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Literacy Score Gains in Grades K-2 in a Response to Intervention Program

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This is to certify that the doctoral study by

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Project Study Submitted in Partial Fulfillment

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Abstract

Fewer than half of students demonstrated proficiency on Michigan state-administered summative assessments at the end of third grade at a rural, Title I school in Michigan. The purpose of this quantitative study was to compare reading fluency gains between grade levels (i.e., kindergarten, first, and second grades) in an effort to better understand which grade level demonstrates the most growth. The framework for this research study was the constructs of the variability of learning disabilities. Using a sample of 260 cases, this ex post facto pre–post quantitative study investigated the measurable fluency gains between grade levels in the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Oral Reading Fluency (ORF) and Nonsense Word Fluency (NWF) scores of students by using a one-way analysis of variance (ANOVA). Archived NWF and ORF scores were used to compare gain scores at each grade level. Three one-way ANOVA using composite gain score data, $F(2, 236) = 26.619$, $p < .001$; NWF gain score data, $F(1, 162) = 102.30$, $p < .001$; and ORF gain score data, $F(1, 153) = 47.626$, $p < .001$, revealed a statistically significant difference in mean fluency gain scores between the grade levels with fluency gain scores at the kindergarten level showing the largest difference while scores at the first grade level showing the smallest difference. The results of this study are intended to inform educators and promote positive social change by providing insight into how to maximize student literacy by concentrating resources by identifying the grade level in which students demonstrate the highest growth.

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Section 1: The Problem

The Local Problem

The problem addressed in this project study is at a rural, Title I school in Michigan where only 37% of students demonstrate proficiency in reading fluency on the Michigan Student Test of Educational Progress at the end of third grade over the most recent 5 years of data on the state summative assessment (Michigan Department of Education, 2020). In order to improve student performance in reading fluency, interventions within the response to intervention (RtI) framework were consistently applied, yet with unknown success. Thus, school personnel are uninformed on how to most effectively allocate resources and intervention time across early elementary grade levels in order to increase the measurable growth in reading proficiency measures in the area of literacy. The RtI framework is key to the identification of students with specific learning disabilities and to curbing the disproportionate identification of students from diverse cultural and linguistic backgrounds as having specific learning disabilities (Willis, 2019). Currently, the difference in measurable growth in reading fluency while students are involved in targeted literacy reading proficiency interventions at each grade level within the RtI framework for primary level students in a rural, Title I school in Michigan is unknown. This leaves school personnel with the challenge of how to most effectively allocate resources and intervention time across early elementary grade levels in order to increase the student reading proficiency growth of the RtI program in the area of literacy. Without information on which grade level has the greatest growth, school systems are left to broadly apply intervention resources without adequate depth of the

interventions. Research has indicated that increasing the depth and focus of interventions

also increases the effectiveness of the interventions (Jaeger & Pearson, 2016).

Early literacy skills are widely accepted as strong predictors of future academic

achievement and broader life outcomes (Adlof & Hogan, 2019). The ability to identify

the most effective grade level to target literacy skills would allow schools to concentrate

their limited intervention resources to maximize growth. The gap in practice created by

the lack of information regarding differing measurable growth between grade levels may

limit the fidelity of the intervention application process. Further research on when

literacy interventions generate the most growth during the early elementary years is

needed to better inform schools on what grade levels to concentrate literacy intervention

resources (Lovett et al., 2017).

Rationale

Literacy interventions within an RtI framework are being implemented across the

United States, but there is little research regarding the effectiveness of literacy

interventions within an RtI framework at individual grade levels. This gap in practice in

the early elementary grades (K-2) has schools surmising at what grade level and at what

intensity to implement literacy interventions, placing students at risk of future retention

based on third grade reading legislation. Currently, 14 states and the District of Columbia

enforce third grade reading laws, which require retention of students who cannot

demonstrate grade-level proficiency in reading by the end of third grade, in addition to

eight more states that encourage similar retention practices (Weyer, 2019). If not

addressed, students who perform below grade-level as early as kindergarten are at risk of

maintaining that academic deficit throughout their school careers unless schools bridge the gap between underperforming students and grade-level performance benchmarks (Bulat et al., 2017). The study used measurable growth and not benchmark (level of performance) status within a pretest–posttest design. Benchmarking for this study would not inform the research question for those students within the intervention program who enter the year already at or above benchmark. Because this study looked at growth for all students and not just those who are low performing, growth rate—as opposed to benchmarking—better informs the research questions.

Even with the evidence supporting the effectiveness of early literacy skill intervention and the wide-spread implementation of RtI frameworks following the passage of the Individuals with Disabilities in Education Act (IDEA) of 2004, few empirical studies have been conducted comparing the relative efficacy of literacy interventions at different age levels or grade levels (Lovett et al., 2017). Locally at the target school, which is a rural, Title I school in Michigan, elementary students lag behind national norms in the area of reading skill growth resulting in a decrease in percentile ranking between the beginning year data and end of year data (Transit, 2020). Forty percent of students below grade-level standards in reading in third grade do not close the skill gap by high school (Mathes, 2017). At the target school, over the most recent 5 years of data on the state summative assessment, only 37% of students have demonstrated proficiency on the Michigan Student Test of Educational Progress at the end of third grade (Michigan Department of Education, 2020). According to Zirkel (2017), the lack of empirical studies and guidance from the state and federal level limits the informed

decision-making ability of school personnel. This, in turn, creates difficulty in determining which grade level and what intensity to best apply literacy interventions in order to maximize the efficacy of services and personnel (Zirkel, 2017).

Research has pointed to several contributing factors that result in persistent reading deficits (Gorard, 2017). For a significant percentage of learners, pre-reading exposure and knowledge is missing when entering school, putting these learners behind both kindergarten expectations and their peers (Bulat et al., 2017). Currently, at the target school, interventions are spread across multiple grade levels within the K-12 one-building school district, that results in a broad application of resources but possibly lacks depth of application at key grade levels. Although implementation of an RtI program is required under the reauthorization of the IDEA (2004), no clear guidelines or rules exist to create intensive intervention programs in the kindergarten and first grade years in order to bring students who enter school with lower than grade-level skills up to grade-level expectations in the area of literacy by the end of first grade (D'Agostino & Rodgers, 2017).

Little guidance or research for schools exists on the most effective grade levels at which to implement targeted interventions. However, in a literature review of published studies, Anastasiou et al. (2017) found that research on RtI related to disproportionality emphasized phonemic awareness and phonological skills as key indicators for areas of concern in determining a specific learning disability in the area of literacy. Additionally, the studies primarily focused on RtI in the grade levels from kindergarten through second

grade (Anastasiou et al., 2017). Without appropriate literacy interventions, schools risk

misidentifying students as having specific learning disabilities (Lovett et al., 2017).

Purpose of the Study

In order to strengthen student educational progress, in particular reading fluency,

interventions within the RtI framework were implemented at the target school in the rural

Midwest, yet with unknown success. The purpose of this quantitative study was to

compare reading fluency gains between grade levels (i.e., kindergarten, first, and second

grades) in an effort to better understand which grade level demonstrates the most growth.

This study investigated the measurable growth of all students receiving evidence-based

literacy interventions in the early elementary grade levels of kindergarten, first, and

second. This includes both students receiving special education services and general

education services and those students receiving only general education services. This will

allow school personnel to compare the significance of targeted literacy reading

proficiency interventions by grade level within the RtI framework by utilizing nonsense

word fluency (NWF) and oral reading fluency (ORF) as known indicators for future

reading proficiency for kindergarten, first grade, and second grade students. Identifying

when students demonstrate the most growth in reading fluency can guide educators to

better allocate resources through data-informed measures. Measurable growth at each

grade level was determined by comparing beginning-of-year test scores to end-of-year

test scores for each student. This number was compared to normed growth measures

provided by the University of Oregon Center on Teaching and Learning (2018). The

study used historical data to compare measurable growth produced under intervention

protocols based on student measurable growth on reading fluency measures at the three different grade levels. How the application of early elementary literacy interventions within the RtI framework at different grade levels yields measured growth on NWF and ORF were the focus of this study. The success on the NWF and ORF assessments in the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) battery of assessments correlate with future reading proficiency (Morris et al., 2017).

Definition of Terms

RtI – RtI is a multicomponent method used widely across the United States to identify learning disabilities and address learning needs of the individual student. Although existing in many variations, the common features of RtI are universal screening, tiered and targeted interventions in addition to the core instruction, and progress monitoring for skill growth (Fuchs & Fuchs, 2017).

Third grade retention – Third grade retention is a practice currently employed by 14 states, with eight additional states encouraging similar practice, which requires schools to retain students at their current grade level if they cannot demonstrate grade-level proficiency in reading by the end of third grade (Weyer, 2019).

DIBELS Oral Reading Fluency (ORF) – The DIBELS ORF assessment measures how many words a student can read aloud correctly in one minute. The student is shown a page with grade-leveled reading passage specifically written to minimize variability (O'Keefe et al., 2017). The assessment is given in a one-on-one environment with a trained proctor scoring the assessment as the student reads. A sample ORF assessment can be found in Appendix A.

DIBELS Nonsense Word Fluency (NWF) – The DIBELS NWF assessment is designed to measure a student's alphabetic understanding and phonological recoding by having him or her read consonant-vowel-consonant (CVC) pseudo-words. The fabricated word production delineates the student's ability to memorize whole words from the student's ability to apply phonological skills to unknown words. The assessment occurs in a one-on-one setting with the trained scorer assessing each read work or partial word during a one-minute time period (Van Norman et al., 2018). A sample NWF assessment can be found in Appendix A.

Targeted intervention – Targeted interventions in this study were evidence-based practices designed to strengthen key component skills that contribute to proficient reading for understanding by explicitly teaching these skills within small group or one-on-one settings. Using known skill data to identify areas of need, skill areas selected for improvement can be addressed specifically for increased learning (Connor et al., 2018).

Significance of the Study

This study addresses the local problem by identifying which grade level, out of the three selected grade levels, yields the greatest growth in an existing, targeted RtI program. The findings of this study include strategies for resource allocation to grade levels that demonstrate the highest measurable growth. This information will allow the school system to allocate the available resources in the grade level that shows the lowest gain scores in measurable growth. Measurable growth was determined by measuring the difference between beginning- and end-of-year data when reviewing archival data from kindergarten through second grade. The grade level demonstrating the lowest growth

during the data comparison was identified for the allocation of resources as the data

highlighted the grade level with the richest growth potential as an area to allocate a

higher level of resources in order to maximize potential for learning. This grade span is

significant because, according to Mathes (2017), students who do not demonstrate

proficiency on the National Assessment of Educational Progress (NAEP Reading Report

Card, 2019) at the beginning of fourth grade exhibit a high correlation to an adulthood

performance in the lowest tiers of income, skill-level, productivity, and employability,

and a higher dependence on government support systems.

The results of this study provided needed and relevant insight into the best use of

financial and personnel resources in literacy intervention programs to the local school and

other schools of similar demographics. The results can better inform early elementary RtI

programs on the appropriate grade level(s) at which to concentrate intervention resources.

Limitations of this study focusing on one rural school and limited data were considered

when interpreting results. Additionally, the study provided a structural design that could

be replicated at schools of differing demographics to better understand the efficacy of

literacy intervention programs in hopes to better allocate resources and eliminate the

overidentification of students with learning disabilities. Overidentification and

misidentification of students with learning disabilities continues to be a significant

problem in special education even after the transition from a severe discrepancy model to

the RtI model made standard by the reauthorization of the IDEA of 2004, that serves as

the primary legislative guidance for special education programming (Phillips, 2018;

Watkins et al., 2018). Anastasiou et al. (2017) noted that the ability–achievement

discrepancy method produced a disproportionate representation within the special education population. Implementation of an RtI framework within the special education identification process aims to address the disproportionate number of students identified with disabilities from culturally and linguistically diverse backgrounds, meaning the number of students identified as having specific learning disabilities who represent culturally and linguistically diverse backgrounds should be in proportion with their representation in the general student population (Bhattacharya, 2021). Improving instructional methods within the RtI framework serves to only improve the problems with disproportionality of the identification students with specific learning disabilities.

Literacy serves as the cornerstone to learning. Early literacy skills are strong predictors of future academic achievement and broader life outcomes (Adlof & Hogan, 2019). Nearly 75% of children who demonstrate low literacy skills when they enter first grade continue to have reading problems as adults (Graham et al., 2018). This same group of adults suffer from a 70% unemployment and/or underemployment rate and a 43% poverty rate (Mathes, 2017). Additionally, students with lower literacy skills were more likely to be identified as students with specific learning disabilities under the discrepancy model as established by the IDEA prior to the changes implemented in 2004 (Landerl et al., 2019). If unaddressed, students who do not receive appropriate and effective intervention to curb reading skill deficits prior to the end of third grade face a 50% chance of not graduating high school (Mathes, 2017).

Schools would have an opportunity to curb the long-term effects of reading skill deficit if more information were available on implementation timing and intensity for

literacy interventions in early elementary grade levels. Students who have reading skill deficits adequately addressed prior to the end of third grade, have better odds of graduating high school and earning a higher income and less of a chance of governmental program dependency and lower-tiered income later in life (Wanzek et al., 2018). Additionally, quality RtI programs have been shown to reduce the number of students erroneously identified as having a specific learning disability (Lovett et al., 2017). Because early intervention has been identified as a key component in reducing misidentification of students as having learning disabilities, especially with students who experience low socioeconomic backgrounds (Cooc, 2018), identifying the most opportune grade level to concentrate intervention resources to maximize effect has the potential to increase student achievement and reduce the misidentification of students as having disabilities. In an effort to maximize growth potential in literacy skill development, this study focuses on the identification of grade level in early elementary that yields statistically significant differences in growth in an existing, targeted RtI program that has been in existence for a decade.

Early literacy interventions within an RtI system are tied directly to special education servicing and the identification of students with specific learning disabilities under the IDEA of 2004, specifically in using a comprehensive RtI program in the identification process for students with specific learning disabilities. This evolution in approach within the IDEA comes on the heels of data that suggests between 30-50% of fourth grade students in the United States lack appropriate grade-level reading skills (Burns et al., 2020). This statistic is compounded by the idea that the number of students

identified as having a specific learning disability has tripled since the onset of IDEA in 1975 (Burns et al., 2017). The research on the effect of RtI programs has been varying, however, states implementing comprehensive RtI programs report a decrease in specific learning disabilities identification rates over time (Burns et al., 2020). Strengthening RtI programs promotes positive social change by minimizing the misidentification of people with specific learning disabilities and increasing reading proficiency for all students, which in turn, will produce higher numbers of high school graduates with employable skills.

Research Questions

Under the premises that the phonetic skill of fluency is a predictor of future reading proficiency (Petrová et al., 2020) and that early intervention is key to filling gaps in early literacy skills (Lovett et al., 2017), this study used the DIBELS NWF assessment scores and the ORF assessment scores to determine measurable growth in the identified skills while undergoing a continuous, research-based RtI program. This study was guided by the following research questions:

Research Question 1: What is the pretest–posttest difference in the individual DIBELS NWF Assessment scores for each grade level (kindergarten, first, and second grade)?

$H1_0$: There is no statistically significant pretest–posttest difference in measured growth for each individual grade level in kindergarten, first, and second grade students in NWF.

$H1_a$: There is a statistically significant pretest–posttest difference in measured growth for each individual grade level in kindergarten, first, and second grade students in NWF.

Using archival data, I compared DIBELS NWF assessment scores collected at the beginning and end of year to determine measured growth. The difference between the beginning-of-year assessment and the end-of-year assessment was used as the growth score. A comparison of the measured growth for each grade level for the school years ending in 2020, 2019, 2018, 2017, and 2016 occurred. I looked for the difference between growth rate and grade level.

Research Question 2: What is the pretest–posttest difference in the individual DIBELS ORF Assessment scores for each grade level (kindergarten, first, and second grade)?

$H2_0$: There is no statistically significant pretest–posttest difference in measured growth for each individual grade level in kindergarten, first, and second grade students in ORF.

$H2_a$: There is a statistically significant pretest–posttest difference in measured growth for each individual grade level in kindergarten, first, and second grade students in ORF.

Similar to the above comparison of archival data from the DIBELS NWF assessment, I used archival data to compare DIBELS ORF assessment scores collected at the beginning and end of year to determine measured growth. The difference between the beginning-of-year assessment and end-of-year assessment was used as the growth score.

A comparison of the growth for each grade level for the school years ending in 2020, 2019, 2018, 2017, and 2016 occurred. I looked for correlation between growth rate calculated as stated above and grade level.

Review of the Literature

Conceptual Framework

The framework for this research study was focused on the constructs of the variability of learning disabilities and its focus on the individual needs of learners. In this framework, three levels of analysis were used to investigate underlying processes that influence learning of content (Fletcher et al., 2018). Although RtI is used to assess and address a variety of disabilities within the school setting, it is most commonly used to support students who otherwise had been erroneously identified as having a learning disability in former special education evaluation models (Bekele, 2019). The variability of learning disabilities construct guided this study by focusing on learning trends within the RtI framework. Identifying data trends specific to student learning patterns can serve to inform practice. Learning disabilities are grounded in five domains, of which three (viz., word recognition, written expression, and reading comprehension) are directly linked to the development of early phonetic skills like ORF and NWF (O'Keefe et al., 2017). An RtI framework fits into the second prong of analysis in the variability of learning disabilities framework by providing a research-based process to evaluate individual cognitive processes related to academic skills (Fletcher et al., 2018).

This multipronged approach to the identification of learning disabilities in elementary-aged children represents a vast change from earlier models deemed highly

subjective as they looked at discrepancies between intelligence and performance (Savitz et al., 2018). Adapted from a model founded in Finland, RtI directly targets the problems with the discrepancy model including over identification of students as having learning disabilities and the disproportionate identification of minorities in special education (Jahnukainen & Itkonen, 2021).

The early identification and intervention protocol within the existing programming at the target school are prevention constructs founded in the underpinnings of the RtI framework which, according to Gomez-Najarro (2020), include the following:

1. All students receive high-quality, research-based core instruction in the general education classroom.

2. Universal screening and progress monitoring are utilized to provide continual information about a student's growth and level of achievement, both individually and in comparison, with the peer data and normed data.

3. Tiered, targeted, research-based and differentiated instruction for all students designed to meet the individual student's needs as demonstrated through progress monitoring data (Savitz et al., 2018).

The RtI framework was developed through study groups developed within the President's Commission on Excellence in Special Education as a framework for assessment, intervention, and decision making in special education (Anastasiou et al., 2017). The tenets behind including the RtI framework in the 2004 reauthorization of the IDEA include creating a stronger association between special education and general education, protecting individual rights to both a free and appropriate public education and

least restrictive environment, and the overidentification and disproportionate

identification of subgroups receiving special education services (Bekele, 2019).

Review of Broader Problem

As research on specific learning disabilities continues to inform and influence

legislation, schools have been called on to design programs to meet the needs of students

especially in the area of literacy. The ability to read is linked to an individual's success in

school and in life. Skills linked to the function and process of reading, like ORF and

NWF, are the building block skills necessary for emergent readers to develop into

independent readers (Petrová et al., 2020). Studies link literacy skills to increases in

future employment opportunities, academic achievement, and broader public health

outcomes (Adlof & Hogan, 2019). Research has shown the early literacy intervention to

be successful at curbing the risk for reading failure, but few empirical studies have been

conducted to determine student growth differences in reading fluency produced by these

interventions by age or grade (Lovett et al., 2017). Schools have the responsibility to

address language development in order to improve academic achievement in literacy

early in school careers (Adlof & Hogan, 2019). Additionally, even though the federal

government recognized the importance of a comprehensive intervention program to

address early literacy development and prevent the overidentification of students with

learning disabilities, little specific guidance on how to implement early literacy

interventions within an RtI framework exists, especially for rural schools that face unique

challenges (Pierce & Mueller, 2018). This information is critical when considering

students who do not have established grade-level literacy skills at the end of third grade

are less likely to catch up to their peers and graduate high school on time (CCSSO, 2019), and that 25% of eighth grade students have not achieved basic reading proficiency on the NAEP (Adlof & Hogan, 2019).

Literacy skills that lag behind grade-level in middle and high school, when the focus of the curriculum transitions from learning-to-read to reading-to-learn, hinder students with lagging skills from fully accessing the curriculum and achieving grade-level expectations across all content areas (Buđevac, 2019). In the 2019 summative testing cycle in the state in that this study was held, over 55% of third grade students tested below proficiency benchmarks in the area of reading (Ackley, 2019). For this reason, among others, many states have implemented gateway retention laws that require students to acquire grade-appropriate literacy skills prior to the end of third grade before transitioning to the fourth grade, which highlights the essential need for schools to address lagging literacy skills early in a student's educational career (Barrett-Tatum et al., 2019). Traditional instructional practices fail to recognize that every student enters school with their unique knowledge level, learning capacity, and skill set in regard to emergent reading skills (Çakıroğlu, 2018). To inform this literature review, a search of relevant literature was conducted utilizing the Walden University Library. Search terms included *RtI*, *early literacy*, *third grade reading legislation*, *literacy intervention*, *multi-tiered systems of support*, *reading intervention*, *early intervention*, *specific learning disabilities*, and *learning to read*.

Historical Background: RtI

RtI, when first introduced in the late 1990s, was presented as a valid answer to misrepresentation of subgroups in special education. The RtI model was designed using a medical model that utilized a multitier approach to address early literacy skills (Willis, 2019). The RtI model saw massive expansion when introduced as a valid alternative to the severe discrepancy model in the reauthorization of the IDEA (2004). This measure aimed to reduce the percentage of children misidentified as having a specific learning disability, reduce the disproportionate representation of minorities identified learning disabled, and close the gap for children entering school with literacy skills lower than their peers (Willis, 2019). Problematically, even though RtI represented a major shift in educational design and is currently in use in every state in the United States of America, the evidence-based practices that form the foundation of the RtI framework have not been consistently implemented from state to state (Al Otaiba et al., 2019).

RtI is touted as one of the largest and most progressive developments in the education spectrum to come about in recent decades (Vaughn et al., 2020). More specifically, RtI is key to reading skill development in the areas of phonemic awareness, phonics, and whole-word reading with students leading up to the third grade level. Research shows RtI effectively impacting reading skill development in early elementary years but finds that effect dwindling after third grade (Hendricks & Fuchs, 2020). A key change from traditional instruction to an RtI model includes a perspective shift from the idea of reading readiness being based in student maturity and a hierarchy of skills to an evidence-based system of reading skills grounded in a reading continuum in which

students can grow along (Petrová et al., 2020). A literature review by Baye et al. (2019)

found no significant differences in studies which indicate the overall mean effect (*d*) of

0.21 using standardized measures over 82 studies which looked at reading interventions

at and after the fourth grade level. This effect is statistically much lower than the effect at

the lower grades and relatively consistent in the upper grade grouping, making grade-

level a moderator in looking at effect of intervention programming (Bresina et al., 2018).

Furthermore, the RtI model was designed to replace the IQ achievement discrepancy

approach previously used to identify learning disabilities in the special education process

(Al Otaiba et al., 2019).

Before the rapid expansion of RtI, the model most commonly used by schools to

determine specific learning disabilities was the discrepancy model, which looked for a

large gap between intelligence and achievement. Unfortunately, the discrepancy model

had two major flaws: overidentifying children of minority and low-income groups as

having specific learning disabilities and not identifying all students with specific learning

disabilities because the gap between achievement and ability was not severe enough

(Alahmari, 2019). The latter scenario left students to fail longer until the gap widened

enough to fit within the parameters. Even though the discrepancy model proved

problematic, over time, through using well-defined, albeit flawed qualification

parameters, educators perceived the process as valid and were comfortable with the time-

established implementation of the model (Grigorenko et al., 2020). This led to

widespread debate among educators and researchers around selection of assessment tools

and better methods to serve students with learning disabilities as the commonly used

models prior to RtI were riddled with inaccuracies and cultural inequities (Alahmari, 2019).

The implementation of research-based RtI models that embody early, targeted instructional interventions has been shown to lower the number of students erroneously identified as having a specific learning disability by 70% (Vernon-Feagans et al., 2018). Although the RtI model implementation has moved the curve in the right direction in addressing the overrepresentation of minority children identified as having learning disabilities, the lack of consistency of implementation has created latent disproportionality in schools (Alahmari, 2019). The evolution of the RtI framework implementation has created a fissure of knowledge and confidence among educators as school districts juggle implementation and training with little specific guidance from the state and federal level (Al Otaiba et al., 2019).

The Science of Learning: Teaching Children to Read

Children do not learn to read by happenstance. The science of learning across all disciplines identifies how people learn and how different teaching methods promote learning (Meng & Ling, 2021). The field of psychology has dedicated much of the last 100 years to understand how people learn (Weinstein et al., 2018). Specific to literacy, learning to read involves mastering concepts rooted in the five components considered essential by the research of the 2000 National Reading Panel and which form the science of reading: phonics, phonemic awareness, fluency, vocabulary and comprehension (Ceballos et al., 2020). Although the concepts associated with learning to read have been pared down to five widely recognized components, children differ in aptitude, pace, and

maturity, which all alter the timeline in which individual children learn to read (Engelmann, 2021). In order to develop a system in the teaching of reading that embraces both the five components of reading and the differing learning rates of students, RtI was developed in the area of literacy to offer a more targeted approach to learning that benefits the individual child (Carter-Smith, 2017). One of the tenets of the RtI framework is data collection to inform practice (Carter-Smith, 2017). The combination of the DIBELS NWF and the ORF Assessments address all five essential components of reading (University of Oregon Center on Teaching and Learning, 2018).

Because learning is primarily a language-driven process, collecting, examining, and using language skill data to drive instruction needs to be an area of focus in all early-learning programs (Burns et al., 2017). Of these measurable skills, ORF is an imperative skill as it serves as a prerequisite competency for comprehension and reading mastery (Aldhanhani & Abu-Ayyash, 2020). Language and literacy skills are so vital that Çakıroğlu (2018) asserted that language and literacy skill development affect the development of humanity and that language and literacy skills are linked to all skill areas humans encounter. Because literacy is such a key component to learning in school and succeeding in life and common American curriculums transition from 'learning to read' to 'reading to learn' around third to fourth grade, the task of developing and learning essential literacy skills has become the focus of early elementary (K-2) education (DellaVecchia, 2020). Adding credence to the push to implement programs focused on literacy and language skill mastery in the early elementary grades are studies such as Connor et al. (2018), which found language and literacy interventions at the third and

fourth grade levels produce inconsistent and unexpected results, few of which were deemed educationally significant.

Third Grade Reading Laws

Students whose reading skills lag behind the reading skills of their peers at the end of third grade face an exponentially growing risk of falling and staying behind grade-level expectations for the remainder of their school careers (Look, 2017). After a 2011 report from the Annie E. Casey Foundation was released with data illustrating children who are not reading proficiently at grade-level at the end of third grade are four times more likely to be a high school dropout, states across the nation began to react with a variety of reading legislation that either mandated third grade retention or allowed for third grade retention based on reading proficiency (D'Amico et al., 2019; García & Weiss, 2017). This movement was fueled by the federal policy shifts under three presidents promoting reform of the public education system including Clinton's Goals 2000, G.W. Bush's No Child Left Behind, and Obama's Race to the Top (Barrett-Tatum et al., 2019). Additionally, the mass adoption of Common Core Standards throughout the United States further promoted the standardization of grade-leveled skill sets for American students (Vegel, 2019). All of these standards-based educational reform movements strongly discouraged social promotion in public schools and in turn, spurred the creation of gateway retention laws. Gateway retention laws require demonstration of skill levels before a student is promoted to the next grade level, mainly literacy skills (Barrett-Tatum et al., 2019).

Not all research supports the notion of gateway retention as a way to improve literacy skill levels. Schwerdt et al. (2017) reported that the immediately recognized gains realized after retention do not carry forward with any significance when measured 4 years after retention. Additionally, after 6 years, any benefits from retention are statistically insignificant. Converse to the premise of gateway retention, which is formed on increasing high school success and completion rates, Hughes et al. (2018) found a causal relationship between in-grade retention and the failure to complete high school. Barrett-Tatum et al. (2019) reported that students who are retained in-grade, are five to ten times more likely to drop out than their socially promoted peers, making in-grade retention the number one predictor of high school dropout (Hughes et al., 2018). This problem is amplified among minority students, specifically Hispanic and African American students; low-income students, mainly in urban areas; and male students, who are twice as likely to be retained their female counterparts; all of whom demonstrate a statistically lower chance of graduating high school after an in-grade retention than their white and/or higher income peers (National Center for Education Statistics, 2020).

Gateway retention practice is based on the premise that the root problem resulting in student failure in acquiring literacy skills is lack of student comprehension of the learning standards. However, another year of exposure to the same material while recycling the same instructional methods is unlikely to change the outcome for these students (Barrett-Tatum et al., 2019). Although numerous studies and literature reviews have indicated the lack of effectiveness of gateway retention practices for academic growth and school success, nineteen states have implemented laws mandating third grade

retention for children who are not performing at grade level in reading while ten states have implemented laws which allow third grade retention for struggling readers (DellaVecchia, 2020). The Midwestern state for this study recently enacted a third grade reading law that mandates retention at the end of third grade for students who do not perform at a proficient level on the state-wide reading assessment typically administered in April of each school year. The first round of gateway retentions for this state were scheduled to occur at the conclusion of the 2020–21 academic year, however, the Covid-19 pandemic pushed back implementation to the 2021–22 school year.

Validation of Early Literacy Interventions

The ability to read and understand written content is fundamental to academic success across all content areas. Reading, writing, and oral language are the building blocks of a comprehensive understanding of written language (Foorman et al., 2017). Literacy skills are not only instrumental in academic achievement, but also directly affect employment opportunities and personal health (Adlof & Hogan, 2019). Students who fail to develop mastery of the aspects of language experience difficulty in school and in many aspects of life (Burns et al., 2017). The acquisition of literacy skills is both complex and linear (Connor et al., 2018). Because school curriculum incrementally builds upon previous knowledge and content, students who lag behind the grade-level expectations are at-risk of experiencing a literacy gap, which once created, proves difficult to overcome. Furthermore, students who experience literacy gaps and fall behind their peers academically, are more likely to exhibit disciplinary, health and emotional problems throughout their school years. These factors bleed over into adulthood for children who

fall behind their peers in literacy skills in elementary school and manifest as higher

unemployment rates and increased reliance on government assistance programs (Hirsh et

al., 2019). Students do not reach school-age with uniform and consistent literacy skills. In

order to address differing skill levels, schools are called upon to offer differentiated

learning and tiered support to address the varying literacy skill levels of students as they

enter school (Çakıroğlu, 2018). Furthermore, those students who continue to lag behind

grade-level benchmarks without mediation stand a higher chance of being misidentified

as having a learning disability (Fletcher et al., 2018).

To address these trends, the Reauthorization of the Individuals with Disabilities

Act in Education of 2004 reinforced for schools the importance of implementing an RtI

framework. The discussion on reimaging the approach to learning disability identification

came from decades of ineffectual an unfair identification practices using the IQ

discrepancy model, which disproportionately identified minorities as being learning

disabled (Alahmari, 2019). The RtI Framework, in its design, addresses the increasing

over-identification of students with learning disabilities based on literacy gaps more

likely to be attributed to stark differences in exposure to precursor literacy skills prior to

entering school rather than actual learning disabilities (Pfost et al., 2019). The Utah State

Board of Education (2020) reports that students who have demonstrated below grade-

level skills at the beginning of the year and receive early literacy interventions are seven

times more likely to meet reading benchmarks at the end of the school year than their

peers who perform at the same beginning of the year level and receive no reading

interventions. Additionally, research indicates that measures such as ORF can effectively be used as indicators of progress in the area of literacy (Bresina et al., 2018).

Learning to read is a complex collection and melding of specific skills which start to form in early childhood and continue to develop through the school years. The continuous nature of this multidimensional process lends to the ability for educators to parse out lagging skills and address these skills individually and in a targeted fashion. Left unaddressed, trailing skill sets as basic as alphabetic principals, understanding the association between letters and words, are essentially linked to future reading struggles (Pfost et al., 2019). Recent policy shifts are increasing efforts to focus more and stronger literacy skill development efforts into the primary grade levels, starting as early as preschool (D'Agostino & Rodgers, 2017). The overarching tenet for the creation of literacy and language development curriculum guides and pacing is built around the belief that students are expected to enter the first grade with the same skills they would have demonstrated at the end of first grade a decade ago in order to be appropriately prepared for increasingly stronger curricular demands in subsequent grade levels (D'Agostino & Rodgers, 2017). The increased curricular demands combined with the significantly different skill sets children have developed by the time they enter school for the first time have necessitated comprehensive literacy and learning intervention programs at the primary grade levels (Lovett et al., 2017). Additionally, as demands increase for teachers to develop, implement, and monitor complex literacy intervention programs, the need for targeted teacher training in the area of literacy also increases (Engelmann, 2021).

After years of investigation into the best practices for teaching reading, the National Reading Panel, a group formed by the U.S. government and tasked with improving reading proficiency in the nation's schools, defined learning to read best practices as providing explicit instruction in five specific components. Phonics, phonemic awareness, fluency, vocabulary, and comprehension complement each other as the five components in the what the National Reading Panel refers to as the science of reading (Ceballos et al., 2020). These five components and the National Reading Panel's science of reading form the tenets behind targeted literacy intervention within an RtI program can effectively address lagging literacy skills in students early in literacy development (Tunmer & Hoover, 2019).

Using early literacy interventions under the RtI framework involves assessing student skill levels in the five components of reading using a normed assessment. Using this data, areas of need for each student are identified. In addition to every student receiving Tier I instruction through the core curriculum in the broad, large-group classroom setting, students identified with areas of need receive supplementary instruction through small-group instruction specifically designed to target the areas of need (Mathes, 2017). Students are progressed-monitored periodically to assess individual growth. If sufficient growth isn't realized through the combination of Tier I and Tier II instruction, the student received individual, Tier III instruction with increased frequency from the targeted instruction evident in Tier II (Mathes, 2017). If evident growth is not measured over time, the student may be assessed for learning disabilities, that underlines the RtI framework as critical in the identification process for special education (Miciak &

Fletcher, 2020). More commonly, students active in the RtI framework make significant gains and narrow the literacy gap between initial performance levels and grade-level expectations (Lovett et al., 2017).

Since 2004, the RtI framework within the instructional process has served as the cornerstone for the identification of students with specific learning disabilities (Grapin, 2018). This methodology replaced the ability–achievement discrepancy method for identifying students with specific learning disabilities as the ability–achievement discrepancy method as it employs a wait-to-fail approach to student performance and lacks the necessary treatment validity (Anastasiou et al., 2017). The RtI model is designed to overcome some of the limitations of the traditional ability–achievement discrepancy method by taking a more individualized approach to instruction and application of supports within the process of identifying students with specific learning disabilities (Anastasiou et al., 2017).

Implications

The results from this study may inform decisions on resource allocation within an existing targeted RtI Program. By allocating resources to the grade level(s) based on demonstrated the highest measurable growth in literacy skills, the school system can build on those gains and maximize skill-growth potential. Conversely, the data may inform the district to increase resource allocation in lower performing grade levels to improve measurable growth in those areas. Currently, information identifying which grade level harnesses the biggest growth potential is lacking, leaving schools broadly applying literacy interventions to multiple grade levels instead of focusing intervention

resources at one grade level. The information from this study could build depth and increase effectiveness of literacy intervention programs by targeting grade levels with the largest growth potential as demonstrated by archival growth data. The problem that at the target school over the most recent 5 years of data on the state summative assessment, only 37% of students demonstrate proficiency on the Michigan Student Test of Educational Progress at the end of third grade could be addressed (Michigan Department of Education, 2020).

Summary

Early literacy skills are widely accepted as strong predictors of future academic achievement and broader life outcomes. Being able to identify the best grade level to target literacy skills would allow schools to concentrate their limited intervention resources in order to maximize growth. Further research on when literacy interventions generate the most growth during the early elementary years is needed to better inform schools on what grade levels to concentrate literacy intervention resources. Using one-way ANOVA in a gain score situation, this study investigated the measurable growth of all students receiving evidence-based literacy interventions in the early elementary grade levels of kindergarten, first, and second. The study used a quantitative approach toward archival data to determine measurable growth. Because RtI is a critical component in the process of identifying learning disabilities within the special education process in federally funded schools (IDEA, 2004), understanding how better apply the process to maximize student growth will only help student achieve more. In turn, a better understanding will contribute to positive social change. The results can better inform

early elementary RtI programs on the appropriate grade level(s) to concentrate

intervention resources. The remaining sections of this study includes a description of the

quasi-experimental design and the researcher's approach to the necessary data analysis.

Additionally, descriptions of the target school district demographics, data selection, plan

for analysis, likely assumptions, limitations, and delimitations are included in subsequent

sections of this study. Most importantly, an explanation of how the researcher plans to

protect the rights of participants is also included in the remaining sections of this

proposal. Limitations of this study focusing on one rural school and limited data were

considered when interpreting results.

Section 2: The Methodology

The problem addressed in this project study was that at the target school, over the most recent 5 years of data on the state summative assessment, only 37% of students demonstrated proficiency in reading fluency on the Michigan Student Test of Educational Progress at the end of third grade (Michigan Department of Education, 2020). In order to improve student performance in reading fluency, interventions within the RtI framework were consistently applied, yet with unknown success. This left school personnel uninformed on how to most effectively allocate resources and intervention time across early elementary grade levels in order to increase the measurable growth in reading proficiency measures of the RtI program in the area of literacy.

I investigated whether or not there was a statistically significant difference between the measurable growth when comparing different grade levels of all students receiving evidence-based literacy interventions in the early elementary grade levels of kindergarten, first, and second. To examine the measurable growth at each grade level, I used DIBELS ORF and NWF archival data from 5 consecutive school years. For this project study, the hypothesis was that the measured growth at different grade levels would be significantly different. Also, I compared the DIBELS Composite scores within the archival data from the years 2016–2020 to look for ongoing overall trends in literacy skills and to determine whether there was a statistically significance difference in literacy skill growth between grade levels when all students were exposed to a comprehensive targeted intervention program that used evidence-based strategies.

Research Design and Approach

In the study, I used the ex post facto pre–post design to evaluate reading fluency gains at three different grade levels. DIBELS ORF and NWF scores of students from school years 2016–2020 were retrieved to create two sets of student scores. The purpose of this quantitative study was to compare reading fluency gains between grade levels (i.e., kindergarten, first, and second grades) in an effort to better understand which grade level demonstrates the most growth. The aim was to determine the relationship between them, that is, to determine whether a statistically significant difference in measurable growth existed between grade levels in a targeted intervention program at the target school. Because measurable growth using scaled scores are used in this study, a quantitative method was selected. A qualitative approach would not have been appropriate as the comparative nature of the study does not indicate a qualitative design. According to Chevalier and Buckles (2019), when determining a possible difference between variables, a comparative design is appropriate. Additionally, describing the difference between variables is elucidated within ANOVA research. The study met the definition of ex post facto pre–post research as the participants were not randomly assigned and because I used quantitative data to investigate the relationship between variables. Using this method allowed me to compare gain scores between grade levels on the selected sub-tests.

Construction of the Data Sets

The NWF and the ORF subtests served as separate variables. Student scores on the assessments were the dependent variables. Each of the grade levels served as

individual cohorts over the course of the 5-year span. The scores were aggregated across 5 years. To ensure the data met the conditions for one-way ANOVA, the data sets were tested for the assumptions of one-way ANOVA. The results indicated that the data sets selected for this study met the homogeneity of variances conditions. A one-way ANOVA was conducted to determine which grade level demonstrates the highest measurable growth. The study used data from the 2020, 2019, 2018, 2017, and 2016 to conduct a grade-level analysis of the targeted intervention as applied to multiple grade levels over multiple years.

Setting and Sample

The school selected for this study was a Title I school in Michigan that runs a targeted RtI Program. The rural, K-12 school district in this study consisted of one K-12 building within a district that spanned over 700 square miles and has a total population of $N = 175$ students. The student population was 68.9% Caucasian, 27.5% American Indian/Alaskan Native, 2.4% African American, and 1.2% Hispanic. The district employed a full-time superintendent/principal, a part-time Title I coordinator, 13 full-time classroom teachers, and four trained paraprofessional interventionists. Relevant to this study, three full-time early-elementary classroom teachers, the superintendent/principal, the part-time Title I coordinator who also served as a classroom teacher, and the four trained paraprofessional interventionists were jointly responsible for literacy outcomes. The average class size was approximately 15 students.

The school used the DIBELS suite of assessments for over 15 years and staff members were trained annually in administering and scoring the DIBELS assessments by

outside certified agencies. To realize a total representation of the effect the targeted intervention system has on student growth, every student with beginning-of-year and end-of-year assessment scores in a grade on the selected subtests were included in the grade level cohort scores for comparison. Data were collected through the data storage system within the school district. The data collected for this study were from the school years ending in 2016, 2017, 2018, 2019, and 2020.

Instrumentation and Materials

Archival data collected using the DIBELS Suite of Assessments were used for this study. Examples of each test can be found in Appendix A. The data were collected under the guidelines established by the University of Oregon Center on Teaching and Learning (2018), the organization that developed the DIBELS Assessment Suite and oversees its implementation and use. Using predictive validity data from five studies, predictive correlations using linear normal form (LNF) for the DIBELS NWF assessment ranged from 0.54 to 0.79 across grade levels. Additionally, LNF correlations for the DIBELS ORF assessment ranged from 0.75 to 0.93 across grade levels (University of Oregon Center on Teaching and Learning, 2018). Using the intercept and slope reliability model, intercept reliability estimates constantly fell at or above 0.80 with slope reliability estimates falling consistently at or above 0.33 for both the NWF and Oral Ready Fluency assessments across grade levels (University of Oregon Center on Teaching and Learning, 2018).

Test-retest reliability was expected to be somewhat lower using the DIBELS assessments than other forms of assessments due to the expected rapid growth on the

skills the DIBELS assessments were designed to measure. With this in mind, for NWF at the kindergarten level the mean test-retest reliability using LNF measured at .82. (University of Oregon Center on Teaching and Learning, 2018). The mean test-retest reliability LNF for first grade assessments was .75 and .77 at second grade. For the ORF test, the median test-retest reliability measured at .91 across all grade levels (University of Oregon Center on Teaching and Learning, 2018).

The study focused on two subtests: NWF and ORF. The data were uploaded into the IBM SPSS Statistics (Version 28) program to look for differences between growth rate calculated as stated above and grade level. I used an ex post facto pre–post design with a one-way ANOVA of pretest and posttest scores.

Data Procurement and Analysis

Data Procurement

I began data collection after first receiving approval from the Institutional Review Board at Walden University (Approval No. 10-11-21-0979583) and approval from the Board of Education in the target school district. The use of archival data, that eliminated direct student contact, negated the need for participant consent. After receiving the DIBELS data from the school years ending in 2016–2020, I completed the analyses. Data were received in paper form, transferred to a Microsoft Excel document, coded for relevant variables, and screened for data that met the parameters of the study. All other identifiers were removed.

Data were secured on the password-protected school network. According to O'Neil (2011), obtaining consent from participants was not necessary as the data were

collected in an educational setting to assess student performance within the education

program, the collected data does not identify students individually, and the data were

collected within the normal educational process and program at the school. Consent for

the data were obtained prior to collection by the District Board of Education.

Data Analysis

The data were uploaded and stored in the IBM SPSS Statistics (Version 28)

program for analysis. One-way ANOVA was used to determine whether the gain scores,

determined by change realized between the pretest and the posttest at each grade level,

were statistically different from each other (Leppink, 2018). For instance, the analysis

assisted in determining whether the students while in first grade realized greater gain

scores than the students did while in second grade.

The hypotheses tested was that gain scores would vary between grade levels and a

grade level with higher gain scores could be identified. The one-way ANOVA compared

the means and standard deviation of the data samples to determine if there were

statistically significant differences between the mean gain scores of each of the three

grade levels. As acceptable in the field of education, the critical alpha value was set at $p =$

.05 with 95% confidence (Perdices, 2018). The assumptions for one-way ANOVA were

also checked for homogeneity of regression as the pretest results cannot be statistically

significantly different across levels of the grade levels (Cooksey & McDonald, 2019). I

used the IBM SPSS Statistics (Version 28) to analyze the data sets. The inclusion of 5

years of data provided data consistency over time and a broader sample size to evaluate.

With the use of multiyear data, I was also able to evaluate the data for gain score trends

over time. This allowed me to detect whether the gain scores were consistently trending differently at one grade level over another.

Using the archival data from the years ending in 2020, 2019, 2018, 2017, and 2016, I gathered student performance data from the DIBELS NWF and ORF assessments for students in kindergarten, first grade, and second grade. The study used existing archival data gathered within the DIBELS test sequence over the course of kindergarten, first grade, and second grade. Both the NWF and the ORF subtests were analyzed for individual student growth in each of the identified grade levels. The beginning scores of each test period were subtracted from the ending scores from the test period to find the difference in measurable growth or gain score. Students with missing performance scores for either the beginning or end of the test period were eliminated from the sample population. A power analysis revealed a minimum data sample number of 80 with a medium effect.

For each grade level, I used the collected DIBELS Assessment Score archival data to determine (a) the mean value and standard deviation of individual scores at beginning and end of year (using SPSS descriptive function) and (b) the statistical significance of pre–post gain scores differences between the beginning and end of the year (using SPSS one-way ANOVA). The gain scores for each grade level were checked for statistical significance. Group comparisons were conducted using grade level as the independent variables. The gain scores represented the continuous dependent variable. Mean gain scores were calculated for each grade level and compared.

Assumptions, Limitations, and Delimitations

Assumptions were that teachers and instructional aides (a) have been trained to implement a variety of evidence-based literacy interventions, (b) used these interventions during the scheduled intervention times, (c) have been trained to administer the DIBELS assessments correctly, and (d) administered and documented the assessments correctly. Another assumption was that all students had received appropriate targeted interventions based on their established abilities. Additionally, the study assumed all archived data provided for this study were accurately collected.

This study was limited by sample size and lack of population diversity. The results lack applicability to scenarios at larger, more diverse schools. Data from students who did not complete the full academic year at the research site were removed from the study. Random sampling for this study was not possible as the archival data were used from the already small sample size. The scope of this study was limited to the difference between beginning scores and end scores ascertained using the DIBELS ORF and NWF assessments compiled over academic years ending in 2020, 2019, 2018, 2017, and 2016. These standardized scores were used to compare measured growth between the different grade levels.

The kindergarten, first, and second grade classrooms at the research site within the one school building district, bound this study. The study was also delimited by the experience level of the teachers, intervention staff, and assessment staff employed by the research site school. I selected to examine the differences in measurable growth of students in kindergarten, first grade, and second grade using standardized scores at the

three different grade levels and across 5 years. Because the nature of the study is specific to the RtI program at the research site, the results have limited generalizability to other school districts.

Protection of Participants' Rights

The Board of Education granted approval for the use of archival data. Using archival data eliminated the need for recruitment of participants. All data were coded to remove names and protect the identity of students and staff members.

Data Analysis Results

I conducted a one-way ANOVA (.05 significance level) to determine whether gain scores for DIBELS ORF and NWF differed between the grade levels. In this section, I first present the descriptive statistics. Then, the research questions and hypotheses will be reiterated. Following the research questions were the results of the conducted data analyses that answer the research questions.

Descriptive Statistics

I collected the archival data for the target school for school years ending in 2016 to 2020. This yielded data from a total of 5 school years. Once students with incomplete school year data were removed, the data collection resulted in usable data for a total of 85 kindergarten students, 80 first grade students, and 75 second grade students. According to parent classification, 70% of this population were White, 27% Native American, 1% African American, and 2% Hispanic.

Data Assumptions

Because this ex post facto pre–post design study required the use of pretest and posttest data to determine gain scores, student data without both a pretest score and a posttest score were removed. Using the procedures outlined by Wagner (2019), each data set was assessed to ensure it met the homogeneity of regression conditions before conducting the one-way ANOVA. This ensured the pretest data were not statistically significant across the grade levels.

Using Levene's Test of Equality of Variances to test the null hypothesis that all populations variances were equal (Wagner, 2019), I was able to reject the null hypothesis as all p-values fell within the statistical significance threshold of .05. The NWF Scores yielded a $p < .001$, the ORF Scores a $p = .004$, and the Composite Scores a $p < .001$.

Descriptive Statistics

The lowest mean gain score for the NWF assessment was in kindergarten ($M = 12.00$, $SD = 17.19$). The highest mean gain score for the NWF assessment was in first grade ($M = 48.85$, $SD = 28.36$). The NWF assessment analysis compared gain scores ($n = 164$) for kindergarten and first grade. The lowest mean gain score for the ORF assessment was in first grade ($M = 23.31$, $SD = 14.85$). The highest mean gain score for the ORF assessment was in second grade ($M = 44.80$, $SD = 23.24$). The ORF assessment analysis compared gain scores ($n = 155$) for first grade and second grade over 5 years of data collection.

Additionally, composite scores were analyzed at each grade level to normalize the gain score data over the grade levels. The highest composite gain score was for

kindergarten ($M = 117.03$, $SD = 36.14$). The lowest composite gain score was for first grade ($M = 59.58$, $SD = 67.40$). The composite gain scores were lowest in first grade, that also realized the highest standard deviation.

Inferential Statistics

Research Question 1

What is the pretest–posttest difference in the individual DIBELS NWF Assessment scores for each grade level (kindergarten, first, and second grade)?

$H1_0$: There is no statistically significant pretest–posttest difference in measured growth for each individual grade level in kindergarten, first, and second grade students in NWF.

$H1_a$: There is a statistically significant pretest–posttest difference in measured growth for each individual grade level in kindergarten, first, and second grade students in NWF.

To answer this question, I conducted a one-way ANOVA of the NWF data. The independent grouping was grade level, with groups representing students in grades kindergarten, first grade, and second grade over the course of 5 school years (2016–2020). The homogeneity of variances should be met before making inferences from the one-way ANOVA data (Wagner, 2019). Levene's test met the threshold of less than 0.05, ($p < .001$) meaning there was enough variance in the data sample to justify the possible mean differences.

The results of the one-way ANOVA were significant, $F(1, 162) = 102.31$. Statistically significant ANOVA results indicate significant differences in NWF gain

scores between grade levels for the assessment period tested. Thus, the null hypothesis

was rejected. Table 1 presents the one-way ANOVA results used to address this research

question.

Table 1

Results of One-Way ANOVA Comparing NWF Gain Scores Between Grade Levels

		Sum of squares	*df*	Mean square	*F*	*p*
NWF gain scores	Between groups	55641.702	1	55641.702	102.310	< .001
	Within groups	88104.200	162	543.853		
	Total	143745.902	163			

Note. ANOVA = analysis of variance; NWF = nonsense word fluency.

Research Question 2

What is the pretest–posttest difference in the individual DIBELS ORF

Assessment scores for each grade level (kindergarten, first, and second grade)?

$H2_0$: There is no statistically significant pretest–posttest difference in measured

growth for each individual grade level in kindergarten, first, and second grade students in

ORF.

$H2_a$: There is a statistically significant pretest–posttest difference in measured

growth for each individual grade level in kindergarten, first, and second grade students in

ORF.

To answer this question, I conducted a one-way ANOVA of the ORF data. The

independent grouping was grade level, with groups representing students in grades

kindergarten, first, and second over the course of 5 school years (2016–2020). The

homogeneity of variances should be met before making inferences from the one-way

ANOVA data (Wagner, 2019). Levene's test met the threshold of less than 0.05, (p = .004).

The results of the one-way ANOVA were significant, $F(1, 153) = 47.626$. Statistically significant ANOVA results indicate significant differences in ORF gain scores between grade levels for the assessment period tested. Thus, the null hypothesis was rejected. Table 2 presents the one-way ANOVA results used to address this research question.

Table 2

Results of One-Way ANOVA Comparing ORF Gain Scores Between Grade Levels

		Sum of squares	*df*	Mean square	*F*	*p*
ORF gain scores	Between groups	17872.748	1	17872.748	47.626	< .001
	Within groups	57417.187	153	375.276		
	Total	75289.935	154			

Note. ANOVA = analysis of variance; ORF = oral reading fluency.

Additional Research Data

I conducted a one-way ANOVA of the composite gain scores at each grade level. Like above, the independent grouping remained grade level, with groups representing students in grades kindergarten, first, and second over the course of 5 school years (2016–2020). Levene's test met the threshold of less than 0.05, (p = .001).

The results of the one-way ANOVA were significant, $F(2, 236) = 26.619$. Statistically significant ANOVA results indicate significant differences in composite gain scores between grade levels for the assessment period tested. Thus, the null hypothesis was rejected. The highest composite gain score was kindergarten (M = 117.03, SD =

36.14). The results show that first grade students had significantly lower gain scores (M = 59.58) and a significantly wider variation of gain scores (SD = 39.66) and measured skill level when compared to kindergarten and second grade results

Conclusion

The purpose of this quantitative study was to compare measurable growth between grade levels in an effort to better understand which grade level demonstrates more growth within a targeted literacy intervention program. In order to accomplish this, I looked at differences in gain scores on the NWF and ORF assessments by grade level over the course of 5 years in a school that consistently utilized a targeted RtI program in the area of literacy. I used archival data from school years ending in 2016–2020. Additionally, I analyzed composite gain scores across those same grade levels. No other identifiers were included in the data collection or presentation. All data were protected by password and network security measures on the school's technology infrastructure.

I performed two one-way ANOVAs to answer the research questions. Additionally, a third one-way ANOVA was used for the composite data. The results for Research Question 1 indicated there was a statistically significant difference in NWF gain scores between grade levels indicating the null hypothesis could be rejected. The results for Research Question 2 indicated there was a statistically significant difference in ORF Gain Scores between grade levels indicating the null hypothesis could be rejected. These results support the conceptual framework of the variability of learning disabilities construct that indicates the practice of identifying data trends specific to student learning patterns can inform practice.

The findings of this research drove the project, a white paper, regarding using research data to inform decisions on resource allocation.

Section 3 consists of a description of the white paper including recommendations, goals, and a review of the literature. Additionally, based in the study findings and supported by the literature, a description of deliverability to the school district is included.

Section 3: The Project

Students were struggling to demonstrate proficiency on the state-administered

reading assessment despite the implementation of a robust targeted reading intervention

program designed based on the RtI Framework. This ex post facto pre–post design study

is expected to better inform the knowledge of administrators and educators within the

district about how to allocate financial and educational resources within the RtI

framework of targeted interventions in order to increase literacy skills in kindergarten,

first grade, and second grade. Section 3 includes a description and goals of the project, a

review of the literature associated with the project, ideas on implementation and

evaluation, and implications for social change. Because the results of the study indicated

a significant difference in gain scores between grade levels, a white paper was deemed

the most appropriate project for this study, that will encourage a data-informed allocation

of resources within the district to promote an increase in literacy skills prior to the state

summative testing for reading at the end of third grade.

Description and Goals

Analysis of the research data indicated that first grade students had the lowest

gain scores and the widest variation of growth and measured skill level, identifying the

first grade level as an area of concern within the RtI program. To address overall reading

proficiency and concerns about gain scores at the first grade level, I developed a white

paper to advocate for more data-driven decision making in financial and personnel

resource allocation within the RtI program. A white paper is a form of recommendation

advocating for a policy change based on facts (Purdue Writing Lab, n.d.). One goal of

this white paper was to improve the resource allocation process within the RtI program.

Other goals were to (a) provide a better understanding of literacy skill growth trends at

the early elementary grade levels and (b) increase awareness of literacy learning among

stakeholders within the RtI system. The white paper will be presented during the school

board meeting that directly follows the completion of the project. Stakeholders—

including teachers, paraprofessionals, administration and board members—are the

individuals of interest for the white paper recommendations.

  The recommendation was to encourage data-informed allocation of resources for

literacy interventions within the RtI program, specifically an increase in resource

allocation at the first grade level where gain scores were both lower and more widely

varied. The data were also used make a recommendation to broaden the use of the RtI

framework to promote the success of literacy interventions in increasing reading skills in

the early elementary grade levels.

Rationale

  The project style I selected was a white paper including a policy recommendation

for intervention data to be used by the district to better allocate resources within the RtI

program both within grade levels and across grade levels. A white paper was used for the

project as it is an effective strategy to concisely present research findings from an ex post

facto pre–post design study, and by definition, a white paper promotes change by

advocating for specific action based on research findings (Purdue Writing Lab, n.d.).

  The white paper is focused on the research findings and results from the data

analysis presented in Section 2: there was a significant difference in gain scores between

grade levels. The research findings included information that stakeholders need to understand in order to make data-informed decisions for the allocation of resources both within and across grade levels in the RtI program. Other formats to present the findings, such as trainings and presentations, would not have been as appropriate for this project study.

Review of the Literature

The study addressed the concern of low reading scores on state issued standardized assessments in the area of reading by looking at gain scores by grade level within the RtI literacy program leading up to the third grade testing. The literature review in this section is based on the project, a white paper, to address the differing growth rates in literacy skills by grades level. According to Lambert (2012), the purpose of a literature review is both to provide context to the research study and to relate the findings of a study to the existing research and knowledge base. Conducting a literature review also clarifies and provides direction for future paths of study. This literature review will inform stakeholders on using data-driven decision making within an RtI literacy framework and relate early intervention to literacy score gains. The first part of the literature review is focused on the effective use of the white paper format, whereas the second part supports using data-driven decision making within an RtI framework.

The databases used to search scholarly articles on the above topics were ERIC, the Walden Library, and EBSCO. Keywords used in the search include *white paper, policy recommendation, response to intervention, data-driven decision making, data and response to intervention, literacy interventions, fidelity,* and *educational policy*.

White Paper Effectiveness

According to the research, the white paper format can influence opinions using information-based content (Mattern, 2021). When a problem is identified and the researcher would like to present solutions or recommend a course of action to alleviate the problem, a white paper serves as an effective, relevant means to communicate to stakeholders (Stelzner, n.d.). White papers are a form of content marketing created with the intention to educate the reader. In education, white papers can serve as media intended to influence stakeholders and drive change within an organization. White papers have been used to influence policy changes and implement change of practice in education. Because they were problem–solution based in structure, white papers can be the impetus to encourage education stakeholders to embrace change in education reform (Shepard et al., 2009). The white paper for this project study promotes recommendations for procedural change toward data-informed resource allocation within the existing RtI program that directly benefits students in early elementary grade levels in the area of literacy skill development.

Targeted and Tiered Intervention as Instructional Practice

Literacy interventions can improve early reading skills in students when implemented correctly. Low literacy skills in the early elementary levels were linked by research to a variety of poor outcomes (D'Agostino & Rodgers, 2017). Closing the achievement gap for those students lagging behind their peers in literacy skill attainment can improve school success and increase higher education prospects (Dietrichson et al., 2021). Research indicated that teaching academic literacy skills in determined areas of

need demonstrated the highest efficacy when compared to other methods (Foorman et al., 2018). According to Austin et al. (2019), research has indicated significant, positive growth in literacy skills when students receive targeted intervention in addition to core instruction. This is especially true for students who do not learn the necessary literacy skills through typical classroom instruction. Research has shown that students who receive specific direct instruction have a better chance at closing the literacy achievement gap (Vernon-Feagans et al., 2018).

Interventionists who have a depth of understanding regarding the student needs and the selected intervention realized an increase in efficacy within a targeted intervention program. Increasing the knowledge of interventionists was an important, effective strategy for increasing the efficacy of a targeted intervention system (Aiken et al., 2020). Targeted interventions create a rich learning environment where students with reading difficulties receive explicit instruction that closely matches their demonstrated needs. The better interventionists were at defining student needs and implementing specific skill-based interventions, the better the effect of the interventions, especially if the interventions were performed in a sustained, small-group method (Hall & Burns, 2018). Hall and Burns (2018) also indicated that with the limited resources available for interventions in schools, stakeholders must better understand student needs and effective intervention strategies since schools were encountering a growing population of students with reading difficulties.

Research has indicated that strong literacy interventions in the early elementary grades include targeted, explicit instruction in phonological awareness skills, that include

decoding, word study, fluency, accuracy, and comprehension. Effective interventions

beyond core instruction were those targeted to skill level and explicitly taught (Foorman

et al., 2018). Both the NWF and ORF assessments reviewed in this study measure these

essential literacy skills. Using indicators that were closely linked to the essential literacy

skills to determine appropriate, specific, and supplemental interventions reduced the

percentage of students falling below grade-level expectations in the area of early reading

(Foorman et al., 2017). The relationship between literacy skills and future reading

achievement were well-documented in research. Continued tracking of skill data and

implementation of literacy interventions based of evolving skills, specifically in early

elementary levels, develop sustained positive results when compared to broader applied

interventions (Bleses et al., 2021). This information indicates that interventions need to

be targeted based on skill data and applied to students falling below grade-level

expectations in order to be most effective.

Targeted intervention starts with collecting and analyzing student assessment

data. In the area of early literacy, using skill-based data measures that can be assessed

and benchmarked over time to determine growth is an effective way to identify student

skill deficiencies in order to assign intervention resources in a data-driven design (Abbott

et al., 2017). Based on the data, stakeholders at the classroom level select skills to teach.

Those skills lacking with the majority of students can be taught at the whole-group level

or Tier 1 instruction in an RtI program. Skills lacking in only a handful of students can be

addressed in a small-group or Tier 2 method, with each group member having assessment

data highlighting deficiencies in similar skill sets (Abbott et al., 2017). Students who fall

well below grade level in literacy skills may receive one-to-one or Tier 3 instruction

(Bleses et al., 2021).

Using Data-Informed Practices Within an RtI Framework

Literacy interventions applied without data analysis were not as effective as those

interventions applied after skill deficiency analysis. After over a decade of schools using

RtI frameworks to address lagging reading scores, programs that have structured

communication between stakeholders and utilize data-driven decision making realized

better results when addressing achievement gaps than those programs that do not

prioritize data and communication (Bratsch-Hines et al., 2020; Fraser, 2018; Graham et

al., 2018). One of the most difficult components to maintain with an RtI program over

time is continued fidelity with the consistent use of data to inform intervention decisions

(Buzhardt et al., 2020). Using a data-driven decision-making model, that is evidence-

based, is key to maintaining positive outcomes in an RtI program (Balu & Malbin, 2017).

With educators in the field identifying availability of resources as the primary

barrier to success within an RtI program, available resources must be allocated

appropriately and with purpose (Johnson et al., 2019). Additionally, using data to assign

appropriate interventions to students with skill deficiencies and monitoring skill levels

over time is a key component in the process for identifying students with learning

disabilities within the guidelines set in the IDEA (Hougen & Eberhardt, 2017).

The RtI framework was designed based on the idea that students learn at different

rates. This is evident in my project study as student gains at the first grade level deviate

strongly from each other. Research has indicated that students who demonstrate weaker

language and phonetic skills need more specific and explicit instruction in these skill areas (Connor et al., 2018). In order to deliver explicit instructions through the intervention model, educators must lean on the data screening information to best identify areas of need with each student. Since there is a large variation in literacy skill levels among same-aged children, instruction must be differentiated to meet each child's individual needs (Connor et al., 2018). Data-informed decision making is one of the key principles of RtI and a principle that must be closely adhered to, especially in the area of early literacy, in order to promote positive outcomes for all students (Buzhardt et al., 2020).

The RtI model uses explicit core instruction, the identification of skill deficiencies, and the design and application of appropriate interventions. Accurately identifying the target skills or sub-skills is necessary to the informative cycle of data analysis that makes the RtI framework successful at addressing the achievement gap (Poon-McBrayer, 2018). RtI as a research-based practice is rooted in a cyclic approach where instruction and intervention are closely followed by assessment. The assessment data then informs the next round of instruction (National Center for Education Evaluation and Regional Assistance, 2021). Using data-informed practices within an RtI framework is essential for promoting and maintaining positive growth outcomes for students.

The Role of Data in Ensuring Fidelity in an RtI Framework

Fidelity within an RtI framework is defined as the extent to which a program is enacted as intended. Since the RtI framework, as designated within the IDEA of 2004, indicates programs must rely on data derived from skill-based screenings to select and

apply interventions (Zirkel, 2017). Fidelity within an RtI setting is dependent on the program's adherence to the essential components of the program, the intervention structure in time and frequency, quality delivery of evidence-based instructional strategies, using data to identify student deficiencies, and differentiation of delivery (Stockard, 2020).

Fidelity is essential to maximizing student growth in a program and ensuring educator continued engagement with the system over time. In a recent study of RtI programming in Maine, nearly two-thirds of surveyed educators indicated their programs lacked fidelity of practice (Johnson et al., 2019). Capin et al. (2018) indicated that fidelity with data collection is crucial to accurate interpretation of intervention outcomes. Furthermore, researchers have found that fidelity in data usage to differentiate instruction based on literacy skills resulted in greater gains (Guo et al., 2016). In comparison with teachers who work mainly in a special education setting, general education teachers are more likely to be unprepared and undertrained to maintain fidelity to the intervention practices found within a targeted intervention program (Varghese et al., 2021). Findings from Johnson et al. (2019) indicated that just over half of educators feel their school district has the information necessary to administer an effective RtI program.

Project Description

The white paper containing the findings of the project study will be presented to relevant stakeholders including administrators, board members, teachers, and interventionists to relay recommendations and conclusions drawn from the research. The

findings indicate a significant difference in gain scores between grade levels in the area of literacy within the RtI program.

The white paper presentation will allow for administrators, board members, teachers, and interventionists to make data-informed decisions for resource allocation within the existing RtI program to increase student gains at each primary grade level. The white paper includes an introduction, the concerns, research findings, recommendations for change, and a conclusion. The white paper will be presented at a school board meeting.

Needed Resources and Existing Supports

The white paper will be distributed to all relevant stakeholders and presented at a school board meeting. Although administrators and board members are in key positions for policy change, teachers and interventionists are essential to implementing policy change with fidelity. School administrators will be key personnel in communicating between the board of education and other stakeholders to ensure results from the project study are shared and recommendations are followed in order to ensure increased literacy skill growth within the RtI program based on better resource allocation. In order to distribute the white paper, I will need computer and printer access, paper, and email access. The district supports the research project to increase the effectiveness of the RtI program. The presentation of the white paper will encourage targeted and rich dialogue among stakeholders regarding the study results and recommendations. Stakeholder questions will be answered as they arise during the presentation.

Potential Barriers

Reaching all stakeholders presents as a potential barrier. All stakeholders may not be present at the board meeting when the white paper is presented. In order to minimize this barrier, I will inform all stakeholders of the presentation date and time well in advance of the presentation. The presentation will be recorded and shared with any stakeholders unable to attend the initial presentation. Additionally, staffing and budget availability may also be a barrier to immediate implementation of the recommendations.

Implementation and Timetable

I intend to have the white paper presentation placed on the school board agenda after my doctoral study has been approved by Walden University. I, as the researcher, plan to prepare a presentation that walks stakeholders through the elements of the whitepaper before April 2023. All stakeholders, including but not limited to school board members, administrators, teachers, interventionists, will be given the opportunity to review and discuss the white paper findings and recommendations.

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Project Evaluation Plan

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The white paper project will be evaluated formatively with stakeholder feedback regarding the procedural change of utilizing data-informed resource allocation within the RtI program in order to increase student gain scores at the lower-achieving grade levels. Using a survey administered through Google Forms at the conclusion of the presentation, I will determine stakeholder willingness to implement the procedural change of using data-informed resource allocation within the RtI program. A successful project outcome would be if the district transitioned to using literacy data to inform resource allocation

decisions within the RtI literacy program at the primary grade levels. The survey results will also provide me with feedback on individual stakeholder views and will inform the next steps toward improving student gain scores in literacy. The survey results will help formulate subsequent steps in advocating for and implementing data-informed resource allocation within the district. The survey consists of nine linear scale and short-answer questions in Appendix C that are aligned to the white paper project. An annual summative evaluation of the project study will use student assessment scores to track literacy growth comparatively using data gathered during years prior to the implementation of the recommendations and data and results gathered after the implementation. The project evaluation is predicted to launch with the 2023–24 school year, allowing for data-informed resource allocation to begin in the fall of 2023, and the first annual summative evaluation to occur at the conclusion of the 2023–24 school year if the recommendations are implemented.

Annually after implementation of the recommendations, the results will be used in an outcome-based evaluation that will use data to make continuous improvements to the RtI literacy program based on grade-level gain scores. Minimally, this evaluation will continue for three school years after the implementation of the policy change recommendations for the purpose of determining if using data-informed resource allocation made a significant difference to student gain scores by grade level in the area of literacy. The project study will mainly affect procedural decision making for administrators and teachers, although all stakeholders will be affected by the procedural

change as they all have a vested interest in literacy skill growth at the primary grade levels and all serve as advocates for student academic success.

Roles and Responsibilities

It is my responsibility as the formulator of the white paper to ensure all information contained within the white paper and the presentation is based in research. It is also my responsibility as the facilitator to promptly address all questions by stakeholders raised both during and after the presentation. It will also be my responsibility to ensure all stakeholders receive a paper copy of the white paper and comprehend the concerns and recommendations. This is necessary for the stakeholders to make informed decisions regarding the procedural changes necessary to implement data-informed resource allocation within the RtI program. The role of the stakeholders will be to evaluate the presented information and make decisions on procedural change affecting resource allocation.

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Project Implications

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The design of the project study white paper was chosen to specifically facilitate board members and administrators at the target school in making necessary procedural changes in how resources are allocated within and between grade levels in the literacy RtI framework in early elementary grades. Ultimately, the goal is to improve proficiency of third grade students on the state-issued summative reading assessment in third grade. The project study will promote data-informed resource allocation to better target student needs and improve gain scores within the RtI program. Proficiency levels on the third grade state summative assessment are a concern at the target school. Currently, resources

were spread evenly between grade levels. By allocating personnel and financial resources based on student gain scores by grade level, that would more accurately assign more resources to grade levels with more need for increased growth, the students may be able to increase gains in literacy before sitting for the third grade assessment. This project study may influence neighboring districts with similar demographics to implement data-informed resource allocation based on gain scores in order to increase student proficiency on the third grade summative reading proficiency assessment.

Importance of Project to Stakeholders

The stakeholders within the target district are school board members, administrators, teachers, and interventionists. The project is of importance to these stakeholders because they serve in roles directly affected by student reading proficiency scores and are in positions to use data-informed resource allocation within the RtI program. The project study will help the district in making the procedural change from the current equal allocation of intervention resources across grade levels to a data-informed allocation procedure. Additionally, students with demonstrated deficiencies will benefit from more targeted literacy intervention and increased gain scores. Parents will also benefit from higher student literacy skill growth indicated by an increase in gain scores with use of a data-informed resource allocation procedure.

Importance of Project in Larger Context

From my perspective as the researcher, I believe the project study will inform school districts with similar demographics in better resource allocation methods within RtI literacy programs. As of May 2021, only 42.8% of third grade students in Michigan

were proficient on the third grade reading assessment (Michigan Department of Education, 2021). The ability to read and understand written content is fundamental to academic success across all content areas. Students who fail to develop mastery of the aspects of language experience difficulty in school and in many aspects of life (Burns et al., 2017). By increasing proficiency in literacy skills prior to third grade, educators are allowing more students greater access to successful academic and career paths later in life. Additionally, increasing proficiency levels on the third grade state reading assessment will also reduce the number of third grade students facing mandatory retention. This white paper will assist district stakeholders in transitioning to a data-informed resource allocation process that serves to improve student literacy skill gains in the primary grade levels leading up to the third grade summative state assessment.

Conclusion

The project study goals, rationale, review of the literature, project description, project evaluation plan, and project implications for broader social change were described in Section 3. NWF, ORF, and composite scores for grades kindergarten, first, and second were analyzed for 5 school years in hopes of determining a better way to allocate intervention resources within the existing RtI program at the target school district. The research findings indicated that equal distribution of resources across early elementary grade levels did not yield equal gains. The white paper recommendations will promote a data-informed resource allocation procedure to target and increase student literacy gains.

Section 4 addresses the project's strengths, limitations, recommendations for alternative approaches, and insights into the scholarly project. Also included are my

reflections on the project, and an analysis of myself as a scholar, a practitioner, and a

project developer.

Section 4: Reflections and Conclusions

In Section 4, I address the project's strengths and limitations, recommendations

for alternative approaches to the study, my scholarship reflected in the study, and my

reflections on the project development, evaluation, and positive social change from the

project. I also reflect on myself as a scholar and a project developer. Additionally, I

discuss the project's potential to promote social change, the implications of the project,

application of the project findings, and potential direction for future research.

Project Strengths and Limitations

Clear, focused instruction on identified weak skills for literacy intervention serves

as an effective method for overcoming reading problems of struggling readers (Gersten et

al., 2020). RtI serves as a common and acceptable framework to organize data on

programs for struggling readers in elementary schools and apply interventions in a

targeted method. Targeted interventions focused on a planned sequence of skills known

to be essential to reading is recognized to enhance student reading achievement by

providing instruction adapted to students' needs to help them through (Neitzel et al.,

2022). Evidence-based, targeted literacy interventions applied at the early elementary

grade levels yield higher effect sizes than those interventions administered more broadly

or in later grade levels (Dietrichson et al., 2021). If schools can apply resources in order

to better target and apply literacy interventions, students may realize more gains.

According to Stelzner (n.d.), a white paper frames a recommendation based on

factual information. Stakeholders having a research-supported guide to transitioning to a

data-informed resource allocation process in the form of a white paper serves as a

strength of this project. The goal is to increase literacy gain scores at all early elementary grade levels by better allocating personal and financial resources within the existing RtI program. The use of a data-informed resource allocation system will allow educators to better identify areas of need and apply literacy interventions in a more targeted method.

The limitations of this project include administrators not using procedural change with fidelity. The board of education and district administrators need to support the procedural change. Teachers must also understand and support the change. Teachers may need further training on how to identify and rank student literacy needs for support within a targeting intervention program.

Recommendations for Alternative Approaches

I used an ex post facto pre–post quantitative design study for this project. A mixed-methods approach using observations and interviews with teachers and students within the current RtI program along with data analysis may have provided a more thorough understanding of the dynamics of the system. The qualitative pieces may have granted more insight into the nuances of providing targeted interventions to increase student growth. Additionally, the interviews and observations may have offered more insight into why teachers believe student growth varies between grade levels.

Scholarship, Project Development and Evaluation, and Leadership and Change

The learning process at Walden University molded me into a scholar of knowledge who seeks change through education and research. This project has instilled in me the skills necessary to perform adequate research and how to apply those research skills to become an agent of change in my school district and in broader society. With

these skills, I am able to identify problems within the field of education, research potential solutions, and recognize and abate my own biases to lessen their influence. Working within the district at the center of the project allowed me to further develop my leadership, communication, and observation skills as an agent of change and advocate for student learning.

Scholarship

My scholarship included problem identification and transforming that problem into a problem statement and research questions. From there, I conducted a thorough literature review of research related to a conceptual framework, historical basis of current approaches, how children learn, and the importance of early literacy. I have learned to value the research process and its methodical approach to delving into peer-reviewed articles and past research as foundations for future studies. I understand the influence personal bias can have on research and the importance of mitigating personal bias throughout the process. Specific to this project, I learned the importance of early literacy skills within an RtI framework and their ability to affect third grade reading proficiency.

Drawing on my experience with RtI, prior knowledge of early literacy and interventions, and findings from this study, I formed a deeper knowledge base on the importance of early literacy proficiency, how student growth varies, and insight into how targeting interventions affect reading proficiency at the third grade level. With this insight and experience, I aligned my research with early literacy, third grade reading scores, and student growth by early elementary grade level. I chose a white paper as the appropriate format to present the findings of the study. The process extended into further

research into articles to support the white paper based on data-informed resource allocation within and RtI framework. The purpose was to change resource allocation procedures within an existing RtI program to increase student growth at key grade levels.

My Walden University experience taught me to be a data-focused researcher who makes decisions based on research as opposed to decisions made using perceptions. I learned to use valid, credible research as documentation to support a position. My work going forward will benefit students as it is supported in research. Research-based study is important to me as I continue to develop into an agent for change and continue to better myself as a scholar.

This journey in doctoral studies formed me into a knowledge-driven researcher who values empirical data. I have learned to acknowledge and set aside my assumptions and my biases to make research-based decisions within my role as an educator. This process has cemented my position as a seeker of knowledge and as a lifelong learner. I will apply these skills to future problems in education as I encounter them.

Project Development and Evaluation

The selected project format was a white paper that included a procedural change for resource allocation within the existing RtI program. I recommend a change in resource allocation from equal allocation across early elementary grade levels to a data-informed distribution of resources based on student need as demonstrated by gain scores. The project and associated research will improve stakeholder understanding of student literacy growth in early elementary and could improve stakeholder practice by offering an alternative for resource allocation. The data analysis indicated inconsistent growth at

early elementary grade levels. More specifically, students' gains were significantly lower at the first grade level when compared to kindergarten and second grade. Additionally, the deviation of gain scores was also broadest at the first grade level indicating the need for differentiated and targeted intervention at that grade level as core instruction will not meet the needs of all students.

A white paper is formatted to identify a problem and share recommendations to promote change within an organization. The white paper genre can influence opinions using information-based content (Mattern, 2021). In this white paper, I will share recommendations to adjust intervention resources allocation procedures, including assigning interventionists and financial resources, to a data-informed procedure that leans on student gains to identify grade levels with the most need and allocate resources accordingly.

Leadership and Change

This doctoral journey has expanded my ability to acknowledge problems and opportunities for change. In my current position within the school district that employs me, I am in a position to be an agent of change. I use the skills learned through the doctoral process to identify problems and explore research-based solutions. I also use these skills to build others into agents of change within the district.

This project study has allowed me to initiate dialogue with other professionals to improve literacy efforts on a broader front. Fellow educators were receptive to research-based information and to engaging in dialogue regarding best practice. Embracing the role of change agent means leading by example. My Walden University doctoral journey

has made me a better leader and colleague as my understanding of leadership has evolved with my studies. I will use this increased skill and knowledge to perform more project studies in my field and to promote research-based decision making as best practice to improve the educational opportunities for students.

<div align="center">**Reflection on Importance of the Work**</div>

Students developing basic reading skills is the responsibility of both the school and broader society. Students who do not demonstrate reading proficiency by the end of third grade were four times more likely to be a high school dropout. This information pushed states across the nation to react with a variety of reading legislation that either mandated third grade retention or allowed for third grade retention based on reading proficiency (D'Amico, et al., 2019; García & Weiss, 2017). Currently, too many third grade students were lacking the necessary reading skills. As school districts implement RtI programs to address literacy in early elementary, school districts should also implement data-informed resource allocation to improve growth rates at all grade levels by targeting needs based on data. The study I completed highlights the need for continual monitoring of data to better assign resources within an RtI framework as student growth is not consistent from grade level to grade level.

Analysis of Self as a Scholar

This doctoral journey has given me the opportunity to reflect on myself as a scholar. Although I was conditioned through the coursework for my previous degrees to function effectively in the direct delivery classes, I was unprepared for the challenges and intensity of the project study process. The rigorous, scaffolding design of Walden

University's doctoral curriculum allowed me to evolve and grow as a scholar. I was able to take broad information and focus in on a single problem. From there, I developed aligned research questions, completed a literature review on related topics, and conducted a research project based on these components. This process has allowed me to mature as a scholar and develop into an agent of change for my organization and for broader society.

Lifelong learning is a passion for me that I model daily for my colleagues and students. This modeling allows me to positively influence change through my knowledge seeking, but also to influence change by developing a desire for learning in others. A scholar continually strives to improve process through knowledge. It is my responsibility as a scholar to insistently use research-based inquiry to identify problems and investigate understanding and solutions to promote social change.

Analysis of Self as a Practitioner

As an agent of change and a licensed practitioner, I am responsible for continuing to learn and teach through professional development opportunities. As a school leader, I need to promote early literacy as a set of essential, fundamental skills that must be cultivated in every student until each student can demonstrate proficiency. The literature review I conducted supported the importance of early literacy and allowed me the opportunity to review and address concerns with the lack of early literacy as a problem across the United States.

The doctoral journey led me to a better understanding of third grade reading proficiency issues and amplified the need for quality, targeted literacy intervention in

early elementary. Addressing these issues within my current school district will promote deeper understanding and improved practice. This doctoral journey has allowed me to build a platform to increase awareness and promote change within my organization. It has also allowed me to build credibility and trust with other educational leaders through informed dialogue and sharing of knowledge. With the knowledge I now have, I can facilitate change and stress the importance of intent when implementing early literacy intervention as it applies to third grade reading proficiency.

Analysis of Self as a Project Developer

As I embarked on this doctoral journey, I lacked understanding of transitioning a perceived problem into a project study using scholarly writing. The process of fine-tuning a problem into a problem statement for study required me to evolve in my role as a doctoral student. The doctoral project study process was long and hampered by obstacles. Growing into a project developer takes perseverance and determination as the learning curve is steep and often met with ambiguity and self-reflection.

In order to complete the study, I had to learn to write differently and think differently about research. I had to learn how to formulate a problem statement, align purpose and research questions to that problem statement, and complete an exhaustive literature review based in peer-reviewed articles. The literature review was an arduous task as it involved meticulous location of articles and intensive reading and organizing of content. The guidance of my project chair and other mentors along the way was essential to the completion of this project and my progression into a project developer.

Potential Impact of the Project on Social Change

The results of the project study will allow district stakeholders to better allocate resources within an RtI literacy program at early elementary grade levels. This change will allow students better access to appropriate interventions to improve literacy skill growth across kindergarten, first, and second grade. Now that we understand that growth in literacy skill slowed significantly in first grade as compared to kindergarten and second grade, we can adjust our approach to a data-informed allocation of resources. More importantly, tracking student gains each year will allow for continued improvement in student literacy skills that are known indicators for future reading proficiency in the third grade. If we can use these resources to maximize literacy skill growth prior to third grade, more third grade students will be able to demonstrate proficiency on the third grade reading assessment administered by the state. Research showed that third grade reading proficiency is a strong indicator of future success in school and in life. If we continue to improve practice at the early grade levels, we have the potential to set each child up for success in reading. A skill that allows more children to be positive additions to society as adults.

Implications, Applications, and Directions for Future Research

The ability to read is an essential component to academic and career success. The lack of third grade reading proficiency across the nation has forced states to enact third grade reading retention laws to ensure students have the skills necessary to successfully navigate future curricular demands (D'Amico, et al., 2019). For these reasons, early literacy skill interventions are key to lessening third grade retentions and increasing

student success with curricular demands beyond third grade. This project study can assist stakeholders in making data-informed resource allocations as it establishes a discrepancy in student growth between early grade levels. Since student gains in literacy skill attainment are significantly stunted in first grade when compared to both kindergarten and second grade, stakeholders can change and adjust intervention resources to target increased growth at the first grade level.

Future Research

Future research into student growth rates within a RtI program by student skill level at the end of kindergarten should be investigated. This information could help educators better fine-tune literacy instruction at the first grade level that was shown in this project study to have the broadest deviation in literacy skill gain scores between the three grade levels. The significant difference in deviation at the first grade level speaks to the need for more investigation into the cause for these growth differences between students.

Conclusion

Section 4 included extensive insight into the white paper developed for this project study. The development of this project was based on the ex post facto pre–post research study that investigated literacy skill growth at three different grade levels. Data used included archival NWF and ORF assessment scores over a 5-year span. By design, the project study investigated gain score differences by grade level within an existing RtI targeted intervention program.

The results indicated a significant difference in gain scores between grade levels. Specifically, growth in first grade both lagged behind the other two grade levels and had the significant increased deviation between scores as compared to the other grade levels. The project study conclusion will help stakeholders better address literacy skill learning in early elementary grade levels by utilizing a data-informed resource allocation process and by increasing understanding of when students are building literacy skills within their early elementary careers. The white paper will inform stakeholders on the importance of using growth data to inform practice. Lastly and most importantly, the project study will benefit students by giving them the necessary literacy instruction and resources to maximize their literacy skill growth and set them up for future academic and life success.

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Appendix A: Sample Assessments

Sample DIBELS Nonsense Word Fluency Assessment Grade K

dem	het	gan	lun	neg
sep	rom	rin	hon	nen
tut	rop	det	lin	hap
tet	dat	pon	nam	tib
sig	nim	ped	lig	lim
fod	cag	yed	dod	sog
gim	rog	mig	yat	pom
lum	dup	dib	rup	nud
yon	dag	fem	wat	lup
tud	sug	sib	teb	dep
pob	kun	wim	mog	pag
yun	ved	mip	bem	yot
wam	wid	fub	mup	vom
wum	kom	vid	fip	ked
fum	pog	wem	pib	bim

Sample DIBELS Oral Reading Fluency Assessment Grade 1

A Clean House

I like to help my mom clean. My first job is to clean the bathroom. I empty the trash and then I scrub everything until it is clean. Then I sweep and mop the bathroom floor. When I'm done cleaning the bathroom, I sweep and mop the kitchen floor. I tell everybody not to walk on the floors until they are all dry.

Next, I clean my room. I am so glad I don't have to mop the floor in my room. It has carpet. My mom says my room is messy and she does not like that. I try to keep it clean, but I have a lot of toys and clothes. I put some of my toys in the toy chest and the rest I put under my bed.

The clothes on the floor are dirty so I put them in the basket. I can see my floor! Then I fold the clothes on my bed and put them away. I make my bed, so it looks nice. My room is like new. The last thing I do is look at how clean my house is. I am happy that I helped my mom clean.

Appendix B: The White Paper

Transition to Using a Data-informed Procedure for Intervention Resource

Allocation

The low percentage of third grade students demonstrating reading proficiency on

the summative state assessment is a concern among school personnel and the community.

As of May 2021, only 42.8% of third grade students in Michigan were proficient on the

third grade reading assessment (Michigan Department of Education, 2021). Third grade

students are struggling to meet state standards in reading despite the current Response to

intervention program currently in place. The purpose of this white paper is to enhance the

knowledge base and understanding of all stakeholders including district administrators,

school board members, teachers, interventionists, and parents regarding how to increase

reading proficiency by improving the current intervention resource allocation procedures.

In order to promote deeper knowledge and understanding, the findings of a literature

review and a research study were included in this paper. The literature review included in

this white paper highlights the importance of a targeted, data-informed intervention

program in the early intervention grades and the importance of students developing

reading proficiency by the end of third grade. This paper also includes the methods and

results of an ex post facto pre–post quantitative study on student growth by grade level

within the current RtI program. Results concluded that in the current RtI program that

employs equal distribution of resources across grade levels, gain scores were significantly

lower at the first grade level over 5 years than at the kindergarten and second grade

levels. This paper concludes with procedural recommendations based on research findings and supporting literature.

Background of Existing Problem

Literacy interventions within an RtI framework have been implemented across the United States. Within our district over the most recent 5 years of data on the state summative assessment, only 37% of students demonstrate proficiency in reading fluency on the Michigan Student Test of Educational Progress at the end of third grade (Michigan Department of Education, 2020). Students who don't demonstrate proficiency at the end of third grade are at risk of future retention based on third-grade reading legislation. Currently, 14 states and the District of Columbia enforce third-grade reading laws that require retention of students who cannot demonstrate grade-level proficiency in reading by the end of third grade in addition to eight more states that encourage similar retention practices (Weyer, 2019). If not addressed, students who perform below grade-level as early as kindergarten are at risk of maintaining that academic deficit throughout their school careers unless schools bridge the gap between under-performing students and grade-level performance benchmarks (Bulat et al., 2017).

Even with the evidence supporting the effectiveness of early literacy skill intervention and the wide-spread implementation of RtI frameworks following the passage of IDEA of 2004, few empirical studies have been conducted comparing the relative efficacy of literacy interventions at different age levels or grade levels (Lovett et al., 2017). According to Zirkel (2017) the lack of empirical studies and guidance from the state and federal level limits the informed decision-making ability of school personnel.

This, in turn, creates difficulty in determining which grade level and what intensity to best apply literacy interventions in order to maximize the efficacy of services and personnel (Zirkel, 2017). The gap in practice created by this lacking information in the early elementary grades (K-2) has schools guessing at what grade level and at what intensity to implement literacy interventions, placing students at risk. Currently, this school district broadly applies intervention resources across grade levels evenly without focusing more resources on grade levels with increased need. This is not a data-informed practice. Without appropriately assigned literacy interventions, the school risks misidentifying students as having specific learning disabilities (Lovett et al., 2017).

The ability to read proficiently by the end of third grade is crucial for the futures of our students. Forty percent of students below grade-level standards in reading in third grade do not close the skill gap by high school (Mathes, 2017). Students whose reading skills lag behind the reading skills of their peers at the end of third grade face an exponentially growing risk of falling and staying behind grade-level expectations for the remainder of their school careers (Look, 2017). After a 2011 report from the Annie E. Casey Foundation was released with data illustrating children who are not reading proficiently at grade-level at the end of third grade were four times more likely to be a high school dropout, states across the nation began to react with a variety of reading legislation that either mandated third grade retention or allowed for third grade retention based on reading proficiency (D'Amico, et al., 2019, García & Weiss, 2017).

Current Review of Literature of Study

Conceptual Framework

The constructs of the variability of learning disabilities and its focus on the individual needs of learners provides the framework for this study. In this framework, three levels of analysis investigate underlying processes that influence learning of content (Fletcher et al., 2018). Although RtI is used to assess and address a variety of disabilities within the school setting, it is most commonly used to support students who otherwise had been erroneously identified as having a learning disability in former special education evaluation models (Bekele, 2019). The variability of learning disabilities construct guides this study to focus on learning trends within the RtI Framework. Identifying data trends specific to student learning patterns can inform practice. Learning disabilities were grounded in five domains, of which three, word recognition, written expression, and reading comprehension, were directly linked to the development of early phonetic skills like oral reading fluency and nonsense word fluency (O'Keefe et al., 2017). An RtI framework fits into the second prong of analysis in the variability of learning disabilities framework by providing a research-based process to evaluate individual cognitive processes related to academic skills (Fletcher et al., 2018).

This multi-pronged approach to the identification of learning disabilities in elementary-aged children represents a vast change from earlier models deemed highly subjective as they looked at discrepancies between intelligence and performance (Savitz et al., 2018). Adapted from a model founded in Finland, RtI directly targets the problems with the discrepancy model including over identification of students as having learning

disabilities and the disproportionate identification of minorities in special education (Jahnukainen & Itkonen, 2021).

The early identification and intervention protocol within the existing programming at the school were prevention constructs founded in the underpinnings of the RtI framework which include (Gomez-Najarro, 2020):

1. All students receive high-quality, research-based core instruction in the general education classroom.

2. Universal screening and progress monitoring were utilized to provide continual information about a student's growth and level of achievement, both individually and in comparison, with the peer data and normed data.

3. Tiered, targeted, research-based and differentiated instruction for all students designed to meet the individual student's needs as demonstrated through progress monitoring data (Savitz et al., 2018).

The RtI framework was developed through study groups developed within the President's Commission on Excellence in Special Education as a framework for assessment, intervention, and decision making in special education (Anastasiou et al., 2017). The tenets behind including the RtI framework in the 2004 Reauthorization of the IDEA include creating a stronger association between special education and general education, protecting individual rights to both a free and appropriate public education and least restrictive environment, and the over-identification and disproportionate identification of subgroups receiving special education services (Bekele, 2019).

Importance of Third Grade Reading Proficiency

As research on specific learning disabilities continues to inform and influence legislation, schools were called on to design programs to meet the needs of students especially in the area of literacy. The ability to read is linked to an individual's success in school and in life. Skills linked to the function and process of reading, like oral reading fluency and NWF, were the building block skills necessary for emergent readers to develop into independent readers (Petrová et al., 2020). Studies link literacy skills to increases in future employment opportunities, academic achievement, and broader public health outcomes (Adlof & Hogan, 2019). Research has shown the early literacy intervention to be successful at curbing the risk for reading failure, but few empirical studies have been conducted to determine student growth differences in reading fluency produced by these interventions by age or grade (Lovett et al., 2017). Schools have the responsibility to address language development in order to improve academic achievement in literacy early in school careers (Adlof & Hogan, 2019). Additionally, even though the federal government recognized the importance of a comprehensive intervention program to address early literacy development and prevent the over identification of students with learning disabilities, little specific guidance on how to implement early literacy interventions within an RtI framework exists, especially for rural schools that face unique challenges (Pierce & Mueller, 2018). This information is critical when considering students who do not have established grade-level literacy skills at the end of third grade are less likely to catch up to their peers and graduate high school on time (CCSSO, 2019), and that 25% of eighth grade students have not achieved basic

reading proficiency on the National Assessment of Educational Progress (Adlof &

Hogan, 2019).

The Importance of Early Intervention

The ability to read and understand written content is fundamental to academic

success across all content areas. Reading, writing, and oral language are the building

blocks of a comprehensive understanding of written language (Foorman et al., 2017).

Literacy skills are not only instrumental in academic achievement, but also directly affect

employment opportunities and personal health (Adlof & Hogan, 2019). Students who fail

to develop mastery of the aspects of language experience difficulty in school and in many

aspects of life (Burns et al., 2017). The acquisition of literacy skills is both complex and

linear (Connor et al., 2018). Because school curriculum incrementally builds upon

previous knowledge and content, students who lag behind the grade-level expectations

are at-risk of experiencing a literacy gap, that once created, proves difficult to overcome.

Furthermore, students who experience literacy gaps and fall behind their peers

academically, are more likely to exhibit disciplinary, health and emotional problems

throughout their school years. These factors bleed over into adulthood for children who

fall behind their peers in literacy skills in elementary school and manifest as higher

unemployment rates and increased reliance on government assistance programs (Hirsh et

al., 2019). Students do not reach school-age with uniform and consistent literacy skills. In

order to address differing skill levels, schools are called upon to offer differentiated

learning and tiered support to address the varying literacy skill levels of students as they

enter school (Çakıroğlu, 2018). Furthermore, those students who continue to lag behind

grade-level benchmarks without mediation stand a higher chance of being misidentified as having a learning disability (Fletcher et al., 2018).

Summary of Analysis and Findings

Overview

A quantitative method was necessary for this study as the study compared student gains at each grade level by calculating the difference between beginning scores and ending scores. The aim was to determine the relationship between them, that is, to determine whether a statistically significant difference in measurable growth existed between grade levels in the in a targeted intervention program. Because measurable growth using scaled scores are used in this study, a quantitative method was selected. According to Chevalier & Buckles (2019), when determining a possible difference between variables, a comparative design is appropriate. Additionally, describing the difference between variables is elucidated within analysis of variance research. The study met the definition of ex post facto pre–post research as the participants are not randomly assigned and because the study used quantitative data to investigate the relationship between variables. Using this method allowed me to compare gain scores between grade levels on the selected sub-tests. The purpose of this quantitative study was to compare reading fluency gains between grade levels (i.e., kindergarten, first, and second grades) in an effort to better understand which grade level demonstrates the most growth.

Instrumentation and Materials

Archival data collected using the DIBELS Suite of Assessments was used for this study. Examples of each test can be found in Appendix A. The data were collected under

the guidelines established by the University of Oregon Center on Teaching and Learning, the organization that developed the DIBELS Assessment Suite and oversees its implementation and use (2018). Using the archival data from the years ending in 2020, 2019, 2018, 2017, and 2016, student performance data from the DIBELS NWF and ORF assessments was gathered for students in grades kindergarten, first, and second. The study used existing archival data gathered within the DIBELS test sequence over the course of kindergarten, first grade, and second grade. Both the NWF and the ORF subtests were analyzed for individual student growth in each of the identified grade levels. The scores from the beginning and end of each test period were compared to find the difference in measurable growth. Students who did not have performance scores on both the beginning-of and end-of test period administrations were eliminated from the sample population. This created a sample size of approximately 80 students per identified grade level. The data were uploaded and stored in the IBM SPSS Statistics version 28 program for analysis. One-way ANOVA was used to determine whether the gain scores, determined by change realized between the pretest and the posttest at each grade level, were statistically different from each other (Leppink, 2018). For instance, the analysis assisted in determining if the students while in first grade realized greater gain scores than the students did while in second grade.

Data Collection

The collected DIBELS Assessment Score archival data were used to determine for each grade level: (1) mean value and standard deviation of individual scores at beginning and end of year (using SPSS descriptive function); (2) the statistical

significance of gain scores individual score differences at the end vs. begin of year (using

SPSS one-way ANOVA). The data were uploaded and stored in the IBM SPSS Statistics

version 28 program for analysis. The gain scores for each grade level were analyzed for

statistical significance. Each grade level served as the independent variable. The gain

score represented the continuous dependent variable. The difference in gain scores

established mean gain scores. ORF and NWF scores were used for this study because

these two measures of literacy skills are linked to future reading skill development.

Additionally, I looked at composite scores for trend analysis over the grade levels.

Guiding Research Questions

Research Question 1. Is there a significant difference in gain scores between

grade levels from the individual DIBELS NWF assessment scores (kindergarten, first,

and second grade)?

$H1_0$: There is no statistically significant difference in gain scores between

kindergarten, first, and second grade levels in NWF.

$H1_a$: There is a statistically significant difference in gain scores for each

individual grade level between kindergarten, first, and second grade levels in NWF.

To answer this question, I conducted a one-way ANOVA of the NWF data. The

independent grouping was grade level, with groups representing students in grades

kindergarten, first, and second over the course of five school years (2016–2020). The

homogeneity of variances should be met before making inferences from the one-way

ANOVA data (Wagner, 2019). Levene's test met the threshold of less than 0.05, ($p <$

.001) meaning there was enough variance in the data sample to justify the possible mean differences.

The results of the one-way ANOVA were significant, $F(1, 162) = 102.31$. Statistically significant ANOVA results indicate significant differences in NWF gain scores between grade levels for the assessment period tested. Thus, the null hypothesis was rejected. Table B1 presents the one-way ANOVA results used to address this research question. Figure B1 and Table B4 represents the NWF gain scores by grade levels.

Table B1

Results of One-Way ANOVA Comparing NWF Gain Scores Between Grade Levels

		Sum of squares	df	Mean square	F	p
NWF gain scores	Between groups	55641.702	1	55641.702	102.310	$< .001$
	Within groups	88104.200	162	543.853		
	Total	143745.902	163			

Note. ANOVA = analysis of variance; NWF = nonsense word fluency.

Research Question 2. Is there a significant difference in gain scores between grade levels in the individual DIBELS Oral Reading Fluency assessment scores for kindergarten, first, and second grade?

$H2_0$: There is no statistically significant difference in gain scores for kindergarten, first, and second grade levels in oral reading fluency.

$H2_a$: There is a statistically significant difference in gain scores for each individual grade level in kindergarten, first, and second grade levels in oral reading fluency.

To answer this question, I conducted a one-way ANOVA of the ORF data. The independent grouping was grade level, with groups representing students in grades kindergarten, first, and second over the course of five school years (2016–2020). The homogeneity of variances should be met before making inferences from the one-way ANOVA data (Wagner, 2019). Levene's test met the threshold of less than 0.05, (p = .004) meaning there was enough variance in the data sample to justify the possible mean differences.

The results of the one-way ANOVA were significant, $F(1, 153) = 47.626$. Statistically significant ANOVA results indicate significant differences in ORF gain scores between grade levels for the assessment period tested. Thus, the null hypothesis was rejected. Table B2 presents the one-way ANOVA results used to address this research question. Figure B1 and Table B4 represents the ORF gain scores by grade levels.

Table B2

Results of One-Way ANOVA Comparing ORF Gain Scores Between Grade Levels

		Sum of squares	df	Mean square	F	p
ORF gain scores	Between groups	17872.748	1	17872.748	47.626	< .001
	Within groups	57417.187	153	375.276		
	Total	75289.935	154			

Note. ANOVA = analysis of variance; ORF = oral reading fluency

Additional Research Data I conducted a one-way ANOVA of the composite gain scores at each grade level. Like above, the independent grouping remained grade level, with groups representing students in grades kindergarten, first, and second over the course of five school years (2016–2020). Levene's test met the threshold of less than

0.05, (p = .001) meaning there was enough variance in the data sample to justify the possible mean differences.

The results of the one-way ANOVA were significant, $F(2, 236) = 26.619$. Statistically significant ANOVA results indicate significant differences in composite gain scores between grade levels for the assessment period tested. Thus, the null hypothesis was rejected. Table B3 presents the one-way ANOVA results used to address this further data analysis. Figure B1 and Table B4 represents the Composite gain scores by grade levels.
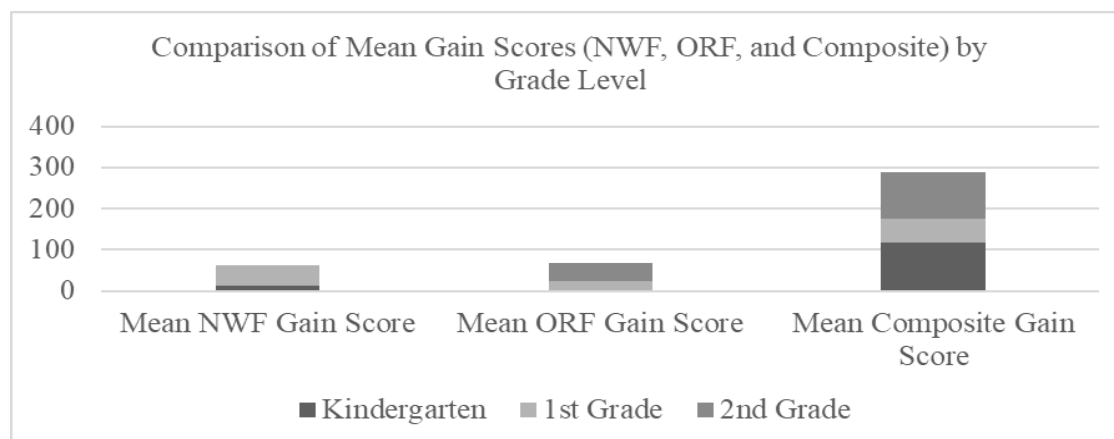
Table B3

Results of One-Way ANOVA Comparing Composite Gain Scores Between Grade Levels

		Sum of squares	df	Mean square	F	p
Composite gain scores	Between groups	161180.233	2	80590.116	26.619	< .001
	Within groups	714488.947	236	3027.496		
	Total	875669.180	238			

Note. ANOVA = analysis of variance.

Figure B1

Comparison of Mean NWF, ORF, and Composite Gain Scores by Grade Level

Note. NWF = nonsense word fluency; ORF = oral reading fluency.

Table B4

Comparison of NWF, ORF, and Composite Gain Scores by Grade Level

		N	Mean	Std. Deviation	Std. Error	Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum	Between-Component Variance
NWF Gain Scores	.00	84	12.0000	17.19344	1.87596	8.2688	15.7312	-14.00	64.00	
	1.00	80	48.8500	28.36654	3.17148	42.5373	55.1627	-18.00	120.00	
	2.00	0								
	Total	164	29.9756	29.69641	2.31890	25.3967	34.5546	-18.00	120.00	
	Model Fixed Effects			23.32066	1.82104	26.3796	33.5716			
	Random Effects				18.43037	-204.2045	264.1557			672.32495
ORF Gain Scores	.00	0								
	1.00	80	23.3125	14.85167	1.66047	20.0074	26.6176	-7.00	65.00	
	2.00	75	44.8000	23.24720	2.68436	39.4513	50.1487	-62.00	105.00	
	Total	155	33.7097	22.11099	1.77600	30.2012	37.2181	-62.00	105.00	
	Model Fixed Effects			19.37203	1.55600	30.6357	36.7837			
	Random Effects				10.74910	-102.8706	170.2900			226.00902
Composite Gain Scores	.00	84	117.0357	36.14210	3.94343	109.1924	124.8790	17.00	217.00	
	1.00	80	59.5875	67.40388	7.53598	44.5875	74.5875	-102.00	215.00	
	2.00	75	111.4667	57.79164	6.67320	98.1700	124.7633	-38.00	334.00	
	Total	239	96.0586	60.65709	3.92358	88.3292	103.7880	-102.00	334.00	
	Model Fixed Effects			55.02268	3.55912	89.0469	103.0703			
	Random Effects				18.39125	16.9274	175.1897			974.63020

Note. NWF = nonsense word fluency; ORF = oral reading fluency.

Means, Standard Deviations, Frequencies, and Percentages

The lowest mean gain score for the NWF assessment was in kindergarten ($M =$ 12.00, $SD = 17.19$). The highest mean gain score for the NWF assessment was in first grade ($M = 48.85$, $SD = 28.36$). The NWF assessment analysis compared gain scores ($n = 164$) for kindergarten and first grade. The lowest mean gain score for the ORF assessment was in first grade ($M = 23.31$, $SD = 14.85$). The highest mean gain score for the ORF assessment was in second grade ($M = 44.80$, $SD = 23.24$). The ORF assessment

analysis compared gain scores ($n = 155$) for first grade and second grade over 5 years of data collection.

Additionally, composite scores were also analyzed at each grade level to normalize the gain score data over the grade levels. The highest composite gain score was kindergarten ($M = 117.03$, $SD = 36.14$). The lowest composite score was first grade ($M = 59.58$, $SD = 67.40$). The composite gain scores were lowest in first grade that also realized the highest standard deviation.

Summary of Results

The purpose of this quantitative study was to compare reading fluency gains between grade levels (i.e., kindergarten, first, and second grades) in an effort to better understand which grade level demonstrates the most growth. To achieve this, I determined if there were differences in gain scores on the NWF and ORF assessments by grade level over the course of 5 years in a school that consistently utilized a targeted RtI program in the area of literacy. I used archival data from school years ending in 2016–2020. Additionally, I analyzed composite gain scores across those same grade levels. No other identifiers were included in the data collection or presentation. All data were protected by password and network security measures on the school's technology infrastructure.

I performed two one-way ANOVAs to answer the research questions. Additionally, a third one-way ANOVA was used for the composite data. The results for Research Question 1 indicated there was a statistically significant difference in NWF gain scores between grade levels indicating the null hypothesis could be rejected. The results

for Research Question 2 indicated there was a statistically significant difference in ORF Gain Scores between grade levels indicating the null hypothesis could be rejected. These results support the conceptual framework of the variability of learning disabilities construct which indicates the practice of identifying data trends specific to student learning patterns can inform practice.

Recommendations

The recommendations contained in this white paper are based on the findings of the project study. I have three recommendations for the school stakeholders to include district administrators, school board members, teachers, interventionists, and parents regarding how to increase reading proficiency.

- Improve the use of targeted, tiered interventions in the literacy instruction program in early elementary grades.

- Implement a data-informed procedure that leans on student gain data to identify grade levels with the most need as a guide for resource allocation within the existing RtI program.

- Improve the focus on fidelity of practice within the intervention program.

Research from the Literature to Support Recommendation

Targeted and Tiered Intervention as Instructional Practice

Research indicates strong literacy interventions in the early elementary grades include targeted, explicit instruction in phonological awareness skills that include decoding, word study, fluency, accuracy, and comprehension. Effective interventions beyond core instruction are those targeted to skill level and explicitly taught (Foorman et

al., 2018). Both the NWF and ORF assessments reviewed in this study measure these essential literacy skills. Using indicators that are closely linked to the essential literacy skills to determine appropriate, specific, and supplemental interventions can reduce the percentage of students falling below grade-level expectations in the area of early reading (Foorman et al., 2017). The relationship between literacy skills and future reading achievement are well-documented in research. Continued tracking of skill data and implementation of literacy interventions based of evolving skills, specifically in early elementary levels, develop sustained positive results when compared to broader applied interventions (Bleses et al., 2021). This information indicates interventions need to be targeted based on skill data and applied to students falling below grade-level expectations in order to be most effective.

Literacy interventions can improve early reading skills in students when implemented correctly. Low literacy skills in the early elementary levels are linked by research to a variety of poor outcomes (May et al., 2017). Closing the achievement gap for those students lagging behind their peers in literacy skill attainment can improve school success and increase higher education prospects (Dietrichson et al., 2021). Research indicated that teaching academic literacy skills in determined areas of need demonstrated the highest efficacy compared to other methods (Foorman et al., 2018). According to Austin et al. (2019), research indicates significant, positive growth in literacy skills when students receive targeted intervention in addition to core instruction. This is especially true for students who do not learn the necessary literacy skills through typical classroom instruction. Research shows students who receive specific direct

instruction have a better chance at closing the literacy achievement gap (Vernon-Feagans et al., 2018).

Using Data-Informed Practices Within a Response to Intervention Framework

The RtI framework was designed based on the idea that students learn at different rates. This is evident in my project study as student gains at the first grade level deviate strongly from each other. Research indicates students who demonstrate weaker language and phonetic skills need more specific and explicit instruction in these skill areas (Connor et al., 2018). In order to deliver explicit instructions through the intervention model, educators must lean on the data screening information to best identify areas of need with each student. Since there is a large variation in literacy skill levels among same-aged children, instruction must be differentiated to meet each child's individual needs (Connor et al., 2018). Data-informed decision making is one of the key principles of RtI and a principle that must be closely adhered to, especially in the area of early literacy, in order to promote positive outcomes for all students (Buzhardt et al., 2020).

Literacy interventions applied without data analysis are not as effective as those interventions applied after skill deficiency analysis. After over a decade of schools using RtI frameworks to address lagging reading scores, programs that have structured communication between stakeholders and utilize data-driven decision making realized better results when addressing achievement gaps than those programs that don't prioritize data and communication (Bratsch-Hines et al., 2020; Fraser, 2018; Graham et al., 2018). One of the most difficult components to maintain with an RtI program over time is continued fidelity with the consistent use of data to inform intervention decisions

(Buzhardt et al., 2020). Using a data-driven decision-making model, that is evidence-based, is key to maintaining positive outcomes in an RtI program (Balu & Malbin, 2017).

The Response to intervention model uses explicit core instruction, the identification of skill deficiencies, and the design and application of appropriate interventions. Accurately identifying the target skills or sub-skills is necessary to the informative cycle of data analysis that makes the RtI framework successful at addressing the achievement gap (Poon-McBrayer, 2018). RtI as a research-based practice is rooted in a cyclic approach where instruction and intervention are closely followed by assessment. The assessment data then informs the next round of instruction (National Center for Education Evaluation and Regional Assistance, 2021). Using data-informed practices within an RtI framework is essential for promoting and maintaining positive growth outcomes for students.

The Role of Data in Ensuring Fidelity in an RtI Framework

Fidelity within an RtI framework is defined as the extent to which a program is enacted as intended. Since the RtI framework, as designated within the IDEA of 2004, indicates programs must rely on data derived from skill-based screenings to select and apply interventions (Zirkel, 2017). Fidelity within an RtI setting is dependent on the program's adherence to the essential components of the program, the intervention structure in time and frequency, quality delivery of evidence-based instructional strategies, using data to identify student deficiencies, and differentiation of delivery (Stockard, 2020).

Fidelity is essential to maximizing student growth in a program and ensuring educator continued engagement with the system over time. In a recent study of RtI programming in Maine, nearly two-thirds of surveyed educators indicated their programs lacked fidelity of practice (Johnson et al., 2019). Capin, Walker, Vaughn, and Wanzek (2018) indicate that fidelity with data collection is crucial to accurate interpretation of intervention outcomes. Furthermore, research finds fidelity in data usage to differentiate instruction based on literacy skills resulted in greater gains (Guo et al., 2016). In comparison with teachers who work mainly in a special education setting, general education teachers are more likely to be unprepared and undertrained to maintain fidelity to the intervention practices found within a targeted intervention program (Varghese et al., 2021). Findings from Johnson et al., (2019) indicate just over half of educators feel their school district has the information necessary to administer an effective RtI program.

Conclusion

Third grade reading proficiency is a concern for this school district, and improving the existing early-elementary RtI program in the area of literacy is a research-supported approach to increase proficiency in reading. Data analysis has shown the current intervention research allocation procedure is not producing equal skill gains across grade levels. First grade has been identified as an area of need based on the data analysis in this study, and research supports using data-informed practices for need identification within the RtI framework. Current research also supports an emphasis on fidelity of practice for improving the effectiveness of existing evidence-based interventions. Transitioning to a data-informed intervention resource allocation procedure

will benefit students and increase third-grade reading proficiency levels while offering

teachers and interventionists the necessary tools to target student needs and apply

appropriate intervention. According to the research, the ability to demonstrate reading

proficiency by the end of third grade is a crucial component for the future academic and

life success of our students.

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Appendix C: Survey

Transition to Using a Data-informed Procedure for Intervention Resource Allocation--Survey

Thank you for allowing me to share my project paper with you. Please take a few minutes to complete this survey as the results will guide the next steps within the school district regarding literacy intervention.

1. Please identify your role(s) within this school district.

   Check all that apply.

   ☐ Secondary Teacher

   ☐ Elementary Teacher

   ☐ Interventionist

   ☐ School Board Member

   ☐ Parent

   ☐ Administrator

   ☐ Student

   ☐ Community Member

   ☐ Other: _____

2. Describe your familiarity with the current literacy intervention program within this school district.

   Mark only one oval.

	1	2	3	4	5	
Not Familiar	○	○	○	○	○	Extremely Familiar

3. Identify your level of concern with the current third grade reading proficiency scores at this school.

    Mark only one oval.

	1	2	3	4	5	
Not Concerned	◯	◯	◯	◯	◯	Very Concerned

4. Please select your comfort level with the current RtI resource allocation model.

    Mark only one oval.

	1	2	3	4	5	
It is adequate and meeting our needs	◯	◯	◯	◯	◯	It must be improved

5. Please select your top three areas of concern within our current RtI system for literacy in early elementary.

    Check all that apply.

    ☐ Resource Allocation
    ☐ Teacher/Interventionist Training
    ☐ Fidelity of Program Implementation
    ☐ Availability of Funding
    ☐ Availability of Appropriate Staff
    ☐ Continual Training of Staff
    ☐ Availability of Evidence-based Resources

6. Please indicate your opinion on the feasibility of transitioning to a data-informed resource allocation model

Mark only one oval.

	1	2	3	4	5	
Not Feasible	◯	◯	◯	◯	◯	Very Feasible

7. Identify your interest in transitioning to a data-informed resource allocation model

Mark only one oval.

	1	2	3	4	5	
I'm not interested	◯	◯	◯	◯	◯	I am very interested

8. Please identify any questions you may have regarding the white paper or the project.

9. Please include any other areas of interest or concern with the white paper or project that were not addressed above.