-wide academic support program that adequately prepares all students, regardless of special education classification, is tremendously far reaching for educators in West Virginia. From a practical standpoint, it is fundamentally important that struggling students receive comprehensive academic support around each of the major components of reading instruction which include fluency, phonics and word recognition, comprehension, knowledge of language and vocabulary acquisition (West Virginia Department of Education, 2019).

Research Question

RQ1: Is there a significant difference in reading achievement on the West Virginia General Summative Assessment of 4th grade special education students who use i-Ready as a

reading intervention tool compared to 4th grade special education students who do not use i-Ready as a reading intervention tool.

Definitions

1. *Common Core State Standards (CCSS)* – A unified set of standards by which all students learn (Coburn et al., 2016).
2. *Formative Assessment* – the frequent evaluation of student learning for the purpose of modifying instruction to improve learning outcomes for students (O'Meara, 2011).
3. *i-Ready* - i-Ready is an adaptive Kindergarten through 12th grade computer-based diagnostic and instructional intervention tool aligned to CCSS for reading and mathematics (Curriculum Associates, 2016).
4. *Multi –Tiered System of Supports* – Multi-Tiered System of Supports (MTSS) is an instructional framework that ensures teachers provide multiple tiers of support and instruction through the use of frequent data collection (Stoiber, 2014).
5. *Special Education* – Special education is term used to describe students identified with learning disabilities (West Virginia Department of Education, 2019).
6. *West Virginia General Summative Assessment* – The West Virginia General Summative Assessment (WVGSA) is an assessment completed at the end of grade levels, third through eighth grade, in the State of West Virginia. This is an assessment of the learning that has occurred over the course of the school year (West Virginia Department of Education, 2019).

CHAPTER TWO: LITERATURE REVIEW

Overview

This chapter opens with the theoretical framework based upon Bruner's (1966) constructivist theory and Vygotsky's (1986) sociocultural learning theory. The theoretical framework section is followed by a thorough review of the related literature. The related literature identifies a historical perspective of educational legislation, multi-tiered systems of support (MTSS), intervention and enrichment programs, competency based programs, and the i-Ready online instructional program. Finally, the chapter concludes with a summary.

Theoretical Framework

From the early days of President Thomas Jefferson, the notion that all students are entitled to a quality education continues to define the progress of society. Modern day education advocates like Horace Mann shaped our public education system and believed all children deserved a high quality education. This notion led theorists and educational practitioners to carefully identify the manner in which children learn best. Public policy and educational accountability has driven research to identify how students learn and how children of various backgrounds and challenges learn best. Research over the last decade continues to shape the strategies and resources educators implement to teach children. Even with vast research outlining what works best, our schools struggle to teach all students to read proficiently (U.S. Department of Education, 2019).

Sociocultural Learning Theory

The i-Ready program is based on the principles of the situated learning theory which theorizes that learning is situational and must occur within authentic contexts and are embedded in activities and culture (Lave, 1988). The situated learning theory has roots to the earlier

theories of Bruner's (1966) constructivist theory and Vygotsky's (1986) sociocultural learning theory. While the constructivist theory hypothesized that learners build knowledge from the context of the learning interaction, the social cultural theory of learning at the Zone of Proximal Development (ZPD) postulates that learning is a dynamic social process where learning occurs slightly above the level at which learners can learn on their own, without additional guidance from a peer or instructor (Wink & Putney, 2002).

Vygotsky's theoretical framework suggests students develop a capacity for learning how to read through relationships and social interactions between teachers and their students (Vygotsky, 1986). In addition, Vygotsky (1986) believed students must develop confidence mastering content and skills before attempting to learn new information. Vygotsky (1986) further believed that the social interactions between student-to-student and student-to-teacher provided greater opportunity for students to acquire and retain knowledge.

While the ZPD emphasized the concept of scaffolding, Vygotsky never specifically used the term in his research or conclusions (Wells, 1999). However, Wood, Bruner and Ross (1976) developed the concept of scaffolding instruction in an effort to articulate the process by which teaching occurs in the ZPD (Wells, 1999). Bruner (1983) described scaffolding as a process through which learning for a child is made easier by increasing the complexity of learning material only after the child has shown enough skill to demonstrate mastery. In addition, Vygotsky asserted that the abilities of children with intellectual disabilities would be miscalculated if educators didn't consider the process by which children learn (Rutland & Campbell, 2006). Thus, Vygotsky took into consideration children with intellectual disabilities when developing the theory of ZPD (Rutland & Campbell, 2006). Further, what Vygotsky was actually suggesting is what is commonly known in today's research as dynamic assessment

techniques (DAT) (Jitendra & Kameenui, 1993). One of the methods of DAT requires the assessment has a graduated prompting procedure in which questions become more complex throughout the assessment (Rutland & Campbell, 1996). Furthermore, traditional assessments that do not increase, or respond to the examinees responses, have noted failures by many modern day theorists (Brown & Ferrara 1985; Brown & Campione 986; Feurersetein 1979; Gallimor et al., 1989; Lidz 1992).

Research continues to demonstrate that DAT are beneficial when assessing students with learning disabilities (Rutland & Cambell, 1996; Landtolf & Poehner, 2010; Farangi & Zahara, 2017). Gallimore et al. (1989) found that if educators only use traditional assessment methods without the use of assistance to the student then the educator could "seriously underestimate the abilities of many at risk students" (p. 60). Feuerstein et al. (1991) found that for children with intellectual disabilities, employing DAT can significantly assist in the process of accurately assessing students' abilities.

Schema

In addition to Vygotsky's theory of ZPD, Bartlett (1932) developed the term schema to describe background knowledge and its importance for language comprehension. While Bartlett (1932) was the founder of the term schema, he didn't develop a sound theory of how it impacted the development of the reading process (Liu, 2015). It wasn't until Rumelhart (1980) further defined schema as the "building blocks of cognition" (p. 34) that schema started to play a role in defining the process of reading. According to Liu (2015), through the development of cognitive psychology in the 1970s, scholars began to recognize that schema relates directly to the theory that prior knowledge impacts readers' understanding and learning from text (Minsky, 1975; Schank & Abelson, 1977; Sanford, 1981; Liu, 2015). Anderson (2012) further simplified the

definition of schema by indicating that it is construct of one's knowledge and past experiences which allows for new information and knowledge to be formed. The schema theory, much like the ZPD theory, suggests comprehension occurs through the interaction between reading text in which new information is associated with background knowledge or saved information in long term memory (Farangi & Zahra, 2017).

The Sociocultural Learning Theory and Supporting Struggling Readers

Applying these conceptual frameworks into a process which teachers can use to help students learn created the concept of multi-tiered system of supports (MTSS). The MTSS process, which was born out of the 2004 reauthorization to the Individuals with Disabilities Education Act (IDEA), is process by which students are grouped and tiered into one of three levels and provided scaffold instruction throughout the instructional delivery. Through the MTSS process, 21st Century educators have a process and structure to use research-based interventions based upon the individual needs of the learner (Hunter et al., 2015). MTSS promotes rigorous curriculum, instruction that addresses students' specific learning needs, and a continuum of gradually intense instructional support (Hunter et al., 2015). The MTSS process utilizes continuous monitoring of student learning through the utilization of data that can drive instructional delivery and resource changes (Hayes & Lillenstein, 2015). Through this process of ongoing progress monitoring, frequent formative assessments, and instructional change educators are more capable of accurately modifying instruction based upon the needs of their students (Cortiella & Horowitz, 2014; Pierce & Mueller, 2018).

Each of the theories discussed in this study contribute to the overall idea that the i-Ready program helps students learn reading material by scaffolding instruction, which is tailored to the specific needs of the learner, and through a program that provides activities that are put into the

appropriate contextual needs of the learner. This research has the potential to provide evidence that these theories can be applied in a manner conducive to 21st Century learning tools such as online instructional programs or computer applications.

Related Literature

Reading is an essential skill that can determine the extent to which a student can achieve academic success (Levine, Ferenz, & Reves, 2000). Unfortunately, students with identified reading disabilities continue to fall further behind their peers (U.S. Department of Education, 2019). As a result, many school districts utilize academic reading interventions to catch up struggling students, including those with disabilities, to required reading level proficiency.

Research on the importance of early childhood education has assumed a more prominent place in national-level discussions about education (Freedburg & Frey, 2017). From the time No Child Left Behind (NCLB) legislation was enacted, early literacy achievement continues to be considered an essential skill which needs to be evaluated (Freedburg & Frey, 2017). The latest research and educational experts conclude the extent of language and literacy skills acquired by students in the primary grades have significant and lasting effects on later achievement (Freedburg & Frey, 2017; Hanover, 2019; Hebbeler & Spiker, 2016). While other factors such as a child's socioeconomic status or the identification of a learning disability can create learning gaps, these gaps can persist through a child's elementary education without properly being addressed by educators (Freedburg & Frey, 2017). Moreover, students that never attain reading proficiency are more likely to drop out of school and not graduate (Freedburg & Frey, 2017).

Society and the context of how students learn in the 21st Century continues to evolve and as such, many believe that today's educational system is flawed and is not meeting the learning needs of students (Hebbeler & Spiker, 2016). However, as many industries have evolved with

the modernization of our society, education has developed a one size fits all feel and teaching is not differentiated to the individual needs of learners (Freedburg & Frey, 2017).

According to the National Assessment of Educational Progress (NAEP) (2019) results, two thirds of the nation's fourth grade students are not reading on grade level. As such, many school districts across the country are looking to current research that can mitigate the issues teachers face with struggling readers. Hebbeler and Spiker (2016) asserts that the model for education needs to evolve into a system that is student centered and customized to the learning needs of each student. While the student learning crisis did not happen overnight, the strategies for addressing struggling readers, especially those with learning disabilities, and improving educational outcomes continues to evolve over time with the passage of different legislation aimed increasing the educational accountability of educators.

History of Educational Accountability in the United States

The Elementary and Secondary Education Act (ESEA) was passed in 1965 under the leadership of President Lyndon Johnson. The ESEA was created as a strategy to address poverty throughout the country and is arguably one of the most significant pieces of legislation ever created by the federal government (Bishop, 2015; Fusarelli & Ayscue, 2019). Under the ESEA, Title I was created to provide resources for programs supporting children of poverty (Parker, 2005). The ESEA was required to be reauthorized every five years to address priorities and issues that were established by Congress, which continue to evolve over time (Bishop, 2015). The ESEA also created a system of accountability for local education agencies (LEAs) and school districts across the country (Parker, 2005). Following several rounds of ESEA reauthorization, President George W. Bush signed into law the No Child Left Behind Act of 2001 (NCLB). This law, which reauthorized the ESEA, required any LEA or school receiving

federal funds, like Title I dollars, to administer statewide standardized tests to all students. Thus, the NCLB legislation increased the accountability pressures placed on schools to improve academic outcomes for students (McMurrey, 2014). After many years of NCLB being the law of the land, President Barack Obama, in an effort to fix NCLB so that teachers and schools had the resources to meet the vigorous goals established by NCLB, reauthorized the ESEA by signing into law the Every Student Succeeds Act (ESSA). Under ESSA, accountability is still predominant, however greater flexibility was reported to be a significant change to the law (Domenech, 2015). Even so, no matter how flexible the law became, the accountability factor still weighs on education leaders and teachers to ensure all students have the necessary skills to be successful (Domenech, 2015).

The Elementary and Secondary Education Act (ESEA)

According to Bishop and Jackson (2015) the ESEA afforded the United States government a manner by which LEAs, school districts, and schools could utilize funding to support children of poverty, school instructional materials, and educational training among other things. Johnson shared the views of Horace Mann, an educational reformer from the early 1800s (McMurray, 2014). Horace Mann believed that public education was basic human right and called it the great equalizer between those with financial resources and those without (Fife, 2018). While Horace Mann is credited with establishing the need for a free public education movement, the idea stretches back to the early 1800s when Thomas Jefferson advocated the idea of free public education in his writings (Fife, 2018).

When President Johnson signed the ESEA into law it was on the heels of the 1954 U.S. Supreme Court decision of *Brown v. Board of Education* (1954). The Brown case established state laws separating black and white schools as unconstitutional *(Brown v. Board of Education*

1954). President Johnsons' ESEA required all students access to a high quality education, regardless of race or socioeconomic status (Domenech, 2015). While Johnson's goal was to improve the learning outcomes of economically disadvantaged students, some believe that the creation of ESEA negatively impacted the very students it was meant to help (McMurrey, 2014).

There is continued debate over the inequities of the nation's educational system (McMurrey, 2014). The argument is primarily based on the perceived differences in resources for schools in disadvantaged areas compared to affluent areas and the belief that many of our country's most at risk student populations do not have access to high quality educational opportunities (McMurrey, 2014). While ESEA was meant to improve equal educational opportunities for students, the legislation fell short of addressing the equity of educational opportunities (Domenech, 2015). In President Johnson's defense, the context of how policymakers and the public think about education accountability was much different than how it exists today (Bishop & Jackson, 2015). The evolution of society and the values society places on the importance of closing the gap in resources and achievement between the haves and have nots led to a national campaign to improve public education (Bishop & Jackson, 2015). As a result, President George W. Bush sought to improve public education with the passage of NCLB (Bishop & Jackson, 2015).

No Child Left Behind Act (NCLB)

For the 2002 reauthorization of ESEA, President George W. Bush signed into law the NCLB Act. This law required any ELA or school receiving federal funds, such as Title I dollars, to administer statewide standardized tests to all students. NCLB was the first performance-based accountability policy which required public schools, receiving federal funding, to make adequate yearly progress (AYP) in math and reading subgroups, which included but was not limited to

special education, sex, race or ethnicity, socioeconomic background, and English speaking status, each year (Mitani, 2018). NCLB was a historical piece of educational legislation that created a foundation for which public education would be measured for at least the next two decades (Mitani, 2018). According to the NCLB law, schools' sub group category scores, which made up the percentage of students who are deemed proficient, were required to reach 100% by the year 2014. In addition, the federal government would ensure the validity of each state assessment tool by conducting the National Assessment of Educational Progress (NAEP), which assessed a sample of fourth, eighth, and 12th grade students (McAndrews, 2013). The requirements of NCLB also required schools' state assessment scores to be made public and if AYP measures were not met, districts and schools were subject to consequences that were frequently met with embarrassment among educators (Mitani, 2018). The most severe consequences for schools not meeting AYP annually under NCLB was the possibility of the school being reorganized or closed (Mitani, 2018). While the stress level of meeting AYP among educators was high, the overall perceptions on the success of NCLB legislation was mixed (Gosnell-Lam et al., 2013). According to Gosnell-Lam et al. (2013), school principals believed the focus on formative assessments and a focus on data was an effective strategy to improve academic outcomes for all students. However, teachers reported a negative perception of NCLB because of the amount of curriculum needed to cover before the required state assessments, the increase in paperwork for accountability purposes and increased stress levels (Gosnell-Lam et al., 2013).

McAndrews (2013) also asserted NCLB had several consequences that were unintended, one of which was states started to lower the standards for what constituted student proficiency in reading and mathematics. The lowering of standards and pressure to meet AYP ultimately left

stakeholders feeling as if schools were teaching to the test in order to have improved reported results on annual state assessments (McAndrews, 2013).

Common Core State Standards (CCSS) and Race to the Top

During the years of NCLB implementation the National Governors Association (NGA) and the Council of Chief State Officers (CCSO) unveiled a bold plan of aligning content standards across the country called the Common Core State Standards (CCSS) (Coburn, Hill & Spillane, 2016). The CCSS were ambitious and required students to learn content through disciplinary reasoning and develop the skills necessary to make inferences (Coburn, Hill & Spillane, 2016). While the concept of having a unified set of standards by which all students should learn was an understandable goal, the implementation of the CCSS was an aggressive change to the philosophy of how students should learn from a pedagogical approach (Coburn, Hill & Spillane, 2016). As of 2018 more than 40 states had adopted the CCSS (Coburn, Hill & Spillane, 2016).

Adoption of CCSSs was not without critics. The change in practice and pedagogy in the nation's classrooms, due to the new CCSS, spurred a significant amount of debate. Because textbook publishers were limited in diversifying content they were incentivized to gear curriculum towards a generic national requirement rather than what local schools and districts actually needed (Hodge et al., 2019). The adoptions of CCSS was met with a great deal of political resistance which primarily surrounded the personal beliefs of individuals regarding the required content in science and in social studies standards, as well as, severe criticisms of the methods and processes required for teaching math standards (Hodge et al., 2019). However, these political challenges were not the only issue facing CCSO adoption. Hodge et al. (2019) argues that the adoption of the CCSOs ultimately created a sentiment that challenged traditional

textbook companies in the curriculum and instruction marketplace. As such, in order to survive political pushback of CCSOs and changing landscape of the digital curriculum age, text book publishers and curriculum providers have started shifting philosophies and marketing strategies to customize and individualize their products to the needs of students rather than the needs of national policy (Hodge et al., 2019).

In addition to the national movement in adopting the CCSS many states have also embraced the increased accountability by overhauling their teacher evaluation systems to reflect the need for improved student learning outcomes (Coburn et al., 2016). Moreover, numerous states were compelled to make these massive changes as they competed for large federal funding opportunities through President Barack Obama's Race to the Top initiative (Coburn et al., 2016). The Race to the Top initiative incentivized many states across the country to redesign their teacher evaluation systems and develop school turnaround models (Coburn et al., 2016). The implementation of CCSS and the Race to the Top initiatives, which include new accountability mechanisms and unified rigorous standards, sought to improve student achievement for all students "by influencing how teachers teach and how students learn" (Coburn et al., p. 243).

Every Student Succeeds Act (ESSA)

In 2015, President Barack Obama signed into law the ESSA after years of criticism facing NCLB. The primary purpose of the ESSA reauthorization was to address many of the NCLB issues, which included the emphasis on standardized tests and measures that held educators responsible for student achievement (Fusarelli & Ayscue, 2019). While NCLB was heavily criticized, it brought attention to the need to make sure our most vulnerable students' needs are being met (Fusarelli & Ayscue, 2019). Never before were subgroups of race, special education identification, socioeconomic status, or English speaking ability, considered to the

extent that NCLB required (Fusarelli & Ayscue, 2019). Ultimately, NCLB made it impossible for communities and stakeholders to ignore persistently low performing students and schools (Fusarelli & Ayscue, 2019).

While ESSA provides flexibility to NCLB requirements, ESSA still requires states to address equity issues for all students. In addition, states must qualify for approval from the federal government to implement flexibility to NCLB by specifically addressing how equity will be achieved (Fusarelli & Ayscue, 2019). In addressing the equity issues among students, ESSA continues to focus importance on issues that prior legislation sought to address, which is the increased academic outcomes for all students (Fusarelli & Ayscue, 2019). In an effort to address equity issues, ESSA is very specific in detailing which schools need aggressive intervention (Korte, 2015). However, the flexibility ESSA provides doesn't prescribe the strategies that shall be used in order to ensure all students are learning and that schools are continuously improving (Korte, 2015). Specifically, ESSA requires that schools which receive federal funding and fall within the bottom 5% of reading and math performance, a high school graduation rate of less than 67% and schools with subgroups of students who consistently exhibit non-proficiency on state assessments are subject sanctions based upon the state's approved accountability plan (Korte, 2015).

Interestingly enough, there has been more upheaval in the nation's educational system since the passage of ESSA than there has been in the last three decades (Bohan, 2018). While resistance to change always plagued educational reform, none are as aggressive and divisive as recent teacher strikes across the country (Bohan, 2018). Teacher strikes have bloomed across states as reformers call for greater accountability with the resources already provided to districts,

schools and teachers (Bohan, 2018). Educational leaders struggle to find a balance between implementing ESSA and supporting the needs of teachers in classrooms (Bohan, 2018).

Continuous School Improvement

Traditionally, research on school and classroom effectiveness has primarily concentrated on student learning outcomes and school and classroom environments (Scherer & Nilson, 2019). In addition, school culture and climate are also considered important factors in what can define a high performing school; they alone are not the only prerequisites (Scherer & Nilson, 2019). DuFour and Reeves (2016) assert that continuous school improvement is highly dependent upon the effectiveness of a professional learning community (PLC) within the school. Furthermore, effective PLCs can improve teaching and learning dramatically (DuFour & Reeves, 2016). However, effective PLCs use an assessment process to continuously monitor data which assists in guiding and modifying instruction to meet the diverse sets of learning needs within a classroom and school (DuFour & Reeves, 2016). The quality and frequency of how well a school PLC is able to obtain relevant and useful data, especially instructional data around reading and mathematics, is extremely important (DuFour & Reeves, 2016). Moreover, the ability to respond to individual needs is fundamentally important in a school that has a continuous improvement philosophy (DuFour & Reeves, 2016). DuFour and Reeves (2016) also assert that in order to have an effective school improvement process which leads to quantifiable progress in student learning, school must employ high quality PLCs that utilize academic interventions that are based upon reliable sources of student performance data.

Continuous school improvement is very much a cyclical process that affords schools and teachers a process by which they can set goals, identify improvement strategies, and evaluate changes (DuFour & Reeves, 2016). Furthermore, this process is required for what many

researchers have identified as the required systemic and sustainable change needed to improve schools (Sparks, 2018). While the data sets that school leaders and teachers monitor through this process the can include cultural and climate data, attendance, graduation rate, college readiness, and academic performance indicators (Spark, 2018). While academic data can include proficiency, academic growth, course completion rates and college readiness indicators, many accountability systems include reading and math proficiency (Sparks, 2018). One of the primary reasons that reading and math proficiency is so highly used is because they are the foundational building blocks for future learning (Miller et. al., 2017).

Learning to Read through a Multi-Tiered Systems of Support (MTSS)

Learning to Read

For many children learning to read poses many barriers and challenges (Seidenberg, 2017). While there are many factors that can impact a student's ability to read effectively, research has shown that there are some factors that can have a positive impact on a child's ability to read. These factors include early introduction to early literacy activities, the quality of early childcare and pre-kindergarten programs, English Language Learner (ELL) proficiency, and family socioeconomic status (Lemons et. al, 2014).

According to Kasper et al. (2018) reading proficiency has two determinant qualities which include reading outcomes and the will to read. Specifically, reading outcomes encompass the extent to which an individual has vocabulary knowledge and can comprehend the meaning of text and the will to read is the extent to which an individual enjoys reading (Kasper et al., 2018). According to Kasper et al. (2018) a good reader exhibits both qualities. However, while an individual can master vocabulary knowledge and understand the meaning of text with proficiency, if they do not get enjoyment out of reading then academic progress in other areas

can be hindered, making it difficult to maintain reading effectiveness over time (Kasper et al., 2018). Therefore, it is important for teachers to develop students' vocabulary and comprehension skills as well as a focus on building students interest in reading every day (Kasper et al., 2018).

Research also indicates children who are not proficient readers will also struggle in other academic areas because curriculum in other academic content areas and higher grade levels require independent reading skills (Kuo, 2014). Recognizing with specificity the reading skills deficits of children is fundamentally important step to addressing the individual needs of the learner (Kuo, 2014). Therefore, the use of the MTSS process is an important tool to ensure the individual learning needs of students are being met.

Multi-Tiered System of Supports (MTSS)

Born out of the 2004 reauthorization to the Individuals with Disabilities Education Act (IDEA), a framework for supporting the learning needs of students with various academic and behavioral needs called MTSS was established (Karah, 2018). Through the MTSS process students are grouped and tiered into one of three levels based upon their academic or behavioral needs and provided scaffolded instruction (Fuchs & Vaughn, 2012). These levels and descriptions are found in Figure 1. According to Karah (2018), through implementation of the MTSS process students are provided academic or behavioral supports which include:

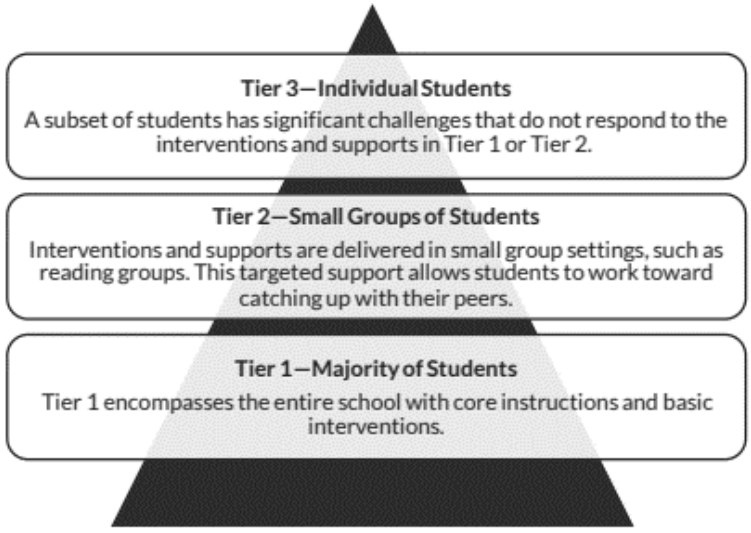
- Universal screening of students at the beginning of the school year;
- Tiered instructional or behavioral interventions that can be increased or decreased;
- Continuous data collection and assessment of student progress.

According to Hunter et al. (2015), MTSS promotes rigorous curriculum, instruction that addresses students' specific learning needs, and a continuum of gradually intense instructional

support. The continuum of support includes resources, structures, and instructional practices which address the needs of struggling students who are placed into three different tiers (Hunter et al., 2015). In addition to the different instructional delivery levels, a system of data collection is utilized throughout the MTSS process to monitor student progress within each tier (Cortiella & Horowitz, 2014).

Figure 1

Multi-Tiered System of Support Tiers of Instructional and Behavioral Interventions



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There are several benefits to using the MTSS process as an instructional tool. Two major benefits include early intervening and the identification of learning disabilities (Kuo, 2014). Early intervening is a term used in the IDEA (2004) which references preventative services to children before they are identified as having a learning disability (Kuo, 2014). The term early intervening differs from the term early intervention which refers to special education services used for young children and early intervening is a practice applied to all children regardless of if they have a learning disability (Kuo, 2014). Furthermore, the importance of early intervening is

paramount as research by Lemons et al. (2014) indicates without early effective interventions it is unlikely struggling readers will catch up to their peers.

Research also indicates many students do not receive the required intensive instruction until after they are identified with a reading disability (Kuo, 2014). Therefore, utilizing a process to intervene early is a fundamentally important strategy for teachers as they work to close the achievement gap to make sure all students can read. It is through the MTSS process, educators have a process and structure to use research-based interventions based upon the individual needs of the learner (Hunter et al., 2015).

The MTSS process utilizes continuous monitoring of students' learning through the utilization of data that can drive instructional delivery and resource changes (Hayes & Lillenstein, 2015). An important characteristic of the MTSS process, which includes the instructional strategy concept of MTSS and early intervening is that they both provide research-based intervention when any student, including students with learning disabilities, begin to fall behind and struggle (Hayes & Lillenstein, 2015). The MTSS process provides the differentiated supports and evidence-based practices aligned to students' needs required for early intervention. In addition, the ongoing progress monitoring, frequent formative assessments, and instructional change based upon student learning data aids the teacher in being able to modify instruction based upon the needs of the student (Cortiella & Horowitz, 2014; Pierce & Mueller, 2018).

The term MTSS is synonymous with the term response-to-intervention (RtI) (Cortiella & Horowitz, 2014). Introduced in 2004, RtI was designed to provide students, who exhibit issues with learning, the appropriate high-quality instruction that would help them catch up to their peers (Averill & Rinaldi, 2013; Hunter et al, 2015). Both MTSS and RtI ensure all students are exposed to high quality instruction, promote immediate intervention when learning issues are

identified and provide a stop gap measure for developing reading issues. However, Fisher and Frey (2010) further refined the RtI design by defining Response to Instruction and Intervention (RtI2). The primary difference between RtI and RtI2 is that each tier of instruction is enhanced by focusing on more consultation and collaboration with other professionals and students' families (Fisher & Frey, 2010). In addition, Fisher and Frey (2010) further explain that Tier I interventions are enhanced by focusing on the quality of scaffolded instruction, Tier 2 has a stronger focus on the quality of supplemental instruction and Tier 3 aligns pull out class instruction with in class instruction.

Intervention and Enrichment Programs

School leaders across the country are charged with improving the educational outcomes of students they serve. As such, educational leaders are continuously assessing the quality of resources and tools provided to teachers in order to provide high quality instruction that aligns to content standards and is appropriate for all learners (Hanover, 2014). As educators develop a better understanding of the complex issues facing student learning there is an increased responsibility for educators to differentiate learning and to ensure all students are learning at optimum levels (Hanover, 2014). As such, educational leaders are continuously looking to implement modern and up-to-date remediation, intervention and enrichment programs that assist teachers in meeting the needs of all students (Hanover, 2014).

Remediation, intervention, and enrichment programs are designed to improve the efficiency and delivery of instruction provided to students within the MTSS tiers (Hayes & Lillenstein, 2015). Furthermore, teacher led, direct instruction, that takes place in a small group atmosphere has been shown to be more effective than whole group instruction (Hunter et al., 2015). Traditionally, whole group instruction occurs within Tier I instruction while small group

teacher directed instruction occurs within Tier II and Tier III (Hunter et al., 2015). The remediation occurring in Tier II or Tier III has traditionally been the classroom teacher or an educational interventionist that can provide instruction in the classroom or by pulling the students in Tier II or Tier III out of the classroom environment. Burnett and Merchant (2015) found that many core instructional programs focused on vocabulary skills to build strong readers. As such, students systematically fail to improve in the areas of reading comprehension, vocabulary and conceptual content knowledge, which are required skills of proficient readers (Burnett & Merchant, 2015).

While there can be many barriers to improving reading instruction in primary and intermediate elementary school grades, Murnane et al. (2012) narrowed these challenges down to three areas which include:

- At the expense of developing reading comprehension, vocabulary and conceptual content knowledge teachers only focus on word-reading skills;
- Lack of educator expertise and capacity to teaching the necessary strategies and skills;
- Limited time in the school day for struggling students to learn the vocabulary and skills needed for them to become proficient readers.

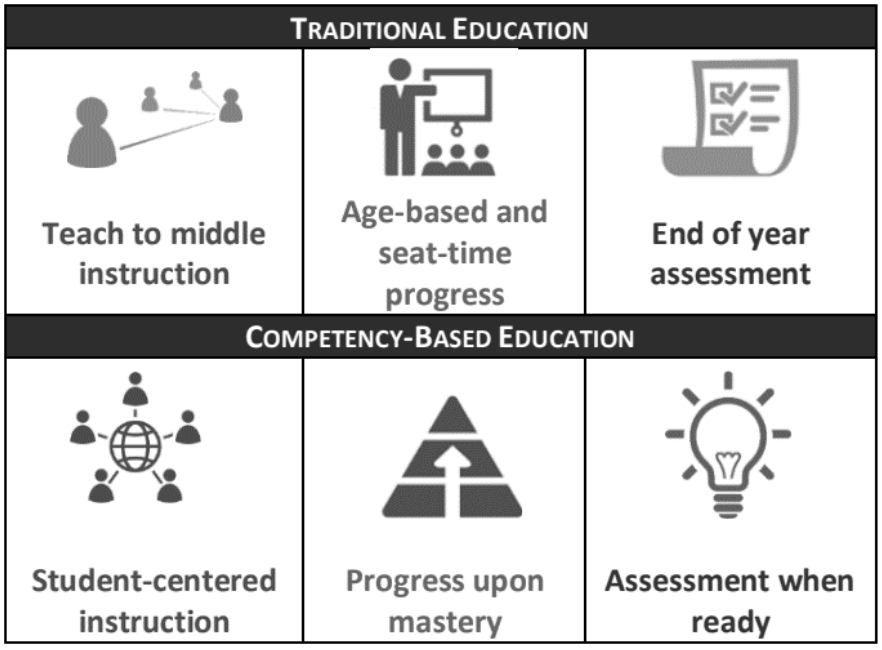
It can be challenging for school leaders to find solutions to these obstacles. However, with the resources available in today's technology driven world, opportunities exist to resolve some of these issues (Hanover, 2014). In addition, supplemental instruction at a Tier II or Tier III level can be accomplished through technology or by traditional teacher led instruction as long as the appropriate supports are in place (Hanover, 2014).

Competency Based Learning

Some schools and districts are exploring competency-based learning (CBL) instead of the traditional time-based progression of students, within grade levels, and the holistic grading approach to assess student learning (Hanover, 2020). The CBL model provides a structure where instruction and student progression is based on the mastery of skills (Hanover, 2019). Within the CBL model of instruction students advance through the required content at their own pace and progress to new content only when they can demonstrate mastery of previously learned content (What is Competency Education, 2020). Figure 2, provides a comparison of traditional educational practice and competency-based instructional practice.

Figure 2

Comparison of Traditional and Competency-Based Education



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When students engage in CBL lessons the learning expectations and competencies are clearly defined and lesson objectives should describe the standards, skills, and measurable

learning targets students should be able to achieve upon completion of the lesson (Hanover, 2019). Hanover (2019) concedes that both the CBL and standards-based grading (SBG) models align learning standards and describe what students should know and be able to do, however the key difference between the two is that CBL focuses on the mastery of content before students advance and SBG focuses on grades and seat-time before advancement. Furthermore, CBL ensures methods for differentiating instruction based upon the unique needs of each learner, multiple options for students to demonstrate mastery and frequent formative assessments are defined as they are integral components of the CBL model (Hanover, 2019).

Online Learning Model

Online learning has evolved as a highly used model for delivering instruction in colleges and universities over the past two decades (Kuo, 2014). Moreover, K-12 schools have also started to evolve to offer online learning opportunities for students. In addition, the 2020 Coronavirus (COVID-19) has compounded the usage of online learning for schools across the country (Vlachopoulos, 2020). The International Association for K-12 Online Learning (iNACOL) estimates that online learning programs were growing at a rate of 30% annually in 2015 (Vlachopoulos, 2020). However, Vlachopoulos (2020) asserts that online education serving as a solution to worldwide school closures due to COVID-19 could prove to be overly optimistic because research has indicated that technology "doesn't guarantee an effective – or pleasant – learning experience" (Vlachopoulos, 2020, p. 17). Furthermore, online learning requires a very specific set of pedagogical strategies that must be considered when transitioning teaching and learning form the physical classroom to an online setting (Korhonen, 2019). As such, completely different pedagogical strategies are needed for online learning than what would be incorporated in a traditional classroom (Korhonen, 2019). Thus, online learning can bring

about opportunities for new learning environments that support students in acquiring needed skills and attitudes for learning and mastering new material (Vlachopoulos, 2020). As interest in online learning continues to increase as more school stakeholders recognize the benefits associated with high quality online k-12 programs, schools and districts are investing in online learning platforms, technology and digital infrastructure to support the COVID -19 emergency situation (Hodges, et al., 2020).

As online learning continues to evolve from web-based virtual programs to more robust opportunities to rethink personalized instruction and innovative strategies for instructional delivery, more schools and classrooms will be imbedding online learning activities into the daily fabric of learning (Powell et al., 2015). Through the use of online learning, traditional textbooks are being replaced with web-based content with tools that can provide assessments of learning quickly and accurately (Powell et al., 2015). Furthermore, because online learning provides greater flexible access to instruction and content at any time or location, it has grown in popularity as an instructional tool (U.S. Department of Education, 2014).

Blended Learning

Even with the increased demand for online learning opportunities, school and classrooms alike have looked toward online learning to enhance learning experiences and to address the need to screen and differentiate learning for all students. Through this blended learning model, traditional classroom instruction is blended with online programming in order to meet the needs of students (Lu et al., 2018). Over the last several years blended learning has evolved to become more popular because of the ability for online programs to provide data analysis, analytics and prescriptions for how to address students' needs (Lu et al., 2018). Moreover, blended learning can combine the most effective teaching strategies of traditional learning with the benefits of

online learning which has the ability to provide personalized learning to diverse groups of learners (Powell et al., 2015). According to Powell et al. (2015) the best educational opportunities exist through personalized learning environments where highly qualified teachers are able to provide instruction through digital resources. The evolution of online learning has reshaped the way modern educators design courses and provide personalized instruction (Powell, et al., 2015). As online resources become more readily available educators are turning to these digital platforms as a strategy to improve differentiated instruction for diverse sets of learners (Powell et al., 2015).

In addition to online learning programs, the emergence of mobile applications and portable device technologies, such as tablets and smart phones, have expanded opportunities for online learning to engage students in learning and to facilitate communication and engagement between students and teachers (Luna-Nevarez, 2018). West (2013) explains, "in their individual lives, young people are accustomed to personalized content and instantaneous communication" (p. 6). Thus, the digital device has become a necessary tool for students in their learning and it is forcing educators to adapt their teaching strategies and utilize these mainstreamed technologies Luna-Nevarez, 2018). Because the devices are popular with today's students, devices such as tablets and smartphones have been found to be an efficient form of communication and learning because it is accessible 24 hours a day seven days a week (Luna-Nevarez, 2018).

Online learning and virtual learning programs were once thought of in isolation compared to traditional learning models where instruction took place exclusively in a brick and mortar classroom. However, as research has indicated the digital technologies that exist in the early 21st Century have aided in reshaping what online and virtual learning can look and feel like (Powell et al., 2015). No more do students have to pick online learning or traditional classroom learning.

The two modalities of instructional delivery can be blended to utilize the best qualities that each have to offer in providing a high quality learning experience for the student (Ma et al., 2019).

Evolution to blended learning models has been a slow process mainly due to the amount of negative criticisms on digital learning for young children. The Council on Communications (2016) for the American Academy of Pediatrics assert that children between the ages of two to five years old receive one hour or less of digital screen time because longer exposure could lead to other health issues. However, guidelines for children over the age of five years of age are limited and merely suggest that time limits be established by parents (Council on Communications, 2016). Moreover, it is evident that the digital content exposure on children and students is complex, with some research findings that indicate there are positive outcomes, negative outcomes, or with some research indicating there is little to no associations (Dillon et al., 2019).

Benefits and Limitations of Blended Learning

The University of British Columbia's Centre for Teaching, Learning and Technology, which is dedicated to researching the effectiveness of technology integration into traditional instructional methods, has identified several benefits and limitation to blended learning models. According to the University of British Columbia's Center for Teaching, Learning and Technology (2020) there are benefits and limitation to blended learning. Benefits can include:

> Enhanced opportunity for student control of their learning, free up class time for more interactive elements, increased learning opportunities resulting from a greater variety in teaching modalities, approaches and resources, more flexible access to content and instruction at any time, from any place, and possibility of tackling multiple issues when a problem is multi-faceted. (p. 2)

Limitations can include:

> Design and implementation challenges, instructors are required to feel comfortable working with and managing technology, instructors need time and practice to develop the skills required to achieve the intended outcomes of an increased use of teaching and learning technology, and risk of overloading students. (p. 2)

Because of the limitations around blended learning are predominantly teacher focused limitations, many seasoned educational practitioners with deep roots into the present educational system may be reluctant to the concept of blended learning. However, the educational urgency before the American educations system has never been greater (Soifer, 2015). Furthermore, while early experimentation of online learning programs has received some negative criticisms because it had the appearance of replacing the teacher, the impacts of at home learning due to the COVID-19 Pandemic have created even more questions as to the positive and negative impacts online learning has in the 21st Century (Vlachopoulos, 2020). The urgency caused by COVID-19 will only deepen the dependency and flexibility that parents and students will demand for online and blended learning options (Vlachopoulos, 2020).

Elements of Teaching Reading

Learning to read requires a complex range of skills that all contribute to a student learning to comprehend text (Shanahan et. al, 2020). According to Simms and Marzano (2018) reading skills are acquired through a continuum upon which skills are developed. This continuum begins with word recognition through alphabetic knowledge, then moves to fluency, then vocabulary, and finally comprehension (Simms & Marzano, 2018). In addition, to understand the complex range within this continuum of learning to read it is also important to understand the difference between constrained skills and unconstrained skills. Constrained skills

revolve around fluency and word recognition while unconstrained skills comprehension and vocabulary (Simms & Marzano, 2018).

Word Recognition

Simms and Marzano (2018) assert that word recognition development occurs through four phases: "(1) the prealphabetic phase, (2) the partial alphabetic phase, (3) the full alphabetic phase, and (4) the consolidated alphabetic phase" (p. 20). In the prealphabetic phase students learn to read words by looking at visual or context cues. In the prealphabetic phase students do not associate words with how they are spelled (Simms & Marzano, 2018). Instead, students associate words with a learned visual or context cue. The partial alphabetic phase occurs when students form connections from the sound a letter makes to the sound of the letter within a word (Simms & Marzano, 2018). In this transition, students stop using visual cues and begin phonetic, letter-sounding, cues to read words. To make this transition, students must establish the understanding that a relationship exists "between printed letters and spoken sounds" (Simms & Marzano, 2018, p. 21). The next phase students' reading skills should evolve to is the full alphabetic phase. The full alphabetic phase occurs when students begin to read words after deciphering printed language code (Simms & Marzano, 2018). During this phase, students' knowledge of the alphabet starts to evolve into phonics knowledge or phonemic awareness. Phonemic awareness is when a student understand that certain sounds are associated with spelling patterns (Simms & Marzano, 2018). Phonemic awareness helps students learn to sound words out, which is a critical skill in learning to read independently (Simms & Marzano, 2018). Finally, students transition to the consolidated alphabetic phase when they are independently able to read large amounts of text (Simms & Marzano, 2018). As students are able to read

increasingly larger amounts of text within the alphabetic phase, they also begin to build a greater level of reading fluency and accuracy.

Fluency and Accuracy

Fluency is the reader's ability to read words accurately at acceptable pace (Simms & Marzono, 2018). According to Simms and Marzano (2018) prosody, accuracy and automaticity are all components of reading fluency. Specifically, prosody describes the similarity of oral reading sounds to oral reading speech (Simms & Marzano, 2018). Reading words correctly defines accuracy in reading while automaticity is reading words quickly and without consciously understanding that you are reading words (Simms & Marzono, 2018). According to Simms & Marzano (2018) accuracy and automaticity are the primary goals of word recognition. Further, when word recognition and prosody are combined you develop fluency in reading (Simms & Marzano, 2018).

Comprehension and Vocabulary

According to Simms and Marzano (2018) comprehension and vocabulary skills take time to develop and can last into adulthood. Further, comprehension and vocabulary develop in an unpredictable progression, unlike fluency and accuracy which can develop in a predictable progression (Simms & Marzano, 2018). Not to be confused with MTSS and RtI Tiers of Instruction, Beck et. al. (2002) established that vocabulary instruction could be categorized into three tiers. Tier one terms are frequently heard in conversations and are words that are generally known and can be also categorized as site words (Simms & Marzano, 2018). Examples of tier one words would be baby, clock, dog, or food. Tier two type words can also be generalized words that appear more specifically in content areas. Tier two words can also be classified as high frequency words (Simms & Marzano, 2018). An example of a tier two word can include

required, tend, or maintain. Finally, tier three words are much more subject specific words and are usually taught through explicit content related instruction (Simms & Marzano, 2018). In addition, there are five characteristics of effective instruction to teach vocabulary which include "presenting individual terms and their descriptions in rich contexts, asking students to generate information about terms" (Simms & Marzano, 2018, p. 27), "using multimedia methods to introduce and practice terms" (Simms & Marzano, 2018, p. 27), "asking students to relate new terms to words they already know" (Simms & Marzano, 2018, p. 27), "and providing multiple exposures to new terms and opportunities to use those terms in the classroom" (Simms & Marzano, 2018, p. 27).

Real World Scenarios

Each day individuals build knowledge in life and in education (Marlieke et al., 2018). According to Marelieke et al. (2018) to build knowledge we "integrate separately learned instance by inferring an association between them" which occurs through the "reactivation of old information while learning new information" (p. 1). This knowledge building schema process which occurs in the brain assists in learning new information (Farangi & Zahra, 2017). According to Proudfoot and Kebritchi (2017) using real world scenarios as a vehicle to engage students in the learning is a key factor in providing effective Science, Technology, Engineering and Math (STEM) instruction. Furthermore, Curriculum Associates (2015) asserts real world scenarios presents content that connects students with prior knowledge, links lessons to student interests, and increases student engagement because of real-world themes and interactive learning sessions. According to Pollock, Black and Ford (2012) engaging students' prior knowledge is not simply accessing their previous academic understanding, accessing prior knowledge can also include accessing prior interests and real-world experiences. Further, the

ability to engage learners based upon their prior knowledge is essential when providing meaningful instruction (Farangi and Zahra, 2017).

Explicit Instruction and Instantaneous Feedback

Research strongly supports the concept of explicit instruction and instantaneous customized feedback to support reading instruction (Farangi & Zahra, 2017). Explicit and differentiated instruction based upon the individual needs of the learner refers directly to the specific and direct instruction for students that includes modeling and delivery of new content, followed by practice of the newly developed skills (Hunter et al., 2015). Furthermore, Swanson et al. (2017) suggest that explicit instruction is an important component in reading comprehension and vocabulary acquisition. Further, research also suggests that explicit instruction be applied to foundational reading and literacy skill sets such as phonics, phonological awareness and high frequency words (Foorman & Moats, 2004). Instantaneous feedback refers to the immediate feedback during learning that provides opportunity for instruction to be modified with different content, strategies, or intensity to ensure high levels of learning (Fyfe & Rittle-Johnson, 2017).

Frequent Interactivity

In today's society students have a low threshold for attention (Rosen, 2020). Classroom instruction must keep students actively involved and engaged in their learning experiences which can allow for deeper understanding of content and new skills (Rosen, 2020). According to Lovell-Johnston (2019) digital devices offer more opportunities for students to interact with the elements on the screen and to respond in a tactile manner than a static resource. Moreover, Lovell-Johnston (2019) assert that digital devices offer more efficient interactivity because when

a student attempts to manipulate the element on a static medium, like paper or a textbook, items must be erased, rewritten or redrawn.

i-Ready Technology-Based Intervention Program

According to Curriculum Associates (2016), the i-Ready program is an adaptive Kindergarten through 12th grade computer-based diagnostic and instructional intervention tool for reading and mathematics. The online program was created to align CCSS and reflects the shifts to rigorous learning required in today's classrooms (Curriculum Associates, 2016). The program utilizes an instructional diagnostic at the beginning of each year which identifies the extent to which students have mastered specific standards of learning in reading or mathematics (Curriculum Associates, 2019). While the program has a specific focus on providing intervention driven instruction to students, the program also has frequent progress monitoring and formative assessments which provide detailed reports that can group students with similar learning deficits around specific standards (Curriculum Associates, 2019). According to Curriculum Associates (2019) these detailed reports provide teachers with valuable time-saving data to develop small group activities for students to address their learning deficiencies. In addition, i-Ready also provides suggested instructional resources for teachers to plan intervention activities, for small group instruction (Curriculum Associates, 2019). While the i-Ready program uses adaptive online learning technology to differentiate and accelerate learning for each student, the program also utilizes real world scenarios to make the learning process relevant and engaging to the learner (Curriculum Associates, 2015).

Curriculum Associates (2015) assert that the i-Ready program provides learners explicit instruction with instantaneous feedback through their online lessons and topics are sequenced in small parts that are taught individually. This model of online instruction affords the student the

opportunity to utilize prior knowledge, in real-world engaging learning simulations, as they are exposed to new concepts and skills. Thus, through a scaffolded learning approach the student is able to acquire new information. Throughout the process the learner's differentiated lessons, while simultaneously being offered customized feedback on their learning, are modified based upon how well they progress through the lessons (Curriculum Associates, 2015). If a student continues to fail showing proficiency on skills or standards, then the program alerts the instructor that more intense one-on-one direct instruction or intervention is required (Curriculum Associates, 2015). Some research indicates that students who use the i-Ready program show "positive and statistically significant gains" compared to the control group on the Florida Standards Assessment and the Smarter Balanced Assessment (Swain et al., 2020, p. 3). Swain et al. (2020) also found that higher achievement in grades K-2 was achieved through implementation of the i-Ready program.

Summary

Schools and districts are beginning to refine their understanding of how students learn best and most efficiently to retain information. The research within this literature review outlined the different theories, legislation, federal policy, instructional practices and programs shaping our current educational landscape. These key pieces of legislation and federal policy drive educational reform and accountability. From these reform efforts, methods to ensure all students are learning and no student falls short of success have been created. In addition, programs that capitalize on modern day resources, such as technology and internet, are being created as solutions to challenges educators face in their quest to ensure all students become proficient readers.

Programs like i-Ready have been created in an attempt to assist teachers in differentiating instruction for struggling students, catching students up who are not proficient in reading, providing frequent assessments of learning so teachers can modify instruction, and creating opportunities for teachers to lead instruction within small groups. Moreover, the COVID-19 Global Pandemic has forced schools and classrooms across the world to move to remote and virtual forms of learning. This creates an urgency to determine the effectiveness of these programs for all students, especially those students with established learning disabilities.

While research exists to show that programs like i-Ready can be effective, limited research and literature are available on the extent to which these programs meet the needs of students who have been identified with learning disabilities. The i-Ready program has been shown to have success for some states and districts in improving reading and math scores for students (District Administration, 2016). Little research can be found on the impact i-Ready has on students with identified learning disabilities. Therefore, this study will seek to determine the effect i-Ready has on improving the reading proficiency of 4th grade students with disabilities.

CHAPTER THREE: METHODS

Overview

The purpose of this study was to examine whether the i-Ready online reading support program makes a difference in reading scores of fourth grade students in special education. This chapter will explore the research designs, research questions, hypotheses, participants and setting, the instrumentation which will be used, data collection procedures, and the methods for data analyses for this study.

Design

This research study uses a quantitative, casual-comparative design because the study is non-experimental in nature and seeks to identify a cause-and-effect relationship between at least two variables (Gall et. al., 2017). Moreover, a quantitative, casual-comparative design was most applicable because the groups of students being compared have been predetermined and are not randomized (Gall et. al., 2017). Furthermore, the design allowed the researcher to determine if there is a relationship exists between the implementation of i-Ready and student achievement of special education students. Within the study the independent variable was special education students' participation or nonparticipation of the i-Ready program and the dependent variable is student achievement. Special education students are defined as students who have an identified learning disability and have an active Individualized Educational Plan (IEP). Student achievement is defined as the West Virginia General Assessment (WVGSA) scale score for reading.

Research Question

RQ1: Is there a significant difference in reading achievement on the West Virginia General Summative Assessment of 4th grade special education students who use i-Ready as a

reading intervention tool compared to 4th grade special education students who do not use i-Ready as a reading intervention tool?

Hypotheses

The null hypotheses for this study are:

$H_0$1: There is no significant difference in reading achievement scores on the WVGSA between 4th grade special education students who use i-Ready as a reading intervention tool compared to 4th grade special education students who do not use i-Ready as a reading intervention tool.

Participants and Setting

Student Study Group

The participants for this study were selected from a convenience sample of fourth grade students from 32 elementary schools in West Virginia from school year (SY) 2018-2019. The convenience sample includes 1,588 fourth grade students, for SY 2018-2019, from 32 elementary schools in West Virginia with 48% of students that are associated with a low socioeconomic status (SES), 18% of the students are identified as special education, and 1% of the student population is identified as an English Language Learner (ELL). The ethnic and racial demographics of students are 89% white, 4% black, 5% multi-racial, 1% Hispanic, 1% Asian.

The sample to be examined was also inclusive of 120 special education students, 60 of which received i-Ready instruction during their 4th grade year. The demographics for special education students receiving i-Ready instruction include 49% low SES and racial demographics that include 80% white, 6% black, and 7% multi-racial and 2% Hispanic.

The control group demographics were inclusive of 35% low SES, and racial demographics that include 95% white, 2% black, and 2% multi-racial and 1% Hispanic. The

control group students were fourth grade students that did not receive i-Ready instruction and instead were exposed to a non-digital teacher-led intervention program for instruction during their fourth grade year which was SY 2018-2019. From the 32 selected elementary schools, 120 fourth grade students' archived WVGSA scale score results from SYs 2017-2018 from SY 2018-2019 were collected, organized and studied. This exceeded the minimum requirement for a medium effect size which requires a sample of at least 100 participants with a statistical power of 0.7 at the 0.05 alpha level (Gall et. al., 2017). From this sample, 60 special education students received one year of i-Ready instruction while 60 students received no i-Ready instruction and instead used a non-digital teacher led intervention program. Student were randomly selected from the sample population. For the students receiving i-Ready instruction and those not receiving i-Ready instruction the students' SY 2017-2018 WVGSA third grade reading scale scores were then compared to their SY 2018-2019 fourth grade WVGSA reading scale scores. The 2018-2019 SY was the first year these students received i-Ready instruction.

Instrumentation

The instrument used for this study was the WVGSA Reading scale scores for the 2017-2018 SY and 2018-2019 SY. Research questions were answered by using archived WVGSA results of fourth grade students from the 2018-2019 SY to determine the academic improvement from those students' third grade year (2017-2018 SY). The first year these students were exposed to i-Ready instruction was their fourth grade, 2018-2019 SY. The WVGSA is an American Institute for Research (AIR) standards-based assessment, aligned to the West Virginia State Content Standards, used to assess the academic proficiency of students (West Virginia Department of Education, 2019). The purpose of the WVGSA is to measure the achievement of students' knowledge and understanding of the West Virginia Content Standards. While the

WVGSA AIR assessment was tailored to the West Virginia Content Standards, the assessment tool is used by 20 states across the country (American Institutes for Research, 2019). The tool assesses the domains of learning and content clusters of the West Virginia Content Standards for grades 3-8. The assessment breaks domains of learning down to reading literary text, reading information text, writing, and language (West Virginia Department of Education, 2019). The tool further assesses the content clusters with each domain. For reading literary text and reading informational text, the following clusters are assessed: key ideas and details, craft and structure, and integration of knowledge and ideas. Reading informational text also includes a cluster for listening. Finally, writing and language are the two remaining content clusters that are assessed with the tool. Further, the American Institutes for Research and Ohio Department of Education (2017) found sufficient evidence for the validity and reliability of the AIR assessment based upon the test blue print structure and development. According to the American Institutes for Research and Ohio Department of Education (2017) the alignment of the state assessment tool to the Ohio Learning Standards (OLS) ensures the test scores are valid indicators of the assessment. In addition, the American Institutes for Research and Ohio Department of Education (2017) found the assessments had a Cronbach's alpha that was "uniformly near 0.9" (p.33). The same blue print structure and process for developing the Ohio State Test (OST) was used to create the WVGSA (West Virginia Department of Education, 2019).

The WVGSA is a mandatory assessment for all West Virginia public school students enrolled in grades 3-8. The WVGSA is a valid assessment based upon the standard setting process used to establish the test (West Virginia Department of Education, 2019). The WVGSA was used as a valid instrument used by Hagerman (2018) in researching the impact of educator preparation on student academic achievement. Further, the standard setting process for the

WVGSA is defined as a "technical process in which panels of content experts participate in a federally approved process to determine cut scores per grade level" (West Virginia Department of Education, 2019, para. 1). WVGSA scores are measured by percentiles and scale scores, which are broadly broken into four different categories: Does Not Meet Standard, Partially Meets Standard, Meets Standard, Exceeds Standard (West Virginia Department of Education, 2019). For the purposes of this study the scale score will be used. The third grade WVGSA assessment has a scale score range of 420 -724 and the fourth grade WVGSA assessment has a scale score range of 431-726 (West Virginia Department of Education, 2019). In addition, the third grade and fourth grade WVGSA reading assessment has a at least 27 and a maximum of 31 questions (West Virginia Department of Education, 2019). Further, in a letter from the United States Department of Education (USDE), Office of Elementary and Secondary Education (January 18, 2017), the USDE evaluated the WVGSA, reported in the *USDE Peer Review of State Assessment Systems Report*, and found that the assessment met the requirements for test validity for federal accountability purposes under the Elementary and Secondary Student Act (ESSA).

Procedures

A letter to participating school district A's Superintendent was submitted to afford the researcher the rights to use the school district A's student assessment data from the WVGSA (see Appendix A). A letter to school district B's Board President was submitted to allow the researcher the rights to use school district B's student assessment data from the WVGSA (See appendix B). A statement regarding the rights, confidentiality, and anonymity protections were included in the letter. Once approval was received from the participating school districts, the Liberty University academic administration and the Institutional Review Board (IRB) granted permission prior to beginning this study (see Appendix C). Once approval was obtained by IRB

and academic administration the following steps were completed to collect data.

A random selection of special education student third and fourth grade WVGSA archived assessment scores, 2017-2019, from two West Virginia school districts was collected. The random selection of students from the population was done by assigning a random number to each student and then used a random number table to select students for the study. This data was requested from each county's assessment office and data was stored on a flash drive. Data was gathered and assessed using Excel and SPSS software. To ensure anonymity, the names of teachers and students were omitted from the data sets. During the scope of this study there was no interaction with human participants. To ensure data was secure and safe, WVGSA and i-Ready data was stored on a secure, password protected USB thumb drive.

Data Analysis

An independent samples *t* test was conducted to compare the reading achievement scale scores on the WVGSA between fourth grade special education students who use i-Ready as a reading intervention tool compared to fourth grade special education students who do not use i-Ready as a reading intervention tool while controlling for prior student achievement. Measures of central tendency, which include mean, minimum and maximum scores, and standard deviation, was determined by using descriptive statistics. An independent *t* test was the most appropriate test because *t* tests are a specific type of ANOVA used when there are only two groups being compared on the same dependent variable (Gall et. al., 2017). The dependent variable for the proposed study was the mean scores from the WVGSA Reading scale scores for the 2017-2018 SY and 2018-2019 SY. The groups were distinguished by whether they received the i-Ready intervention. In addition, the students being compared were only in one of the groups not both. To assess whether the null hypotheses was accepted or rejected, an alpha level of 0.05

was used. To test for assumptions for *t* test, a Box and Whisker Plot was used to look for extreme outliers in the data for each group of data. Extreme outliers were deleted from the data set. To test for the assumption of normality a Shapiro-Wilks test would have been used if less than 50 (Gall et. al., 2017). However, since the sample was greater than 50 a Kolmograv-Smirnov was used (Gall et. al., 2017). The null hypothesis was rejected at the 95% confidence level. Finally, to check for assumptions of equal variance, Levene's Test of Equality of Error Variance was used.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this study was to examine whether the i-Ready online reading support program makes a difference in reading scores of fourth grade students in special education. This chapter restates the research question and null hypothesis. The chapter also includes descriptive statistics of the variables, both independent and dependent. The chapter will then include the results of the data and statistical analysis, which includes data screening and assumptions.

Research Question

RQ1: Is there a significant difference in reading achievement on the West Virginia General Summative Assessment of 4th grade special education students who use i-Ready as a reading intervention tool compared to 4th grade special education students who do not use i-Ready as a reading intervention tool?

Null Hypothesis

$H_0$1: There is no significant difference in reading achievement scores on the WVGSA between 4th grade special education students who use i-Ready as a reading intervention tool compared to 4th grade special education students who do not use i-Ready as a reading intervention tool.

Descriptive Statistics

The convenience sample (N=120) for this research was inclusive of two groups of special education students, Group 1 received i-Ready instruction and Group 2 which did not receive i-Ready instruction. All participants were in the third grade during the 2017-2018 school year (SY) and fourth grade of the same school during the 2018-2019 SY and were identified as having a learning disability. The demographics for the convenience sample reported included 50%

coming from households of low SES and racial demographics that include 80% white, 9% black, and 10% multi-racial and 2% Hispanic.

For the study, the researcher placed students into two groups. Special education students who (*N*=60) received i-Ready instruction (Group 1) and special education students (*N*=60) who did not receive i-Ready instruction program and instead used a non-digital teacher-led intervention for instruction. (Group 2). For Group 1 the mean WVGSA Reading Score increased from 2018 (*M* = 537.6) to 2019 (*M* = 554.1) showing on average students improved their scores (*M* = 16.5). Students in Group 2 increased from 2018 (*M* = 553.4) to 2019 (*M* = 555.1) showing on average students improved their scores (*M* = 1.7). Descriptive statistics for both the i-Ready group and non-i-Ready group are contained in Table 1, Table 2 and Table 3.

Table 1

Descriptive Statistics: Students' 2018 WVGSA Reading Scale Score (N=120)

Group	Mean	*n*	*SD*
Group 1 i-Ready	537.6	60	35.4
Group 2 No i-Ready	553.4	60	26.8
Total	545.5	120	32.2

Table 2

Descriptive Statistics: Students' 2019 WVGSA Reading Scale Score (N=120)

Group	Mean	*n*	*SD*
Group 1 i-Ready	554.1	60	37.1
Group 2 No i-Ready	555.1	60	39.1
Total	554.6	120	38.2

Table 3

Descriptive Statistics: Difference in WVGSA Reading Scale Scores (N=120)

Group	2018	2019	Difference
Group 1 i-Ready	537.6	554.1	16.5
Group 2 No i-Ready	553.4	555.1	1.7
Total	545.5	554.6	9

Results

Data Screening

The dependent variable for this study, students' WVGSA scale scores from 2018 and 2019 were assessed for data inconsistencies. In the data preparation phase of analysis, the researcher ensured each of the student's scores being analyzed included both a 2018 score and a 2019 score. Any student that did not have a 2018 and a 2019 WVGSA score was removed from the study.

For each group, the researcher then utilized a Box-and-Whisker plot to identify potential outliers within the 2018 and 2019 WVGSA Reading Scores of both Group 1 (see Figure 3) and Group 2 (see Figure 4). The Box-and-Whisker plot yielded evidence that an extreme outlier was present in the 2018 SY for Group 1. There were no extreme outliers for the 2019 SY for Group 1 or for the 2018 and 2019 SYs for Group 2. The extreme outlier removed from the data set.

Figure 3

Box-and-Whisker Plot for (Group 1) students who received i-Ready WVGSA Scale Scores

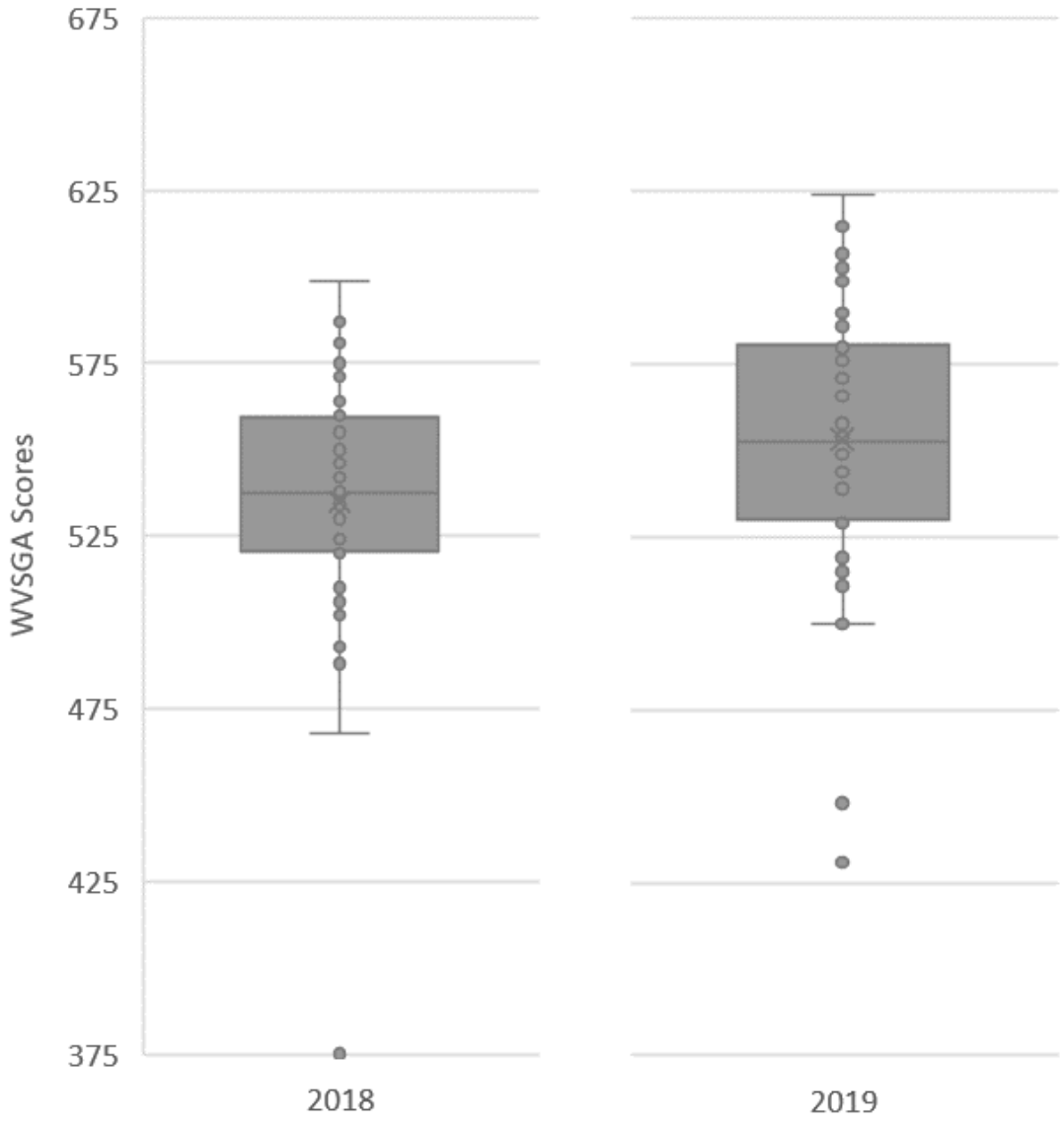
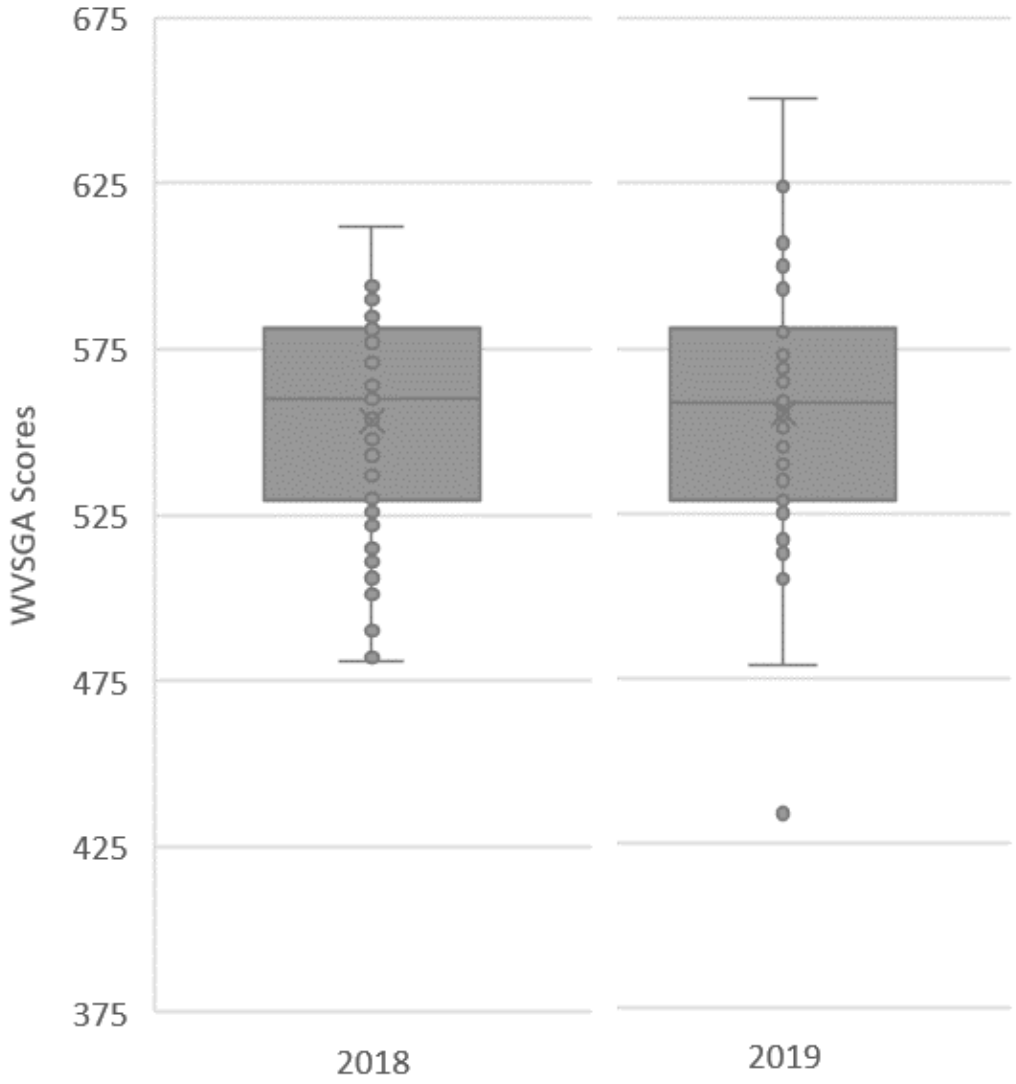


Figure 4

Box-and-Whisker Plot for (Group 2) students who did not receive i-Ready WVGSA Scale Scores



Assumption Tests

A Kolmogorov–Smirnov test was conducted to test for normality. The Kolmogorov–Smirnov was most appropriate for this study because the sample size ($N = 120$) was greater than 50 (Gall et. al., 2017). Since $p > .05$, the results of the Kolmogorov–Smirnov indicated no statistical significance for the i-Ready and no i-Ready variable. Therefore, the data represented a

normal distribution for the WVGSA results for students receiving i-Ready and the students not receiving i-Ready (see Table 4).

Table 4

Tests of Normality via the Kolmogorov-Smirnov Test

	Kolmogorov-Smirnov Test[a]		
	Statistic	df	Sig.
Received i-Ready	.103	59	.193
Did not receive i-Ready	.090	60	.200[d]

a. Lilliefors Significance Correction

d. This is a lower bound of the true significance

Levene's Test of Equal Variance was used to check for the assumption of homogeneity of variance. The assumption of homogeneity of variance was satisfied, $p = .154$ (see Table 5).

Table 5

Levene's Test of Equality of Error Variances

F	df1	df2	Sig.
2.056	1	117	.154

Hypothesis

The null hypothesis stated, "There is no significant difference in reading achievement scores on the WVGSA between 4th grade special education students who use i-Ready as a reading intervention tool compared to 4th grade special education students who do not use i-Ready as a reading intervention tool." The null hypothesis was tested using an independent samples *t* test. The independent samples *t* test determined that there is a statistically significant

difference between the means of special education students who received i-Ready instruction (n = 59, M = 16.47, SD = 35.73) and special education students who did not receive i-Ready instruction program and instead used a teacher led intervention for instruction (n = 60, M = 1.73, SD = 27.019). The independent samples t test resulted in a p = 0.012. Since p = 0.012 < .05, the null hypothesis was rejected (Table 6).

Table 6

$H_0$1 Independent Samples t test

	Levene's Test for Equality of Variances		*t* test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	2.056	.154	-2.541	117	.012	-14.741	5.801	-26.229	-3.253
Equal variances not assumed			-2.535	107.998	.013	-14.741	5.814	-26.266	-3.216

CHAPTER FIVE: CONCLUSIONS

Overview

This chapter includes a discussion of the results of the data analysis and a reiteration of the purpose of this study. The chapter reports an analysis of the findings of the study which was to determine if the i-Ready program made a significant difference in the reading achievement for special education students. The research of this study will then be compared to existing research and a report of the limitations of this study will be discussed. Finally, recommendations for future study will be explored.

Discussion

The purpose of this quantitative, casual-comparative study was to examine whether the i-Ready online reading support program makes a difference in reading scores of fourth grade learning-disabled students. The research compared the reading achievement of learning-disabled special education students who received i-Ready instruction and special education students who did not receive i-Ready instruction and instead used a non-digital teacher-led intervention program for instruction. The independent variable for the study was special education students' participation or nonparticipation of the i-Ready program and the dependent variable was student achievement.

The research question for this study asked "Is there a significant difference in reading achievement on the West Virginia General Summative Assessment of 4th grade special education students who use i-Ready as a reading intervention tool compared to 4th grade special education students who do not use i-Ready as a reading intervention tool?" The null hypothesis stated that there is no significant difference in reading achievement scores on the WVGSA between 4th grade special education students who use i-Ready as a reading intervention tool

compared to 4th grade special education students who do not use i-Ready as a reading intervention tool. A statistically significant difference was found between the means of students who used i-Ready as an intervention tool and the students who did not use i-Ready as and intervention tool and instead used a non-digital teacher-led intervention program. Therefore, the null hypothesis was rejected at the 95% confidence level. The results of this study conclude that the i-Ready program is associated with improved reading scores for students with learning disabilities.

The results of this study are supportive of Vygotsky's (1986) sociocultural learning theory which hypothesized that learners build knowledge from the context of the learning interaction. Further, learning at the Zone of Proximal Development (ZPD) suggests that learning is a dynamic process that learning occurs slightly above where learners can learn on their own without guidance from an instructor (Wink & Putney, 2002). The study's findings support Vygotosky's (1986) assertion that students can be more successful when instruction can be scaffolded in such a way that the learner builds knowledge from a lower level. The students in this study had an identified learning disability and were placed in an intervention program that was designed to meet their individualized academic needs. In this study, evidence suggests the i-Ready program to be successful by providing ongoing progress monitoring, frequent formative assessments and instructional changes based upon the progress and needs of each student. These findings align with the research by Cortiella & Horowitz (2014), Pierce & Mueller (2018) and Hayes and Lillenstien (2015). The findings of this study also support research from Farangi and Zabra (2017) which found that explicit instruction and instantaneous customized feedback supports reading instruction achievement similar to what the i-Ready program's adaptive computer-based instruction model provides.

The research by Swain et al. (2020) on the use and effectiveness of i-Ready is also consistent with this study's findings. Swain et al. (2020) found that higher achievement in grades K-2 was achieved through implementation of the i-Ready program. Comparatively, this study also found that through the implementation of the i-Ready program, learning-disabled students learned at higher rates than students who did not receive i-Ready instruction.

Implications

The results of this study provide evidence that the i-Ready online instructional program is an effective tool for providing instructional intervention to students with learning disabilities. In addition, it reveals the effectiveness of online digital learning programs warrants further research. Just as research indicates that effective teachers with the appropriate training and pedagogy are needed for effective classroom instruction, it could be asserted that quality online digital instructional programs require specific traits to ensure effectiveness (Wiliam & Leahy, 2015). Researching the traits of effective online digital programs could provide valuable information for educational leaders when selecting appropriate programs and resources for student learning, especially in during the time of a global pandemic that requires many students to learn in an online setting.

This research study yields important information regarding the effectiveness of an online digital learning program for students with learning disabilities and is an improvement to the current research on the effectiveness of the i-Ready program for all students, not just a subgroup of students within a school. Meeting the needs of a diverse set of learners within a classroom can be a challenge for many classroom teachers. However, the results of this study, provide evidence that the i-Ready program can be a valuable tool for the classroom teacher to ensure that students

are receiving differentiated instruction based upon the individualized needs of each learner, especially those that may have a learning disability.

Limitations

This study was limited by student populations samples. The research samples were obtained from 4th grade elementary students from two different West Virginia school districts. One school district implemented the i-Ready program and the other school district did not implement the i-Ready program. The district in which students did not receive i-Ready instruction is a smaller, more affluent, school district with a smaller population of low socioeconomic status (SES) students. The demographics for special education students receiving i-Ready instruction was 49% low SES. The group of students who did not receive i-Ready instruction was 35% low SES. However, the group with a higher rate of low SES is also the group that received the i-Ready instruction, which was found to be more effective than the non-digital teacher led program used by the non i-Ready group. Additional study for the effect the i-Ready program has on students from varying levels of SES, could yield additional valuable information.

Another limitation of this study is the limited age and grade level of the population samples. For the purposes of this study 4th grade students were studied. However, the i-Ready program is a Kindergarten through 8th grade instructional program. In order to develop a more thorough analysis of the effectiveness of the i-Ready program for special education students at higher grade levels, additional research would be warranted.

Finally, another limitation of the study was the fidelity of implementation of the i-Ready program. The i-Ready program suggests 35-45 minutes of online instruction per week for maximum learning to take place (Curriculum Associates, 2015). However, the extent to which

students in the sample populations met the threshold of 35-45 minutes was not studied and was not the in the scope of this study. However, additional research into the how fidelity to the i-Ready program's usage correlates to learning-disabled students' achievement could yield important information for educational practitioners.

Recommendations for Future Research

1. With the research findings indicating a positive improvement in the students' learning with use of the i-Ready program, further research could assess the reasons why some students reading scores did not improve as much as others' who were exposed to the i-Ready program.
2. Research on the fidelity of implementation of the i-Ready program could lead to additional understanding into the potential effectiveness of the program for students with disabilities.
3. Further refining learning-disabled students' exceptionalities to study the extent to which the i-Ready program improves reading scores for specific learning disabilities.
4. Researching the extent, the i-Ready program improves student learning for students from varying levels of SES.

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APPENDIX A

March 5, 2021

[redacted]
Superintendent
[redacted]

Dear Mr. [redacted]

As a doctoral student in the School of Education at Liberty University, I am conducting research as part of the requirements for a doctoral degree. The purpose of my research is to determine the extent to which a digital learning program improves learning outcomes in reading for 4th grade special education students and I am seeking approval to use your school district's archived West Virginia General Summative Assessment (WVSGA) results for the 2017-2018 and 2018-2019 school years.

The requested archived results are limited to students with an identified learning disability and have West Virginia General Summative Assessment Scale Scores for their 3rd grade 2017-2018 school year and 4th grade 2018-2019 school year. Students who are identified as an English Language Learner should not be included in the data being provided. Participation will be completely anonymous, and no personal, identifying information will be collected, as such student names and/or student ID numbers should be redacted.

A permission letter document is attached for your convenience.

Sincerely,

[redacted]
Ryan S. Saxe
Doctoral Student
[redacted]

APPENDIX B

March 5, 2021

[redacted]
Board President
[redacted]

Dear Mrs. [redacted]

As a doctoral student in the School of Education at Liberty University, I am conducting research as part of the requirements for a doctoral degree. The purpose of my research is to determine the extent to which a digital learning program improves learning outcomes in reading for 4th grade special education students and I am seeking approval to use your school district's archived West Virginia General Summative Assessment (WVSGA) results for the 2017-2018 and 2018-2019 school years.

The requested archived results are limited to students with an identified learning disability and have West Virginia General Summative Assessment Scale Scores for their 3rd grade 2017-2018 school year and 4th grade 2018-2019 school year. Students who are identified as an English Language Learner should not be included in the data being provided. Participation will be completely anonymous, and no personal, identifying information will be collected, as such student names and/or student ID numbers should be redacted.

Since I am the Superintendent of Cabell County Schools, I am requesting approval from you, as Cabell County Board President, approval to use the school district's data for the purposes of this research required for this study. A permission letter document is attached for your convenience.

Sincerely,

[redacted]
Ryan S. Saxe
Doctoral Student
[redacted]

APPENDIX C

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

April 16, 2021

Ryan Saxe
Gary Kuhne

Re: IRB Application - IRB-FY20-21-699 THE EFFECTS OF USING AN ONLINE READING PROGRAM TO IMPROVE LEARNING FOR SPECIAL EDUCATION STUDENTS

Dear Ryan Saxe and Gary Kuhne,

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your research with the data safeguarding methods mentioned in your IRB application.

Decision: No Human Subjects Research

Explanation: Your study is not considered human subjects research for the following reason:

(1) It will not involve the collection of identifiable, private information.

Please note that this decision only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued non-human subjects research status. You may report these changes by completing a modification submission through your Cayuse IRB account.

Also, although you are welcome to use our recruitment and consent templates, you are not required to do so. If you choose to use our documents, please replace the word *research* with the word *project* throughout both documents.

If you have any questions about this determination or need assistance in determining whether possible modifications to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office