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THE EFFECTS OF EARLY IDENTIFICATION AND INTERVENTION ON READING SCORES AT THE KINDERGARTEN LEVEL

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THE EFFECTS OF EARLY IDENTIFICATION AND INTERVENTION ON READING SCORES AT THE KINDERGARTEN LEVEL

by

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SPE*CIAL DEDICATION*

In loving memory of Mandi D. Murdock who was my special friend.
We shared many ideas, dreams, failures, trials, and love for reaching children
to make the difference that lasts!
I wish you were here as I walk across this stage as
Dr. Cara Nickell Milby,
but you will be forever with me in my heart.
In a world where you can choose to be anything, choose to BE KIND!
Jeremiah 29:11

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Abstract

Research indicates that reading fluently is the key to success: academically, economically, socially, as well as to a healthier lifestyle (Forrest, 2018; Wanzek et al., 2018). While research has shown that Response to Intervention (RTI) is a positive instructional program that will increase primary students' academic abilities at grades 1 and 2 (Richards et al., 2007), there is a need for more research regarding RTI with kindergarten students. This quasi-experimental quantitative research study examined if early identification and intensive intervention through the addition of Response to Intervention (RTI) at the kindergarten level will lead to increased reading scores and better grades. Two kindergarten classrooms from a small elementary school in Western Kentucky provided 14 students for the sample. They became the experimental and comparison groups because their September STAR Early Literacy Assessment scores and their first quarter Reading Foundational Skills grades revealed they were struggling to learn how to read. Findings revealed using RTI with both groups of students was statistically significant for their STAR Early Literacy Assessment Scores and Reading Foundational Skills grades. Discussion includes the study's relation to P-20 goals and suggestions for future research.

Keywords: P-20 education, early intervention, early identification, evaluation, struggling readers, kindergarten, developmental delay, Response to Intervention (RTI), STAR Early Literacy Assessment, specially designed instruction (SDI)

CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER I: INTRODUCTION

Children with disabilities have not always been treated fairly within the U.S. public educational system (Moody, 2012). Individuals were sometimes ashamed of family members who had disabilities, they often considered them unhealthy, defective, and hid them away. Sometimes these individuals were even abandoned because families did not understand their disabilities. Before the 1970s, more than 1.75 million children with disabilities were not allowed to enroll in public schools (Moody, 2012). Even though three million children who had at least one disability were enrolled in school across the nation, most did not receive an appropriate education according to their needs. Many states could legally reject any child they thought could not be educated. For example, in New York State, children who had an IQ score of below 50 were denied an education because they were thought to be unable to learn academic concepts, and children who were blind or had specific mobility limitations were excluded as well. Some systems accepted them as students but were not authorized to create special classes to meet their needs (Moody, 2012).

The 1960s and 1970s saw the enactment of several laws to improve education for disadvantaged children (Special Education Law Timeline, n.d.; Moody, 2012). In 1968 several supporting advancements in special education following a Congressional investigation uncovered that 1.75 million children who had disabilities were not enrolled in school, that 200,000 were in institutions, and that another 2.5 million who were enrolled were receiving a substandard education (Moody, 2012). The Rehabilitation Act of 1973, Section 504, required educational facilities that accepted federal funding to provide the same access to educational and extracurricular services and activities for all students even those with disabilities (Korst, 2022; Yell, 2012).

The Education for All Handicapped Children Act passed in 1975 (EAHCA) required school districts to develop specific individual plans called Individualized Education Programs (IEP) for any student having a qualifying disability (Yell, 2012). However, for the next few years, conflicting regulations, and questions about whether the federal government or the individual states were in charge made compliance difficult and regulations easy to ignore (Moody, 2012). By 1979, many students had still not received an IEP or any required education services, and were needlessly taught in special classes, not serviced as stipulated within regular classrooms (Special Education Law Timeline, n.d.; Moody, 2012). EAHCA underwent congressional reauthorization several times during the next two decades to improve educational services for students with disabilities. The most recent amendment, the Individuals with Disabilities Education Improvement Act (IDEA 2004) made significant changes for the administration of special education and encouraged educators to use programs such as Response to Intervention (RTI) as a new framework to identify children with learning disabilities and provide research-based early intervention for identified children (Richards, et al., 2007; O'Connor, et al., 2014). IDEA 2004 also specified qualifications of special education teachers (Yell, 2012).

Research shows that successful reading and writing requires a good foundation of oral language and phonemic awareness. However, when schools wait until students are in grade 1 or 2 before identifying reading difficulties and beginning early intervention, those students fall farther behind and catching up is nearly impossible (MacDonald & Figueredo, 2010). The Kentucky Department of Education (KDE) reported in 2022 that of the 638,236 public school students enrolled during 2020-2021, more than 15,000 children from ages 3-5 were enrolled in special education (Kentucky Education Facts, 2022. Therefore, early identification of struggling

kindergarten students is a vital step in reducing reading deficits. Samuels (2015) wrote about nonreading primary students, "If you haven't succeeded by 3rd grade, it's more difficult to remediate than it would have been if you started before then." Wanzek et. al., (2011) agreed; if students do not develop strong reading skills during their primary years, they will as a result have difficulty throughout school, will not make good grades, and will likely not graduate with their peers.

Several other researchers (O'Connor, et al., 2014; Wanzek et. al., 2018; Gonzalez-Valenzuela, 2017; Stevens, et al., 2017; Vellutino, et. al, 2006) agree with Samuels that the longer the wait before children receive scientific-based early interventions, the longer they will continue to struggle and not catch up on academic skills. Analysis of research conducted by educators indicates developmental delays in reading can be corrected if students are identified and receive early reading intervention during kindergarten (Jeon, et al., 2011; Partanen & Siegel, 2013; Penn State, 2018; Samuels, 2015; Stevens, 2017; Wanzek, 2018).

Purpose of the Study

The purpose of this study was to determine if early identification of struggling kindergarten students followed with scientifically based intense intervention can prevent students from failing academically (O'Connor, et al., 2014; Wanzek, et al., 2018). Because successful student identification along with appropriate intense interventions are integral to a child's success (Richards, et al., 2007), this study will examine if early identification and intensive intervention for students in kindergarten can lead to increased reading scores and better grades, which may lead to success in school, better job choices, and improved student futures.

Significance of the Study

This quasi-experimental quantitative research study explored the effect of early identification and intervention of students not making steady progress in literacy in kindergarten. Research reveals that reading fluently is the key to success in life: academically, economically, socially, and healthfully (Forrest, 2018; Wanzek, et al., 2018). Samuels (2015) said that students who read proficiently by age 10 could go on to higher education, but those whose reading delays go unaddressed may not graduate from high school. The unemployment rate of nonreaders is four times higher than for adult readers, and they also earn 42% less in earned wages (Tam, 2017). Incarceration statistics reveal that 85% of juveniles sent to court and 70% of adult prisoners cannot read or understand fourth grade reading material. These deficits in reading and comprehending hinder their ability to complete daily tasks or maintain better than menial paying jobs (Literacy Mid-South, n.d.).

Additionally, negative social impacts result from illiteracy as well (Literacy Pittsburg, 2022; Tam, 2017). Not progressing with classmates can create feelings of low self-esteem, lack of confidence, low interest and lead to frustrations and undesirable behaviors and actions (Sousa, 2016). Too embarrassed, students may withdraw or zone out instead of asking an adult for help (Literacy Pittsburg, 2022). Inadequate feelings also affect adults who cannot read the newspaper so they can talk with others during general conversations (Pittsburgh, Literacy, 2022; Tam, 2017). Furthermore, when one cannot understand medical instructions regarding prescriptions or at home care, quality health is difficult to maintain (CDC, 2022). In 2017, a report from the U.S. Department of Education (USDE) stated that adults with extremely limited academic skills have more work-related accidents and poorer health conditions than proficient readers (Literacy Pittsburg, 2022; CDC, 2022).

Theoretical Framework about Learning and Developmental Delay

The theoretical framework for this study includes Abraham Maslow's Hierarchy of Needs: how people of all ages are motivated by goal completion (Maslow, 1943). Specific needs in the lower hierarchy levels must be satisfied before a person will attempt to fulfill needs at higher levels (Kurt, 2021; Thompson, n.d.). A second related theory is Piaget's Eight Stages of Psychosocial Development (McLeod, 2018) which identifies specific periods of time within a person's life that must be experienced for learning to occur (Thompson, n.d.). Teachers knowledgeable of and who understand these theories will be more equipped to recognize where students are in their development and where they need to begin in the process of helping them address their developmental delays and become successful in all academics, especially reading.

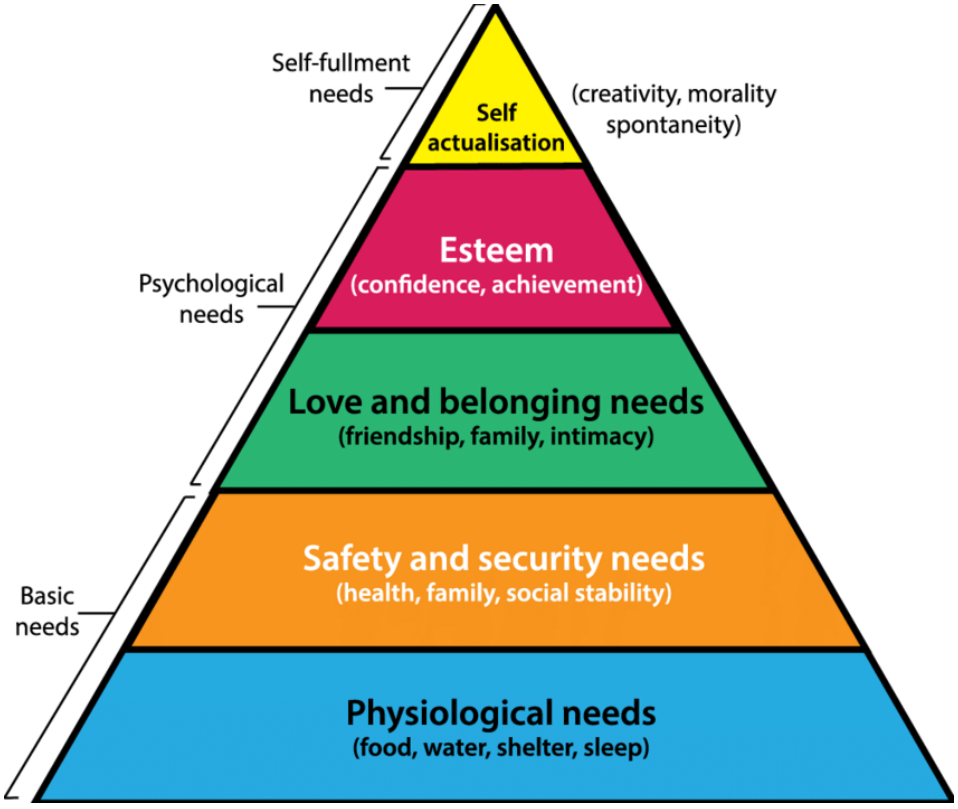
Maslow's Hierarchy of Needs

While students are sitting within classroom, their minds may be miles away because of distractions due to social or family troubles, emotional insecurities, or a physical lack of sleep (Kurt, 2018). Abraham Maslow's pyramid-shaped Hierarchy of Needs demonstrates the dependence of each stage upon the gratification of the previous stage for success to occur (Maslow, 1943; Fisher & Crawford, 2020) and provides a prototype for how students learn. Maslow describes five levels of needs: physiological, safety, social, self-esteem, and self-actualization (see Figure 1) (Thompson, n.d.; Kurt, 2021). He has three beliefs about the relationship of needs to learning: immediate needs influence immediate actions; when a need emerges, that need will always win; and needs must be satisfied before the next need can be fulfilled. The most fundamental needs of food and shelter must be satisfied for the safety level to be achieved. For example, when a hungry child is handed a mathematics worksheet to complete, he may act out; however, his misbehavior is likely due to his immediate hunger rather than a

reaction to the assignment (Thompson, n.d.; Kurt, 2021). A teacher's understanding of Maslow's Hierarchy allows educators to recognize students' needs to help them grow beyond personal obstacles and reach their fullest educational potential (Kurt, 2021). The higher a student achieves in Maslow's Hierarchy, the greater is the student's level of learning. The triangle in Figure 1 below lists the five stages of Maslow's Hierarchy of Needs, beginning with the most basic on the bottom rising to the most complex (Corrigan-Kavanagh, E., Escobar-Tello, C., & Pui Ying Lo, K., 2016).

Figure 1

Maslow's Hierarchy of Needs



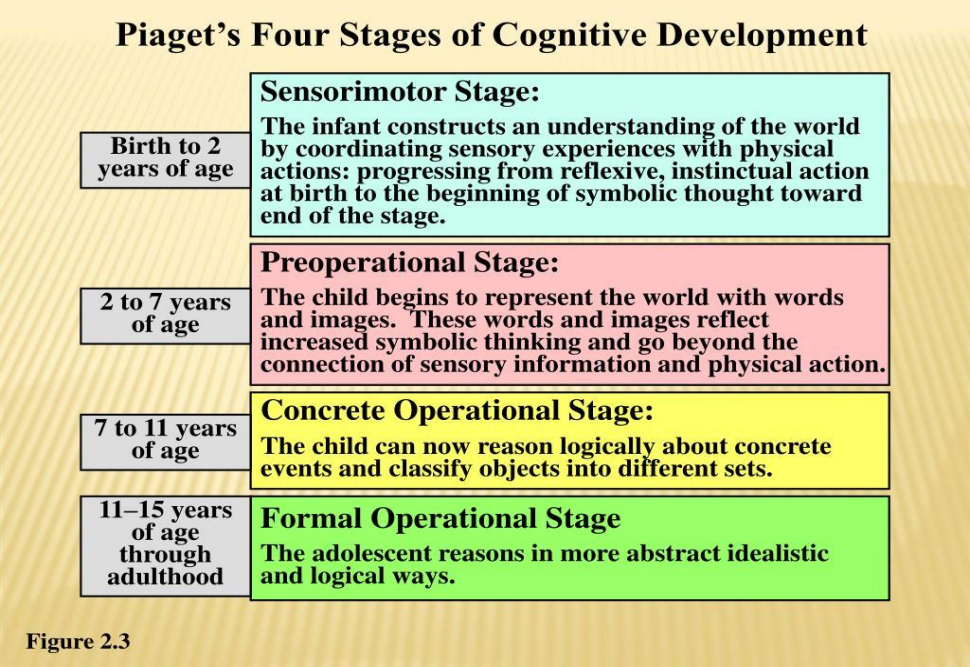
Piaget's Stages of Cognitive Development

Jean Piaget's Cognitive Development Theory describes the learning process people follow as they mature from birth through adulthood (Reynolds, 2021; Thompson, n.d.). Piaget noted that children think in ways distinctly different from adults. They explore wherever they are. Piaget theorized that understanding develops through a specific sequence of patterns that he based on four important features of thinking: (1) the sequence always occurs in the same order, (2) no stage is ever omitted, (3) each stage develops upon the previous stage, and (4) earlier steps are integrated into new steps (Reynolds, 2021; Thompson, n.d.). His first two stages, sensorimotor and preoperational, occur at the ages when a developmental delay in a child can first be recognized. During the sensorimotor stage, from birth to 24 months, infants use senses and actions (i.e., smell, touch, bite) to learn about their world. In the preoperational stage, ages 2-7, children invent make-believe play, create language, and think both imaginatively and realistically. The simple drawings, improvisations, and imaginative stories that kindergarten students create are all forms of metacognition. These activities signal the achievement of sensorimotor abilities and the movement into stage two preoperational activities which are critical cognitive-building activities to thinking development at the kindergarten level (Thompson, 2017; Reynolds, 2021). An understanding of Piaget's Cognitive Development Theory provides classroom teachers with the ability to identify where students are in their cognitive development so they can provide activities to help them obtain their full educational capacity (Kurt, 2021).

Figure 2 lists the four stages of Piaget's Cognitive Development beginning with the earliest stage of development at the top followed with each additional stage below: (https://www.bing.com).

Figure 2

Piaget's Stages of Cognitive Development



Research Questions

The 1990 Individuals with Disabilities Act (IDEA) expanded the original definition of developmental delay from birth to 5 years old to also include students ages 6 to 9 years of age (Yell, 2012). Developmental Delay is a disability category under IDEA for a child who is at least 3 years old but not yet 9 years old. This category refers to a child who has not acquired skills or achieved commensurately with established performance expectations for his/her age in one or more developmental areas: cognition, social-emotional, communication, self-help/adaptive behavior, and motor development (KDE Eligibility Form, n.d.).

The focus of this research study was to determine if identification of kindergarten students who are demonstrating at-risk signs of Developmental Delay (DD) in learning, followed with intensive intervention and progress monitoring data collection will lead to the achievement

of higher assessment scores on the STAR Early Literacy Assessment and better reading grades. To facilitate the study, the following research questions were developed to guide the research:

1. What is the difference in STAR Early Literacy Achievement on the pre- and post-assessment data of kindergarten students who are identified as having a Developmental Delay (DD) and received Specially Designed Instruction (SDI) through RTI tier 3 interventions (experimental group) compared to students who have not been identified for special education services (comparison group)?
2. What is the difference in reading grades as shown on the report cards of the students in the comparison group who have not been identified for special education services compared to the experimental group of students who are identified as having a Developmental Delay (DD) and receive Specially Designed Instruction (SDI) through RTI tier 3 interventions?

Limitations

Limitation 1: The study occurred during the 2022-2023 academic year, within a single elementary school of slightly more than 400 students in rural western Kentucky. The two kindergarten classrooms contained 19 students each. As a result, this quasi-experimental quantitative research study involved a small number of subjects in both the comparison and experimental groups.

Limitation 2: This district is small, and district and school budgets are fixed. Where neighboring districts have larger funding to purchase more than just one assessment program for data collection, this district only has the one data collection instrument available to gain screening and progress monitoring data results.

Limitation 3: This small rural district is limited to a small number of faculty members to fill the necessary teaching positions within the school district. The researcher in this study is a full-time, self-contained FMD/MSD secondary teacher who also serves as a special education resource teacher at the elementary school. She is also the job skills teacher/coach for her FMD/MSD students so they can earn certificates to work following graduation.

Definition of Terms

Accommodations are instructional strategies that do not change performance expectations or invalidate measurements for students with diagnosed disabilities (i.e., assistive technologies, etc.) (CPAC, 2009; RTI Action Network, 2022).

Cognitive Development is particularly important to the development of the thinking process from early childhood through adolescence. The growth of thinking in children involves information processing, reasoning, and using language, memory, and intellect to better understand the world around them (Rapiti & Gongala, 2023).

Data-Based Decision-Making process uses data (e.g., progress monitoring, diagnostic scores) for research-based decisions about students' programs (Schildkemp, et. al. 2013).

Developmental Delay (DD) is a disability category under IDEA for a child at least 3 years old but not yet 9 years old. This category refers to a child without acquired skills or achievement commensurate with established performance expectations for that age in at least two development areas: cognition, social-emotional development, communication, self-help/adaptive behavior, and motor development (KDE Eligibility Form, n.d.).

Early Intervention is the process used to identify students not making satisfactory progress who may need additional intensive instruction on academic skills. Early intervention is one aspect of the RTI process (RTI Action Network, 2022).

IDEA 2004 is the federal law that requires greater accountability for student performance through changes in the IEP's, discipline of, and identification of students having learning disabilities. The law requires the special education teacher to be certified and scientifically based teaching strategies and methods to be implemented with students (Yell, 2012).

Illiterate refers to someone who has never learned to read or write (Schmidt, 2022).

Individualized Education Programs (IEP) are separate educational plans for each student with disabilities. The plans include accommodations, modifications, and special services (Korst, 2022; KDE 2020).

Literacy refers to one's capability of understanding, evaluating, and using written materials, of having skills necessary for developing knowledge and individual potential, for creating relationships, and for achieving personal goals for success (Jennings, 2010; Sousa, 2016; Gonzalez-Valenzuela & Martin-Ruiz, 2017, ODEC, 2013).

Low literacy refers to not being able to read at a level higher than sixth grade (Schmidt, 2022).

Progress Monitoring is the assessment procedure within Response to Intervention that collects data during instruction to track students' progress or lack of (RTI Action Network, 2022).

Quantitative Research focuses on cause-and-effect relations with few variables and numerical data of numeric patterns (Ravid, 2020). Social science researchers use quantitative research to explore numeric patterns. They can conduct simple or sophisticated statistical analyses to convert data into averages or percentages, show relationships of data, or make comparisons across data (Coghlan & Brydon-Miller, 2014).

Response To Intervention (RTI) is a multi-level identification model currently used for early identification of reading, math, and social disabilities when students' responses to scientifically-based instruction during targeted intervention are substantially below that of peers. All children participate in recurring universal assessment screenings to identify those at risk for learning deficits who will receive supplemental tier 2 and tier 3 instruction. **Tier 1 Intervention** usually meets the needs of 80-85% of all classroom students. **Tier 2 Intervention** provides small group lessons for those 15-20% students not responding to tier I instruction. **Tier 3 Intervention** provides intense and individualized intervention, usually by a specialist, for those 5% who do not respond to tier 1 or tier 2 implementation (CPAC, 2009; RTI Action Network, 2022). Those who continue to show poor response may be considered for special educational placement (Catts et al., 2015).

Specially Designed Instruction (SDI) is an appropriate adaptation of "content, methodology, or delivery of instruction" based on an eligible child's unique learning needs resulting from a specific disability and are in the child's IEP (RTI Action Network, 2022).

Summary

The results of this quasi-experimental quantitative research study could potentially assist another school or district looking for solutions to a similar problem: kindergarten students failing to learn to read and continuing to struggle throughout their school careers. This study made use of the students' Reading Foundational Skills grades, STAR Early Literacy Assessment, and the Response to Intervention (RTI) to see if identification and intensive intervention in kindergarten leads to increased reading scores and possibly keep them out of special education classrooms for the remainder of their P-12 education.

Research tends to indicate that identification and evaluation of developmental delay during kindergarten is the KEY to academic success for a lifetime of learning!

CHAPTER II: LITERATURE REVIEW

Since early 1990, educational research has investigated why some children with unaddressed reading deficits fall behind peers. Recent USDE research on literacy in America showed that 21% or one out of every five adults cannot compare or contrast information, paraphrase, or make simple inferences, which is a low level 2 of five levels of literacy skills as defined by the Program for the International Assessment of Adult Competencies (NCES, 2019). Literacy has been defined as being able to understand, use, evaluate, and make connections with sixth-grade reading material. On the other hand, adults unable to comprehend sixth-grade text are said to exhibit low literacy. Furthermore, an adult who cannot read or write at all is illiterate (Schmidt, 2022).

Educators at the small rural Western Kentucky public school for whom this study was conducted have been concerned with the percentage of kindergarten students who, for the past few years, have not gained basic skills required to read or do basic mathematics. Faculty members have also observed that more children have been entering kindergarten demonstrating learning delays and, despite additional classroom assistance, are not able to overcome those problems and “catch up” with peers in both reading and mathematics. Following two more years of unsuccessful additional classroom assistance to overcome struggles and make progress, these students are finally evaluated and identified for special education services where they remain through grade 12. These students have been left academically behind peers the entire time. The researcher hopes that the results of this study will assist educators in this and other schools who are searching for ways to enhance academic programs and reach more students.

This chapter first explored three main reasons why literacy is important to children both while in school and throughout adult life. Second, this chapter investigated why some children

enter kindergarten and are not ready to learn. Third, this research focused on Response to Intervention, an educational program that numerous schools are utilizing to improve reading and math skills of elementary students when they are falling behind. For the special education students, the variable of specially designed intervention (SDI) was also investigated to see if there were positive results on reading grades and STAR scores.

Importance of Reading

Literacy is crucial to everyday life, from forming friendships to becoming a successful individual (Sousa, 2016; Gonzalez-Valenzuela & Martin-Ruiz, 2017). While the home is often the first schoolroom, official reading instruction begins in kindergarten, but not all children come to school ready to learn. In 2013, approximately 75,000 of America's students were not able to read (Sousa, 2016; Gonzalez-Valenzuela & Martin-Ruiz, 2017). When children do not read by age 10, their futures are affected not only academically, but also economically, as well as in their health and adult social relationships (Sousa, 2016; Gonzalez-Valenzuela & Martin-Ruiz, 2017). Reading is critical to success in life, from graduating from school, to driving, to running a home, to acquiring and keeping a job, to following instructions, to completing the simplest of tasks. When a person is unable to read, life is a constant struggle.

The Importance of Reading Skills for Academic Success

Forty years ago, research indicated that third graders who had low reading assessment scores were less likely to finish high school compared to peers whose reading scores were higher (Stevens, et al., 2017). Forty years later, Hernandez agrees that for children unable to read proficiently by grade 3, finishing school is four times more difficult than for peers who read proficiently. Additionally, children with the lowest reading scores make up at least 63% of all students who leave high school before graduation (Literacy Mid-South, n.d.; Wanzek et al.,

2018). Being able to read and understand is essential for academic success, especially when third grade teachers expect good readers and fourth grade teachers reduce, even stop reading instruction in favor of other subjects (Wanzek et al., 2018).

A student in fourth grade reading below grade level struggles with science or history because most information is in written sources (i.e., textbooks, online sites). While students may recite details from a book, higher level skills of drawing conclusions or evaluating the importance of ideas is beyond their grasp. As students advance, reading assignments are more complex, and without support, students continue to struggle and fall further behind. A student reading at a basic level may be able to identify information, make simple assumptions, and recognize details, but proficient readers apply what is read and make assumptions. Advanced readers create more complex inferences and can support their understanding and their conclusions (Wanzek et al., 2018).

A 2022 literacy study about the current rate of U.S. citizens older than 15 years old who read and write proficiently was alarming (Literacy Statistics, 2022). The National Center for Education Statistics (2019) showed that while four of every five U.S. adults, or 79%, have at least a medium level of literacy skills in English, one-half of them cannot read above a sixth-grade reading level. One of every five adults, for a total of 43 million adults, exhibit low level literacy skills and cannot summarize, compare material, or make low-level interpretations, all medium to high level reading skills. Kentucky's low literacy rate is comparable at 23% of all adults (U.S. Literacy Rates by State, 2023). Juel and others found that primary level students without strong foundational skills in literacy have reading difficulties throughout school. One child in six not reading proficiently before grade 4 will not graduate on time, at a rate four times greater than that for proficient readers (Wanzek et al., 2018).

The Importance of Reading Skills for Economic Success

Because strong literacy skills form the core of all future learning, the lasting effects of dropping out of school contribute to more students living in poverty (Wanzek et al., 2018). Adults must have a good job to support themselves and their families, but for those without a diploma, the unemployment rate is two to four times higher than for those with a vocational certificate or university degree (Literacy Pittsburg, 2022). Searching for jobs in classified ads, writing resumes, completing applications, reading a superior's instructions, or explaining to a potential employer about relatable skills and experiences are difficult tasks when one is illiterate. Moreover, the financial impact indicates that illiterate adults average from 30 to 42% less income than adults who read (Tam, 2017).

Additional research shows a strong relationship between the quantity of incarcerations in U.S. prisons and the lowest literacy skills (Literacy Mid-South, 2016). A 2018 study by Forrest reported that approximately 50% of prisoners incarcerated within English-speaking penitentiaries were functionally illiterate. Up to 60% of U.S. inmates are juveniles and adults with learning disabilities, and 70% do not comprehend fourth grade material. Most prisoners, therefore, do not possess appropriate reading skills required to complete daily tasks or maintain more than menial pay jobs (Literacy Mid-South, 2016). The Department of Justice (DOJ) found that 85% of all youths who appear in court-mandated hearings are functionally low-literate and unable to read and write at the simplest level (Literacy Mid-South, 2016). Juvenile incarceration limits the possibility of graduation while increasing the prospect of future imprisonment. Furthermore, dropouts will likely run afoul of the law three times more often than graduating peers and 63% more so than college graduates (Literacy Mid-South, 2016). Approximately 33% of inmates surveyed as to why they dropped out of school said lost interest or could not do the classwork

(Literacy Mid-South, 2016). “The link between academic failure and delinquency, violence, and crime is welded to reading failure” (Literacy Mid-South, 2016, p. 2).

Literacy is also related to adult good health (CDC, 2022). Achieving quality health is difficult when a person is unable to read doctors’ orders and medication instructions or simply understand their health risks. They may take the wrong dosage whether it be too much or not enough (CDC, 2022). In 2017, the U.S. Department of Education stated that adults with the worst health demonstrate the most limited literacy skills as well (Literacy Pittsburg, 2022; CDC, 2022). In addition to poor health, illiterate adults experience more workplace accidents as well (Literacy Pittsburg, 2022; CDC, 2022). If workers cannot understand written safety instructions or hazard signs, they are dangerous to themselves and their co-workers. More sick-leave and recovery time is required because they are unable to read doctor’s instructions or test results, or to recover quickly from workplace injuries (Literacy Pittsburg, 2022).

The Importance of Reading Skills for Social Success

Social impacts are another undesirable result of illiteracy (Literacy Pittsburg, 2022; Tam, 2017). Not keeping up academically with classroom peers (or adults in the workforce) may eventually lead to feelings of low self-esteem, lack of enthusiasm, and negativity toward others according to Nelson & Harwood (as cited by Sousa, 2016; Tam, 2017). A loss of self-confidence can affect one’s attempts to make friends, especially if others look down on them for being different. Students not understanding grade-level materials feel isolated or lost when they cannot understand concepts being taught. Embarrassed that they need assistance, they may either disrupt or withdraw as class continues (Literacy Pittsburg, 2022). School-based interventions that accentuate students’ self-esteem can be effective but should be used cautiously and always linked to achievement. “Motivation and achievement do improve when self-esteem interventions

center on instilling a sense of personal responsibility for academic performance" (Sousa, 2016, p. 37).

These same feelings of inadequacy can negatively impact adults throughout life when they cannot discuss local events, such as a boil water advisory or a road closure that was announced in the local newspaper (Literacy Pittsburgh, 2022; Tam, 2017). People lacking proficient literacy skills often suffer from depression. Women not able to read well are five times more likely to become depressed. Other studies found proficient literacy abilities decrease feelings of depression because self-esteem and self-confidence can lessen feelings of isolation and shame (Forrest, 2018). The Centers for Disease Control and Prevention in a 2021 report warned that medications often prescribed for depression during pregnancy may cause the baby to develop learning deficits affecting cognition and could lead to a diagnosis of Developmental Delay (DD) during primary school (CDC, 2021).

Developmental Delay Defined

The disability category of Developmental Delay (DD) was first defined during the 1970's as a disability category occurring in children ages 3 to 5. DD was also given as a reason some children were at-risk for reading difficulties (Demirci and Kartal, 2018). According to Yell (2012), IDEA 2004 authorized the identification of DD to include children 6 through 8 years of age years to also receive special education services under the IDEA category of Developmental Delay (DD). DD is a disorder in which a child has not achieved an expected developmental skill as have other children of the same age. The delay may appear in the child's speech and language, motor development, cognition, self-help/adaptive behavior, or social-emotional development (KDE DD eligibility form, 2018).

Various characteristics indicate the possibility of DD. While some delays are recognized during infancy, others may not emerge until students enter kindergarten (SSMHealth, 2022). The earliest and most recognizable signs of DD include delayed motor function skills in infants such as rolling over, sitting up, crawling, and walking much later than developmentally appropriate. Delayed communication skills include talking or socializing much later than is normal, or an inability to remember, learn, or connect consequences with actions. Delayed self-help actions independent including dressing, brushing teeth, or using the bathroom are symptoms as well (SSMHealth, 2022). When at least two significant delays in any of the five areas mentioned previously are identified, the diagnosis will be DD (Demirci and Kartal, 2018; KDE DD eligibility form, 2018). When DD is diagnosed early during yearly pediatric well-child visits, early therapy can lead to a better outcome (Hasler & Akshoomoff, 2019), and likewise, school-based intervention such as RTI can begin in kindergarten.

Medical Causes of Developmental Delay

Research studies by Gonzalez-Valenzuela (2021) and Hasler and Akshoomoff (2019) indicated that some choices mothers make are not healthy for their unborn baby. Those choices include taking drugs (i.e., illegal drugs, certain prescriptions, or even over the counter), consuming alcohol, smoking, and vaping. Mothers' medical situations including obesity, uncontrolled diabetes, fevers above 101 degrees, or serious infections may also leave negative implications for the unborn baby (CDC, 2021). The age of the mother-to-be is another risk factor. For example, when her age is greater than 35, the risk of the infant having Down syndrome is increased (Hasler & Akshoomoff, 2019; Gonzalez-Valenzuela et al., 2021).

Additionally, one out of every ten babies in the U.S. is born premature, prior to 37 weeks, and may be at risk for DD (Gonzalez-Valenzuela et al., 2021; Hasler & Akshoomoff, 2019).

Babies born earlier than 33 weeks and weighing less than 3.307 pounds have more probabilities for speech, vision, rapid recall, and phonologic awareness delays than do babies who are born full-term (Gonzalez-Valenzuela et al., 2021; Hasler & Akshoomoff, 2019). Often children born earlier than 37 weeks have some type of learning deficit and experience academic struggles, especially in reading (Gonzalez-Valenzuela et al., 2021; Hasler and Akshoomoff, 2019).

Twin births have also been investigated for the possibility of one or both babies developing learning deficits (Gonzalez-Valenzuela et al., 2021). Their study on 124 kindergarteners, 62 boys and 62 girls, evaluated the possibility of learning deficits following Cesarean section or vaginal births. The study evaluated controls including IQs, abilities to read and write, birth weights, mother's age at delivery, gestational age at birth, and fetal observations (Gonzalez-Valenzuela et al., 2021). Demirci and Kartal (2018) agreed that children born by Cesarean or transverse births show early developmental delay signs (DD) from their early exposure to anesthesia and high-risk complications (Demirci and Kartal, 2018).

Early exposure to anesthesia can be a link to DD, affecting fine and gross motor skills, recall, focus, and learning development (Feng et al., 2022). Feng's study researched the differences between children exposed and not exposed to general anesthesia. They studied children younger than 2 years of age who had been exposed to one or more anesthesia events (i.e., laryngeal mask or endotracheal tube) comparing them to same-age children with no exposure. Subgroups showed how many times children received anesthesia and the length of each exposure. Variables such as brain cancer, broken femur, head injury, heart failure, leukemia, lung contusion, pneumonia, respiratory failure, perinatal complications, seizure, shock, or stroke during which patients were exposed to general anesthesia were also evaluated (Feng et al., 2022). Studies of 11,457 children exposed to anesthesia before age 2 were compared to

comparable studies of 22,914 children never exposed. Their findings indicated that children who experienced general anesthesia during surgery report a higher risk of DD, especially if that exposure occurs before 12 months of age. These researchers also found that boys have a greater likelihood of showing developmental delay than do girls (Feng et al., 2022).

In 2016 and 2017, the U.S. Food and Drug Administration (FDA, 2017) issued health alerts about general anesthetic and sedation with young children and expectant women. They strongly advised the postponement of procedures that require anesthesia because of possible negative effects (FDA, 2017). The results of their study supported the FDA recommendation for parents to delay elective surgeries and procedures until the child is older than 2 years (Feng et al., 2022).

Socioeconomic and Parental Causes for Developmental Delay

Parental and socioeconomic factors have been linked to children who have developmental delays and learning problems (Sousa, 2016). One study focused on parental and sociocultural influences during early childhood and their relationship to DD (Demirci and Kartal, 2018). The family unit, level of parental education, and status socioeconomically will have the greatest effect on a child's development before children become five years old (Sousa, 2016). Often, children identified as having DD do not have proper housing, meals, clothing, or books because their parents may not have been able to provide for good childcare, regular meals, early education, doctor's care, or safe housing and may live near low performing schools. Health or family problems frequently lead to higher student absences and less academic progress. During summer, academic skills usually decrease because of little or no access to education programs. Children may likely enter kindergarten without the necessary language or social skills required

for successful learning. As a result, students have weaker academic skills and success and are less likely to finish school (Sousa, 2016).

The family unit of today does not resemble families of a few decades ago when the stay-at-home mother cooked dinner every night for the whole family who ate together and discussed the day's activities (Sousa, 2016). In 2021, 20% or 19 million children lived in America's single parent homes, compared to just 9% in 1960 (Chamie, 2021). In today's economy, single parents often work longer hours at jobs which means less time spent as a family. As such, there is less time to cook which means that less nutritious meals such as pizza, peanut butter, or bologna sandwiches, processed or greasy fast foods, hamburgers and fries often replace the once-balanced, home-cooked dinners. Sousa (2016) attributes poverty, divorced or separated parents, neglect or abuse, and poor nutrition as factors linked to children developing learning delays and problems.

Response to Intervention

The Individuals with Disabilities Education Improvement Act of 2004 (IDEA) encouraged the use of research-based strategies and curriculum for two reasons: (1) to provide higher student academic achievement results and (2) to determine if students had a learning disability (Yell, 2012; Vanderheyden et al., 2016; Berkeley et al., 2020). Response to Intervention (RTI) and other multi-tiered programs were developed to identify students with learning difficulties to provide strategies to bring about higher academic results (Sousa, 2016; Vanderheyden et al., 2016; Berkeley et al., 2020).

Response to Intervention (RTI) is a research-based method of instruction that is focused on prevention and remediation that, through intervention, provides a method for teachers to meet individual students' academic needs. Through the two-fold process of measuring student

responses to programs, strategies, approaches, and interventions while looking for enhanced learning and progress, RTI was born (Sousa, 2016; Vanderheyden et al., 2016; Waterford, 2017; Berkeley et al., 2020). The basis of the RTI method is the early intervention provided to students when academic difficulties are first noticed (Sousa, 2016). The RTI objective is achievement growth for all students. Besides providing preventive and remedial services for students at-risk, RTI can also recognize learning deficits. For example, a student with substantially low academic achievement and unsuccessful RTI may be at risk for a learning disability and may need special education services. The idea behind this dual discrepancy model is that if a student receives quality instruction along with RTI remediation assistance, then a struggling student who does not have a disability will also make satisfactory progress (Sousa, 2016). However, if a struggling student is not making adequate progress, perhaps specially designed instruction (SDI) through special education services is needed.

Because the program was both scientific and research-based, RTI was quickly utilized by school systems (Lightner, 2022). The Pennsylvania Department of Education explained their RTI goal was “to improve student achievement using research-based interventions matched to the instructional need and level of the student” (Lightner, 2022). According to the National Center on Response to Intervention (NCRTI), when school systems implement RTI with recommended fidelity, pedagogy is improved and students with learning deficits achieve academic success. The NCRTI further recommends that the three-tiered RTI program be implemented schoolwide for the most success to be achieved (Vanderheyden et al., 2016; Waterford, 2017; Berkeley et al., 2020).

The term Multi-Tiered System of Supports (MTSS) includes RTI as one of several multi-tiered intervention frameworks (Vanderheyden et al., 2016;Waterford, 2017; Berkeley et al.,

2020). Whether the system is RTI or another MTSS, the frameworks are similar. The first step identifies students at academic risk through any of various assessment packages such as the STAR Reading Assessment (Waterford, 2017). The assessment packages create information databases so teachers can determine which instructional practices and interventions students should receive to prevent them falling farther behind. RTI also encourages the assessment of specific outcomes. Teachers assess students to see if current interventions are working, if students are showing progress, and what adjustments are needed to improve academic results and increase scaled scores (Vanderheyden et al., 2016;Waterford, 2017; Berkeley et al., 2020).

Tiers of Intervention

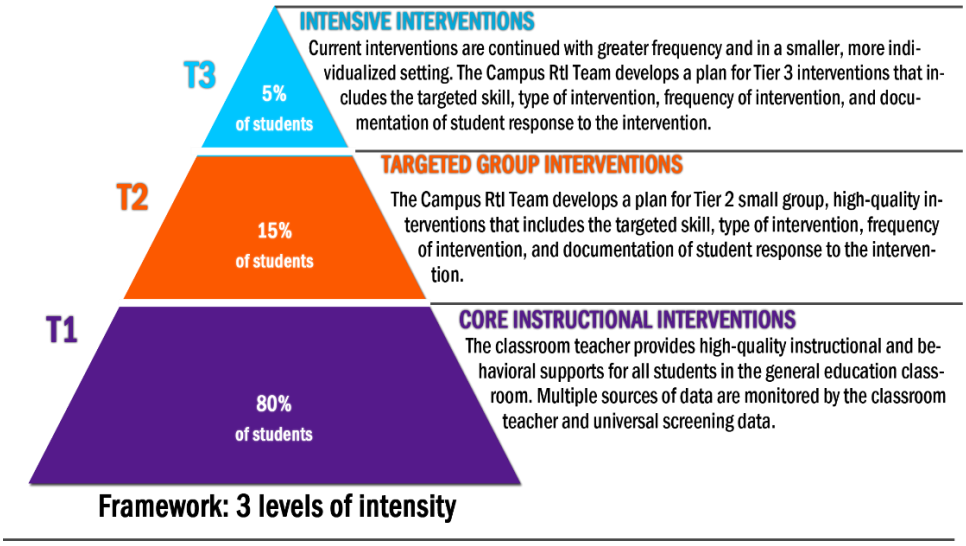
At each of the three tier levels, teachers present skill specific interventions based on students' responses (needs) to the instruction (Bailey, 2020). Interventions are selected from research-based strategies that have consistently impacted student outcomes. Tier 1 is the initial level of instruction presented to the whole group of students, focusing on high level core instruction for every child. RTI has reported that at least 80% of all students have responded positively to instruction during tier 1 (Vanderheyden, et al., 2016). Tier 2 offers outside the regular classroom, small group intervention lessons on basic skills needed for the 5-20% of the students placed in this tier; these sessions are outside the classroom and taught by certified teachers. Tier 3 offers intensive instruction through either one-on-one or small group sessions, also outside of the regular classroom, for 1-5% of the students who have shown little progress in the previous tiers and need additional intense instruction. Student needs for tiers 2 and 3 are identified through the progress-monitoring that accompanies each set of interventions (Vanderheyden et al., 2016; Waterford, 2017).

Strategies to address students unique learning styles are imbedded within all three RTI tiers of instruction. Students learn with research-based intervention strategies based on seven identified learning styles: solitary/intrapersonal, visual/spatial, logical/mathematical, verbal/linguistic, physical/kinesthetic, social/interpersonal, and auditory/musical (Kansas University Faculty, 2022). Using research-based instructional strategies based on these seven learning styles, teachers can meet diverse learning levels and needs of all students, addressing each individual weakness to decrease academic delays (Kansas University Faculty, 2022).

The Response to Intervention Model in Figure 3 below depicts the three tiers of intervention that are integral to the RTI instructional process (https://www.bing.com).

Figure 3

The Response to Intervention Three-Tier Model



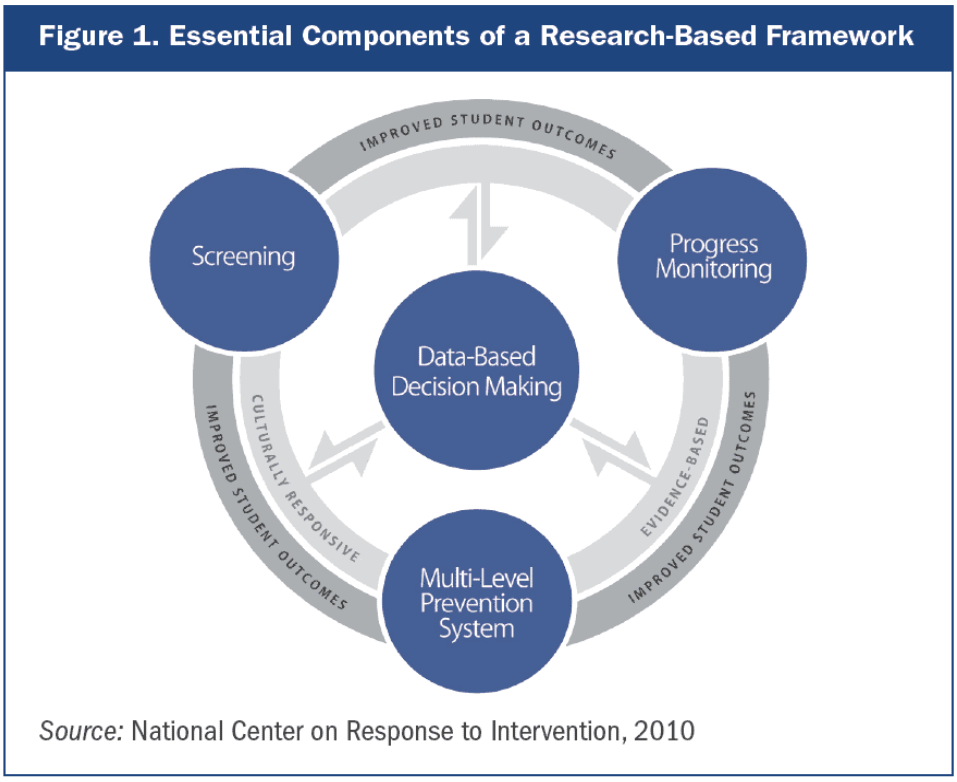
Crucial Components of RTI

The National Center on RTI (NCRTI) has defined four crucial elements for the RTI research-based structure. Those elements are universal screening, continuous progress monitoring, a multi-level prevention structure, and data-based decision making (Waterford, 2017).

Figure 4 below (Waterford, 2017) illustrates the four Response to Intervention components and how they interrelate with each other.

Figure 4

Essential Components of a Research-Based Framework



Universal assessment screening gathers each student's strengths and weaknesses (Vanderheyden et al., 2016; Bailey, 2020). Screening determines which students require supplemental academic support and at what tier level the intervention support will occur (Waterford, 2017). All students in the RTI classroom are evaluated throughout the instruction to gain pertinent data. The RTI Action Network has released charts of information regarding screening instruments such as age range, skills assessed, administration time and format, predictive validity, criterion measure used, and benefits and limitations of each package.

Through *progress monitoring* (Bailey, 2020; Vanderheyden et al., 2016; Waterford, 2017), teachers make informed decisions concerning each student's continuing instructional needs based on multiple data points. At least two *progress monitoring* assessments related to what students have been learning should take place during each tier intervention session (Waterford, 2017; Vanderheyden et al., 2016). Progress monitoring looks at how successfully the reading pedagogy improves students' abilities both individually and in whole group and can even identify additional students who may become at-risk (Vanderheyden et al., 2016; Waterford, 2017; Bailey, 2020). This recurring monitoring provides data that is necessary for the *decision-making component* by continually collecting systematic data points to determine additional strategies and interventions that should be implemented next (Bailey, 2020; Lightner, 2022).

The RTI component of *tiered instruction* utilizes instruction centered on *evidence-based intervention.* Effective RTI/MTSS systems include three tiers of preventive instruction to address individual learning challenges (Vanderheyden et al., 2016; Waterford, 2017; Bailey, 2020). From data about individual student weaknesses, teachers prepare individualized intervention instruction of research-based strategies for students' specific learning problems at each tier level. Tier 1 offers high quality instruction and behavioral support from the classroom teacher for every child within the classroom. According to Figure 3 on page 34, 80% of classroom students respond positively to the research-based whole group instruction of tier 1. Tier 2 offers small group, research-based intervention strategies on the identified skill to approximately 15% of the classroom. For the last 5%, tier 3 offers students intensive instruction from a reading specialist or special education teacher because of little progress they made in the other two tiers (Vanderheyden et al., 2016; Waterford, 2017). When schools implement interventions, teachers focus instruction on specific, individual needs by targeting individual deficits. Students'

academic skills improve as has been documented by universal screening assessments (Bailey, 2020; Wiley, 2021).

Decision-making through data analysis (Vanderheyden et al., 2016; Waterford, 2017; Bailey, 2020) allows educators to use relevant student data gathered from the ongoing screening assessments and continuous monitoring of progress to identify students with specific learning deficits, the needed pedagogy, and when students move between tiers (Waterford, 2017). After further screening has been administered to students who are falling below set cut point, the teacher uses that data to decide the student's next intervention, intensity, and length (Understanding the components of RTI, 2022).

Universal Assessment Screening Tools for Reading

Response to Intervention (RTI) requires teachers to utilize universal assessment tools to determine baselines, strengths, weaknesses, and progress. The STAR Early Literacy Assessment for preschool and kindergarten and the STAR Reading Assessments for grades 1-3 are among recommended packages for the initial literacy screening step (Pool & Johnson, n.d.). To provide an easy process of understanding STAR data from assessments that continue throughout the intervention process, STAR offers a chart of monitoring tools that schools and districts may use (NCII, 2021).

The STAR Early Literacy Assessment is one portion of the total Renaissance STAR Assessment Program, a computer-based program that identifies where students' scores fall related to their literacy development (STAR Early Literacy, 2023). For children in preschool through third grade who are not reading or not reading well, this assessment measures students' understanding and usage of 41 different skills necessary for learning to read. Those skills are separated into ten domains and include the following: alphabetic principle, concept of printed

word, visual discrimination, phonemic awareness, phonics, word structure, vocabulary, both sentence- and paragraph-level comprehension, and early numeracy (STAR Early Literacy, 2016). These domains are crucial to learning to read proficiently.

STAR Reading Assessments require just 15 minutes for a student to finish. The program then creates immediate diagnostic feedback so teachers can monitor students' skill development, guide planning, create focus for instruction/strategies, and identify students requiring additional support (STAR Early Literacy, 2023). The STAR reports provide three kinds of key scores: scaled scores, percentile rank, and student growth percentile for individual readiness. There are also methods for watching growth measurement and monitoring that growth (STAR Reading Assessment, 2021). Skill Set Scores are reworked into an easy-to-understand chart of each child's strengths and weaknesses for each subdomain (STAR Early Literacy, 2023). From this data, teachers see how students are progressing or falling behind, what intervention is needed, and if the interventions are working. Of significant importance is that educators may determine personal school or district benchmark scores as the minimal level of acceptable achievement (STAR Reading Assessment, 2021). The school for which this study was completed used the STAR Early Literacy for data gathering and monitoring because the Kentucky Department of Education had ranked the program in the top ten, based on reliability (NCII, 2021).

Development of RTI and MTSS in Kentucky

By 2017 several states had implemented RTI systems or had shifted to other models of Multi-Tier Systems of Support (MTSS) (Berkeley et al., 2020). Kentucky, West Virginia, New Jersey, and Oklahoma had developed distinctive systems not referenced as either MTSS or RTI. The initial *Kentucky System of Intervention (KSI)* was an RTI framework extension that stressed education through accelerated learning, classroom teachers' increased expertise, and the needs of

the whole student. The three tiers focused on behavior and academics while teachers integrated evidence-based, appropriate teaching strategies (Berkeley et al., 2020). More recently, the Kentucky Department of Education released the *KyMTSS Implementation Guide* for a more unified understanding of the expanded Kentucky vision of their new comprehensive multi-tiered system of support (Wainwright, 2022). The enhanced focus is not just on increased achievement for all Kentucky students, from primary through grade 12, but also on the creation of schools that are trauma-sensitive while they focus on the whole student: social and emotional learning, mental health, and culturally responsive and resiliency practices that are all equitable. All Kentucky schools are to integrate intervention within core instruction and assessment while planning, implementing, improving, and sustaining educational programs. The hope is that the KyMTSS framework will bring together systems, information, and methods for positive and inclusive educational experiences equitable for all Kentucky students from the smallest buildings to the largest campuses across the state (Wainwright, 2022).

Benefits of RTI and MTSS Instruction

The benefits for schools and districts that utilize RTI/MTSS are numerous. RTI has been successful with preschool, elementary, middle, and secondary students because the RTI format allows teachers the opportunity for early identification of any student who has different learning disabilities (Catts et al., 2015). Using a problem-solving approach, RTI provides focused instruction at three ability levels and can also provide intervention for behavioral and social-emotional problems (Fuchs et al., 2014). Students can also learn improved study skills through RTI. The RTI approach guides children to overcome learning deficits and not qualify for special education and related services (The Use of RTI, 2021).

A study of RTI with kindergarten students showed that data points of growth provided valuable data to predict reading outcomes (Catts et al., 2015). The growth achieved by students in January was adequate to predict what outcomes would show, meaning that waiting until a May assessment before making additional decisions regarding instruction was not always necessary. Therefore, a blend of where the child was at the start of kindergarten and where he or she is in January can provide a good indication of risk for reading difficulties in first grade (Catts et al., 2015).

Previously, some students have had to "wait-to-fail" before qualifying for services from special education teachers, but with RTI/MTSS instruction, students can now be identified early and receive SDI (Berkeley, et al., 2020). From a high of 44.6% in 2007, the percentage of special education enrollment dramatically declined to 38.6% in 2016, the most recent reporting year, because of RTI/MTSS instruction. The rate also dramatically declined for students of color previously over-represented in special education programs (Berkeley, et al., 2020).

Another benefit came from a series of survey studies conducted between the years 2014 through 2019 (Berkeley, et al., 2020). In 2014, a national study surveyed 619 both general classroom and special education teachers about the RTI program and implementation. In 2019, an earlier study had asked 139 general and special education teachers about the same topic. Both studies agreed with the similar studies in 2015 and 2018 that, despite the lack of understanding about the operation of RTI, the program has had a great influence on instructional models and practices in elementary schools across the nation (Berkeley, et al., 2020).

Limitations of RTI and MTSS Instruction

While the benefits of RTI/MTSS include higher reading scores and fewer students needing identification and evaluation for SDI, there have been a few barriers uncovered.

Research completed during 2015 reported an implementation mismatch in 146 elementary schools across 13 states that had employed RTI for a three-year period (Berkeley et al., 2020). Two significant findings were (1) that no statistically important comprehensive reading measure benefits for students in second and third grade were reported, and (2) that negative effects were reported for children assigned to tier 2 or 3 interventions. Three explanations were offered. First, six out of ten classrooms reported student absences during instruction. Second, most students went immediately to tier 2 interventions, bypassing tier 1 completely. The third reason was that too many students received tier 2 and 3 interventions.

RTI experts recommend that up to 20% of students need tier 2 interventions (Bailey, 2020) instead of the study's reported 41% (Bailey, 2020). Additionally, a 2017 analysis found that skillful implementation of high-quality interventions was the reason for improved tier 2 scores. They added that "high fidelity of implementation" is vital for RTI's success (Berkeley et al., 2020, Bailey, 2020). Tier 1 strategies are implemented within the general education classroom to all students and generally meet the needs of approximately 80% of the class (Bailey, 2020). Following progress monitoring to verify their correct placement, students are then placed within the appropriate instructional group and tier matching needs.

In 2014, Al Otaiba et al., posed the following question: "Is the reality of RTI, as implemented in practice, potentially also a wait-to-fail model" (Berkeley et al., 2020, p. 334)? Should special education instruction be delayed if students spend excessive time within RTI tiers before receiving SDI? This means that students who may need SDI must wait to be identified, evaluated, and perhaps eventually denied access to rights and protections that students with disabilities receive. A letter from the United States Department of Education Office of Special

Education and Rehabilitative Services dated January 21, 2011, clearly states, “RTI is not to be used in lieu of special education or to delay special education evaluations” (Lightner, 2022).

An unintended but negative consequence of RTI is that the growth of these prevention systems has increased special education paper workload because special education teachers are expected to support any additional students who need intervention at any tier (Berkeley et al., 2020). The inclusion movement and RTI has affected how many special education teachers there are across the nation as the number has dropped nearly 20% in the last 15 years. That means that there are fewer special education teachers who can work with general classroom teachers and serve the added students who may have an underlying disability. Becoming overextended while expected to support all students may mean that students with learning disabilities may not obtain the appropriate and meaningful education they should receive (Berkeley et al., 2020).

Relationship of RTI and MTSS to Special Education

A major question about RTI/MTSS use within the classroom concerns the relationship to special education programs already established within the school. RTI/MTSS is invaluable because of the success shown for everyone within a classroom and not just students with special needs. Most of the strategies and tier interventions occur within the child’s regular classroom where many students are placed. Additionally, teachers can recommend any student to receive intervention. Despite any overlap, there is also a difference between multi-tiered support systems and special education classes. RTI/MTSS are instructional frameworks that offer interventions to students struggling with reading, mathematics, or behavior but are not to replace special education services. Unlike special education, there are no national laws that control the implementation within a school system or district (How is RTI different from special education? 2022).

Some educators look at the general education frameworks of RTI/MTSS as a scale or a continuum (How is RTI different from special education? 2022). At tier I, most students show progress and do not need additional intervention. However, when progress is not made, students will receive more intensive intervention in tier 2. In tier 3, an even smaller number of students receive intense instruction, often with a special education teacher. While students with specific learning disabilities (SLD) participate in the RTI/MTSS process, IDEA 2004 encouraged multi-tier support systems to assist in the identification of a specific learning disability and to identify the intervention level where the child should make progress. RTI intervention tiers are not to take the place of special education instruction because the strategies and interventions can become part of instruction presented in or out of the classroom (How is RTI different from special education? 2022).

As well as providing ways in which students can succeed, RTI/MTSS is also useful to screen for special education to see if a struggling student has a specific learning disability (How is RTI different from special education? 2022). Since there are no medical tests to diagnose SLDs, RTI/MTSS is a means to determine the reason for a student's struggles and lack of progress. While RTI/MTSS can reduce overidentification of students eligible for specially designed services, the framework cannot alter a special education evaluation nor be the only screening for a special education eligibility. In fact, a child may go through a psycho-educational evaluation process while receiving RTI interventions (How is RTI different from special education? 2022). IDEA 2004 states, "a local educational agency may use a process that determines if the child responds to scientific, research-based intervention as a part of the evaluation procedures" (Lightner, 2022). This is why teachers can apply RTI/MTSS instruction in both regular and special education classrooms. Additionally, there are interventions and

programs once limited to special education programs now available to any struggling student who may not yet have qualified for special education services (How is RTI different from special education? 2022).

Research Studies Regarding RTI in Early Primary Grades

Passage of the 2004 Individuals with Disabilities Education Act (IDEA) gave school systems an open door to implement multi-tier response to intervention models (O'Connor et al., 2014). In some instances, when evaluation for intensive special education intervention occurred, some students had originally been overlooked and not identified until the end of second grade or even later. Some schools began to implement RTI at the realization that delaying identification of students for special education suspended valuable early intervention for reading achievement, a wait-to-fail scenario (O'Connor et al., 2014). A second reason schools began to implement RTI was the belief that a lack of adequate instruction had caused some children to not learn to read (O'Connor et al., 2014). The new thinking was that some students would not have required SDI if prior instruction had been more research-based or delivered within small groups or tiers with specific, focused lessons, activities, and on-going monitoring. Following the inclusion of at-risk students in tier 2 intensive intervention and adding the screening/progress monitoring process several times a year gave schools hope. When students score lower than the pre-assigned cut scores, that may point to inadequate reading progress and the need for more intensive intervention strategies (O'Connor et al., 2014).

Kindergarten Studies

Wanzek's review of collaborating studies completed during the early 2000's contained helpful information (Wanzek et al., 2018). Findings by Vaughn & Linan-Thompson (2003), Vellutino, Scanlon, Small and Fanuele (2006), and Partenan and Siegel (2014) supported

primary grades as the optimum time to begin intensive learning intervention strategies. The researchers concluded that primary teachers should begin by assessing students' baseline reading achievement. Lam and McMaster found similar results in their 2014 study. Students assessed with extremely low levels of beginning reading achievement will continue to have low reading achievement skills in the future, especially if interventions are not intensive and research-based (Wanzek et al., 2018).

Little et al., (2012) investigated whether standardized interventions using individual student performance data to adjust the next-instruction lessons were more valuable than a tier 2 school-developed next-instruction intervention at the kindergarten level. Ninety at-risk kindergarteners were given the Pearson/Scott Foresman Early Reading Inventory (ERI). Tier 1 intervention was followed with eight weeks of tier 2 lessons with students receiving 100 days of 30-minute sessions of either teacher-developed interventions or ERI lessons. Performance and progress monitoring data was recorded every fourth week and included unmastered content/skills so interventions could continually be modified to meet student's performance and the school's supplemental reading interventions (i.e., curriculum pacing and regrouping adjustments). Students with similar results were grouped/regrouped throughout at seven different measurement points. Data from regular assessments determined grouping modifications, curriculum pace, and focus of all instruction. Students with strong, consistent performance fast-tracked into more intense instructional groups, while those reporting weaker performances were divided into smaller groups for instruction tailored to specific needs. While results did not reveal statistically significant differences on outcome measures, students in the ERI tier 2 interventions ranked at or above the 30^{th} percentile on word reading deficits compared to those instructed with teacher-developed interventions (Little et al., 2012). Their study concluded that teacher-developed

lessons must include research-based strategies and focus on specific instructional needs to meet RTI standards (Wanzek et al., 2018).

A second study involved 103 kindergarten children at-risk for reading deficits (Little et al., 2012). In that randomized control study, outcomes following ERI instruction modified to student performance for the experimental group were compared to outcomes in the control group who received non-modified ERI standardized instruction. End of kindergarten assessments showed the experimental (intense intervention) group scoring higher than did the control group. Post-test outcomes revealed "statistically significant differences on measures of letter knowledge, phonemic blending, word reading, spelling, and oral reading fluency" (Little et al., 2012, p.190). The instruction that was student focused and based on progress monitoring data led to higher student results (Little et al., 2012).

The large Partenan and Siegel study (2013) provided more positive results from early literacy instruction, intervention, and implementation. Using longitudinal effects of an intervention when students were in early primary, researchers followed students from 30 elementary schools in the North Vancouver, Canada School District. These students had previously been part of another study of 650 kindergarten to seventh grade students. The students' reading scores were evaluated in kindergarten and again in grade 7. Post-tests identified 22% of the kindergarten students as at risk-for reading, but when later assessed at grade 7, that percentage had dropped to just 6% (Partenan & Siegel, 2013).

First Grade Studies

In a 2014 study by Al Otaiba and others, the two RTI models of typical RTI and dynamic RTI were researched to see which model was more successful. The study sample included 522 first grade students from 34 classrooms within 10 culturally and socioeconomically diverse

schools. In the typical RTI model, tier 1 is instruction with the entire class after which those who require additional instruction move to the tier 2 small group format or to tier 3 for one-on-one intensive instruction, the level depending on students' assessed needs. The typical RTI model is the one that most RTI schools chose. In that model, educators wait for the completion of tier 1 instruction and progress monitoring for additional documentation to support moving students to other tiers (Al Otaiba et al., 2014).

On the other hand, the dynamic RTI model did not require tier 1 instruction to be completed. Instead, pre-assessment screening data identified students with potential reading difficulties (Al Otaiba et al., 2014) who then moved to instruction at either tier 2 or 3 intervention, based on their needs. In tier 2, students received 30 minutes of intervention two times each week with four to seven classmates. Students with serious reading difficulties scoring below the 40^{th} percentile were assigned to tier 3. On the other hand, any student who scored at least a 95 in comprehension and word identification remained in tier 1. Interventions were the same across both the typical and dynamic models. The only difference occurred when supplemental sessions were given. The district reading specialist chose evidence-based instructional interventions to support Open Court's grade 1 reading series, *Imagine It!* at tier 2. Students in tier 3 received 45 minutes of intensive intervention 4 times a week, and teachers taught from scripted lessons containing explicit teaching details (Al Otaiba et al., 2014). The dynamic RTI group finished with better reading scores than the typical RTI group (Al Otaiba et al., 2014). In a similar 2010 study, Vaughn, Denton, and Fletcher proposed that students pre-assessed at the lowest level should go immediately to tier 3's intense interventions. Students who skipped tier 1 instruction for tier 3 scored higher than did the typical students who completed tier 1 before being placed in tier 2 (Al Otaiba et al., 2014). The researchers did not want RTI to

become another wait-to-fail model for two reasons. First, dynamic RTI should be conducted because scores on pre-intervention assessments can accurately predict students' poor responses. The second reason is the difficulty that schools have assisting consistently weak responders to catch up. Any wait puts struggling students farther behind and makes their progress more difficult to achieve (Al Otaiba et al., 2014).

O'Connor (2014) compared reading achievement from a RTI kindergarten and from a first-grade model to their reading achievement and relationship to special education at the completion of second grade. Results from five schools and 214 students who received tier 2 intervention during either kindergarten or in first grade were compared with results from a group of 208 second-grade students identified with average reading abilities. They were then compared to a third group of 102 second-grade low-level readers who had not received tier 2 intervention. These last two groups of 310 (208 + 102) students became the historical control group. RTI students overall had much higher second-grade outcomes than did the control group. There was no significant difference in the percentage of special education placements, except that a larger percentage who qualified for special education received low scores. By the end of grade 2, those who received RTI intervention posted higher scores than did students from the historical control group. The exception was the second-grade students who had qualified for special education following RTI intervention (O'Connor et al., 2014). O'Connor recommended that RTI be implemented in not only first grade but also kindergarten and to also identify students who may lose skills during summer vacation (O'Connor et al., 2014). The researchers suggest continuing the program in later grades, too. Many schools have since implemented RTI across grades and assess students on a pre-determined year-round schedule so that, if scores suggest risk, students can be moved to another tier, according to O'Connor (2014).

> some students may develop risk for reading difficulties in first grade and still score adequately (e.g., at or above the 25th percentile) on kindergarten measures. For these students, having access to RTI in kindergarten would not matter because they would not have been selected for tier 2 intervention at that time. Other students with reading difficulties in first grade might have alphabetic or phonemic difficulties that would have been apparent at the beginning of kindergarten. (p. 309)

Providing all students access to RTI while in kindergarten may eliminate or reduce difficulties that often appear in first grade as students continue to learn to read.

Longitudinal Studies

The O'Connor 3-year longitudinal study randomly assigned year 1 schools to begin the RTI model during either kindergarten or first grade (O'Connor et al., 2014). Also in the study's first year, students in second grade became the historical control group, and their scores were compared to end of second-grade scores. Students were moved to tier 2 when their scores indicated at-risk levels. Students scoring above cut points for a minimum of 6 weeks moved to the less-intensive whole group in tier 1. Foundational reading skills were assessed for progress at least three times (fall, winter, spring), so students who did not continue improvement at tier 1 were returned to tier 2 (O'Connor et al., 2014).

A smaller group of Partenan and Siegel's original kindergarten students was reexamined in a longitudinal study (Partenan & Siegel, 2013). Four hundred and six students had completed the WRT3 Reading Test each year from kindergarten to seventh grade and were in one of the following four groups: (1) at-risk in K and below average in seventh grade, (2) at-risk in K and average in seventh, (3) not-at-risk in K and below average in seventh, and (4) not-at-risk in K and average in seventh. Two different reading intervention programs were used: *Firm*

Foundations for all kindergarten students and *Reading 44* for other students. Struggling readers received tier 3 interventions. The pre-and post-tests included the WRAT3 Reading Assessment for all students. Results showed evidence of sustained positive results from early literacy instruction during kindergarten (Partenan & Siegel, 2013).

Gonzales-Valenzuela and Martin-Ruiz, 2017) reviewed research from ten randomly selected Spanish elementary schools to investigate the impact of a written and oral language intervention curriculum for Spanish students identified as at risk of having learning disabilities. This small sample included fifty-six at risk students between the ages of 5 and 7. The study's longitudinal design included repeated measures along with four assessment points and three intervention points that occurred for a period of three years. From primary classrooms in ten area schools, the researchers created two study groups (intervention instruction and no intervention) and two reading variables (reading accuracy and reading comprehension). The intervention group scored higher on both reading variables at all assessment points. The results demonstrated that early intervention program for both written and oral language was effective in improving the reading abilities of children at risk of having difficulty with learning (Gonzales-Valenzuela and Martin-Ruiz, 2017).

Summary

The question of what the best strategy is to teach all children to read has been an educational dilemma since before one room schools were established in colonial America. While some children apparently have no problem learning to read, or to solve mathematical problems, others struggle and fall behind. Since the early 1990's, educators have investigated why some children have not been able to succeed.

The public elementary school for which this study was conducted is in a small rural Western Kentucky district. The faculty has observed that over the years, a greater number of children were entering kindergarten who demonstrated an inability to grasp basic skills and despite additional assistance, were not able to overcome those deficits. Because the school does not usually assess for special education services in kindergarten but waits until the end of grade 2, the students find themselves at least three grade levels behind: kindergarten, grade 1, and grade 2. However, if during kindergarten these students had been identified, evaluated, and had qualified for special education services including SDI, they could be reading text at grade-level.

This chapter first explored three reasons why literacy is important: academically, economically, and socially, to not only school children but throughout adult life. Second, possible medical, family, and social factors were investigated as to why not all kindergarten students come ready to learn. Third, this research then centered on an educational program, known as Response to Intervention. RTI is a multi-level instructional and assessment program that has helped struggling students beginning in grade 1 and beyond to learn basic reading and math skills when falling behind. In conjunction with RTI, the STAR Early Literacy Assessment Program was also investigated for the assessment portion of the study. Both programs have been approved for use by the Kentucky Department of Education. The chapter ended with brief summaries of several research studies conducted to determine the effectiveness of RTI, especially at the kindergarten level. The researcher hopes that this study will join the ranks of studies that have found positive results combining Response to Intervention with specially designed instruction at the kindergarten level.

CHAPTER III: METHODOLOGY

This study evaluated to what degree the implementation of early intervention within two kindergarten classrooms in a small rural elementary school in Western Kentucky could increase students' STAR Early Literacy Assessment scores and Reading Foundational Skills grades. The study followed an experimental group of four struggling kindergarten students who had previously been identified with developmental delay and the comparison group of 10 students who scored the lowest on the STAR assessment. The research instruments were STAR Early Literacy Assessment and Response to Intervention (RTI), both of which had been approved by the Kentucky Department of Education as valid research tools (Wainwright, 2022).

Research Design

Due to the small size of the experimental group, a quasi-experimental quantitative research design was selected because there were only two groups and one intervention (Farmer & Farmer, 2021). With this design, the researcher does not randomly assign subjects to the experimental and comparison groups but does manipulate the independent variable. The experimental group received the independent variable of specially designed instruction (SDI). The comparison group did not receive the independent variable. Researchers usually attempt to ensure that subjects in the two groups are as comparable as possible (Farmer & Farmer, 2021). For example, within this study, both the experimental and comparison groups included Caucasian boys and girls who are in kindergarten, are not making academic progress in reading, and are being assessed in reading achievement. An additional characteristic of this design is that a pretest and a posttest are administered to gather data from the STAR Early Literacy Reading Assessments. Following comparison of those pre- and post-scores, variations between the groups can be credited to the intervention.

Purpose of the Study

The study investigated early identification and evaluation of kindergarten students who are struggling to learn to read for possible qualification for developmental delay and specially designed instruction (SDI). The goal was to determine if that relationship would lead to higher reading scores and grades compared to that of students who are also struggling but have not been evaluated for special education services. Even though IDEA 2004 allowed for the identification of children ages 3-9 to receive special education services under the category of Developmental Delay, early evaluation for specially designed instruction at the kindergarten level is not completed at the researcher's school until the end of grade 2. That time is when students who may have been struggling since early kindergarten are finally referred for a psycho-educational evaluation for the determination of a student's eligibility for service within the special education program. Because the school has historically decided to exhaust all research-based strategies before considering evaluation, a second purpose is for the school district to reconsider their current identification and evaluation practice and implement these steps at the kindergarten level before students fall even farther behind.

Research Questions

The principal research question was the determination of whether early identification followed with intense intervention will lead to increased reading scores for kindergarten children. The two research questions below steered the investigation and were assessed using quasi-experimental quantitative measures:

1. What is the difference in STAR Early Literacy Achievement on the pre- and post-assessment data of kindergarten students who are identified as having a Developmental Delay (DD) and received Specially Designed Instruction (SDI) through RTI tier 3

interventions (experimental group) compared to students who have not been identified for special education services (comparison group)?

2. What is the difference in reading grades as shown on the report cards of the students in the comparison group who have not been identified for special education services compared to the experimental group of students who are identified as having a Developmental Delay (DD) and receive Specially Designed Instruction (SDI) through RTI tier 3 interventions?

Description of the Population

Ravid described the population of a research study as individuals who have a minimum of one common characteristic or trait that the researcher investigates (Ravid, 2020). The target population were students within two classrooms during the 2022-2023 kindergarten program at a small Western Kentucky elementary school. The school district is the major employer within the county. In 2020, the county population was 8,888, down 623 persons from the 2010 census (America Counts, 2021). At that time, 14% of the county's population, or 1,244 persons, lived at or below poverty level. One hundred and seventy-one persons were unemployed as of August 2022. While 86% of adults aged 25 or older had finished high school, only 14.5% had attended higher education or obtained a degree or a certificate (America Counts, 2021). In the current 2022-2023 school year, approximately 1,021 students are enrolled in high school, middle school, and two elementary schools. The Title I school designated as the study school has 424 students in preschool to grade 5. Sixty-one percent or 283 students are considered economically-disadvantaged (Livingston County Report Card, 2022).

There are no state assessment scores provided for kindergarten level students because the Kentucky Summative Assessment (KSA) is routinely given at end of grade 3. The goal is for

every student to score proficient, particularly in reading and math. The 2021-2022 assessment showed that reading scores for SLES students were improving with a 32.1% growth to 59.7%. The state content index was 59.1% (Livingston County Report Card, 2022). Even though their grade 3 scores in reading are at or near the state level, the school district knows that their scores must continue to improve, so they want to reach more students earlier and decrease the number who are struggling to not continue to fall behind.

Sampling Procedures Used

The total of kindergarten students enrolled during the 2022-2023 school year at this study school was N = 38. That number was divided between two regular classrooms, each with one teacher and one paraprofessional. Students who had previously been identified either while in this school's preschool or at their previous school from where they had moved qualified for special education services under the disability category of Developmental Delay and were assigned by the school interventionist to become the experimental group consisting of three boys and one girl (N = 4). From the researcher, a special education teacher, they received intense individual research-based intervention strategies during their weekly RTI tier 3 intervention time. Of the remaining 34 students, a total of 10 scored in a Level 1 or Level 2 intervention category on the August STAR Early Literacy Assessment and were selected by the school interventionist to form the comparison group. These four girls and six boys (N = 10) received tier 3 interventions but did not receive specially designed instruction (SDI). A total of N = 14 students in all were identified for inclusion within both the experimental and comparison groups within this study.

Variables in the Study

According to Ravid (2020), a variable within a research study is a person, place, thing, or occurrence that is measured and can assume distinctive values. The dependent variable that is independent can trigger a difference in the dependent variable, but the dependent variable will not affect the independent one (Ravid, 2020). In this study, the dependent variable was the Response to Intervention (RTI) framework provided for all study subjects (N = 14) by certified teachers during tier 3 groups. The independent variable was the specially designed instruction (SDI) provided in tier 3 by the special education resource teacher for the experimental group of students (N = 4).

Description of Risk

Risk 1: This small rural school district has a history of having students who move between the two elementary schools and out of and back into the district on a recurring basis. This issue could cause a decrease or increase in the number of students within the sample during the study and could possibly alter the outcome.

Risk 2: Because each classroom teacher is administering her own pre-and post-assessments as well as the progress monitoring for the ten students within the comparison group, this independent step might become a risk to bias. Bias might be avoided if the same person could administer the STAR Early Literacy Assessments and progress monitoring actions. If both teachers were consistent on what research-based strategies they were implementing with the students, that would be another step to avoiding bias.

Confidentiality and Anonymity

Because the researcher is an employee of the school district, confidentiality is already a requirement, and professionalism is necessary for all faculty and staff. Student information is

shared only with staff currently working with the specific students. The faculty and staff are held to the same professionalism and confidentiality standards. None of the student names were shared or revealed in research data reports included in Chapter IV of this dissertation study.

Description of Instruments

Because the school has been using Response to Intervention within their instructional program and the STAR Early Literacy and the STAR Reading assessments for data gathering and progress monitoring for several years, agreement was made to continue their use rather than purchase different programs. In addition, students' Reading Foundational Skills grades from the first and third quarter report card were also included in the data-gathering process.

Response to Intervention

Response to Intervention (RTI) is a nationally accessible multi-tiered instructional and assessment program that can identify students exhibiting learning and or behavior difficulties (Response to Intervention, 2022). The program takes students from where they are in their progress toward grade-level standards and provides three levels of intervention instruction to increase students' understanding of their below grade-level skills. All tiers of instruction are research based, not teacher-created (Response to Intervention, 2022). Research shows that systematically modifying RTI interventions in response to a student's performance (revealed through progress monitoring) can be successful (Coyne, et al., 2013). Using RTI, school districts identify the data of students at risk for below grade-level learning outcomes. Teachers track progress while instructing research-based strategies individually and in small groups, by altering the difficulty and type of strategies based on each student's performance. RTI has become an invaluable tool to identify students with learning or behavior deficits (Bailey, 2020).

STAR Early Literacy Assessment

The STAR Early Literacy Assessment was first given in September as a pre-test for the purpose of obtaining students' baseline scores for research question 1. Additional STAR assessments continued after each period of intervention and ended with a post-test in March. The scaled scores range from *At or Above Benchmark, On Watch, Intervention, and Urgent Intervention* (Renaissance Star Student Report, 2022). Students making adequate progress move to the next tier, but those who have not progressed are moved down one or two tiers for more intensive instruction. From the data, teachers can see students' progress or lack of, what type of intervention is needed, and if interventions are working (STAR Reading Assessment, 2021). All assessment data were collected from the STAR Early Literacy program in reading administered during the pre-test in September, the mid-test in December, and the post-test in March, and from the regular progress monitoring assessments during and between tier interventions.

Reading Foundational Skills Grades

As part of the quarterly progress report to the parents, the Reading Foundational Skills grade details 14 specific reading skills that students should master by the end of the kindergarten school year (Livingston County Standard Report Card, 2022-2023). The 14 skills include: follow words on the page, identify all letters and sounds, name and print all upper and lowercase letters, know all vowel sounds, recognize high frequency words, read at kindergarten grade level, among others. For each quarter, the students are scored as reaching non-mastery (65), partial mastery (75), and mastery (90). These three levels of academic performance were converted into number equivalents to provide numerical data. These reports cards are sent home in September, December, March, and May (Livingston County Standard Report Card, 2022-2023). From the grades, teachers can see students' progress or lack of, if interventions are working, and what

strategies are needed. The scores from the first quarter in September and the third quarter in March were compiled as part of the data. The first quarter scaled scores formed the baseline for research question 2.

Data Security

Data security is not a problem within this school district because access to all data is password protected and only accessible to specific district staff members through the district web page. Staff members access STAR data by going to their school tab, the Quick links tab, choose Assessment, STAR Log In, and then choose student or teacher followed with the username and password. Staff members are given usernames and passwords to access data needed for their student population. District administrators have access to the entire database; principals and counselors can access their building's data scores, and teachers have access to their grade level student information. The access to student grades is similar; from the district web page, they choose the staff tab, then the Infinite Campus (IC) Staff Login followed with IC username and password. The data from these two sources are easily found until the student graduates or leaves the district. The paper data collected for this study is shredded after 5 years, but hard copies are secured in fireproof filing cabinets.

Since the researcher was already employed by the school district as a special education resource teacher for these classrooms, the school system did not require completion of an application for the Institutional Review Board (IRB). The superintendent allowed the district assessment coordinator (DAC) to sign the IRB letter, verifying researcher's employment and indicating no need for completion of an IRB agreement (Appendix B). Information concerning the study, purpose, and results was explained in writing to the district superintendent, and in

writing and in person with the district director of special education (DOSE), the elementary and high school principals, and the DAC prior to beginning the process.

Procedures for Data Analysis

Baseline scores for research question 1 were collected when classroom teachers administered the September STAR Early Literacy Assessment pre-test. Ten students whose low scores fell under the Intervention and Urgent Intervention categories formed the comparison group and received tier 3 intervention from a certified teacher. The experimental group of four students was formed from students previously identified under the category of Developmental Delay and were receiving specially designed instruction (SDI) services and were assigned to a tier 3 intervention group with a special education teacher. Follow-up assessments with STAR Early Literacy Reading Assessment were administered by the teachers in December and again in March. Continuous progress-monitoring assessments by the tier teachers were administered to determine growth and progress (or lack of) for each student.

An Excel spreadsheet was created with each student's reference code to provide anonymity with no identifiers. Five additional columns were created: two for the students' STAR pre- and post-assessment scores, two for the first and third quarter reading grades, and one for the group identifiers as experimental or comparison. The chart of data collected on the 14 students was sent by email to the statistician at Murray State University who used SPSS version 20 to run the data and create three types of tables: descriptive statistics tables, data tables for reading grades and for STAR assessment scores, and *t*-test tables. The information in the 14 tables were included in Chapter IV: Findings and Analysis.

Summary

Renaissance STAR Assessment is a research-based computer program for teachers to discover the literacy development of students (STAR Early Literacy, 2016). For children in preschool to grade 3 who are not reading or not reading well, the STAR Early Literacy Assessment measures those students' levels of understanding 41 different skills necessary for learning to read. The STAR program creates immediate diagnostic feedback for monitoring skill development, guiding planning, creating instructional focus, and identifying students requiring more support (STAR Early Literacy, 2016). Each RTI intervention period is followed by either the STAR Early Literacy for kindergarten students or the STAR Reading Assessment for older students to document student progress to that point.

The purpose of this study was to look for a relationship between early intervention, evaluation, and identification of students with Developmental Delay. A second goal was to determine the difference in pre- and post-assessment data for the experimental group (students who received specially designed instruction) and the comparison group (students who did not receive SDI following implementation of Response to Intervention (RTI) to all students.

Two kindergarten classrooms from a small Western Kentucky school district were chosen by the researcher to become the population. The sampling procedures included STAR Early Literacy Assessments given to students during September, referrals from classroom teacher and parent concerns. Data scores from the first and third quarter Reading Foundational Skills grades were combined with September and March STAR Early Literacy Assessment scores in an Excel spreadsheet and sent to a university statistician for creation of result tables from the SPSS program.

The description of risk included the possibility of having inadequate data should one or more students from the experimental group move out of school or district, leaving no more students to be identified and evaluated. The instruments to determine students' baseline scores and provide progress monitoring data were the STAR Early Literacy Reading Assessment scores and the Reading Foundational Skills grades. Since the researcher was already employed and the resource teacher for these students, no IRB was needed, and a letter from the district office supported that decision (Appendix B).

CHAPTER IV: FINDINGS AND ANALYSIS

The purpose of this research study was to determine the effects of specially designed instruction (SDI) on kindergarten reading scores of students struggling to learn to read. Participants' pre- and post-assessment scores from STAR Early Literacy Assessment and their pre- and post-grades for Reading Foundational Skills as reported on participants' first and third quarter report cards were compared at the end and t-tests were used to analyze the data.

The experimental group of four students was chosen based on their previous identification and qualification for Developmental Delay (DD). One student qualified for DD in the areas of cognition, self-help/adaptive, and social-emotional, while another qualified in the self-help/adaptive, social-emotional, and communication areas. Two students qualified in self-help/adaptive and social-emotional, and the fourth student qualified in all five areas including motor development. This group received specially designed instruction (SDI), the variable for this study, during their RTI tier 3 lessons.

Analysis of Research Questions

The comparison group of 10 students was chosen because their scores from the September pre-STAR Early Literacy Assessment were the lowest of all 38 students. They received RTI tier 3 intervention from classroom teachers. Two specific research questions were examined in this research study and are discussed in the following sections. Research question 1 focused on students' STAR Early Literacy Achievement scores:

> What is the difference in STAR Early Literacy Achievement on pre- and post-assessment data of kindergarten students identified as having a developmental delay (DD) and who received specially designed instruction (SDI) through RTI

tier 3 interventions (experimental group) compared to students not identified for special education services (comparison group)?

This question pertains to the experimental and the comparison groups' STAR Early Literacy Assessment's September and March scores. These scores follow RTI intervention for both and SDI for the experimental group. The null hypothesis posits no difference in the two groups of STAR pre- and post-achievement scores.

Research Question 1 Results

Table 1

STAR Assessment Descriptive Statistics: Total Group

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Pre-STAR	14	642.64	19.748	73.889
Post-STAR	14	741.50	26.155	97.862

Note. Table 1 shows that the total sample included 14 students: four in the experimental group (Table 2) and 10 in the comparison group (Table 5). The difference in the mean scores from the pre- to the post-STAR Assessments is shown (Yockey, 2018; Ravid, 2020).

Table 2

STAR Assessment Data Table: Experimental Group

	STAR Early Literacy Scores		Participants
Student IDs	Pre-STAR	Post-STAR	Group
OM	544	620	1
SC	731	793	1
MN	824	979	1
HS	644	799	1

Note. The pre- and post-STAR assessment scores of each student in the experimental group listed in Table 2 are those achieved for the September and March assessments. The pre-STAR scores ranged from 544 to 824; the post-STAR scores ranged from 620 to 979. The STAR benchmark score is 700.

Table 3

STAR Assessment Descriptive Statistics: Experimental Group

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Pre-STAR	4	685.75	59.859	119.717
Post-STAR	4	797.75	73.298	146.596

Note. For the experimental group, post-mean scores in Table 3 show STAR Reading Assessment data. The post-mean score of 797.75 demonstrates that the STAR Reading Assessment scores improved by 112.00 points over the pre-mean score of 685.75 (Yockey, 2018; Ravid, 2020).

Table 4

STAR Assessment T-test: Experimental Group Paired Samples Test

	Paired Differences							
				95% Confidence Interval of the Difference				Significance
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	*t*	*df*	One-Sided *p*
Pair 1 Pre-STAR Post-STAR	-112.000	49.980	24.990	-191.529	32.471	4.482	3	.010

Note. In Table 4, post-STAR Early Literacy Assessment scores for the experimental group (M =797.75, SD = 146.596) are higher than pre-test STAR scores (M = 685.75, SD = 119.717), *t*(3)

= -1.911, $p < .05$, $d = -2.241$. The p-value of < .010 is less than .05. The null hypothesis was rejected. The figures displayed above show statistically significant data (Yockey, 2018).

Table 5

STAR Assessment Data Table: Comparison Group

Participants	STAR Early Literacy Scores		Comparison (0)
Student IDs	Pre-STAR Test	Post-STAR Test	Groups
CJ	560	747	0
MR	668	698	0
MA	698	756	0
PG	593	568	0
RL	592	745	0
RN	645	756	0
CV	658	720	0
HJ	622	719	0
MI	577	657	0
WS	641	824	0

Note. The pre- and post-STAR assessment scores listed above are those achieved by each student within the comparison group on the September and March assessments. The results of the study indicate that progress was made by the comparison group. The pre-STAR scores ranged from 560 to 698. The post-STAR scores ranged from 568 to 824. The STAR benchmark score is 700.

Table 6

STAR Assessment Descriptive Statistics: Comparison Group

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Pre-STAR	10	625.40	13.973	44.187
Post-STAR	10	719.00	21.682	68.565

Note. For the comparison group, post-mean scores in Table 6 show STAR Reading Assessment data. The post-mean score of 719.00 demonstrates that the STAR Reading Assessment scores improved by 93.60 points over the pre-mean score of 625.40 (Yockey, 2018; Ravid, 2020).

Table 7

STAR Assessment T-test: Comparison Group Paired Samples Test

	Paired Differences							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	*df*	Significance One Sided *p*
Pair 1 Pre-STAR Post-STAR				Lower	Upper			
	-93.600	67.594	21.375	-141.954	-45.246	-4.379	9	<.001

Note. Table 7 above shows that post-test STAR Early Literacy Assessment scores for the comparison group (M =719.00 , SD = 68.565) are higher than pre-test STAR Early Literacy Assessment scores (M = 625.40, SD = 44.187), t (9) = -4.379, $p < .05$, d = -1.385. The p-value of .001 is less than .05. The null hypothesis was rejected. The numerical data displayed above shows statistical significance (Yockey, 2018).

Research Question 2 Results

Research question 2 focused on students' Reading Foundational Skills grades as reported on first and third quarter report cards:

> What is the difference in reading grades as shown on report cards of comparison group students who received only RTI tier 3 intervention compared to the group of experimental students who received specially designed instruction (SDI) through RTI tier 3 interventions?

This question pertains to the Reading Foundational Skills grades for the experimental and comparison groups as reported on first and third quarter report cards. These scores follow RTI intervention for both and SDI for the experimental group. The null hypothesis posits there will be no difference in students' reading grades on quarterly report cards.

Table 8

Reading Grades Descriptive Statistics: Total Group

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Pre-Grades	14	80.64	1.361	5.093
Post-Grades	14	86.43	2.040	7.633

Note. The total sample included 14 students: four in the experimental group (Table 2) and 10 in the comparison group (Table 5). The difference in the mean scores from the first quarter pre-reading grades (80.64) to the post-reading grades (86.43) reveal that reading grades improved by 5.79 points (Yockey, 2018; Ravid, 2020).

Table 9

Reading Grades Data Table: Experimental Group

Participants	Report Card Reading Grades		Experimental (1)
Student IDs	Pre-Grades	Post-Grades	Groups
OM	80	81	1
SC	91	94	1
MN	89	96	1
HS	75	93	1

Note. The pre- and post-reading grades listed above are those achieved by each student in the experimental group for the first and third grading periods. The pre-grades ranged from 75% to 91%. The post-grades ranged from 81% to 96%.

Table 10

Reading Grades Descriptive Statistics: Experimental Group

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Pre-Grades	4	83.75	3.772	7.544
Post-Grades	4	91.00	3.391	6.782

Note. The post-mean grades in Table 10 reveal that the reading grades improved for the experimental group. The post-mean grades of 91.00 demonstrates that the reading grades improved by 7.25 points over the 83.75 pre-grade mean (Yockey, 2018; Ravid, 2020).

Table 11

Reading Grades T-test: Experimental Group

	Paired Differences							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				Significance
Pair 1 Pre-Grades Post-Grades				Lower	Upper	*t*	*df*	One Sided *p*
	-7.250	7.588	3.794	-19.325	4.825	-1.911	3	<.076

Note. In Table 11, the post-test reading grades for the experimental group (M = 91.00, SD = 6.782) are not significantly higher than pre-test reading grades for the experimental group (M = 83.75, SD = 7.544), t(3) = -1.911, $p < .05$, $d = -0.721$. The *p*-value of .076 is greater than .05. The null hypothesis was retained. The data shown above does not exhibit statistical significance (Yockey, 2018).

Table 12

Reading Grades Data Table: Comparison Group

Participants	Report Card Reading Grades		Comparison (0)
Student IDs	Pre-Grades	Post-Grades	Groups
CJ	75	77	0
MR	79	93	0
MA	81	82	0
PG	75	75	0
RL	75	91	0
RN	84	90	0
CV	78	78	0
HJ	83	79	0
MI	83	85	0
WS	81	96	0

Note. The pre- and post-reading grades listed above are those achieved by each student in the comparison group for the first and third grading periods. The results of the study indicate that the comparison group made progress. The pre-grades ranged from 75% to 84%; the post-grades ranged from 75% to 96%.

Table 13

Reading Grades Descriptive Statistics: Comparison Group

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Pre-Grades	10	79.40	1.118	3.534
Post-Grades	10	84.60	2.363	7.471

The post-mean grades in Table 13 show that reading grades improved for the comparison group. The post-mean grades of 84.60 demonstrates that the reading grades improved by 5.20 points over the pre-mean score of 79.40 (Yockey, 2018; Ravid, 2020).

Table 14

Reading Grades T-test: Comparison Group

	Paired Differences							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				Significance
				Lower	Upper	*t*	*df*	One Sided *p*
Pair 1 Pre-Grades Post-Grades	-5.200	7.208	2.279	-10.356	-.044	-2.281	9	.024

Note. In Table 14, the post-test reading grades for the comparison group (M = 84.60, SD = 7.471) are higher than pre-test reading grades for the comparison group (M = 79.40, SD = 3.534), t(9) = -2.281, $p < .05$, $d = -0.955$. The *p*-value of .024 is less than .05. The null hypothesis was rejected. The numerical data displayed above shows statistical significance (Yockey, 2018).

Summary

The purpose of this study was to determine if there was a relationship between early intervention, evaluation, and identification of students with developmental delay. Another goal was to determine the difference in pre- and post-assessment data for the experimental group (students who received specially designed instruction) SDI and the comparison group (students who did not receive SDI) following implementation of Response to Intervention (RTI) to all students. This study included two kindergarten classrooms of 38 students at South Livingston Elementary School (SLES). The sampling procedures included STAR Early Literacy

Assessments given to students during September, first quarter Reading Foundational Skills grades, referrals from classroom teachers, and parent concerns. Results indicated that Response to Intervention (RTI) is a contributing factor in the progress that was made by both groups.

CHAPTER V: CONCLUSIONS

The use of Response to Intervention (RTI) has been studied for over three decades, with the emphasis being the use of RTI with students in first grade through middle school to improve their learning delays so they could achieve expected grade level academic abilities. While several researchers reported academic progress with RTI in the primary grades (Al Otaiba et al., 2014; see also Gonzales-Valenzuela & Martin-Ruiz, 2017; O'Connor et al., 2014), a few studies (Wanzek et al., 2018; see also Little, et al, 2012; Partenan & Siegel, 2013) focused on the identification of struggling readers at the kindergarten level. None included the additional special education services of SDI as a variable to address students' academic deficits.

The primary research questions for this study focused on whether early identification and intervention could lead to increased reading scores for kindergarten children. The two research questions listed below guided the research for this study:

1. What is the difference in STAR Early Literacy achievement on the pre- and post-assessment data of kindergarten students who are identified as having a developmental delay (DD) and who received specially designed instruction (SDI) through RTI tier 3 interventions (experimental group) compared to students who have not been identified for special education services (comparison group)?
2. What is the difference in reading grades as shown on the report cards of students in the comparison group who have not been identified for special education services compared to the experimental group of students who are identified as having a developmental delay (DD) and receive specially designed instruction (SDI) through RTI tier 3 interventions?

This study was conducted using quasi-experimental quantitative measures to show differences between the means of the two groups. *T*-tests for paired samples were conducted to compare pre-

and post-data results from STAR Early Literacy Assessment scores and Reading Foundational Skills grades from first and third quarter report cards.

Relationship to Research

This study and outcomes contribute to the growing research regarding Response to Intervention (RTI) at the primary level. While many of the research articles for this study referenced those that focused on RTI in primary grades 1 through 3, four specific RTI studies were conducted with kindergarten students. Discussion of these four studies follow below. The final paragraph will discuss the relationships of this study's outcomes to those four related studies.

Several collaborative studies conducted during the early 2000s were reviewed and restated by Wanzek (2018), providing useful insights on intensive intervention at the primary level. His extensive research included studies by Vaughn & Linan-Thompson (2003), Vellutino, et al (2006), Partenan and Siegel (2014), and Lam and McMaster (2014), who agreed that kindergarten and other primary teachers should instruct students with low levels of reading achievement using intensive, researched-based interventions. The program Response to Intervention (RTI) was developed around intensive research-based instructional strategies for students identified as having academic deficits.

Little et al., (2012) investigated whether standardized interventions using individual student performance data to adjust the next-instruction lessons were more valuable than a tier 2 school-developed next-instruction intervention at the kindergarten level. Their findings concluded that if teachers develop intervention lessons, the research-based strategies must focus on students' specific instructional needs to meet RTI standards (Wanzek et al., 2018).

An additional randomized control study of kindergarten students by Little et al., (2012) followed students receiving intensive intervention (experimental) and students receiving non-modified standardized instruction (control/comparison). Outcomes from assessments at end of kindergarten showed higher experimental group scores than from the control group. They also revealed statistically significant differences for various measures of reading achievement (Little et al., 2012). This is another study that supports the use of RTI in primary grades but particularly at the kindergarten level with students assessed with reading delays.

A large longitudinal study by Partenan and Siegel (2013) provided additional support for early literacy instruction, intervention, and implementation. Researchers studied early primary students from a Canadian school district who had been part of an earlier study of 650 kindergarten to seventh grade students. Kindergarten and seventh grade assessment results were evaluated and revealed that of the 22% kindergarten students originally identified as at risk-for reading difficulties, only 6% continued to have reading difficulties (Partenan & Siegel, 2013). This study strongly supports instruction, intervention and implementation at the kindergarten level as demonstrated by the percentage reduction. There were additional studies that focused RTI in other primary grades. These studies additionally reported positive results when intervention was based on intensive, research-based strategies. Because their study also focused on kindergarten students, the findings are relevant to this study.

While SDI provided for students receiving special education services are researched-based, this researcher was unable to locate RTI-focused studies that included variables based on SDI. The findings from this study will increase research knowledge about the use of RTI in conjunction with SDI for kindergarten students who qualify for developmental delay (DD).

Conclusions of the Study

Results indicated that Response to Intervention (RTI) is a contributing factor to the progress made by both groups as shown by their March STAR Early Literacy assessment scores and Reading Foundational Skills grades for their third quarter reports to parents and guardians. The data shows that the use of RTI for both the comparison and the experimental groups of students was statistically significant. The data in Tables 4, 7, and 14 indicated why the null hypotheses were rejected; the p-values were less than the alpha of .05. However, Table 11 data indicated that *p*-value was greater than the alpha .05, so the null hypothesis was retained.

Discussion

Practical Significance

This quasi-experimental quantitative research study explored the effect of early identification and intervention of kindergarten students not making adequate reading progress. Research indicates that fluent reading is the door to a more successful life: academically, economically, socially, as well as enjoying better health (Forrest, 2018; Wanzek et al., 2018). Samuels (2015) said that students who read well when they are 10 years old may achieve college success, but students whose reading deficits are not addressed may not graduate from high school. On average, nonreaders earn 42% less income and face unemployment four times as often as adults who read well (Tam, 2017). Eighty-five out of every 100 young adults in juvenile court as well as 70 percent of all prison inmates are not able to comprehend material written at a grade 4 reading level. Reading and comprehension deficits impede attempts to obtain and keep good jobs or to conduct daily tasks (Literacy Mid-South, n.d.; Literacy Pittsburgh, 2022; Tam, 2017). Maintaining quality health also becomes more difficult if one cannot understand doctor's prescriptions or directions for homecare (CDC, 2022). Adults with the most limited academic

abilities have a higher number of work-related accidents and health problems (Literacy Pittsburg, 2022; CDC, 2022). Reading proficiently is necessary for children and adults to move successfully throughout each stage of life.

P-20 Implications

The P-20 education model encompasses preschool through Grade 20 (college graduation and beyond) symbolizing lifelong learning. Implementation, innovation, diversity, and leadership are the four areas of emphasis in the P-20 program. This study's purpose was to offer a research-based solution to a problem many districts face: many kindergarten level students do not learn to read and, therefore, struggle to read throughout school. The concern is that some school districts wait until students reach grade 2 or later before considering early identification and evaluation for special education services. When this occurs, students with reading insufficiencies can become three, perhaps even four grade levels behind same age peers. Some may never catch up. The implementation of this plan could improve students' reading skills to where they may not be behind, at least no more than two grade levels, and perhaps able to eventually catch academically up with same age peers.

This solution is innovative in that none of the research data about RTI in the primary grades addressed SDI as a variable to decrease reading delays to increase reading skills at the kindergarten level. If districts implement this plan, then struggling kindergarten readers could be evaluated for special education. Qualifying students could receive RTI and SDI addressing their deficits, meaning that on the three-year re-evaluation, the students would no longer qualify for special education services under the category of Developmental Delay (DD). If students qualify for another disability such as Other Health Impairment (OHI), Specific Learning Disability (SLD), or Mild Moderate Disability (MMD), then they would not be two to three grade levels

behind if the district had not evaluated during kindergarten. Early identification and intervention are KEY to reading success for struggling kindergartners who are not making adequate progress after the first month of instruction.

This solution also addresses diversity in the seven different learning styles through which students learn: visual/spatial, auditory/musical, physical/kinesthetic, logical/mathematical, verbal/linguistic, social/interpersonal, and solitary/intrapersonal (Kansas University Faculty, 2022). These learning styles are addressed when teachers implement some or all within intervention strategies used. The use of research-based strategies within the RTI tier interventions addresses students' diverse learning needs and decreases barriers that may be present. A multitude of evidence-based practices are available for teachers' utilization while teaching standard-based, high-quality content, meeting the needs of all students. Ensuring that students can overcome developmental delays as early as is possible is more of a possibility for more students (Kansas University Faculty, 2022). "Some students designated as 'learning disabled' may be merely…struggling…in an environment designed advertently to frustrate their efforts. Just changing our instructional approach may be enough to move these students to the ranks of successful learners" (Sousa, 2016, p. 5).

The P-20 program provides additional emphasis on the development of highly qualified teachers. This strategic, researched-based plan addresses the researcher's personal growth in leadership. The researcher will share findings with administrators and teachers from other districts in need of solutions to help their struggling readers access grade-level achievement skills sooner than later. Because the researcher will present from the position of teacher and researcher, other classroom teachers would likely be more receptive to listening and accepting these outcomes.

Another aim of the P-20 Program is the development of life-long learners. Students who achieve reading proficiency can become life-long learners, self-sufficient individuals, and knowledgeable parents of the next generation of readers. In a leadership role, the researcher would create professional learning opportunities for other educators to implement innovative and diverse evidence-based learning opportunities for students.

Limitations of the Study

Demographics limited the study because the student population was confined to one elementary school and two kindergarten classrooms. Because the population for the two classrooms was a total of 38 students, the sample was obviously small and further limited by the four special education students who formed the small experimental group. An additional 10 students were chosen following STAR Early Literacy Assessment during September. Because their scores did not reveal adequate progress which placed them in the STAR categories of either urgent intervention or intervention, the 10 students formed the comparison group. In this quasi-experimental research study, there was such a small number of participants that a comparison between the two groups could not be made.

Recommendations for Future Research

While reviewing the comparison group's STAR Early Literacy Assessment scores and comparing September baseline scores to those from March, this researcher recognized that out of the 10 students within the comparison group, three are reading at or above grade level, with seven reading below grade level. If not evaluated before the end of this school year before their graduation to grade 1, these seven children will become struggling kindergarten readers in grade 1 and one grade level behind same age peers. However, if identification and evaluation were to

be completed this school year, these students could automatically receive SDI instruction in addition to RTI interventions in grade 1.

The experimental group's STAR scores showed that three of the four students, 75%, are currently reading at or above grade level, with only one child reading below kindergarten level. Next year, these four students will continue to receive both RTI and SDI instruction to assist them to make continued progress.

Recommendations include ongoing support and implementation of RTI for this comparison group and all South Livingston Elementary School (SLES) students, as based on the data results. The recommendation also includes continuing RTI and SDI for the experimental group of students in grade 1 and following. For the 2023-2024 school year, the administration should follow with needed support to recognize possible students for early identification and evaluation during both kindergarten and grade 1. The researcher recommends using multiple pieces of additional data to show the increases and decreases in the research data scores.

The current study was limited to one elementary school, two kindergarten classrooms of 38 students, and a sample of 14 struggling readers. The study's purpose was to determine if the addition of SDI as a variable to Response to Intervention (RTI) as a tier 3 strategy during kindergarten could improve reading skills and keep students from falling so far behind that they may need to repeat a grade and still not read on grade level. The findings were not only valuable to the school and district in which the research study was conducted but also provided implications for future research regarding the implementation of RTI at the kindergarten level.

There is a need for a longitudinal study that follows the progress of these 14 students through additional grade levels. This researcher hopes to continue this study at the completion of students' second grade, or before they become 9 years of age. At that time more data will be

compiled regarding their reading grades, STAR Early Literacy and STAR Reading Assessment scores, and academic progress. Data will be examined for evidence of reading skill improvement or delay. Additionally, the researcher will assess to see if any comparison group students have been identified for special education evaluation during first or second grade, or by the end of grade 2.

If another researcher should wish to also research the impact of RTI and SDI during kindergarten, a larger number of schools and students should be considered. Additional data would show a wider lens of the effects. That additional data could include reports from other student assessments such as Mastery Connect, a correlation to students' STAR Early Literacy Math scores, to STAR Reading and Math scores for grade 1, and a possible relationship to students' discipline referrals, if any.

Summary

Response to Intervention (RTI) is a scientific, research-based instructional program designed to identify students who are having academic difficulties. The purpose is to improve student achievement by matching instruction to the needs and levels of each student. The study investigated a relationship between early intervention, evaluation, and identification of students in kindergarten identified as having a developmental delay. A second purpose was to determine the difference in pre- and post-assessment data for the experimental group (students who received specially designed instruction) and the comparison group (students who did not receive SDI following implementation of RTI). RTI was shown to be a contributing factor in the progress made by both groups in this study. This study and outcomes contribute to the growing research that has been conducted regarding Response to Intervention (RTI) at the primary level.

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APPENDIX A

Developmental Delay (DD) Eligibility Determination Form

Enter District Name Here

Developmental Delay (DD)
Eligibility Determination Form

Attachment *to Admissions and Release Committee (ARC) Conference Summary*

☐ Initial Determination of Eligibility for this Category of Disability	☐ Re-Determination of Eligibility for this Category of Disability
Student's Full Name:	SSID:
Date of Birth:	Date of Eligibility Determination:
School:	

The ARC determines a student to have a ***developmental delay*** and is eligible for specially designed instruction and related services when:

Complete During ARC		The ARC compared and analyzed evaluation data and documents the following interpretation:
☐ **Y** ☐ **N**	1.	Student is three through eight years of age. *(Note: Eligibility for DD ends on the student's ninth birthday.)*
☐ **Y** ☐ **N** ☐ **Insufficient**	2.	Student has not acquired skills or achieved commensurately with recognized performance expectations for his/her age in **one or more** of the developmental areas. ☐ cognition ☐ social-emotional development ☐ communication ☐ self-help/adaptive behavior ☐ motor development
☐ **Y** ☐ **N** ☐ **Inconclusive**	3a.	Student demonstrates a measurable, verifiable difference between expected performance and current level of performance documented by: ☐ scores of two standard deviations or more below the mean in one or more of the five (listed above) developmental areas using norm-referenced instruments and procedures **OR** ☐ scores of 1 ½ standard deviations below the mean in two or more of the five developmental areas (listed above) using norm-referenced instruments and procedures
☐ **Y** ☐ **N** ☐ **NA**	3b.	**If 3a is marked inconclusive,** the professional judgment of the ARC verifies the existence of significant atypical quality or pattern of development.
☐ **Y** ☐ **N**	4.	Evaluation information confirms there is an adverse effect on educational performance.
☐ **Y** ☐ **N**	5.	Evaluation information confirms lack of instruction in reading and math is not a determinant factor in the eligibility decision.
☐ **Y** ☐ **N**	6.	Evaluation information confirms limited English proficiency is not a determinant factor in the eligibility decision.

Developmental Delay
Eligibility Determination Form

Student's Full Name:	SSID:

In the following box, provide supporting documentation that demonstrates the ARC:

- Used multiple sources to triangulate the data and substantiate the existence of the disability; and
- Confirmed the progress of the student is impeded by the disability to the extent the student's educational performance is significantly and consistently below the level of similar age peers.

Supporting Documentation:

The ARC used the interpretation of the evaluation data documented above to determine:

☐ The student meets the eligibility criteria for developmental delay, which adversely impacts his/her education, and is eligible for specially designed instruction and related services.

☐ The student does not meet the eligibility criteria for developmental delay and is not eligible for specially designed instruction and related services.

☐ The student has developmental delay, but it does not adversely impact his/her education; therefore, the student is not eligible for specially designed instruction and related services.

☐ Evaluation data are insufficient to determine eligibility. Additional assessments and data will be obtained in the area(s) of:

The ARC will reconvene by _____ to review and determine eligibility.

APPENDIX B

Livingston County Board of Education Institutional Review Board Letter

LIVE RED
Reaching Excellence Daily
LIVINGSTON COUNTY SCHOOLS

Dr. David Meinschein
Superintendent

Livingston County Schools
Physical Address: 1370 US Hwy 60 East
Burna, KY 42028
PO Box: PO Box 219
Smithland, KY 42081
Phone: (270) 928-2111
Fax: (270) 928-2112

October 11, 2022

Dr. Wilson:

This letter is to verify the employment of Cara Milby with Livingston County Schools and her professional involvement with the kindergarten program at South Livingston Elementary School. Her employment with the district grants her access to the continuous progress data needed in the research she is conducting for her dissertation as part of Murray State University's doctoral program. As the Instructional Supervisor of Livingston County Schools and District Assessment Coordinator, Mrs. Milby has been granted access and given permission to use this data in her research. For that reason, IRB approval is not necessary.

Please contact me if there should be any additional information needed to have Mrs. Milby's submission unlocked.

Sincerely,

Jennifer Sullivan

Jennifer Sullivan
Instructional Supervisor
Livingston County Schools

APPENDIX C

Murray State University Institutional Review Board Letter

MURRAY STATE UNIVERSITY

Institutional Review Board

328 Wells Hall
Murray, KY 42071-3318
270-809-2916 • msu.irb@murraystate.edu

TO: Chanel Schwenck, Educational Studies Leadership and Counseling

FROM: Jonathan Baskin, IRB Coordinator JB

DATE: March 7, 2023

RE: Human Subjects Protocol I.D. – IRB # 23-123

Project Title: *The Effects of Early Identification and Intervention on Reading Scores at the Kindergarten Level.*
Principal Investigator(s): Cara Milby
Determination: Quality Improvement/Assessment - Activity is not research as defined in 45 CFR 46.102(l)

The Murray State University IRB has reviewed the information you supplied for the project named above. Based on that information, it has been determined that this project does not involve activities and/or subjects that would require IRB review and oversight. The IRB will keep your determination form on file for a period of 3 years.

Please note that there may be other Federal, State, or local laws and/or regulations that may apply to your project and any changes to the subjects, intent, or methodology of your project could change this determination. You are responsible for informing the IRB of any such changes so that an updated determination can be made. If you have any questions or require guidance, please contact the IRB Coordinator for assistance.

Thank you for providing information concerning your project.