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A Program Evaluation of the Reading Mastery Initiative in a Rural Primary School

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A PROGRAM EVALUATION OF THE READING MASTERY INITIATIVE IN A

RURAL PRIMARY SCHOOL

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A Dissertation

Presented to

The Faculty of the School of Education

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In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

By

Michael J. Daddario

December 2019

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RURAL PRIMARY SCHOOL

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December 2019

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Abstract

Educational success and attainment, and individual sustainability depend on reading ability. School leaders, especially at the elementary and primary level, have great responsibility ensuring student success in learning to read. In this era of standards-based curriculum and high stakes testing and accountability, school leaders must be certain the programs employed to grow student reading ability are successful. This program evaluation analyzes the effects implementing a scripted, direct instruction reading program has had at a rural, primary school. Specifically, this study investigated the correlation between the Scholastic Reading Inventory and the Virginia Third Grade Reading Standards of Learning Assessment, analyzed the extent student achievement changed on the two assessments from implementing the Reading Mastery initiative, and determined the extent the practice of regrouping students for instructional alignment was utilized and the effect it had on student achievement. Findings indicate a moderate correlation between the Scholastic Reading Inventory and the Third Grade Reading Standards of Learning Assessment, a significant increase in Lexile when comparing beginning and end of year scores, a significant decline in Standards of Learning Assessment scores when comparing three years pre-Reading Mastery implementation to three years post implementation, and found that students remaining in their original program placement demonstrated greater Lexile and grade level equivalency growth than students regrouped to a lower level or accelerated. If program goals, increasing reading ability and increasing Standards of Learning pass rates are to be obtained, Reading Mastery initiative implementation will require modifications. Recommendations for policy, practice, and future studies are included.

A PROGRAM EVALUATION OF THE READING MASTERY INITIATIVE IN A

RURAL PRIMARY SCHOOL

CHAPTER 1

INTRODUCTION

Acquiring the ability to read in the elementary years is essential for future academic success and is a key to advancing in our society (Schieffer, Marchand-Martella, Martella, Simonsen, & Waldron-Soler, 2002). Individuals' reading ability has tremendous influence on ability to sustain themselves and is a predictor of future educational performance and attainment (Feister, 2010). Unfortunately, many students struggle to decode and comprehend written language. Because of reading's importance to success in all aspects of learning and life, many schools devote a substantial portion of their instructional resources, especially in early schooling years, to developing literacy skills in children, and often encourage the teaching of literacy across all content areas. Additionally, improving literacy has prompted widespread implementation of pre-kindergarten programs for students as young as three years old (Barnett, Lamy, & Jung, 2005). These early intervention programs are designed to alleviate environmental factors associated with poor literacy skills.

With so much emphasis placed on literacy development during the elementary ages, one would expect for students in the United States to perform adequately on reading assessments. Unfortunately, in far too many instances children are not learning to read proficiently. Results on the 2017 National Assessment for Educational Progress (NAEP) indicate that only 35% of fourth- and 35% of eighth-grade students can read at or above a proficient level. Additionally, there is a substantial achievement gap between Black and

White students. While 47% and 45% of White students scored at or above the proficient level in fourth and eighth grade, respectively, only 20% and 18% of Black students performed at the same level (NAEP, 2017). Hispanic students performed slightly better than Black students but lag White students significantly. The results for Hispanic students were the same for fourth- and eighth-grade students: 23% scored at or above the proficient level (NAEP, 2017).

Results on the 2017 NAEP reading assessment indicate that students in Virginia performed above the national average. In Virginia, 43% of fourth- and 37% of eighth-grade students performed at or above the proficient level (NAEP, 2017). However, there is a large gap in the achievement results when comparing White, Black, and Hispanic students in Virginia. White students performed significantly higher than their Black and Hispanic peers. Fifty-four percent and 45%, respectively, of fourth- and eighth-grade White students scored at or above the proficient level, while 29% and 28% of fourth- and eighth-grade Hispanic students, and 21% and 18% of fourth- and eighth-grade Black students scored at or above the proficient level (NAEP, 2017).

Students in Virginia fared much better on the English/Reading Standards of Learning Assessment than they did on the NAEP; however, there still exists room for improvement. Looking specifically at the third-grade Standards of Learning results from the 2012-2013 through 2017-2018 school years, on average, 75% of students in Virginia performed at a proficient level (Virginia Department of Education, 2017a). Table 1 gives pass rates for Virginia third graders on the Reading Standards of Learning Assessment across the 2013-2018 school years.

Table 1

Third Grade Reading Virginia Standards of Learning Pass Rates for Virginia, Spring

2013-2018

Year					
(% Passing)					
2013	2014	2015	2016	2017	2018
72%	69%	75%	76%	75%	72%

Note. Adapted from the Virginia Department of Education School Report Cards (Virginia Department of Education, 2017a).

Program Description

The focus of this study was the reading instruction at Brook Trout Primary School (a pseudonym), a small rural school in Virginia. Despite the relatively consistent performance of students in the State of Virginia on the third-grade Reading Standards of Learning Assessment, Brook Trout Primary School experienced a 23% decline in the rate of students passing the third-grade English/Reading Standards of Learning Assessment from the spring of 2013 through the spring of 2018 (Table 2). To be fully accredited in Virginia, a school must have an overall pass rate of 75% on the English/Reading Standards of Learning Assessment. Brook Trout Primary School has not been fully accredited according to the Virginia Department of Educations expected level of performance in reading since the 2011-2012 school year. The Standards of Learning Assessment data for Brook Trout Primary School shows inconsistent performance with significant decreases in performance from Spring 2014, Spring 2016 and Spring 2018.

Table 2

Reading Standards of Learning Pass Rates for Brook Trout Primary School Third Grade

Students, Virginia 2013 – 2018

Year					
(% Passing)					
2013	2014	2015	2016	2017	2018
73%	64%	74%	66%	66%	50%

Note. Adapted from the Virginia Department of Education, School District Report Cards, (Virginia Department of Education, 2017a). Shading indicates implementation of the Reading Mastery program.

The reading achievement data for Brook Trout Primary School demonstrates that from 2013-2018, anywhere from a quarter to half of the third-grade students were not performing at an acceptable level on Virginia's Standards of Learning Assessment. Additionally, on average, Brook Trout Primary School's percentage of students passing the Virginia Third Grade Reading Standards of Learning assessment is approximately 8% lower than Virginia's pass rate. Educators at Brook Trout Primary School also found that many of their students were reading multiple grade levels below expected performance.

During the summer of 2015, the Trout County Public School's central office administration decided to implement the McGraw-Hill Reading Mastery program and Corrective Reading program at Brook Trout Primary School. The goal of implementation was to improve student achievement in reading. Therefore, this program evaluation of the Reading Mastery initiative that was implemented during the 2015-2016 school year sought to clarify the impact the program had on student reading achievement at Brook Trout Primary School. Student reading achievement at Brook Trout Primary School is measured by the Virginia Third Grade Reading Standards of Learning Assessment and the Scholastic Reading Inventory.

Context. Trout County is a small, rural county located in the coastal region of Virginia. The county is bordered by water on two sides and its residents are largely dependent on fish, crabs, oysters, agriculture, lumber, and tourism for income. Trout County Public Schools is one of the largest employers in the county and provides educational services to approximately 1,250 students in grades PreK-12. Trout County Public Schools consists of three schools: Brook Trout Primary School (PreK-3), Trout County Middle School (4-8) and Trout County High School (9-12). Brook Trout Primary School serves approximately 400 students in PreK-third grade. The student population at Brook Trout Primary School is 59% Black, 38% White, and 3% classify as other. Almost 70% of the students attending Brook Trout Primary School receive free or reduced-price meals. Table 3 provides specific demographic information for Brook Trout Primary School.

Table 3

Demographic Snapshot of Brook Trout Primary School Spring 2013-2018

Year	N	Black	White	Other	Male	Female
2013	98	46 (47)	46 (47)	6 (6)	53 (54)	45 (46)
2014	76	49 (65)	26 (34)	1 (1)	38 (50)	38 (50)
2015	69	39 (57)	28 (41)	2 (2)	44 (64)	24 (36)
2016	89	55 (62)	34 (38)	0 (0)	42 (47)	47 53)
2017	60	37 (62)	21 (35)	2 (3)	40 (67)	20 (33)
2018	72	49 (68)	22 (31)	1 (1)	41 (57)	31 (43)
Total	464	275 (59)	177 (38)	12 (3)	258 (56)	206 (44)

Note. Percentage in parenthesis.

Brook Trout Primary School's staff consists of 17 kindergarten through third-grade classroom teachers, five PreK teachers, four resource teachers, two special education teachers, two reading and math intervention teachers, two regional special education teachers and 12 instructional assistants. Of the 17 kindergarten through third

grade teachers in the 2017-2018 school year, 14 (82%) have been teaching for five or fewer years. At Brook Trout Primary School, 12 teachers hold Post Graduate Professional Teaching Licenses and four hold Collegiate Professional Licenses. Additionally, four teachers hold Provisional Licenses; these teachers have bachelor's degrees but have not completed the requirements for a teaching license in Virginia. Finally, 25 teachers have certifications in early, primary, or elementary education, two have reading specialist certifications, two have degrees in special education and one has a degree in administration and supervision. Several teachers hold multiple certifications.

The school facilities in Trout County are inadequate to meet the demands of 21st-century learning. Brook Trout Primary School is almost 70 years old, and issues arise almost daily related to the physical plant. Trout County is currently in the planning phase for possible construction of new school facilities and/or renovations to its current facilities. Currently, Brook Trout Primary School has four to five classes at each grade level, and there are approximately 17 students per classroom. This is well below the maximum of 24 that Virginia allows in its Standards of Quality guidelines (Virginia Department of Education, 2017b).

Description of the program. Trout County Public Schools purchased and implemented the Reading Mastery program at the beginning of the 2015-2016 school year to address the low reading performance of its students. Specifically, the program was put in place to have a direct impact on student reading abilities that are measured by the Virginia Third Grade Reading Standards of Learning Assessment. The Reading Mastery program was implemented in some form at all three of Trout County's schools at the beginning of the 2015-2016 school year.

The Reading Mastery program is a scripted, Direct Instruction program designed to teach reading to all students. The philosophy behind Direct Instruction is that by breaking learning into small increments and providing students with clear, unambiguous instruction, student learning can improve and accelerate quickly (National Institute for Direct Instruction, n.d.). The Reading Mastery program places great emphasis on instructing students to read through explicit modeling of skills and strategies, repeated opportunities for student guided practice, the immediate correction of student errors, a gradual release of teacher directed instruction, and through constant teacher supervision and progress monitoring (Gersten, Woodward, & Darch, 1986). The Reading Mastery program includes instruction in the five key elements of reading that were identified by the National Reading Panel, these include: phonics, phonemic awareness, vocabulary, fluency, and comprehension (Schieffer, Marchand-Martella, Martella, & Simonsen, n.d.). The Reading Mastery program places great emphasis on the explicit teaching of phonics and phonemic awareness in the lower levels of the program, and shifts focus to vocabulary, fluency, and comprehension from level two and beyond (Schieffer et al., n.d.). Finally, the Reading Mastery program is predicated on five key instructional principles: the program can teach all children to read, instruction is designed to be direct and unambiguous, every reading skill is taught in isolation and then applied, daily practice occurs in decoding and comprehension, and progress monitoring is continuous and reteaching occurs when errors are made (Engelman et al., 2008).

Reading Mastery was implemented at Brook Trout Primary School during the 2015-2016 school year in first through third grades. Kindergarten implemented the Reading Mastery program mid-year during the 2016-2017 school year. Students in

kindergarten through second grade are provided reading instruction using the Reading

Mastery Signature Series, while students in third grade are instructed using either the

Reading Mastery Signature Series, or the Reading Mastery Corrective Series. Students in

Grades K-2 are placed at appropriate levels in the Reading Mastery Signature Series for

Tier 1 reading instruction. Students entering third grade on level are instructed with Level

3 of the Reading Mastery Signature Series. If a student entering third grade does not

place into Level 3, then the student receives Tier 1 reading instruction with the Reading

Mastery Corrective Series. The Reading Mastery Corrective Series is broken into 4 levels

(A, B1, B2 and C) and is designed to remediate reading deficiencies in decoding, fluency

and comprehension for students in Grades 3-12 who are below grade level (United States

Department of Education, Institute of Education Sciences, What Works Clearinghouse,

2007).

Students at Brook Trout Primary School are given a placement test at the

beginning of each year to ensure they are placed in a reading group that is instructionally

appropriate. At Brook Trout Primary School students are grouped homogenously by

reading level regardless of grade level to allow for leveled instruction in small groups.

Students switch class for the reading block and teachers instruct one level of the Reading

Mastery or Corrective Reading program. The reading instructional block is

approximately 120 minutes long and occurs first thing in the morning. Reading Mastery

and Corrective Lessons vary in duration from 30-90 minutes. During the instructional

block each teacher completes one Reading Mastery or Corrective lesson and provides

instruction in writing. Depending on the grade, students also engage in print through

teacher read alouds or by reading independently. Instructional assistants have been

trained and provide instruction to students using the Reading Mastery Signature Series. Students instructed by an instructional assistant are monitored by a teacher. The teacher and instructional assistant alternate groups occasionally so the teacher can monitor student progress and provide the instructional assistant with feedback. After every five to 10 lessons students are given a timed fluency checkout to monitor fluency and errors while reading. Students who consistently demonstrate exceptional progress can be moved up to a more challenging level, and students who decline, or show stagnation in growth can be regrouped to a more appropriate level to ensure alignment of ability and instructional level. Additionally, second- and third-grade teachers supplement the Reading Mastery program's daily stories with comprehension questions modeled after the deeper level questions found on the Virginia Third Grade Standards of Learning Assessment. Third grade started this practice during the 2016-2017 school year and second grade began during the 2107-2018 school year. Each day, second and third grade students are given three to five questions modeled after the ones found on the Virginia Standards of Learning Assessment. These questions align to the specific knowledge and skills that are required of students in the State of Virginia. The questions may require students to provide multiple responses to a question, or in the case of an alphabetical order or sequencing question, the students may be required to rearrange or manipulate answer choices.

Overview of the Evaluation Approach

This section provides a detailed description, and a graphical representation of the logic model that was created to evaluate the Reading Mastery program at Brook Trout Primary School. An explanation as to why this model of evaluation was chosen also is

provided, as well as an explanation of the purpose and focus of the evaluation. Finally, the evaluation questions that were investigated in this program evaluation are presented.

Program evaluation model. The program evaluation plan began with the development of a logic model (Figure 1). A logic model is a graphical depiction of a program that demonstrates how a program works (Mertens & Wilson, 2012). For this evaluation, a modified version of Stufflebeam's Context, Input, Process, and Product (CIPP) model of evaluation was used (Stufflebeam & Coryn, 2014). Specifically, the model evaluates a program's context, the inputs and resources needed to implement the program, the process or events needed to make the program work and the results of these processes, and evaluates if the intended outcomes of the program are being achieved (Stufflebeam & Coryn, 2014). The logic model developed for this evaluation follows a linear progression starting at inputs on the left, and ending with intended products (i.e., outcomes) on the right. Note that the *Context* factor in CIPP was not used in this program evaluation.

Input factors. The inputs needed to implement the Reading Mastery program at Brook Trout Primary School include the human and monetary resources that were necessary to implement the program, including: professional development, purchasing of the Reading Mastery instructional materials, revising the school's master schedule, and creating data collection and analysis documents. When the Reading Mastery program was first implemented at Brook Trout Primary School at the beginning of the 2015-2016 school year, teachers received a day and a half of instruction on how to implement the scripted lessons. The consulting firm that provided the initial professional development has since followed up with monthly observations and coaching and has assisted with data

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collection and analysis. The final piece of professional development involves the division literacy coach consistently monitoring instructional delivery and providing feedback on lesson implementation. The division literacy coach conducts classroom observations and meets individually with teachers to provide support with implementing Reading Mastery lessons. She also reviews student data to ensure that teachers keep their data sheets current, and she makes suggestions regarding student placement in the Reading Mastery program.

  Process activities. The process activities found in the logic model include the things necessary to make the program work, and the process outputs describe the results of the process activities. The process activities and outputs include professional development, the distribution of instructional materials, learning to use the data collection and analysis tools, and learning to implement Reading Mastery lessons. Even though the Reading Mastery lessons are scripted, they still require teachers to familiarize themselves with the script so that instruction is delivered at a fluid, brisk pace. The data collection tools that were developed by the division literacy coach were developed using Google Docs. Teachers input data weekly in their Google Doc to monitor student progress on reading checkouts that occur after every five to 10 lessons. The reading checkouts are a timed fluency assessment that students read to see how many words they can read accurately within a time limit. Teachers record each students time, number of words read, and the number of errors made while reading. An additional spreadsheet is used to monitor each teacher's lesson progression in the Reading Mastery program.

  Outcomes. Lastly, the logic model includes short term, medium range, and long-term outcomes—or products. Short term outcomes are the ones that should result within

three months of the program being implemented, these include: Reading Mastery lessons being implemented with students, and data being collected and interpreted. Medium range outcomes are the outcomes one would expect to see after the program has been implemented for several months up to about a year. The medium range outcomes include improved reading skills, modifications to lessons to meet student needs, and regrouping of students based on individual performance. Finally, the long-term outcomes are the results one would ultimately expect from implementing the Reading Mastery program. The long-term outcomes for this evaluation include students being placed at their instructional level, improvement of student achievement in reading, and determining if other programs are needed for students who are not responding to Reading Mastery.

Purpose of the evaluation. The purpose of the program evaluation at Brook Trout Primary School is to describe the impact implementing the Reading Mastery program has had on student achievement in reading. This program evaluation was summative and considered an Outcome/Impact Evaluation because its intention was to evaluate the progress the Reading Mastery program was having toward meeting its intended outcomes (Mertens & Wilson, 2012).

The results of this evaluation will be of most interest to the Trout County Public School's district level administration (superintendent, assistant superintendent, literacy coach), the Brook Trout Primary School administration, and the staff of Brook Trout Primary School. The stakeholders were interested in knowing if the Reading Mastery program was effective at achieving the outcomes it was implemented to achieve, namely increasing student achievement in reading.

Focus of the evaluation. This evaluation of the Reading Mastery program at Brook Trout Primary School was primarily focused on the intended outcomes. Specifically, this evaluation sought to discover whether the Reading Mastery program improved the reading achievement of students at Brook Trout Primary School, as measured by the Scholastic Reading Inventory and the Virginia Standards of Learning Assessment. Additionally, this evaluation investigated the student regrouping practice at Brook Trout Primary School to determine how prevalently this practice was utilized.

Inputs	Process Activities	Process Outputs	Short Term	Medium Range	Long-Term
				Outcomes	
Teacher, IA, and Administration Professional Development provided by Consultant and Literacy Coach	1.5 full days with ongoing support and refresher sessions	Teachers, IAs and administration learn to implement RM Lessons	Lesson procedures and routines implemented efficiently with students	Student reading skills improve	Student reading achievement on SOL, SRI, and PALS assessments improve
Reading Mastery Instructional Materials	Materials distributed to teachers	Teachers, IAs and administration familiarize themselves with RM materials	RM teachers provide instruction, students interact with materials to complete lessons	Lessons modified to meet student needs (supplemental comprehension in 2nd and 3rd grade).	RM better suited to meet student needs
Master Schedule	Revise schedule to accommodate RM program	2- hour block, homogeneous grouping, student's switch classes for reading	Sufficient time for RM lessons	Tiered reading supports	Incorporating other reading programs to meet student needs
Data Collection and Analysis	Create and distribute data collection tools	Teachers and administration learn to collect and interpret RM data	Data is collected and interpreted	Students are regrouped as needed based on performance	Students placed at instructional level

Figure 1. Logic model of implementation of the Reading Mastery program at Brook Trout Primary School. SOL – Standards of Learning, SRI – Scholastic Reading Inventory, PALS – Phonological Awareness Literacy Screening, RM – Reading Mastery, IA – Instructional Assistant.

Evaluation questions. The evaluation questions answered by this investigation were developed from the intended outcomes of the logic model. The intended outcomes are what the Trout County Public School's administration and the staff of Brook Trout Primary School expected to occur because of implementing the Reading Mastery Program. The following evaluation questions were investigated:

1. What is the relationship between two reading assessments (Scholastic Reading Inventory and the third-grade Virginia Standards of Learning Assessment) at a small, rural school in Virginia?

   a. What are the range and mean Lexile scores on the Scholastic Reading Inventory for students who scored at the fail, proficient, and advanced levels on the third-grade Reading Standards of Learning Assessment during the Spring 2017 and 2018 assessment cycles?

   b. What is the number and percent of students categorized by reading grade level as determined by the Scholastic Reading Inventory to score at the fail, proficient, and advanced levels on the third-grade Reading Standards of Learning Assessment during the Spring 2017 and 2018 assessment cycles?

   c. To what extent are the Scholastic Reading Inventory Lexile scores and the third-grade Reading Virginia Standards of Learning Assessment scores correlated for a third-grade sample of students during the Spring 2017 and 2018 assessment cycles?

2. Has there been a change in reading achievement following the implementation of the Reading Mastery program at a small, rural school in Virginia?

a. To what degree have the third-grade Reading Standards of Learning Assessment scores changed when comparing the means and scaled scores of the three years prior to implementation of the Reading Mastery program to the three years after implementation?

b. To what degree have Lexile scores changed when comparing beginning of the year scores to end of the year scores on the Scholastic Reading Inventory for all second- and third-grade students during the 2016-2017 and 2017-2018 school years? For Black students? For White students? For girls? For boys?

3. To what extent has the practice of regrouping students within the Reading Mastery program been utilized at Brook Trout Primary School during the 2017-2018 school year?

a. What proportion of students were accelerated in the Reading Mastery program?

b. What proportion of students were remediated through regrouping to a lower level in the Reading Mastery program?

c. How has categorization of student reading by grade level and Lexile scores changed for students who have been accelerated or regrouped to a lower level of the Reading Mastery program when compared to students who were not accelerated or regrouped?

Significance of the Study

The answers to these evaluation questions provided the leaders and teachers of Trout County Public Schools, including myself-the Principal of Brook Trout Primary School, with the achievement affects the Reading Mastery program has had on students. This evaluation allowed the division and school leadership team to make data driven decisions regarding the program's implementation. The leadership teams will be able to decide if implementation was successful, or if modifications are needed. Additionally, this evaluation investigated two areas where research about the Reading Mastery program is limited. These areas were the program's achievement effects on statewide assessments, and the achievement effects on students who are regrouped within the program. Results of this evaluation provided insight into Reading Mastery's effect on student achievement on Virginia's Standards of Learning Assessment. Also, school leaders learned how regrouping students for instructional alignment within the Reading Mastery program has affected achievement.

Definitions of Terms

Corrective Reading - A remedial reading program published by McGraw-Hill Publishing Company. The program is designed for students in Grades 3-adult. The program focuses on the decoding of words to develop fluent reading and comprehension (United States Department of Education, Institute of Education Sciences, What Works Clearinghouse, 2007).

Direct Instruction - Siegfried Engelmann's comprehensive model of instruction that seeks to efficiently teach subject matter, so all students learn in a minimum amount of time (Watkins & Slocum, 2004).

Explicit Instruction - Explicit instruction means that students receive direct and

       systematic instruction through meaningful teacher-student interactions designed

       to teach skills with teacher guidance (Rupley, Blair, & Nichols, 2009).

Fluency - The ability to read text with accuracy, speed, and proper expression (National

       Reading Panel, 2000).

Phoneme - The smallest part of spoken language that when combined form syllables and

       words (National Reading Panel, 2000).

Phonemic Awareness - It is the ability of an individual to recognize and manipulate the

       phonemes found in spoken words (National Reading Panel, 2000)

Phonics - The way letters and sounds correspond to one another and how this knowledge

       can be used to decode and pronounce words (Shanahan, 2005).

Program Evaluation - A process that measures, interprets, and judges the achievements of

       a program to attain its outcomes or goals (Mertens & Wilson, 2012).

Reading Comprehension - The active process of understanding, interpreting, and

       inferring author's meaning within text by constructing meaning through word

       recognition and relating what is read to one's own knowledge and beliefs

       (Shanahan, 2005).

Reading Mastery - A basal reading program published by McGraw Hill Publishing

       Company. The program is designed for students in Grades PreK-5. The program

       focuses on the decoding of words to develop fluent reading and comprehension

       (McGraw Hill Publishing Company, 2013).

Scaffolding - Refers to support provided by a teacher to take a student from present

       knowledge to intended objective (Rupley et al., 2009).

Vocabulary - The meaning of words (National Reading Panel, 2000).

CHAPTER 2

REVIEW OF LITERATURE

The following sections are a review of the extant literature surrounding the key

elements of implementation of the McGraw-Hill Reading Mastery program. They include

why learning to read is important, Reading Mastery and Direct Instruction, characteristics

of high-quality reading instruction, and a synopsis of the five key elements identified as

essential to any effective reading program: phonemic awareness, phonics instruction,

vocabulary, fluency, and comprehension.

The Case for Learning to Read

Reading is the gateway skill necessary to successfully navigate the complex world

we live in. Everywhere we look we find print. Even with technological advances, we are

surrounded with print and people still must know how to read proficiently. Children who

are unable to read proficiently find themselves struggling in school. They are often

retained and fail to graduate (Feister, 2010). Fewer graduates means fewer applicants for

jobs, college admissions, and the military (Feister, 2010).

The impact of not learning to read proficiently has dire consequences for the

individual and society. Failure to learn to read by the end of third grade has direct links to

one's success in school, and the likelihood of graduating from high school (Feister,

2010). Students who struggle to read find it difficult to acquire the information and skills

needed to be successful in other subject areas in school, and this often leads to retention

(Feister, 2010). Being retained one time doubles the likelihood of a student dropping out;

being retained twice almost guarantees that a student will not graduate from high school (Hattie, 2009).

The impacts of having deficient reading skills not only affects an individual's chances of graduating from high school, but it also influences their ability to sustain themselves. Individuals with reading difficulties earn on average 30-40% less, and they lack essential skills necessary to pursue further educational opportunities that could lead to career advancement (Reder, 2010; World Literacy Foundation, 2015). In addition to earning less, individuals who lack the ability to read are more likely to adopt poor nutritional and hygiene habits (World Literacy Foundation, 2015). Having poor nutrition and hygiene habits can lead to further health and medical complications.

Individuals who lack proficient skills in reading also have negative effects on our society. Every student who does not graduate from high school represents $260,000 in lost wages, taxes, and productivity (Feister, 2010). Those struggling to read are three times more likely to become dependent on the welfare system and are more likely to end up collecting unemployment benefits (Feister, 2010; Reder, 2010; World Literacy Foundation, 2015). Finally, the inability to read proficiently has a direct impact on the likelihood of an individual contributing to the societal costs associated with incarceration. Most prison inmates have poor literacy skills, and up to 85% of juveniles that are incarcerated are functionally illiterate (World Literacy Foundation, 2015). It has been found that inmates released from prison with poor reading skills have high rates of recidivism (World Literacy Foundation, 2015).

Poverty. Many students enter school lacking the prerequisite skills necessary to learn to read because of living in poverty. Approximately 15 million children (21%) in

the United States live in homes where the income level is below the federal poverty

threshold. However, some argue that an income twice that amount is needed to meet

basic family needs (National Center for Children Living in Poverty, 2018).

Table 4

2018 Poverty Guidelines for the 48 Contiguous States and the District of Columbia

Persons in Family/Household	Poverty Guideline
1	$12,140
2	$16,460
3	$20,780
4	$25,100
5	$29,420
6	$33,740
7	$38,060
8[a]	$42,380

Note. Adapted from United States Department of Health and Human Services (2018)
Poverty Guidelines.
[a]Add $4,320 for each family member in the household above 8.

A student's economic status can have a great influence on their achievement in school.

The overall effect size for economic status is $d=.57$, and the effect size for students

qualifying for free or reduced-price meals in school is $d=.66$ (Hattie, 2009).

The early learning experiences of children significantly influences their

educational trajectories (Harvard Family Research Project, 2014). Two early learning

experiences that influence academic achievement include family engagement, and access

to quality preschool programs. Unfortunately, students from impoverished homes are

often not afforded these opportunities because of insufficient resources and skills (Crowe,

Connor, & Petscher, 2009; Feister, 2010; World Literacy Foundation, 2015). Children

living in the poorest homes enter school with a vocabulary one third of that of their more

affluent peers (World Literacy Foundation, 2015). Children of poverty typically lack

access to high quality preschool programs that provide necessary skills for success in school (Feister, 2010; Hattie, 2009). Finally, children from poverty often come from environments where parents or guardians lack the ability to read or provide interactions needed for linguistic development (Feister, 2010; World Literacy Foundation, 2015).

Reading Mastery

Reading Mastery is a basal reading program with multiple levels that utilizes Direct Instruction methods to provide scripted lessons to children learning to read (Schieffer et al., n.d.; United States Department of Education, Institute of Education Sciences, What Works Clearinghouse, 2006). The program was created by Siegfried Engelmann in the 1960s and was originally known as the Direct Instructional System for Teaching Arithmetic and Reading (DISTAR). DISTAR is now published under the name of Reading Mastery by The McGraw-Hill Publishing Company. The Reading Mastery Program is highly structured, and lessons are scripted to ensure uniformity of instruction. Lessons are fast paced and offer multiple opportunities for students to practice learned skills (Goss & Brown-Chidsey, 2012). Students are instructed in small, homogenous groups, and lessons use cueing and reinforcement procedures to promote high levels of engagement through choral response (McCollum, McNeese, Styron, & Lee, 2007; National Reading Panel, 2000; Thames, Kazelskis, & Kazelskis, 2006; United States Department of Education, Institute of Education Sciences, What Works Clearinghouse, 2006). The Reading Mastery program begins by providing explicit instruction in phonemic awareness and phonics, and eventually moves to the direct teaching and practice of fluency, vocabulary, and comprehension (Jarvis, 2016; Schieffer et al., 2002;

SRA/McGraw-Hill, 2009; Thames et al., 2006; United States Department of Education, Institute of Education Sciences, What Works Clearinghouse, 2006).

Direct instruction. Direct Instruction, as used throughout, refers to Siegfried Engelmann's comprehensive model of instruction that seeks to efficiently teach subject matter, so all students learn in a minimum amount of time (Watkins & Slocum, 2004). There are three main components of Direct Instruction:

(a) program design that identifies concepts, rules, strategies, and big ideas to be taught and clear communication through carefully constructed instructional programs to teach these; (b) organization of instruction, including scheduling, grouping, and ongoing progress monitoring to assure that each student receives appropriate instruction and sufficient instruction; and (c) student-teacher interaction techniques that assure that each student is actively engaged with instruction and masters the objectives of each lesson. (Watkins & Slocum, 2004, pp. 75-76)

Direct Instruction has been described as a way:

to control all the major variables that impact student learning through the placement and grouping of students into instructional groups, the rate and type or examples presented by the teacher, the wording that teachers use to teach specific concepts and skills, the frequency and type of review of material introduced, the assessment of students' mastery of material covered and the responses by teachers to student's attempts to learn the material. (Stockard & Engelmann, 2010, p. 4)

A final description of Direct Instruction states that it is a careful sequencing of learning activities that plans student-teacher interactions, while providing guided and independent practice, and ongoing assessment of learning (Kozloff & Bessellieu, 2000).

Reading Mastery lessons typify Direct Instruction principles through scripted lessons, emphasis on student mastery, high levels of student engagement and teacher-student interactions, and systematic practice and review of each skill taught (Thames et al., 2006). Reading Mastery lessons are scripted and fast paced. The lessons are highly participatory and include many student-teacher interactions. The instruction moves from teacher guided to student guided through a process known as mediated scaffolding (Kozloff & Bessellieu, 2000). Lessons are structured to ensure consistent delivery, presentation is clear and unambiguous so all children understand, content is sequenced so that material is taught in an aligned and coherent manner, teacher presentation includes a high degree of student interaction, and practice and review is included in each lesson (Carnine, Silbert, Kame'enui, & Tarver, 2004).

Project Follow Through. In 1968, under the direction of Lyndon B. Johnson, The United States Federal Government funded a study to determine the most effective instructional methods for teaching reading to at risk students in grades kindergarten through three (Eppley, 2011). Project Follow Through was the largest educational experiment ever conducted and involved more than 200,000 students in 178 communities (National Institute for Direct Instruction, n.d.). The students represented in the study spanned the full spectrum of demographics, ethnicities, and economic status. To eliminate equity barriers, the research project included a nutrition component, and medical and dental care for participating students. Siegfried Engelmann, with the backing

of The University of Illinois, entered his DISTAR program into the experiment. When the study concluded in 1977, nine years after it began, Engelmann's DISTAR program was the clear winner. "Direct Instruction had significantly higher academic achievement with students than any of the other programs," and "subsequent research found that the DI students continued to outperform their peers, and were more likely to finish high school and pursue higher education" (National Institute for Direct Instruction, n.d., para.3). The students taught with Engelmann's DISTAR program also outperformed students using other instructional methods in basic academic skills, problem solving, and had higher ratings of self-esteem (National Institute for Direct Instruction, n.d., para.3). Shortly after the conclusion of Project Follow Through, Engelmann revised his DISTAR program and published it with SRA/McGraw Hill as Reading Mastery.

Although the results of Project Follow Through demonstrate that Engelmann's DISTAR program had the greatest impact on student achievement, the results need to be considered with caution. Project Follow Through was originally designed as a compensatory educational program to expand Head Start, but due to budget issues changed its focus to assessing the impact of nearly 20 different instructional methods on student achievement (Kennedy, 1978). The change in purpose of Project Follow Through caused there to be conflicting interpretations of the research questions and the measures that would be employed to evaluate the instructional programs (St. Pierre, 1982). Comparison groups chosen for Project Follow Through were not adequately matched to the groups of students receiving the instructional interventions. In general, the most disadvantaged students were placed in the experimental instructional models, leaving students for the comparison groups that were inadequately matched based on

socioeconomic variables (Watkins, 1997). Concerns were raised over the fidelity of implementation of each of the instructional methods that were tested. Several of the sponsors who participated in Project Follow Through developed their own measures so there was no consistent measure across all the models (Fullan, 1983). Additionally, some of the instructional method sponsors provided intensive staff development, while others did not, and were only interested in the government funding that came with participation in Project Follow Through (Fullan, 1983). Finally, The U.S. Department of Education sub-contracted various parts of the study to different contractors, and this further convoluted the projects purpose and results.

Characteristics of Effective Reading Instruction

Reading instruction looks different in almost every school, and even within schools. However, there are certain characteristics of reading instruction that lead to higher levels of achievement; these include explicit instruction, instruction delivered in small groups, instruction that is scaffolded, and authentic reading and writing activities (Foorman & Torgesen, 2001; Pressley, 2002; Pressley et al., 2001; Rupley et al., 2009; Taylor, Peterson, Pearson, & Rodriguez, 2002). An additional characteristic to be explored where there is disagreement about practice is the level of text through which reading instruction is delivered. Each of these elements will be discussed in turn.

Explicit instruction. Explicit instruction is an effective way to teach the five major components of reading: phonemic awareness, phonics, fluency, vocabulary, and comprehension (Foorman & Torgesen, 2001; National Reading Panel, 2000; Pressley, 2002; Pressley et al., 2001; Rupley et al., 2009; Shanahan, 2005; Taylor et al., 2002). Explicit instruction occurs when students receive direct and systematic instruction

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through meaningful teacher-student interactions that are designed to teach skills with teacher guidance (Rupley et al., 2009). Modeling is a form of explicit instruction employed by teachers (Pressley, 2002; Rupley et al., 2009). Teachers often model through think-alouds and talk-alouds. When using these strategies, a teacher will model the use of a skill by talking aloud their thought process of deciding when and how to employ a specific skill. Teacher modeling gradually turns to guided and independent practice of the skill by students.

Grouping practices. The type of grouping used in a classroom to deliver instruction in reading has been found to have a significant impact on achievement. Instruction in classrooms where reading achievement is high occurs in small groups (Foorman & Torgesen, 2001; National Reading Panel, 2000; Pressley, 2002; Rupley et al., 2009; Taylor et al., 2002). Delivering instruction in small groups increases the amount of interaction a teacher and student has, and it allows for the intensity of instruction to be increased. Instruction delivered in small groups has been found to be just as effective as instruction delivered one to one (National Reading Panel, 2000).

Scaffolding instruction. Reading achievement increases in classrooms where teachers scaffold their instruction and coach their students during instruction (Foorman & Torgesen, 2001; Pressley, 2002; Pressley et al., 2001; Rupley et al., 2009; Taylor et al., 2002). "Scaffolds are forms of support provided by the teacher to help students bridge the gap between their current abilities and the intended goal" (Rupley et al., 2009, pp. 128-129). When scaffolding or coaching, a teacher provides just enough assistance so the child can accomplish the learning objective on their own. Scaffolded instruction is a delicate balance between providing too much and too little support. Teachers must be

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careful not to provide answers to students, but instead guide students to acquiring answers on their own through questioning and coaching (Taylor et al., 2002). Telling students answers is reflective of a teacher-directed classroom and leads to lower achievement in reading (Taylor et al., 2002).

Authentic reading and writing. Achievement is higher in classrooms where students are engaged in authentic reading and writing and not simply completing worksheets (Pressley, 2002; Pressley et al., 2001; Taylor et al., 2002). In the most effective classrooms, it was discovered that 90% of students were engaged in actual reading and writing at least 90% of the time (Pressley et al., 2001). Authentic reading and writing occur when students engage in reading or writing that extends beyond simply completing assignments.

Level of text. The level of text through which reading instruction is provided has led to disagreement amongst some researchers. Some researchers believe that reading instruction must occur with text that is precisely matched to the students reading level, while others argue that students should be instructed with materials matched to the student's grade level. Those advocating for students to be taught with instructional materials at the student's actual reading level have found that a child's motivation for learning increased, thus making for an effective and optimal learning situation (Pressley et al., 2001). Pressley (2002) argued that the most effective teachers align instructional materials and tasks to the student's level and gradually increase difficulty as student proficiency improves (Pressley, 2002). On the contrary, Shanahan (2017) asserted that there is no evidence supporting the practice of instructing reading at the child's individual level. He believes that struggling readers should be provided instruction with materials

that are on or above grade level and that struggling readers should be partnered with proficient readers for daily partner reading (Shanahan, 2017). Finally, Adams (2009) claims that instructing weaker reading students at their level denies them the opportunity to experience language and information that is age appropriate and will only keep them performing at a lower level.

Components of Effective Reading Instruction

The National Reading Panel, under the direction of The National Institute of Child Health and Human Development, released a report in 2000 that summarized research about reading instruction. The National Reading Panel was formed in response to the ongoing debate between the whole language and basic skills philosophies of the 1990s (Shanahan, 2005). The panel of scholars, school administrators, teachers, college educators, reading specialists, parents, and scientists was charged with reviewing reading research so that schools would know how to proceed with teaching children to read (National Reading Panel, 2000; Shanahan, 2005). After holding numerous public hearings and reviewing research related to reading, the panel decided on seven topics to investigate; only the first five will be reviewed here in detail:

- Phonemic Awareness Instruction

- Phonics Instruction

- Fluency Instruction

- Vocabulary Instruction

- Comprehension Instruction

- Teacher Education and Reading Instruction

- Computer Technology and Reading Instruction. (National Reading Panel, 2000)

The National Reading Panel (2000) set stringent criteria for selecting research to review. The committee reviewed research that contained: a detailed description of participants, interventions that were described exactly so that replicability could occur, descriptions of implementation fidelity, full details of outcome measures, and studies that were recent. The findings of The National Reading Panel pertaining to phonemic awareness instruction, phonics instruction, fluency instruction, vocabulary instruction, and comprehension instruction will be synthesized below. One critique of the National Reading Panel's work is the limiting of research to only seven areas. Doing so eliminated other factors that may be relevant to reading instruction.

Phonemic awareness instruction. Phonemes are the smallest part of spoken language and are combined to form syllables and words (National Reading Panel, 2000). "Phonemic awareness is the ability to hear and manipulate the individual sounds within words" (Shanahan, 2005, p. 6). Instruction in phonemic awareness led to higher achievement in overall reading, spelling, word recognition, and comprehension (Shanahan, 2005). Studies indicate that instruction in phonemic awareness yields its best results when occurring at younger ages, when taught in small groups, and lasts 5-18 hours (15 minutes/day; National Reading Panel, 2000; Shanahan, 2005). The overall effect size of phonemic awareness instruction on a child's reading ability was found to be 0.86, although kindergarten (0.95) and preschool (2.37) students benefitted the most (National Reading Panel, 2000).

Phonemic awareness instruction is most effective when manipulating phonemes is combined with letters, and when instruction focuses on one or two phonemic manipulations (National Reading Panel, 2000). There are six different phoneme manipulations, they are: phoneme isolation, phoneme identity, phoneme categorization, phoneme blending, phoneme segmentation, and phoneme deletion (National Reading Panel, 2000). These six phoneme manipulations serve as the basis for phonemic awareness instruction and assessment. Phoneme segmentation and blending are usually the hardest and last skills to develop but were found to have the greatest impact on early reading ability (Shanahan, 2005).

The Reading Mastery program provides explicit, systematic instruction in phonemic awareness early in the program by teaching children to isolate, segment, blend, manipulate, and discriminate phonemes prior to identifying the letters for each phoneme (Grossen, n.d.; Schieffer et al., 2002). Instruction occurs through direct teaching, guided practice, and by allowing students to practice phoneme manipulation techniques.

Phonics instruction. Phonics instruction involves the learning of sounds that correspond to individual and combinations of letters (Schieffer et al., 2002). Instruction in phonics involves teaching students how letters and sounds correspond to one another and how this knowledge can be used to decode and pronounce words (Shanahan, 2005). Students begin to read when they can use phonics skills to decode words (Jarvis, 2016).

The Reading Mastery program teaches 40 letter-sound correspondences directly and sequences them to allow the most frequent combinations to appear in print quickly (Schieffer et al., 2002). This allows the Reading Mastery program to transition to actual story reading after the 90th lesson of the kindergarten level.

Several distinctions must be made when analyzing phonics. The first is in understanding systematic phonics. "Systematic phonics is the teaching of phonics with a clear plan or program" (Shanahan, 2005, p. 11). Two more distinctions are understanding the difference between synthetic and analytic phonics. Synthetic phonics, also known as explicit phonics, involves teaching students letter sounds and how to use this knowledge to decode words (National Reading Panel, 2000; Shanahan, 2005). Analytic phonics is using recognizable parts within a word to identify the word (National Reading Panel, 2000; Shanahan, 2005). Ultimately, the purpose of phonics instruction is to teach students how to apply alphabetic principles and how to use this knowledge to decode words, and to recognize familiar words accurately and automatically (National Reading Panel, 2000).

The National Reading Panel (2000) found that systematic phonics instruction gave students a better start in learning to read. Students receiving phonics instruction experienced improvements in word recognition, spelling, and story comprehension (National Reading Panel, 2000; Shanahan, 2005). The overall effect size for systematic phonics instruction was 0.44 (National Reading Panel, 2000). Phonics instruction demonstrated its greatest effectiveness in kindergarten (0.56) and first grade (0.54) (National Reading Panel, 2000). Unlike phonemic awareness instruction, phonics instruction effectiveness differed little based on group size (Shanahan, 2005).

The National Reading Panel (2000) found several instructional practices that enhanced the outcomes of phonics instruction, they included: using nonsense words to practice decoding skills, decoding practice in isolation of actual reading, and encouraging inventive spelling. Two studies indicated that students who received phonics instruction with the Reading Mastery program outperformed students taught by other programs in

nonsense word fluency (Goss & Brown-Chidsey, 2012; Kamps et al., 2008). Both studies randomly assigned students to treatment groups. While results demonstrated positive gains for students instructed with the Reading Mastery program, it is important to note that sample sizes for the two studies were small, ranging from 12 to 83. Additionally, in one study the experimental groups were double dosed with the same program, and the results were then compared to Reading Mastery (Goss & Brown-Chidsey, 2012).

Two additional studies measuring student growth in phonics yielded conflicting results when the Reading Mastery program was used. In a study analyzing 108 struggling first-grade readers across several classrooms where students were not randomly assigned to a treatment group, no significant difference in phonics skills was noted between Reading Mastery and four other reading programs (McIntyre, Rightmyer, & Petrosko, 2008). The second study of 27 second graders receiving instruction with the Reading Mastery program found significant improvement in decoding and word analysis skills, however it was also concluded that students instructed with Reading Mastery lacked strategies for decoding unknown words and were teacher dependent (Wiltz & Wilson, 2005).

Fluency instruction. Fluency is defined as the ability to read text with accuracy, speed, and proper expression (National Reading Panel, 2000; Shanahan, 2005). Students who read fluently have greater levels of success throughout their schooling (Stockard & Engelmann, 2010). Additionally, fluency has positive effects on student decoding, word recognition, comprehension, and overall reading achievement (Crowe et al., 2009; Shanahan, 2005; Stockard & Engelmann, 2010). Fluency also increases the ability of individuals to comprehend text (National Reading Panel, 2000; Shanahan, 2005; Stockard

& Engelmann, 2010). Fluency requires the ability to automatically decode text, and in doing so improves comprehension by freeing cognitive resources (National Reading Panel, 2000).

Theoretical perspectives on improving reading fluency have focused on two techniques: providing opportunities for repeated oral reading or guided oral reading and encouraging independent or recreational reading. An overall effect size of 0.41 suggests that repeated oral reading has a moderate effect on reading achievement (National Reading Panel, 2000). The impact of repeated readings has been positive for non-impaired readers through fourth grade, as well as with students exhibiting various reading problems through high school (National Reading Panel, 2000). Research in the area of leisure and recreational reading is limited, and therefore a conclusion about its effect on reading achievement is inconclusive (National Reading Panel, 2000).

The Reading Mastery program is structured to include at least two readings of a story during each lesson (Schieffer et al., 2002). In the lower levels of Reading Mastery, the story is read once to focus on decoding and read an additional time to focus on story comprehension. A partner read aloud of the story is added at the later levels of Reading Mastery for additional practice. In numerous studies, Reading Mastery positively improved student oral reading fluency (Crowe et al., 2009; Kamps et al., 2008; Kamps et al., 2003; Lingo, Slaton, & Jolivette, 2003; MacIver, Kemper, & Stringfield, 2003; Stockard & Engelmann, 2010; Strong, Wehby, Falk, & Lane, 2004). These studies ranged in sample size from eight to around 30,000 and included students from all demographics and social economic statuses. In four of the studies reviewed oral reading fluency growth of students instructed with Reading Mastery was compared to that of students instructed

by other programs (Crowe et al., 2009; Kamps et al., 2008; Kamps et al., 2003; Stockard & Engelmann, 2010). In three of the studies the oral reading fluency of students instructed with Reading Mastery was significantly higher, and in the fourth study oral reading fluency growth of students instructed with the Reading Mastery program was like that of the other programs assessed.

Instruction in fluency should include three components, including: oral reading, repetition, and feedback. Oral reading is supported by research for having positive impacts on reading achievement (Crowe et al., 2009; Kamps et al., 2003; National Reading Panel, 2000; Shanahan, 2005; Stockard & Engelmann, 2010). Oral reading practice can take different forms, including paired or partner reading, reading into a tape recorder, or echo reading. Reading texts repeatedly allows students to read or listen to text multiple times. With each reading students improve their fluency, and the positive effects of repetition have shown to generalize to other texts (National Reading Panel, 2000; Shanahan, 2005). Finally, feedback during fluency instruction has resulted in positive effects on reading ability (National Reading Panel, 2000; Shanahan, 2005). Feedback from parents, teachers, volunteers, or peers during partner reads have all been effective at increasing fluency (Shanahan, 2005).

Vocabulary instruction. Vocabulary refers to word meanings and vocabulary instruction refers to the teaching of word meanings (National Reading Panel, 2000). Vocabulary instruction can occur in many ways, including explicit or implicit instruction, use of multimedia, being read to or participating in authentic reading, and through context association (National Reading Panel, 2000). No matter the form, vocabulary instruction aids in story comprehension by enlarging a student's knowledge of words, and

this enhanced vocabulary allows students to relate more easily to text (Jarvis, 2016; National Reading Panel, 2000; Shanahan, 2005; Stahl, 1998). Pre-teaching vocabulary and exposing students to vocabulary from a wide variety of genres and content areas is essential to comprehension (National Reading Panel, 2000; Schieffer et al., n.d.; Stahl, 1998). Vocabulary acquisition is enhanced when repetition of words occurs, and when the words are used repeatedly across multiple contexts:

> The most effective direct instruction in vocabulary helps children gain deep understandings of word meanings…requires plenty of reading, writing, talking and listening; emphasizes the interconnections among words and word meanings and the connections of words to children's own experiences; and provides abundant ongoing review and repetition. (Shanahan, 2005, p. 27)

Reading Mastery provides instruction in vocabulary using a variety of methods, including providing examples and non-examples, pre-teaching vocabulary words, using synonyms, directly teaching definitions, and providing opportunities to use vocabulary words in context (Schieffer et al., 2002). Research on vocabulary growth generally occurs within the area of comprehension, but two studies were found that specifically analyzed vocabulary growth (Ashworth, 1999; MacIver et al., 2003). The results of the two studies conflicted. While Ashworth (1999) discovered that students instructed with the Reading Mastery program outperformed peers using a basal reading program, MacIver et al. (2003) found no significant difference in vocabulary growth for students instructed with the Reading Mastery program.

Comprehension instruction. Comprehension is the essential goal of reading. It is the active process of understanding, interpreting, and inferring an author's meaning of

text through word recognition, and by relating what is read to one's own knowledge and beliefs (Shanahan, 2005). Cognitive participation in the reading process allows the reader to understand what is read, to construct visual representations of what is read, and to understand based on prior knowledge (National Reading Panel, 2000). Readers read to learn, to be entertained, or to find out information, and the knowledge gained from reading allows readers to make sense of text. Text comprehension is enhanced when a reader can automatically recognize words and possesses a large vocabulary that automatically assigns meaning to those words (Jarvis, 2016; Jeul, 2006; National Reading Panel, 2000; Shanahan, 2005). A reader must use available cognitive space to monitor meaning construction while reading and cannot get bogged down in word recognition. Increasing word recognition and automaticity occurs through instruction in phonemic awareness, phonics, and fluency.

The likelihood of text being comprehended is increased when readers are given instruction in comprehension strategies (National Reading Panel, 2000). "Strategy instruction explicitly teaches students thinking processes or problem-solving techniques that can be used intentionally to construct understandings during reading or to increase the possibility of remembering the information that was read" (Shanahan, 2005, pp. 28-29). There are seven comprehension strategies that can be taught to increase comprehension, they are: question asking, comprehension monitoring, summarization, question answering, story mapping, graphic organizers, and cooperative grouping (National Reading Panel, 2000; Shanahan, 2005). In order to better understand text, a reader should preview and make predictions prior to reading, assimilate prior knowledge to the topic, stop occasionally to ask questions, and take time to summarize what is read.

While each of the seven comprehension strategies can lead to increases in comprehension, the National Reading Panel (2000) found that when teachers demonstrate for students the use of multiple strategies simultaneously through reciprocal teaching, comprehension can be maximized. Reciprocal teaching involves the teacher providing a demonstration of the metacognition involved in the strategy. The teacher provides a clear explanation of the strategy, a description of how and when to use it, and justifies the strategies use (Shanahan, 2005). Once the strategy has been taught, the student practices the strategy with the teacher until the student is able to employ the strategy independently. A good strategy user will alter and modify the use of strategies when faced with a comprehension problem.

The Reading Mastery program explicitly teaches students literal and inferential comprehension, along with reasoning skills (Grossen, n.d.; Schieffer et al., 2002). Results of several studies demonstrate mixed results in comprehension when the Reading Mastery program is compared to other reading programs. Several studies found that student growth in reading comprehension, when taught with the Reading Mastery program, lagged the growth demonstrated by students instructed with other reading programs (McCollum et al., 2007; Ryder, Burton, & Silberg, 2006). However, in a study comparing the comprehension of second graders taught with Reading Mastery to students taught using a basal program, students instructed with the Reading Mastery program outperformed the students instructed with the basal program (Ashworth, 1999). Finally, two studies showed no significant difference in comprehension for students instructed using the Reading Mastery program, and those taught with other reading programs (MacIver et al., 2003; McIntyre et al., 2008). It is important to recognize that none of the

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studies reviewed for comprehension growth followed optimal research design since students were not randomly assigned to treatment groups.

Summary

Acquiring the ability to read allows individuals to successfully navigate the complex world we live in while lacking the ability to read or read proficiently can lead to difficulty in school and in life and has dire impacts on our society. Reading Mastery, formerly known as DISTAR, is a basal reading series created by Siegfried Engelmann. The program employs Engelmann's philosophy of Direct Instruction by controlling all aspects of the instructional process, including curriculum, instructional arrangement and delivery, and assessment. Research on the Reading Mastery program's effectiveness is mixed. In general, research supports the program in teaching early skills in reading development, including phonemic awareness, phonics, and fluency. However, research on the later stages of reading development, vocabulary, and comprehension, is inconsistent.

There is broad consensus among researchers of reading instruction that certain characteristic lead to higher levels of achievement, these include: explicit instruction, grouping practices, scaffolded instruction, and engagement in authentic reading and writing experiences. There is some disagreement about the level of text that should be used to teach students to read. Some researchers believe that students should be taught with materials that are at the student's actual reading level, while others believe they should be instructed with materials that are age appropriate.

In 2000, The National Reading Panel released a report summarizing reading research. The panel focused on seven areas of instruction: phonemic awareness, phonics,

fluency, vocabulary, comprehension, teacher education, and computer technology (only

the first five were reviewed in this literature review). The committee discovered that

these five components of reading are essential and should be taught with explicit

instructional techniques. The committee's research indicated that these components are

interrelated, and therefore success or difficulty in one component can impact other

components.

CHAPTER 3

METHODS

This chapter explains the research design of the study and addresses participants, data sources, data collection, data analysis, delimitations, limitations, assumptions, and ethical considerations. This study falls within the methods branch of research or program evaluation designs because it focuses on the collection and interpretation of quantitative data (Mertens & Wilson, 2012). The study examined the effects, or outcomes a program has had and, therefore, fits into the pragmatic paradigm (Creswell, 2014). Researchers in the methods branch prefer true experimental designs where random sampling is the expectation. Since all students in this study received instruction from the same program neither random sampling nor a true experimental design is possible; thus, part of this investigation was designed as a quasi-experimental program evaluation study (Creswell, 2014; Mertens & Wilson, 2012).

As discussed in Chapter 1, the primary purpose of this study was to determine the impact the Reading Mastery program had on the reading achievement of second- and third-grade students at Brook Trout Primary School. In this study, the dependent variable was identified as reading achievement scores, which was measured by the Scholastic Reading Inventory and the third-grade Virginia Standards of Learning Reading Assessment.

Evaluation Questions

The evaluation questions designed to guide this study are:

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1. What is the relationship between two reading assessments (Scholastic Reading Inventory and the third-grade Virginia Standards of Learning Assessment) at a small, rural school in Virginia?

    a. What are the range and mean Lexile scores on the Scholastic Reading Inventory for students who scored at the fail, proficient, and advanced levels on the third-grade Reading Standards of Learning Assessment during the Spring 2017 and 2018 assessment cycles?

    b. What is the number and percent of students categorized by reading grade level as determined by the Scholastic Reading Inventory to score at the fail, proficient, and advanced levels on the third-grade Reading Standards of Learning Assessment during the Spring 2017 and 2018 assessment cycles?

    c. To what extent are the Scholastic Reading Inventory Lexile scores and the third-grade Reading Virginia Standards of Learning Assessment scores correlated for a third-grade sample of students during the Spring 2017 and 2018 assessment cycles?

2. Has there been a change in reading achievement following the implementation of the Reading Mastery program at a small, rural school in Virginia?

    a. To what degree have the third-grade Reading Standards of Learning Assessment scores changed when comparing the means and scaled scores of the three years prior to implementation of the Reading Mastery program to the three years after implementation (2012-13, 2013-14, and 2014-15)?

b. To what degree have Lexile scores changed when comparing beginning and of the year scores to end of the year scores on the Scholastic Reading Inventory for all second- and third-grade students during the 2016-2017 and 2017-2018 school years? For Black students? For White students? For girls? For boys?

3. To what extent has the practice of regrouping students within the Reading Mastery program been utilized at Brook Trout Primary School during the 2017-2018 school year?

a. What proportion of students were accelerated in the Reading Mastery program?

b. What proportion of students were remediated through regrouping to a lower level in the Reading Mastery program?

c. How has categorization of student reading by grade level and Lexile scores changed for students who have been accelerated, or regrouped to a lower level of the Reading Mastery program when compared to students who were not accelerated or regrouped?

Research Design

The first evaluation question and its two accompanying sub-questions investigated the relationship between two reading assessments used at a small, rural primary school in Virginia through measures of central tendency and correlational analysis. The reading data being investigated were derived from second- and third-grade students over a two-year period. It is limited to two years because even though the Reading Mastery program has been in place for three years, the Scholastic Reading

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Inventory has only been given to second- and third-grade students for two years (2016-2017 and 2017-2018). The second evaluation question and its two accompanying sub-questions explored reading achievement over the same two years to determine the extent to which the Reading Mastery program outcomes were being achieved in comparison to the results achieved prior to the implementation of the Reading Mastery program. These questions were investigated by using inferential statistics. The third evaluation question investigated, through measures of central tendency, the frequency of regrouping students within levels of the Reading Mastery program. Data for evaluation question three were analyzed for second- and third-grade students for one school year because data were only kept on the practice of regrouping during the 2017-2018 school year.

Participants

Participants for this study included the full population of students who attended Brook Trout Primary School and participated in the third-grade Reading Virginia Standards of Learning Assessment during the 2013-2018 assessment cycles. Additionally, students who participated in the Scholastic Reading Inventory during the 2016-2017 and 2017-2018 school years were included. Finally, students who received reading instruction via the Reading Mastery Program during the years 2015-2018 were included in this investigation. The data analyzed for this study consisted of approximately 300 second- and third-grade students from a small, rural primary school in Eastern Virginia. Data were included if students attended school for the entire year and participated in all assessments. Students who transferred during the school year or had missing assessment data were excluded from analysis. Table 5 provides data pertaining to the characteristics of the students that make up Brook Trout Primary School. The school

has a large population of students that qualify as economically disadvantaged, and most

of its population is Black.

Table 5

Student Composition at Brook Trout Primary School

Characteristic	%
Black	65
White	35
Other	<1
Male	55
Female	45
Economically Disadvantaged	70
Students with Disabilities	15

Data Sources

Data to answer the evaluation questions for this investigation were gathered from

the Scholastic Reading Inventory, the Virginia Standards of Learning Assessment, and

from anecdotal data meeting minutes and division data sheets maintained by teachers

using Google Sheets. The data consisted of second- and third-grade Scholastic Reading

Inventory Lexile scores and grade level categorizations for the 2016-2017 and 2017-2018

school years, and the Virginia Standards of Learning Assessment scaled scores and

performance levels for third grade students during the same two-year span. Additionally,

data to investigate the practice of regrouping students for instructional match were

ascertained from school-level data meeting minutes and teacher records.

Scholastic Reading Inventory. The Scholastic Reading Inventory is a computer

adaptive assessment designed to measure reading ability. It is broken into two subtests,

the Foundational Reading Assessment and the Reading Comprehension Assessment. The

Scholastic Reading Inventory subtests can be used to identify struggling readers, plan for

instruction, and gauge the effectiveness of instructional programs (Scholastic, 2014). Brook Trout Primary School only administers the Reading Comprehension Assessment subtest to its second and third grade students, therefore only data from the Reading Comprehension Assessment subtest are available for analysis.

By focusing on skills relevant to reading, the Reading Comprehension Assessment subtest of the Scholastic Reading Inventory assesses students' ability to understand and make meaning of literary and expository text (Scholastic, 2014). The assessed skills include identifying supporting details, drawing conclusions, making comparisons and summarizing and drawing generalizations (Scholastic, 2014). The assessment is computer adaptive and automatically adjusts based on student responses to previous assessment items. Passage topics on the assessment are student selected and include various formats of fiction and non-fiction text. Students are given a series of short passages to read and answer corresponding questions. Students respond to 15-25 embedded completion formatted multiple choice items. Student results on the Reading Comprehension Assessment are reported as a scale score (Lexile measure) that range from 0L to 1600L. The Lexile measure can be converted to an approximate grade level equivalent, see Table 6. Students complete the assessment in a small group setting and it takes approximately 20-30 minutes to complete. The Reading Comprehension Assessment was administered to second- and third-grade students four times during the 2016-2017 school year, and five times during the 2017-2018 school year.

Table 6

Lexile Grade Level Conversion Chart

Lexile	Grade Equivalent	Lexile	Grade Equivalent
25	1.1	675	3.9
50	1.1	700	4.1
75	1.2	725	4.3
100	1.2	750	4.5
125	1.3	775	4.7
150	1.3	800	5.0
175	1.4	825	5.2
200	1.5	850	5.5
225	1.6	875	5.8
250	1.6	900	6.0
275	1.7	925	6.4
300	1.8	950	6.7
325	1.9	975	7.0
350	2.0	1000	7.4
375	2.1	1025	7.8
400	2.2	1050	8.2
425	2.3	1075	8.6
450	2.5	1100	9.0
475	2.6	1125	9.5
500	2.7	1150	10.0
525	2.9	1175	10.5
550	3.0	1200	11.0
575	3.2	1225	11.6
600	3.3	1250	12.2
625	3.5	1275	12.8
650	3.7	1300	13.5

Note. Lexile score bands and grade level equivalences from Scholastic (2014).

The purpose of the Reading Comprehension Assessment is to identify each reader on the Lexile Framework Map for Reading (Scholastic, 2014). Once identified, a student's development in reading can be monitored, and comprehension of Lexile leveled text becomes predictable. Lexile scores are calculated with an algorithm analyzing two features, reader ability and test complexity (Scholastic, 2014). An individual student

Lexile score is then matched for placement within the Reading Comprehension

Assessment proficiency bands, as seen in Table 7.

Table 7

Performance Standard Proficiency Bands for the Reading Comprehension Assessment, in

Lexile Measures by Grade

Grade	Below Basic	Basic	Proficient	Advanced
K	N/A	BR	0L to 275 L	280 L and up
1	BR	0L to 185L	190L to 530 L	535L and up
2	BR to 215L	220L to 415L	420L to 650L	655 L and up
3	BR to 325L	330L to 515L	520L to 820L	825L and up
4	BR to 535L	540L to 735L	740L to 940L	945L and up
5	BR to 615L	620L to 825L	830L to 1010L	1015L and up
6	BR to 725L	730L to 920L	925L to 1070L	1075L and up
7	BR to 765L	770L to 965L	970L to 1120L	1125L and up
8	BR to 785L	790L to 1005L	1010L to 1185L	1190L and up
9	BR to 845L	850L to 1045L	1050L to 1260L	1265L and up
10	BR to 885L	890L to 1075L	1090L to 1335L	1340L and up
11/12	BR to 980L	985L to 1180L	1185L to 1385L	1390L and up

Note. Lexile score bands and grade level equivalences from Scholastic (2014).

A standard error of measurement cannot be associated to the Reading Comprehension

Assessment subtest of the Scholastic Reading Inventory since each test taken is unique to

the student (Scholastic, 2014). Since each test is individualized, the standard error of

measurement is unique to each test and can be influenced by the text, the item writer, and

the reader (Scholastic, 2014).

Reliability refers to an assessment's ability to measure its purpose consistently

(Mertens & Wilson, 2012). Marginal reliability is used when the same assessment is not

administered to all participants and is calculated based on true scores and does not

account for potential error (Scholastic, 2014). As cited in Scholastic (2014), MetaMetrics

determined a marginal reliability of 0.94 in a study of nearly 3,500 students in a large,

midwestern, urban district. This reliability measure indicates that the Reading

Comprehension Assessment consistently measures student comprehension abilities

(Scholastic, 2014).

Construct validity is a unified measure of how accurately an assessment measures

what it is intended to measure and factors content, criteria, and consequences (Mertens &

Wilson, 2012). The Reading Comprehension Assessment of the Scholastic Reading

Inventory measures how well the reader can interpret and make meaning of written

language, and therefore should be moderately correlated to other measures. Positive

correlations were achieved in studies comparing the Reading Comprehension Assessment

subtest with the Stanford Diagnostic Reading Test, the Standardized Test for the

Assessment of Reading, the PSAT, and SAT (Scholastic, 2014). These positive

correlations indicate that the construct measured by the Reading Comprehension

Assessment subtest is like that of other standardized measures of comprehension

(Scholastic, 2014)

Virginia Standards of Learning Assessment. The Virginia Standards of

Learning assessment is a computerized assessment used by the Virginia Department of

Education to measure each child's progress toward sufficiently mastering grade level

curriculum (Virginia Department of Education, 2015). This assessment is also the

primary component of Virginia's accountability program. The reading assessment is

administered each year to all students in grades three through eight and once again in

high school. The assessment is generally administered toward the end of each school

year. The Reading Standards of Learning Assessment is computer adaptive (Virginia

Department of Education, 2015). This means that each question's difficulty level is

adjusted based on the response to the previous question. The assessment is untimed and includes 33 items presented in multiple choice and technology enhanced formats (Virginia Department of Education, 2015). Technology enhanced items require students to interact with the item in a more engaging manner than a traditional multiple-choice item.

On the Virginia Standards of Learning Assessment each student receives a raw score based on the number of items correctly answered. Raw scores are converted to a scale score ranging between 0 to 600 (Virginia Department of Education, 2015). Scale scores can be used for comparison between test forms within a Standards of Learning subject test but cannot be used to compare assessment results in different content areas (Virginia Department of Education, 2015). Scale scores have been divided into three performance levels that have been established by the Virginia Department of Education: fail/basic (399 or below), pass proficient (400-499), and pass advanced (500-600) (Virginia Department of Education, 2015).

Reliability measures the internal consistency of items on an assessment (Creswell, 2014). High reliability indicates that an assessment is an accurate measurement of a student's proficiency level and that if a student were to retest the likelihood of a similar score is great. According to the *Virginia Standards of Learning Technical Report* (Virginia Department of Education, 2015), 103,027 third-grade students took the reading Standards of Learning Assessment during the 2014-2015 assessment cycle. Core 1 and Core 2 versions of the assessment measured a Cronbach's alpha reliability coefficient of 0.90 and 0.88, respectively, indicating reliability above the desired lower limit of 0.80.

Validity refers to the extent that an instrument measures what it is supposed to (Mertens & Wilson, 2012). The validity of the Standards of Learning assessment is established through test content, response processes, internal structure, and relationships to other variables. Through multiple methods, the Virginia Department of Education (2015) in its *Technical Report* provides evidence that the Standards of Learning assessments successfully measure the knowledge and skills found in the Virginia content standards.

Google Sheets and Google Docs. Data to answer the third evaluation question were gathered through a review of internally managed databases that use Google. The first database is a Google Sheet that teachers used to record student reading data pertaining to achievement on various assessments and progression in the Reading Mastery program. The second database is a Google Doc that contains the anecdotal notes from Brook Trout Primary School data meetings. Data meetings were held two times a month at a minimum and student placement in the Reading Mastery program is a standing item of discussion during these meetings. These databases were shared between teachers and school administrators.

Data Collection

Data to investigate the evaluation questions for this study were drawn from two externally controlled and two internally controlled databases. Scholastic Reading Inventory data were obtained through the Scholastic Achievement Manager database. This database provides student Lexile scores which can be converted to grade equivalent reading levels. The Scholastic Achievement Manager database contained Lexile scores for second and third grade students from the Fall of 2016 to Spring of 2018. Standards of

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Learning assessment data were obtained by accessing the Pearson database. Pearson creates the Standards of Learning Assessments for Virginia and manages data collection and analysis. The Pearson database contained the third-grade student scale scores and corresponding performance levels needed to answer the evaluation questions for this study. Finally, data pertaining to student regrouping within the Reading Mastery program were obtained by reviewing an internally managed Google Sheet and by reviewing anecdotal data meeting minutes that were kept using a Google Doc. The Google Sheet tracked student placement and lesson progression through the Reading Mastery program and served as a data cabinet for all student data relating to reading. The Google Doc contained grade level data meeting minutes pertaining to student placement, progress and regrouping within the Reading Mastery program. The Google Sheet and the Google Doc were maintained within Brook Trout Primary School and were shared between administration and teachers.

Student confidentiality was maintained throughout the study. At no time were student names, identification numbers, or other identifiable information distributed. Permission to access and use Brook Trout Primary School student data was requested of the Superintendent. Data collection and analysis did not occur until permission had been granted from the William & Mary School of Education IRB Committee.

Data Analysis

Data for this study was analyzed with descriptive, inferential, and correlational statistical measures. Descriptive statistics describe averages and levels of variability with data (Mertens & Wilson, 2012). Descriptive statistics include measures of central tendency (mean, median, mode, percentage), and measures of variability (range, standard

deviation; Mertens & Wilson, 2012). Inferential statistics allows for a mathematical way to determine if the results of an experiment occurred by chance or if the results occurred as a result of another influence (Hoy & Adams, 2016). Inferential statistical measures include t-test, analysis of variance (ANOVA) and repeated measures ANOVA (Hoy & Adams, 2016). A coefficient of correlation (Pearson r) measures the strength and direction of relationship between variables (Hoy & Adams, 2016; Mertens & Wilson, 2012). Table 8 provides a succinct summary of the evaluation questions, data source and data analysis for this program evaluation.

Table 8

Evaluation Questions, Data Sources, and Data Analysis

Evaluation Question	Data Source	Data Analysis
1a. What are the range and mean Lexile scores on the Scholastic Reading Inventory for students who scored at the fail, proficient and advanced levels on the third-grade Reading Standards of Learning during the Spring 2017 and 2018 assessment cycles?	Lexile Scores and Standards of Learning Assessment results	Descriptive statistics
1b. What is the number and percent of students categorized by reading grade level as determined by the Scholastic Reading Inventory to score at the fail, proficient, and advanced levels on the third-grade Reading Standards of Learning assessment during the Spring 2017 and 2018 assessment cycles?	Lexile scores and Standards of Learning Assessment results	Descriptive statistics
1c. To what extent are the Scholastic Reading Inventory Lexile scores and the third-grade Reading Standards of Learning assessment Scores correlated for a sample of third-grade students during the Spring 2017 and 2018 assessment cycles?	Lexile scores and Standards of Learning Assessment results	Pearson r correlation
2a. To what degree have the third-grade Reading Standards of Learning assessment scores changed when comparing the means and scaled scores of the three years prior to implementation of the Reading Mastery program to the three years after implementation?	Standards of Learning Assessment results	ANOVA
2b. To what degree have Lexile scores changed when comparing beginning of the year results to end of the year results on the Scholastic Reading Inventory for all second- and third-grade students during the 2016-2017 and 2017-2018 school years? For Black students? For White students? For female students? For male students?	Lexile scores	Repeated measures ANOVA
3a. What proportion of students were accelerated in the Reading Mastery program?	Google Sheet Google Doc	Descriptive statistics
3b. What proportion of students were remediated through regrouping to a lower level in the Reading Mastery program?	Google Sheet Google Doc	Descriptive statistics
3c. How has categorization of student reading by grade level and Lexile scores changed for students who have been accelerated or regrouped to a lower level of the Reading Mastery program when compared to students who were not accelerated or regrouped?	Lexile scores	Descriptive statistics

Delimitations, Limitations, Assumptions

Delimitations. This study analyzed the affect the Reading Mastery program had on the reading achievement of second- and third-grade students at one rural primary school as measured by the Scholastic Reading Inventory and the Virginia Standards of Learning assessment. Since this investigation involved a small sample size, the results are limited to this school and are not generalizable to other educational settings. The results analyzed include the entire student population and are broken into certain subgroups, but special education students are not separated so individual student confidentiality is maintained. The evaluation questions were chosen because stakeholders were interested in the impact the Reading Mastery program has had on student achievement. This school was chosen for this investigation because of its accessibility to the researcher, who is also the school's principal, and because it implements the Reading Mastery program.

This evaluation is not a comparison of the Reading Mastery program to other reading programs and should not be considered as advocating for or against its use. The evaluation primarily focused on assessing the achievement of the intended program outcomes at one school and did not evaluate the program inputs or processes. Therefore, there is no attempt to ascertain whether these facets of the program hindered or assisted with the attainment of the outcomes.

Limitations. The Reading Mastery program at Brook Trout Primary School is implemented as Tier I instruction and therefore no control groups exist. Since no control groups exist, and because students were not randomly assigned to receive instruction through the Reading Mastery program, this investigation is considered quasi-experimental. Quasi-experimental designs are not considered to be the best at

determining the effectiveness of a program but are acceptable when there is no control group and randomization is not possible (Mertens & Wilson, 2012). Therefore, it is understood that the student achievement outcomes analyzed for this study may have been influenced by more than just the Reading Mastery program.

The results for Evaluation Question 3, "To what extent has the practice of regrouping students within the Reading Mastery program been utilized at Brook Trout Primary School during the 2017-2018 school year?" were limited by the size of the sample and the duration of the practice. The sample size analyzed included only student data for a one-year period. Therefore, the investigation into the regrouping practice at Brook Trout Primary School represents a beginning point for further investigation.

Assumptions. For this investigation, it was assumed that the Reading Mastery program was implemented with fidelity since the program is scripted, initial and on-going training occurred, and teachers received feedback through administrative walkthroughs and observations. Additionally, it was assumed that data from the Scholastic Reading Inventory and Virginia Standards of Learning assessments is reliable. Both assessments were administered through a computer-based platform and under strict procedures and security guidelines. With a marginal reliability index of 0.94 over 11,000 administrations, it is assumed that the Scholastic Reading Inventory accurately measures the reading proficiency of students (Scholastic, 2014). All who administer the Virginia Standards of Learning assessment received training on test administration procedures and best practices, as well as testing security. The reliability measurement for the Virginia Standards of Learning Third Grade Reading Assessment of 0.90 and 0.88 on the two versions administered in the Spring of 2015 to 79,553 students indicates that the

assessment obtains a true estimate of each student's ability (Virginia Department of Education, 2015).

Ethical Considerations

Scholastic Reading Inventory and Virginia Standards of Learning assessment data were obtained through password-protected databases. The data were cleaned of student names, identification numbers, and other personally identifiable information and replaced with a randomly assigned numeral prior to analysis. Permission to conduct this investigation was obtained from William & Mary's School of Education Institutional Review Board (IRB) prior to any data collection or analysis. A project proposal that included a rationale, a description of the research methods and a description of the participants was submitted to the IRB. Additional permission to collect and analyze student data was obtained from the Trout County School Division Superintendent. Finally, at no time was student or school division identifiable information released.

Inherent in any research investigation is the bias brought to it by the researcher's personal experiences and views of reality. In this investigation, I acknowledge my own bias toward the Reading Mastery program brought about by my personal experiences teaching with the program and implementing it as a school administrator. To account for this bias, close attention was given to the Proprietary Standards set forth by The Joint Committee on Standards for Educational Evaluation (Yarbrough, Shulha, Hopson, & Caruthers, 2011). Specific attention was given to clarity, transparency, fairness, and disclosure throughout this investigation.

CHAPTER 4

FINDINGS

The purpose of this evaluation was to answer the evaluation questions created for the Reading Mastery initiative at Brook Trout Primary School. This chapter will provide detailed descriptions of data and analyses conducted to answer the evaluation's questions. Each evaluation question and corresponding sub-question will be answered using multiple statistical procedures including descriptive statistics, Pearson r correlation, a one-way ANOVA and a repeated measures ANOVA. Data were organized in Microsoft Excel and analyzed using the Statistical Package for the Social Sciences (SPSS) and XLSTAT.

Summary of Findings for the Study

Evaluation question #1. "What is the relationship between two reading assessments (Scholastic Reading Inventory and the Virginia Third Grade Reading Standards of Learning Assessment) at a small, rural school in Virginia?"

Evaluation question 1 is separated into three sub-questions. Each question examines the relationship between the Scholastic Reading Inventory and the Virginia Third Grade Reading Standards of Learning Assessment using different data and statistical procedures. The purpose of this question is to determine the predictive value that Lexile scores and their reading grade level equivalent have in determining student performance on the third-grade Reading Standards of Learning assessment.

Specifically, Evaluation Question 1a, "What are the range and mean Lexile scores on the Scholastic Reading Inventory for students who scored at the fail, proficient and advanced levels on the third-grade Reading Standards of Learning assessment during the Spring 2017 and 2018 assessment cycles?", analyzed Scholastic Reading Inventory data over two years to establish the range and mean scores on the Virginia Third Grade Reading Standards of Learning Assessment. During the Spring 2017 assessment cycle, 60 complete sets of data were analyzed; 73 complete sets were analyzed during the Spring 2018 assessment cycle. A complete data set included the Spring Scholastic Reading Inventory Lexile score and the corresponding Virginia Third Grade Reading Standards of Learning Assessment scaled score. Two student Lexile scores (one score of 776 and another of 544) were excluded from analysis during the 2-year period because the students did not participate in the Virginia Third Grade Reading Standards of Learning Assessment. In comparing the results of the two assessment cycles, the advanced performance level had the closest mean between the two, separated by 21.3 Lexile points, while the fail level had a difference of 33.7 and the proficient level difference was 27.3. Table 9 displays the mean and range of Lexile scores by performance level on the Virginia Third Grade Reading Standards of Learning Assessment for the 2017 and 2018 assessment cycles.

Table 9

Spring 2017 and 2018 Scholastic Reading Inventory Lexile Ranges and Means for the Fail, Proficient, and

Advanced Performance Levels on the Virginia Third Grade Reading Standards of Learning Assessment

Performance Level	Spring 2017 Lexile			Spring 2018 Lexile			Combined		
	N	Range	*M* (*SD*)	*N*	Range	*M* (*SD*)	*N*	Range	*M* (*SD*)
Fail	21	99- 625	445.6 (129.33)	37	48-668	411.9 (152.90)	58	48-668	424.1 (144.57)
Proficient	36	291-1029	645 (165.68)	32	341-950	672.3 (160.29)	68	291-1029	657.9 (162.52)
Advanced	3	824-1093	932 (142.11)	4	860-1063	953.3 (84.44)	7	824-1093	944 (102.11)

For Evaluation Question 1b, "What is the number and percent of students

categorized by reading level as determined by the Scholastic Reading Inventory to score

at the fail, proficient, and advanced levels on the Virginia Third Grade Reading Standards

of Learning Assessment during the Spring 2017 and Spring 2018 assessment cycles?",

end of year student reading levels were analyzed to discover the number and percent of

students at specific reading levels and their respective performance level on the Third

Grade Reading Standards of Learning Assessment. The Spring 2017 assessment cycle

included 60 complete data sets and the Spring 2018 assessment cycle included 73

complete data sets.

To investigate the categorization by reading grade level to performance level on

the Virginia Third Grade Reading Standards of Learning Assessment the Spring 2017 and

2018 assessment data were combined. For the two years analyzed, seven students (5%)

scored at the advanced level, 68 students (51%) scored at the proficient level and 58

students (44%) scored at the fail level. The reading level range for students scoring at the

advanced level on the Virginia Third Grade Reading Standards of Learning Assessment

was 2.0-8.9. Students scoring at the proficient level had a reading grade level range

between 1.0-7.9 and 53 out of 68 students (78%) scored in the 2.0-4.9 range. Students

who scored at the fail level had a reading grade level range between 1.0-6.9 and 52 of the

58 students (90%) scored in the 1.0-3.9 range. Table 12 provides the performance levels

and reading grade level equivalencies for the 133 sets of student data.

Table 10

Number and Percent of Students Scoring at the Advanced, Proficient, or Fail Level on the

Spring 2017 and 2018 Virginia Third Grade Reading Standards of Learning Assessment

by Reading Grade Level

Reading Level	Advanced		Proficient		Fail	
	No.	%	No.	%	No.	%
1.0 – 1.9	0	0	4	25	12	75
2.0 – 2.9	2	4	22	41	30	56
3.0 – 3.9	0	0	14	58	10	42
4.0 – 4.9	0	0	17	89	2	11
5.0 – 5.9	2	17	7	58	3	25
6.0 – 6.9	1	25	2	50	1	25
7.0 – 7.9	0	0	2	100	0	0
8.0 – 8.9	2	100	0	0	0	0
Total	7	5	68	51	58	44

Note. Some row percentages may not total 100% due to rounding.

Additional analysis of the Spring 2017 and 2018 assessment data yielded a mean

reading grade level equivalency of 3.4 (*SD*=1.49). Students scoring at the advanced level

on the Spring 2017 and 2018 Third Grade Reading Standards of Learning Assessment

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had a mean reading level of 5.6 (*SD*=2.44); students scoring at the proficient level had a mean reading grade level of 3.7 (*SD*=1.35); and students scoring at the fail level had a mean reading grade level of 2.7 (*SD*=1.09). A closer look reveals that nearly twice as many students scored at the proficient level on the Virginia Third Grade Reading Standards of Learning Assessment while reading below grade level (26) than on grade level (14). In addition, 10 students reading on grade level scored at the fail level on the Virginia Third Grade Reading Standards of Learning Assessment.

Evaluation question # 1b auxiliary findings. Additional analysis into evaluation question 1b analyzed the number and percent of students scoring at the Advanced, Proficient, or Fail level on the Virginia Third Grade Reading Standards of Learning Assessment by reading grade for each of the two years individually.

During the Spring 2017 assessment cycle, three students (5%) scored at the advanced level on the Virginia Third Grade Reading Standards of Learning Assessment and all three students had a reading grade level equivalency greater than 5.0. On the Spring 2017 Third Grade Reading Standards of Learning Assessment 36 students (60%), scored at the proficient level and 30 (83%) of those students had a reading grade level equivalency between 2.0-4.9. Additionally, 21 students (35%), scored at the fail level on the Spring 2017 Virginia Third Grade Reading Standards of Learning Assessment, and 17 (81%) had a reading level equivalency of 2.9 or less. Table 11 provides specific details about reading categorization by grade level and performance levels on the Spring 2017 Virginia Third Grade Reading Standards of Learning Assessment.

Table 11

Number and Percent of Students Scoring at the Advanced, Proficient, or Fail Level on the

Spring 2017 Virginia Third Grade Reading Standards of Learning Assessment by

Reading Grade Level

Reading Level	Advanced		Proficient		Fail	
	No.	%	No.	%	No.	%
1.0 – 1.9	0	0	1	20	4	80
2.0 – 2.9	0	0	11	46	13	54
3.0 – 3.9	0	0	9	69	4	31
4.0 – 4.9	0	0	10	100	0	0
5.0 – 5.9	2	50	2	50	0	0
6.0 – 6.9	0	0	1	100	0	0
7.0 – 7.9	0	0	2	100	0	0
8.0 – 8.9	1	100	0	0	0	0
Total	3	5	36	60	21	35

Note. Some row percentages may not total 100% due to rounding.

Further analysis of the Spring 2017 assessment data discovered a mean reading grade level for all third graders, as measured by the Scholastic Reading Inventory, of 3.5 (SD=1.48). Students scoring at the advanced level on the Spring 2017 Third Grade Reading Standards of Learning Assessment had a mean grade level equivalency of 6.5 (SD=1.89), students scoring at the proficient level had a mean grade level equivalency of 3.8 (SD=1.35) and students scoring at the fail level had a mean grade level equivalency of 2.5 (SD=0.58). The 2.0 to 2.9 reading grade level equivalency range had the greatest number of students (24), yet nearly half (11) were rated as proficient on the Virginia

Third Grade Reading Standards of Learning Assessment. Additionally, students who had a reading grade level equivalency of 4.0 (18) or greater passed the Virginia Third Grade Reading Standards of Learning Assessment 100% of the time.

During the Spring 2018 assessment cycle 4 students (6%) scored at the advanced level on the Virginia Third Grade Reading Standards of Learning Assessment. The 4 students scoring at the advanced level had a reading grade level equivalency between 2.0-8.9 with 2 of the 4 students between 2.0-2.9. On the Spring 2018 Virginia Third Grade Reading Standards of Learning Assessment 32 students (44%) scored at the proficient level and 23 of the 32 (72%) had a reading grade level equivalency between 2.0-4.9. Additionally, 37 students (51%) scored at the fail level and 31 of the 37 (84%) had a reading grade level equivalency of 3.9 or below. Table 12 provides specific details of reading categorization by grade level and performance level on the Spring 2018 Virginia Third Grade Reading Standards of Learning Assessment.

Table 12

Number and Percent of Students Scoring at the Advanced, Proficient or Fail Level on the

Spring 2018 Virginia Third Grade Reading Standards of Learning Assessment by

Reading Grade Level

Reading Level	Advanced		Proficient		Fail	
	No.	%	No.	%	No.	%
1.0 – 1.9	0	0	3	27	8	73
2.0 – 2.9	2	7	11	37	17	57
3.0 – 3.9	0	0	5	45	6	55
4.0 – 4.9	0	0	7	78	2	22
5.0 – 5.9	0	0	5	63	3	38
6.0 – 6.9	1	33	1	33	1	33
7.0 – 7.9	0	0	0	0	0	0
8.0 – 8.9	1	100	0	0	0	0
Total	4	5	32	44	37	51

Note. Some row percentages may not total 100% due to rounding.

Additional analysis of the Spring 2018 assessment data discovered an overall mean reading grade level equivalency of 3.3 (SD=1.50). Students scoring at the advanced level on the Spring 2018 Virginia Third Grade Reading Standards of Learning Assessment had a mean reading grade level equivalency of 4.9 (SD=2.85), students scoring at the proficient level had a mean reading grade level equivalency of 3.6 (SD=1.37) and students scoring at the fail level had a mean reading grade level equivalency of 2.8 (SD=1.28). Additionally, the 2.0-2.9 reading grade level equivalency range had the greatest number of students (30). The 2.0-2.9 reading grade level

equivalency range had the greatest number of students fail the Virginia Third Grade

Reading Standards of Learning Assessment (17), while also having the most students

score at the proficient level (11) and the advanced level (2). The variability in reading

grade level equivalency when compared to performance levels on the Virginia Third

Grade Reading Standards of Learning Assessment makes it difficult to identify a grade

level equivalency at which all students above passed the Spring 2018 Virginia Third

Grade Reading Standards of Learning Assessment.

For Evaluation Question 1c, "To what extent are the Scholastic Reading Inventory

Lexile scores and the Virginia Third Grade Reading Standards of Learning Assessment

scores correlated for a third-grade sample of students during the Spring 2017 and 2018

assessment cycles?" a Pearson Correlation Coefficient analysis was performed.

Combining the Spring 2017 and 2018 assessment cycles resulted in a moderate

correlation, $r = .538$, $n = 133$, $p < 0.01$. A strong correlation exists between the Spring

2017 Scholastic Reading Inventory Lexile scores and the Spring 2017 Virginia Third

Grade Reading Standards of Learning Assessment scaled scores, $r = .750$, $n = 60$, $p <$

0.01, but the correlation for the two assessments during the Spring 2018 assessment cycle

was moderate, $r = .404$, $n = 73$, $p < 0.01$. These results indicate that a positive linear

relationship exists between the two assessments and that as scores on one assessment

increase, scores on the other assessment tend to increase also. Table 13 displays the

correlation coefficients for each of the groups.

Table 13

Spring 2017 and 2018 Scholastic Reading Inventory and Virginia Third Grade Reading

Standards of Learning Pearson r Correlations

Testing Period	*N*	Spring 2017 *r*	*Spring 2018 r*	*Spring 2017 and 2018 r*
Spring 2017	60	.750*		
Spring 2018	73		.404*	
Spring 2017 and 2018	133			.538*

*p < 0.01, two-tailed

Evaluation question #2. "Has there been a change in reading achievement

following the implementation of the Reading Mastery program at a small, rural school in

Virginia?"

Evaluation question 2 is broken into two sub-questions. Each question examines

the Reading Mastery initiatives impact on student achievement by analyzing different

assessment measures. The purpose of this question is to discover if the Reading Mastery

program, as implemented, has improved student reading abilities as measured by the

Virginia Third Grade Standards of Learning Assessment or the Scholastic Reading

Inventory.

Specifically, evaluation question 2a asks, "To what degree have the Virginia

Third Grade Reading Standards of Learning Assessment scores changed when comparing

the means and scaled scores of the three years prior to implementation of the Reading

Mastery program to the three years after implementation?", a one-way ANOVA

compared the Virginia Third Grade Reading Standards of Learning scaled scores for the

three years prior to implementation of the Reading Mastery program (Spring 2013, 2014,

2015) to the three years post implementation (Spring 2016, 2017, 2018). A total of 459

scores were analyzed with 238 scores included for the three years prior to implementation

and 221 scores included for the three years after implementation. For the three years prior

to Reading Mastery implementation, four special education students scaled scores were

excluded from analysis because the students participated in an alternative assessment and

the scores do not convert to a standard scaled score of 0-600. Additional analysis

controlling for the special education population was not possible because students could

not be identified across all six years. One score from the Virginia Third Grade Reading

Standards of Learning Assessment was excluded from analysis during the three years

post Reading Mastery implementation because the student received a scaled score of 0

due to parent refusal to allow participation in the assessment. Table 14 displays the mean

scaled scores for the Virginia Third Grade Reading Standards of Learning Assessment

across the six-years analyzed. The one-way ANOVA found a significant difference in the

mean scaled scores on the Virginia Third Grade Reading Standards of Learning

Assessment for the three years pre-implementation of the Reading Mastery program,

$M=428.93$, $SD=71.03$, and the three years post-implementation, $M=405.97$, $SD=62.01$;

[$F(1, 460)=13.58$, $p<.001$]. The analysis found a decline in the mean scaled scores of

22.96 on the Virginia Third Grade Reading Standards of Learning Assessment when

comparing pre- Reading Mastery implementation results to post Reading Mastery

implementation results. Additionally, the decline in mean scaled scores to 405.97 has the

mean student score at Brook Trout Primary School very close to the cutoff between a

pass proficient score (400) and a failing score (399 and below). The mean Spring 2018

score falls in the fail range.

Table 14

Mean Third Grade Reading Standards of Learning Assessment Scores

	Scaled Score	
Year	*M* (*SD*)	N
2013	429.16 (69.79)	94*
2014	422.92 (62.98)	75**
2015	435.39 (81.19)	69
2016	409.34 (58.79)	88***
2017	416.93 (57.06)	60
2018	392.89 (67.96)	72

Note. Sample size does not match Table 3.
*3 student scores excluded because of alternative assessment
**1 student score excluded because of alternative assessment
***1 student score excluded because parent opted child out of testing

To answer Evaluation Question 2b, "To what degree have Lexile scores changed when comparing beginning of the year scores to end of the year scores on the Scholastic Reading Inventory for all second- and third-grade students during the 2016-2017 and 2017-2018 school years? For Black students? For White students? For females? For males?", a repeated measures ANOVA was conducted to compare the Lexile scores of the groups at the beginning of the year and end of the year. The analysis included $n=871$ paired observations. The sample included: second graders, 2016-2017 ($n=74$); second graders, 2017-2018 ($n=85$); third graders, 2016-2017 ($n=61$); third graders, 2017-2018 ($n=73$); Black students ($n=192$); White students ($n=93$); male students ($n=159$); and female students ($n=134$).

Results of the repeated measures ANOVA indicate a significant difference at the $p<.05$ level between beginning and end of year Lexile scores as measured by the Scholastic Reading Inventory [F (1,870) $=1512.40$, $p<.001$]. The mean Lexile point

increase was 203.67 across all groups analyzed. It is difficult to determine a grade level equivalent for this growth because the Lexile point to grade level equivalency growth is not consistent (see Table 6). The 2017-2018 second graders, Black students, and female students exceeded the mean, while the 2016-2017 second graders, 2016-2017 third graders, 2017-2018 third graders, White students, and male students all fell below the mean. Table 15 shows the growth in Lexile score when comparing beginning of the year and end of the year scores for the various student groups during the 2016-2017 and 2017-2018 school years.

Post hoc comparisons using the Tukey honestly significant difference (HSD) test indicated significant differences in 14 of the 28 groups compared. The 2016-2017 third-grade students demonstrated significantly greater Lexile gains than the 2016-2017 and 2017-2018 second-grade students, female students, Black students, and male students. White students significantly outperformed the 2016-2017 and 2017-2018 second-grade students, Black students, and male students. The 2017-2018 third-grade students demonstrated significantly higher Lexile growth over the 2016-2017 and 2017-2018 second-grade students and Black students. Female students significantly outperformed the 2016-2017 second-grade students. Finally, male students significantly outperformed the 2016-2017 second-grade students. Additionally, the 2016 -2017 second-grade students were outperformed by all groups except Black students, and as third graders in 2017-2018 recorded a 50% pass rate on the Virginia Third Grade Reading Standards of Learning Assessment. To the contrary, the 2016-2017 third-grade group had a higher pass rate on the Virginia Third Grade Reading Standards of Learning Assessment (67%) and outperformed 5 of the 7 comparison groups.

Table 15

Lexile Growth

Group	N	Lexile M (SD)		
		Beginning of Year	End of Year	Growth*
2nd graders 2016 – 2017	74	157.23 (201.03)	353.47 (244.27)	196.24
2nd graders 2017 – 2018	85	224.78 (224.20)	487.32 (225.99)	262.54
3rd graders 2016 – 2017	61	438.21 (244.54)	592.66 (194.42)	154.45
3rd graders 2017 – 2018	73	380.30 (268.80)	562.49 (211.83)	182.19
Black	192	238.21 (226.51)	450.66 (222.36)	212.45
White	93	387.87 (287.40)	575.93 (245.78)	188.06
Male	159	289.21 (254.57)	481.77 (225.54)	192.56
Female	134	292.10 (264.77)	508.89 (252.94)	216.79
Total	293	289.64 (258.84)	493.31 (238.04)	203.67

Note. 7 students classified their race as other. These students were counted as part of their grade group, the male or female group, and the all students group. The Total includes second and third graders from the 2016-2017 and 2017-2018 school years.
*SD is not included for Lexile Growth because it is the difference between the end of the year and beginning of the year means.

Additional analysis compared the grade level growth of the 2016-2017 and 2017-2018 second- and third-grade student groups and looked specifically at one cohort group that remained the same both years: the 2016-2017 second graders and the 2017-2018 third graders. Both second-grade groups of students made at least one grade level's growth, on average, each year, while one third grade group of students demonstrated a year's growth. The cohort group consisting of the 2016-2017 second graders and 2017-

2018 third graders made 2.27 years growth over the two years. Female and Black students were the only two subgroups that made at least one year's growth during each of the two years analyzed. All student groups made at least one year's growth in reading during the 2017 – 2018 school year. See table 16 for specific grade level growth for the 2016 – 2017 and 2017 – 2018 second and third grade students as determined by Lexile equivalents.

Table 16

Mean Grade Level Equivalent Growth for the 2016-2017 and 2017-2018 Second- and Third-Grade Students at Brook Trout Primary School

Group	*M (SD)* Fall 2016	Spring 2017	Growth	*M (SD)* Fall 2017	Spring 2018	Growth
Second Graders	1.0 (1.11)	2.10 (1.31)	1.1	1.37 (1.28)	2.83 (1.36)	1.4
Third Graders	2.65 (1.33)	3.46 (1.48)	0.81	2.26 (1.52)	3.27 (1.48)	1.01
Black	1.33 (1.21)	2.34 (1.29)	1.01	1.56 (1.26)	2.79 (1.22)	1.23
White	2.40 (1.63)	3.32 (1.77)	0.92	2.23 (1.71)	3.59 (1.66)	1.36
Male	1.80 (1.43)	2.68 (1.41)	0.88	1.73 (1.50)	2.92 (1.43)	1.19
Female	1.63 (1.52)	2.76 (1.75)	1.13	1.83 (1.43)	3.17 (1.43)	1.34

Note. The Black, White, male, and female groups include second- and third-grade students.

Evaluation question #3. "To what extent has the practice of regrouping students within the Reading Mastery program been utilized at Brook Trout Primary School during the 2017-2018 school year?"

Evaluation question 3 is separated into three sub-questions. Two of the questions determine the number and percent of students at each grade level that have been accelerated or regrouped to a lower level in the Reading Mastery program. The third sub-question discovers achievement effects for students who have been accelerated or regrouped to a lower level of the Reading Mastery program when compared to students whose placement in the program did not change. Sub-question 1 and 2 included students in Grades K-3, but sub-question 3 only included students in second and third grade because these grades use the Scholastic Reading Inventory to measure Lexile and grade level equivalency, which will be used to analyze achievement differences. Evaluation Question 3 only includes data for the 2017-2018 school year because this is the only year data were collected for accelerating or regrouping students to a lower level in the Reading Mastery program.

Evaluation question 3a. "What proportion of students were accelerated in the Reading Mastery program?" determined the number of students in grades K-3 that were accelerated. Reading Mastery assesses students and places them in the program at their instructional level. A student placed in the program that performs exceptional on daily independent work and on checkout assessments can be accelerated to a higher level. During the 2017-2018 school year a total of 16 students (5%) in kindergarten through third grade were accelerated in the Reading Mastery program. First grade had the greatest number of students accelerated (6) and second grade had the fewest accelerated (2).

Kindergarten and third grade each accelerated four students. Table 17 provides specific

details of student acceleration in the Reading Mastery program at Brook Trout Primary

School during the 2017-2018 school year.

Table 17

Number and Percent of Students Accelerated or Regrouped at each Grade Level During

the 2017-2018 School Year.

Grade	No. (%) of Students Accelerated	No. (%) of Students Regrouped to a Lower Level
K	4 (6)	16 (22)
1	6 (7)	18 (24)
2	2 (2)	13 (15)
3	4 (5)	0 (0)

Evaluation question 3b. "What proportion of students were remediated through

regrouping to a lower level in the Reading Mastery program?", discovered the number of

students in grades K – 3 that were regrouped to a lower level in the Reading Mastery

program. Students assessed and placed in the Reading Mastery program who do not

perform well on daily independent work or check out assessments can be moved to a

lower level in the program. During the 2017-2018 school year a total of 47 students

(15%) in kindergarten through third grade were moved to a lower level in the Reading

Mastery program. First grade had the greatest number of students regrouped to a lower

level (18), while third grade had the fewest regrouped to a lower level (0). Kindergarten

had the second most regrouped to a lower level (16), followed by second grade (13).

Table 17 provides specific details of the number and percent of students at each grade

level that were regrouped to a lower level in the Reading Mastery program during the

2017-2018 school year at Brook Trout Primary School.

Evaluation question 3c. "How has categorization of student reading by grade level

and Lexile scores changed for students who have been accelerated or regrouped to a

lower level of the Reading Mastery program when compared to students who were not

accelerated or regrouped?", discovered if this practice has been effective. This analysis

includes beginning of the year and end of the year Lexile scores and reading grade level

equivalencies for 85 second-grade and 73 third-grade students at Brook Trout Primary

School for the 2017-2018 school year. During this period, two second graders and four

third graders were accelerated, while 13 second graders and zero third graders were

regrouped to a lower level in the Reading Mastery program. Additionally, 70 second

graders and 69 third graders remained in their original placement in the Reading Mastery

program.

The 70 second-grade students not regrouped (progressing at a regular pace) had a

mean Lexile growth/grade level growth of 276.51/1.51. For the third-grade students not

regrouped to a lower level, the growth was 187.45/1.05. The second- and third-grade

students not regrouped demonstrated greater Lexile and grade level growth (232.31/1.28)

than the second and third graders who were accelerated (94.5/1.15 and 91.5/0.77,

respectively). Additionally, the second-grade students not regrouped to a lower level,

(232.31/1.28) demonstrated greater Lexile and reading grade level equivalency growth

than the 13 second-grade students who were regrouped to a lower level (213.16/0.70). Of

the 13 second-grade students regrouped to a lower level in Reading Mastery program,

eight had a Fall 2017 Lexile score of 0; their Spring 2018 Lexile scores ranged from 0-

678 (*M*=309.31, *SD*=228.55). Table 18 displays the average Lexile and grade level

equivalencies for second and third grade students who were not regrouped, accelerated,

or regrouped to a lower level in the Reading Mastery program at Brook Trout Primary

School during the 2017-2018 school year. Table 18 also displays the mean Lexile scores

and reading grade level equivalency for the beginning and end of year, along with how

they changed for second- and third-grade students who were accelerated, regrouped to a

lower level, or remained at a regular pace in the Reading Mastery program during the

2017-2018 school year.

Table 18

Mean Lexile and Reading Grade Level Equivalences for Students Not Regrouped,

Accelerated, or Regrouped to a Lower Level in the Reading Mastery Program

Group	*n*	Lexile *M* (*SD*)			Grade Level *M* (*SD*)		
		Fall 2017	Spring 2018	Change	Fall 2017	Spring 2018	Change
2nd Not Regrouped	70	235.59 (206.89)	512.10 (209.91)	+276.51	1.45 (1.22)	2.96 (1.32)	+1.51
3rd Not Regrouped	69	366.67 (269.78)	554.12 (213.90)	+187.45	2.2 (1.53)	3.25 (1.50)	+1.05
2nd Accelerated	2	682.5 (188.8)	777 (4.24)	+94.5	3.45 (2.19)	4.6 (0.14)	+1.15
3rd Accelerated	4	615.50 (80.22)	707 (102.01)	+91.5	3.38 (0.53)	4.15 (0.84)	+0.77
2nd Regrouped to Lower Level	13	96.15 (157.79)	309.31 (228.55)	+213.16	1.32 (0.39)	2.02 (0.91)	+0.70
3rd Regrouped to Lower Level	0	-	-	-	-	-	-
Total Not Regrouped	139	300.65 (252.41)	532.96 (212.18)	+232.31	1.82 (1.43)	3.10 (1.41)	+1.28
Total Accelerated	6	637.83 (110.39)	730.33 (86.98)	+92.5	3.40 (1.06)	4.30 (0.70)	+0.90
Total Regrouped to Lower Level	13	96.15 (157.79)	309.31 (228.55)	+213.16	1.32 (0.39)	2.02 (0.91)	+0.70

Summary

      The program evaluation conducted at Brook Trout Primary School to determine the outcomes of the Reading Mastery initiative has found that a moderate correlation exists between the Virginia Third Grade Reading Standards of Learning Assessment scaled scores and the Scholastic Reading Inventory Lexile scores. The evaluation also discovered mixed achievement results when analyzing outcomes on two assessments used at Brook Trout Primary School. Results for the Virginia Third Grade Reading Standards of Learning Assessment showed a significant decline, while results on the Scholastic Reading Inventory (Lexile) showed a significant increase. Finally, the program evaluation found that students remaining on a regular pace, and not accelerated or regrouped to a lower level, demonstrated greater Lexile and reading grade level equivalency growth.

      Evaluation Question 1 found a moderate Pearson Correlation Coefficient r between the Scholastic Reading Inventory and the Virginia Third Grade Reading Standards of Learning Assessment during the Spring 2017 and 2018 assessment cycles ($r=.538$, $n=133$, $p<0.01$). Additionally, students scoring at the fail, proficient or advanced level on the Virginia Third Grade Reading Standards of Learning Assessment had a mean Lexile score that aligned to their SOL performance level. Students performing at the fail level had a mean Lexile score below grade level (mean Lexile/grade level equivalent 424.1/2.7), students at the proficient level had a mean Lexile score expected for the end of third grade (657.9/3.7) and students performing at the advanced level had a mean Lexile score above grade level (944/5.6).

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Evaluation Question 2 analyzed changes in reading achievement on the Virginia Third Grade Reading Standards of Learning Assessment and the Scholastic Reading Inventory. A one-way ANOVA was conducted and found a significant decline in mean scaled scores on the Virginia Third Grade Reading Standards of Learning Assessment results when comparing the three years pre-implementation (M=429, SD=71.026) of the Reading Mastery program to the three years post-implementation (M=406, SD=62.011). The results of a repeated measures ANOVA found a significant increase in Lexile scores when comparing beginning and end of year Lexile scores (M=204) for second- and third-grade students during the 2016-2017 and 2017-2018 school years. Results also indicated that the 2017-2019 second-grade students, Black students, and female students exceeded the mean growth for all groups compared.

Evaluation Question 3 investigated the practices of accelerating or regrouping students to a lower level in the Reading Mastery program. Data were available for the 2017-2018 school year; during that year 16 kindergarten through third-grade students were accelerated, while 47 students were regrouped to a lower level. Additionally, Evaluation Question 3 analyzed changes in reading grade level equivalency and Lexile scores for second- and third-grade students who were accelerated, regrouped to a lower level, or progressed at a normal pace in the Reading Mastery program. Overall, second- and third-grade students that progressed at a normal pace demonstrated greater Lexile (M=232.31) and reading grade level growth (M=1.28) when compared to students that were accelerated (M=92.5; M=0.90) or regrouped to a lower level (M=213.16; M=0.70).

CHAPTER 5

DISCUSSION OF FINDINGS AND RECOMMENDATIONS

The purpose of this program evaluation was to determine the impact implementing the Reading Mastery initiative had on reading achievement of students at a small, rural primary school and how those achievement effects impact a state mandated assessment. Additionally, this study investigated the correlation between the Scholastic Reading Inventory and the Virginia Third Grade Reading Standards of Learning Assessment, and it analyzed the impact of matching student reading level to placement in an instructional program. The results of this study come in an era of high stakes testing and school accountability when immense pressure is placed on schools to improve results and eradicate achievement gaps persistent across the U.S. and the state of Virginia.

Reading ability is key to educational success and attainment and is essential for advancement in society (Schieffer et al., 2002), and this study seeks knowledge of how a reading program implemented might assist in the betterment of students and ultimately society. Educational leaders are bombarded with information about effective instructional strategies and programs but need research to prove implementation is effective in similar environments as theirs. Leaders seek to improve reading abilities and desire to eliminate the disparities caused by reading deficiencies that begin during the elementary years.

This chapter discusses the relationship and correlational nature of the Scholastic Reading Inventory and the Virginia Third Grade Reading Standards of Learning Assessment. Additionally, analysis of student Lexile scores and reading grade level

equivalency is compared to the performance classifications of fail, proficient and advanced on the Virginia Third Grade Reading Standards of Learning Assessment. This chapter also discusses the degree Lexile scores and performance on the Virginia Third Grade Reading Standards of Learning Assessment were impacted by implementation of the Reading Mastery initiative. Finally, the results of matching student reading level to instructional level are discussed. The chapter also includes a discussion of implications these findings could have on policy and practice, recommendations for future research and a summary.

Reading Assessment Relationship

Evaluation question one analyzed the relationship between two reading assessments administered at a rural primary school in Virginia, the Scholastic Reading Inventory and the Virginia Third Grade Reading Standards of Learning Assessment. Discovering the relationship between these two assessments is vital in this era of high stakes testing and school accountability. School administrators and teachers look for assessments that can predict student performance on state accountability measures.

Evaluation Questions 1a and 1b compare Lexile scores and reading grade level equivalency against performance levels on the Virginia Third Grade Reading Standards of Learning Assessment. The purpose of these questions was to establish a relationship between the two assessments that creates a performance profile administrators and teachers at Brook Trout Primary School could use to predict performance on the Virginia Third Grade Reading Standards of Learning Assessment.

It should be noted that during the Spring 2017 and 2018 administration of the Virginia Third Grade Reading Standards of Learning Assessment 10 students failed the

assessment while scoring on grade level (3.0-3.9), and more students (26) read below

grade level and scored proficient than read on grade level and scored proficient (14).

Further statistical analysis of these students yielded no explanation for these results. The

10 students who failed the Virginia Third Grade Reading Standards of Learning

Assessment and were on grade level had an almost identical grade level equivalency

(3.34) and Lexile score (613.5) as the 14 students who scored proficient and were on

grade level (3.36/613.4). It has been noted by teachers over multiple administrations of

the Virginia Third Grade Reading Standards of Learning Assessment that some students

simply click through answers without reading the passages and with disregard for their

results. To the contrary, there are students who sometimes exceed their expected

performance, and this may be due to incentives put in place or because of goals set with

the teacher. The reasons postulated for this anomaly are mere speculation and lack

qualitative data to verify.

An investigation of the relationship between the Lexile scores and scaled scores

on the Virginia Third Grade Reading Standards of Learning Assessment across two

assessment cycles indicated that a moderate correlation exists ($r=.54$, $p <.05$). However,

closer inspection of the results show that the Pearson Correlation Coefficient is very

different for the two assessment cycles. One year, the correlation was much stronger

($r=.750$) than the second ($r=.404$). Even though an overall moderate correlation existed

between the two assessment cycles, the variability between them warrants further

investigation.

A look into the similarities and differences between the two groups may provide

insight into why the difference exists in the strength of relationship between the two

assessment cycles. The third graders in the first group had a 30% higher Lexile mean at the end of the year, began and ended the year with a higher reading grade level equivalency, had 16% fewer students perform at the fail level and 16% more score at the proficient level, and had 16% more students pass the Virginia Third Grade Reading Standards of Learning Assessment than the 2017-2018 third-grade group. The first third-grade group also had Lexile and scaled Standards of Learning Scores that were strongly correlated. This group of students increased performance on both assessments indicating a positive linear relationship existed. The results of this group are consistent with the expectation that better performance on the two assessments yields a stronger correlation.

The Scholastic Reading Inventory Lexile scores over the two years analyzed lacked a strong correlation to the scaled scores on the Virginia Third Grade Reading Standards of Learning Assessment and should not be used to predict performance on the state accountability measure at Brook Trout Primary School. In this era of high stakes testing and accountability, it is extremely important for teachers and school leaders to know that assessments given can be used to accurately predict student performance on state accountability measures. Having formative and summative assessments with strong correlations to state assessments allows school leaders to make instructional adjustments prior to administering state accountability measures. Aligned assessments allow school leaders to confidently identify and provide intervention to students and they allow for accurate progress monitoring.

The profile created for each performance level of the Virginia Third Grade Reading Standards of Learning Assessment can be helpful to the administration and teachers at Brook Trout Primary School because it can be used as a guide to identify

which score band students might perform. However, it is important to recognize that this performance profile is built on means and therefore has limitations. Additionally, the advanced performance level profile has a small sample size (7) and could be skewed by outlier scores. Therefore, the performance profile constructed using Lexile scores and corresponding reading grade level equivalencies should be used as one part of a comprehensive progress monitoring program to identify students who are on track for successful performance on the Virginia Third Grade Reading Standards of Learning Assessment, and to target interventions to students whose data indicates the potential for weak performance.

If a strong relationship existed between the two assessments, teacher and school leaders at Brook Trout Primary School would be able to use Lexile scores and grade level equivalents to predict student performance on the Virginia Third Grade Reading Standards of Learning Assessment. The moderate correlation for the Spring 2017 and 2018 years (r=.538) indicates that 29% of the variability in Standards of Learning scores is predictable from Lexile scores when using the Correlation of Determination. Secondly, if a strong relationship existed, the range of Lexile scores at each Standard of Learning Performance level would have been more definitive and had less overlap. Finally, if a strong relationship existed between the two assessments there would be alignment between the grade level equivalents and student scoring at each Standard of Learning performance level. If a strong relationship existed, the higher row percentages in Table 10 would move from right to left as the reading grade level equivalencies increased. For instance, a majority of the 26 students that were reading below grade level (1.0-2.9) and scored proficient on the Virginia Third Grade Reading Standards of Learning Assessment

would have scored at the fail level, and most of the students reading at or above grade level (3.0-6.9) and scoring at the fail level would have scored proficient or advanced. Instead, great variability in student performance exists that cannot be explained; this leads to the conclusion that Lexile scores and grade level equivalencies should not be used to predict student performance on the Virginia Third Grade Standards of Learning Assessment.

Changes in Student Achievement

Evaluation question two investigated the extent student achievement changed since the Reading Mastery initiative was implemented at Brook Trout Primary School. The question specifically investigated the extent Lexile scores, reading grade level equivalency and the third-grade Reading Standards of Learning assessment scaled scores have changed. The results of a one-way ANOVA comparing the means and scaled scores on the Virginia Third Grade Reading Standards of Learning Assessment for the three years prior to Reading Mastery implementation to the three years after implementation indicated that a significant difference existed. The mean scores on the Virginia Third Grade Reading Standards of Learning Assessment for the three years pre-implementation of the Reading Mastery program (428.93) were significantly higher than the three years post-implementation (405.97). The significant decline in performance on the Virginia Third Grade Reading Standards of Learning Assessment might initially lead to abandoning the Reading Mastery initiative, but this was only one of the two expected outcomes of implementation. Thus, further investigation into student growth in reading as measured by Lexile and reading grade level equivalent is warranted.

A repeated measures ANOVA was performed to determine the degree student Lexile scores changed from beginning of the year to end of the year. The results of the one-way ANOVA indicated that a statistically significant difference existed between the means of Lexile scores for all students when comparing beginning of the year scores to end of the year scores for the two school years examined. This difference represented an increase of 204 Lexile points on average for second- and third-grade students each year. Table 6 gives an idea of grade level equivalent growth, but since the Lexile Grade Level Conversion Chart is not evenly distributed, a grade level equivalent for 204 Lexile points growth cannot be determined. Additionally, the 2017-2018 second-grade group, Black students, and female students exceeded the mean growth for all students.

Passing state assessments affects a school's accreditation and people's perceptions of the school, and in Virginia can be used to measure growth from year to year. Unfortunately, Brook Trout Primary School does not receive credit for this growth because only one grade is assessed. While Brook Trout Primary School and Trout County Public Schools place great emphasis on performing well on the state accreditation measures, they also place great importance on student growth and believe its students are more important than one test score. Every student is different and each one begins at a different place and learns at their own pace. Expecting all students to perform at a certain level at a certain time along a developmental continuum goes against what is known about child development and common sense. The administration at Brook Trout Primary School believes that learning should be held as the constant and that time is the variable, not the other way as those who make the regulations and policies for education seem to believe.

The Reading Mastery program, as implemented at Brook Trout Primary School, has achieved reading growth in all groups measured during the 2017-2018 school year and with half of the groups during the 2016-2017 school year (second graders, Black, and female). One thing to consider along with growth is the level each group began the year. The second and third grade groups began each year below expectation. The most extreme was the 2016-2017 second-grade group that started the year on average one year below expectation. This group of students experienced Reading Mastery instruction for the first time as first graders and it is common to experience a decline in performance after the first year of a program's implementation. The same student group was measured as third graders in 2017-2018. This group of students made just over a year's growth each year and went from the beginning of first-grade level (1.0) to third-grade, third month level (3.27) during the two years. These students began second grade a grade level below in reading and finished within three quarters of a year (0.73) from being on grade level at the end of third grade.

The investigation into student achievement outcomes since implementing the Reading Mastery initiative at Brook Trout Primary School is contradictory. On one hand there has been a significant decline in performance on the Virginia Third Grade Reading Standards of Learning Assessment, but on the other a significant increase has occurred in Lexile scores. The outcomes of this program evaluation may lead to discussions and decisions being made about the Reading Mastery program at Brook Trout Primary School, but prior to any decision the division should reflect on potential causes for only one of two intended outcomes being reached.

The decline in Standards of Learning assessment results may not be solely attributed to the Reading Mastery initiative. It is important to consider alignment of the written, taught and assessed curriculum. Except for adding daily questions modeled after those found on the Standards of Learning Assessment, Brook Trout Primary School teachers implemented the Reading Mastery program as designed. The Reading Mastery program, especially at the lower levels, focuses on building phonemic awareness, phonics skills, fluency and literal comprehension. It is not until later levels of the program that inferential comprehension is experienced. The Virginia Third Grade Reading Standards of Learning assessment is a higher-level assessment that requires students to apply inferential comprehension skills to answer questions correctly. The misalignment between the cognitive level of what was taught in the classroom and what was assessed may have been a contributing factor to the decline in Standards of Learning Assessment scores at Brook Trout Primary School.

Another factor to consider when analyzing Brook Trout Primary School's decline in performance on the Virginia Third Grade Reading Standards of Learning is variation in sample size. The yearly sample size ranges from a high in Spring 2013 of 98 to a low of 60 in Spring 2017. The fluctuation in sample size from year to year can greatly affect the percentage that each child counts toward the overall pass rate. For instance, in Spring 2013 each child counted 1.02% toward the overall pass rate, while in Spring 2017 each child counted 1.70%.

This program evaluation would not be complete without a discussion of the extreme drop in performance on the Virginia Third Grade Reading Standards of Learning Assessment during the Spring of 2018. This group of students began their compulsory

education as kindergarteners during the 2014-2015 school year. This foundational year of education was tumultuous for these students because two of four kindergarten teachers left during the year and were replaced with long term substitutes. Additionally, as third graders in 2017-2018, the students were instructed by novice teachers. Three of four teachers were new to third grade and all four had fewer than three years of teaching experience. Students instructed by novice teachers or who are taught by uncertified teachers tend to have lower levels of student achievement (Stronge, 2007). While the instructional experiences for this group are unknown during their first- and second-grade years, teacher turnover and inexperience are common among teachers at Brook Trout Primary School. For example, during the 2017-2018 school year, 17 teachers taught in kindergarten through third grade at Brook Trout Primary School and 14 (82%) had fewer than five years of experience. Of those 14 teachers, eight (57%) had fewer than three years of experience, including all four of the third-grade teachers.

Teacher turnover and inexperience leads to concern with fidelity of program implementation. When teachers constantly turnover developing continuity in instruction is impossible to attain. Teachers new to a school have a lot to absorb and it can take several years for them to learn all the intricacies of a program and to deliver instruction effectively. Novice teachers need to learn their students, learn how to manage a classroom, understand assessments, align their instruction to division and state curriculums and learn the school culture and expectations. It takes several years for teachers to become comfortable with all the responsibilities associated with their position and it is understandable how program fidelity can suffer with constant teacher turnover.

Regrouping

Evaluation Question 3 investigated the extent regrouping students for instructional alignment occurs within the Reading Mastery initiative at Brook Trout Primary School and the effect this had on student achievement. Data analyzed to determine the proportion of students accelerated or regrouped to a lower level in the Reading Mastery program were limited to the 2017-2018 school year. The practice of acceleration was used sparingly at Brook Trout Primary School, with only 5% of kindergarten through third-grade students moved to a higher level. First grade had the most students accelerated, and second grade had the fewest. Students accelerated demonstrated consistently exceptional performance on checkout assessments and on daily independent practice. Acceleration of a student occurred after data were reviewed and included input from administration, the reading teacher, and the content coach. Acceleration places students at an appropriate instructional level so that boredom and inattentiveness does not occur, and so positive reading growth continues.

In addition to acceleration, data were analyzed to determine the proportion of students remediated through regrouping to a lower level of the Reading Mastery program during the 2017-2018 school year. During this one-year period 15% of kindergarten through third grade students were regrouped to a lower level. Students regrouped in the Reading Mastery program consistently performed below expectations on checkout assessments and daily independent practice. Student data were reviewed during grade-level meetings and the input of school administration, the reading teacher, and the content coach were considered when deciding to regroup a student to a lower level. All students regrouped were in kindergarten, first, or second grade.

During the 2017-2018 school year, nearly three times as many students were regrouped to a lower level (16) in the Reading Mastery program than were accelerated (47). First grade had both the greatest number of students accelerated and regrouped to a lower level. It is unknown why this occurred, but of the four teachers in first grade, one was brand new to teaching and one had only one year of experience. Inexperienced teachers tend to have lower levels of student achievement than veteran teachers (Stronge, 2007). This often occurs because experienced teachers know their students learning styles, can employ a repertoire of instructional strategies and have a better handle on classroom routines (Stronge, 2010). It is also important to recognize that this first-grade group of students began instruction in Reading Mastery at the semester point of their kindergarten year and did not experience the entire kindergarten program.

The final part of evaluation question three compared the achievement data of students who were accelerated, regrouped to a lower level, or remained at their original placement in the Reading Mastery program. The data analysis to discover the differences in student achievement as measured by Lexile scores and grade level equivalencies led to some interesting findings. First, second- and third-grade students not regrouped, meaning they stayed with their original placement, showed greater Lexile growth (+232.31) and grade level growth (+1.28) than students who were accelerated (+92.5/+0.90) or regrouped to a lower level (+213.16/+0.70). This seems contrary to what might be expected, especially when students who were accelerated demonstrated the least Lexile growth when compared to students remaining at their original placement and students regrouped to a lower level. The outperformance in grade level equivalency can be explained because the Lexile point to grade level equivalency growth is not consistent, as

seen in Table 6. The Lexile interval remains the same throughout, but the change in grade

level equivalency increases at higher Lexile scores. So the six accelerated students in

second and third grade reading at a 4.3 mean grade level at the end of the year equated

Lexile point growth of 92.5 to almost a full grade levels growth (0.90), whereas a 213.16

increase in Lexile equates to less than a grade level of growth for the students regrouped

to a lower level. Additionally, some postulate that the programs rigid, scripted nature

limits a teacher's ability to respond to individual differences and challenge advanced

learners (McIntyre et al., 2008). Finally, Thames et al. (2006) found the greatest benefits

of the Reading Mastery program to be between kindergarten and second grade, with the

greatest growth occurring between first and second. They also found that a

preponderance of Reading Mastery research reviewed provided little support for

increasing comprehension abilities as students progressed through the elementary grades

(Thames et al., 2006). The lack of increasing comprehension abilities could cause

accelerated students to plateau.

Secondly, when interpreting these results, it is important to consider the small

sample size of students in second and third grade who were accelerated (6) or regrouped

(13), when compared to the larger sample of students who were not accelerated or

regrouped (139). For instance, the four third graders who were accelerated had an end of

year Lexile range of 591-807. This broad range among four students caused the mean to

be skewed lower than the median ($M = 707$; $Mdn = 715$).

Thirdly, it is interesting that no third-grade students were regrouped to a lower

level during the 2017-2018 school year. Third grade is the only grade at Brook Trout

Primary School in which students participate in the Virginia Standards of Learning

assessment. Administrators and staff may feel that moving a student back in the Reading Mastery program during their third-grade year may insufficiently prepare them for the expectations of the Virginia Third Grade Reading Standards of Learning Assessment. Additionally, some students in third grade received Tier 2 instruction with Corrective Reading. Corrective Reading mirrors the Reading Mastery program and is used in third grade as Tier 2 instruction for students at Brook Trout Primary School who are one or more grade levels below expectation. Since students placed in this program are already accommodated for their skill deficiencies, moving back in the program may not be necessary.

This analysis has proven inconclusive in determining if accelerating, regrouping to a lower level or leaving students at their original placement in the Reading Mastery program is an effective practice. While students accelerated, regrouped to a lower level, or remaining at their original placement in the Reading Mastery program demonstrated growth in Lexile and reading grade level equivalency, additional data and analyses are needed to definitively determine the effectiveness of this practice. Control groups would need to be established and compared for students accelerated and students who should be accelerated but remain at their original placement, for students regrouped to a lower level, and for students who should be regrouped but remain at their original placement. While the outcomes of this practice are inconclusive, it is known that students instructed in small groups have higher levels of achievement and even mirror the achievement of students taught one to one (Foorman & Torgesen, 2001; National Reading Panel, 2000; Pressley, 2002; Rupley et al., 2009). Therefore, Brook Trout Primary School should

review its grouping practice for size and ensure that reading instruction with the Reading

Mastery program is delivered is small groups.

Implications for Policy and Practice

Trout County Public Schools and Brook Trout Primary School have invested

three years implementing the Reading Mastery initiative and have accomplished one of

their two intended outcomes. During these three years the division has made a substantial

commitment of time, financial resources, and training of staff to implement the Reading

Mastery program. Difficult decisions will need to be made weighing the intended

outcomes against the commitment to implementing the program. Do they abandon the

Reading Mastery program in favor of another? Are their ways that implementation can be

modified so achievement on the Virginia Third Grade Reading Standards of Learning

Assessment is realized? If the decision is made to continue implementing the Reading

Mastery program, the division will need to decide with whom, all students or certain

students? Leaders at Trout County Public Schools must reflect on their intended

outcomes and the results of this evaluation to decide if implementation of the Reading

Mastery initiative continues and how it might be modified to achieve intended outcomes.

The outcomes of the Reading Mastery initiative program evaluation at Brook Trout

Primary School have led to recommendations for change to policy and practice. The

recommendations suggested are based on the results of the program evaluation and are

based in best educational practice.

Policy/practice recommendation 1 - curriculum alignment. The Reading

Mastery initiative, as implemented at Brook Trout Primary School, has resulted in

significant growth in reading as measured by Lexile scores but has not led to success on the Virginia Third Grade Reading Standards of Learning Assessment.

During the two school years examined, students demonstrated significant growth in Lexile score and reading level as measured by the Scholastic Reading Inventory, but at the same time demonstrated a significant decline in performance on the Virginia Third Grade Reading Standards of Learning Assessment. The mean scaled scores on the third-grade Reading Standards of Learning assessment were significantly lower for the three years post Reading Mastery implementation than the three years prior. This relationship is indicative of misalignment amongst the three components of curriculum: written, taught, and assessed. The written curriculum consists of a detailed plan created at the district level that specifies what is to be taught, the taught curriculum is what is actually taught in the classroom and the assessed curriculum is the methods used to evaluate intended learning outcomes (Squires, 2012). The Virginia Third Grade Reading Standards of Learning Assessment is a higher-level assessment based predominately on inferential comprehension. Results of several studies indicate that students instructed with the Reading Mastery program demonstrated less growth in comprehension when compared to students using other reading programs (McCollum et al., 2007; Ryder et al., 2006). Two additional studies showed no significant difference in comprehension for students taught with the Reading Mastery program (MacIver et al., 2003; McIntyre et al., 2008). Implementation of the Reading Mastery program at Brook Trout Primary School included adding daily questions that mirrored those found on the Virginia Third Grade Reading Standards of Learning Assessment.

A recommended change growing out of this program evaluation is that a 30-minute session of daily reading instruction, separate from Reading Mastery, that is specifically aligned to the Virginia Third Grade Reading Standards of Learning be added to daily literacy instruction. A minimum of 30 minutes per day should be allotted to this instruction and it should take the form of comprehension strategy instruction. Comprehension strategy instruction increases the likelihood of text being understood and teaches thinking processes and problem solving techniques that can be used to decipher meaning and remember what was read (National Reading Panel, 2000). This instruction must be aligned both in content and cognitive level to the Third Grade Reading Standards of Learning. To maximize instructional time and to create cross curricular experiences, some of the reading standards could be embedded into other content areas.

Policy/practice recommendation 2 - response to intervention. Implementing a Response to Intervention (RTI) program will create a process to monitor student progress and respond to student needs. RTI is a multi-tiered system of delivery that provides students with an appropriate level of instruction based on their individual academic needs, monitors student progress frequently, bases instructional decisions on student data and provides students additional support and instruction (Barnes & Harlacher, 2008). In an RTI program students are assessed a minimum of three times per year using a universal screener to monitor progress against grade level standards. Students who are struggling or not responding to Tier 1 instruction, the instruction provided daily to all students, receive additional instruction. This instruction occurs in addition to the tier one instruction and is tiered by intensity. An intervention's intensity can be increased in several ways, including: increasing the frequency of intervention sessions, increasing the

duration of sessions, increasing the expertise of the instructor, decreasing the group size and or changing the type or delivery of the intervention (Filderman, Toste, Didion, Peng, & Clemens, 2018). Tier 2 interventions usually occur in small groups and may occur daily or several times per week. Tier 3 interventions are more intense and occur daily in very small or one to one grouping configurations.

Brook Trout Primary School implemented the Reading Mastery program as a tier one instructional program and now should evaluate its RTI program to ensure it is comprehensive. Reviewing its RTI program will ensure that Brook Trout Primary School is monitoring student progress and providing support to struggling students. Brook Trout Primary School should begin by reviewing universal screeners for alignment in content and cognition to the Virginia Standards of Learning for each grade. Brook Trout Primary School should continue administering the universal screeners to all students a minimum of three times during the school year, preferably at the beginning, middle and end of the year. Instead of waiting until the end of the year, third grade students should take the assessment again at the end of the third grading period. This will allow teachers and staff another opportunity to identify students still in need of remediation on grade level standards and provide targeted intervention prior to taking the Virginia Third Grade Reading Standards of Learning Assessment.

Data from the universal screener must be used to identify students in need of additional instruction and then assign them to a tiered intervention. Brook Trout Primary School will need to define what the tiered interventions are and will need to identify the resources needed to implement them. In addition, Brook Trout Primary School will need to use formative assessments to monitor student progress on curriculum standards

between the administration of the universal screener. These assessments should be given weekly and must be aligned to instruction that occurs in the classroom. Students who perform poorly on the weekly formative assessment should be provided remediation immediately and reassessed within a week.

Students reading below grade level could receive two lessons a day using the Reading Mastery program. This would advance the students through the program at a quicker pace and might allow students to reach grade level. For students in second or third grade reading below level, Brook Trout Primary School might consider supplementing daily Reading Mastery instruction with the Corrective Series to reinforce phonics skills and to enhance fluency, which can impact comprehension. Leaders at Brook Trout Primary School should evaluate the master schedule to provide students these instructional opportunities.

Policy/practice recommendation 3 - data-based decision making. Brook Trout Primary School should hold data meetings weekly and use available student data to inform instruction. Creating a data-based decision-making culture will individualize learning based on achievement data and will place a focus on learning outcomes and continuous school improvement (Filderman et al., 2018; Geel, Keuning, Visscher, & Fox, 2016). Data meetings create opportunities for staff members in the instructional process to analyze and interpret student outcomes. Data meetings should be held weekly and the following personnel should attend, school administrators, grade-level teachers, special education teacher(s) and division-level content coaches. Decisions at these meetings must be made using available data and should include discussions about the delivery of interventions, progress monitoring, goal setting and adapting educational practices

(Filderman et al., 2018; Geel et al., 2016). Beyond the focus on implementing interventions and monitoring student progress, data meetings should bring attention to instruction. Student achievement data informs teachers about the effectiveness of their instructional practices, can indicate where instructional changes are needed and ultimately lead to better performance outcomes (Gelderblom, Schildkamp, Pieters, & Ehren, 2016).

Policy/practice recommendation 4 - level of text. Researchers disagree about the level of text that should be used to provide students instruction in reading. Pressley (2002) argues that instruction should align to the student's instructional level, while Shanahan (2017) believes that students should be instructed with material that is on grade level regardless of the student's reading instructional level.

Brook Trout Primary School implemented the Reading Mastery program and included flexible grouping. Throughout the school year students can be accelerated or regrouped to a lower level based on performance. Analyzing available data for the 2017-2018 school year found that first-, second-, and third-grade students who were accelerated or regrouped to a lower level of the Reading Mastery program demonstrated less Lexile and grade level growth in reading than students who continued at a normal pace in the program. However, all students made growth in Lexile score and grade level equivalency. A definitive recommendation regarding this practice is unattainable. Additional data should be collected and analyzed for the practice of regrouping students for instructional alignment. Larger sample sizes and control groups would provide a more absolute decision for this practice

Policy/practice recommendation 5 - assessment alignment. This study found a moderate correlation between the Scholastic Reading Inventory and the Virginia Third Grade Reading Standards of Learning Assessment for students at Brook Trout Primary School. This moderate correlation demonstrates a positive linear relationship between the two assessments but the variability across the two assessment cycles yields caution to using the Scholastic Reading Inventory Lexile scores to predict student performance on the Virginia Third Grade Reading Standards of Learning Assessment. One reason the Scholastic Reading Inventory may not be a valid predictor of performance on the Standards of Learning Assessment is alignment. The written (intended) and taught (enacted) curriculum at Brook Trout Primary School is designed to align with the state standards and the state assessment, the Virginia Standards of Learning, not the Scholastic Reading Inventory. Researchers have found that when there is alignment between the written, taught and assessed curriculums student achievement shows growth (Kurz, Elliott, Wehby, & Smithson, 2010; Roach, Niebling, & Kurz, 2008; Squires, 2012).

Administrators and teachers at Brook Trout Primary School should enact a series of formative assessments throughout the school year that align to the written and taught curriculum. These assessments should be common across the grade level and align to standards to facilitate conversations about what was expected to be learned, what was taught and what was learned by students (Kurz et al., 2010; Squires, 2012). Additionally, the results of these assessments should be used by staff at Brook Trout Primary School to inform instruction and to match struggling students with intervention. These aligned formative assessments measure student progress toward mastering grade level standards

and ultimately predict student performance on the state's measure of accountability.

Table 19 provides a summary of findings and related recommendations.

Table 19

Summary of Findings

Findings	Related Recommendations

1. Mean Lexile scores and grade level equivalencies by performance level on the Virginia Third Grade Standards of Learning Assessment:
    Advanced Level – 944/5.6,
    Proficient Level – 658/3.7,
    Fail Level – 424/2.7
	Lexile scores and grade level equivalencies should be used as part of a comprehensive student data profile to predict performance on the Virginia Third Grade Reading Standards of Learning Assessment and to identify students in need of additional instruction.

2. A moderate correlation existed between the 2017 and 2018 Virginia Third Grade Reading Standards of Learning Assessment scores and the Lexile scores from the Scholastic Reading Inventory ($r=.538$). However, the two years differed greatly in strength of relationship: Spring 2017 ($r=.75$); Spring 2018 ($r=.40$).	Lexile scores alone should not be used to predict performance on the third-grade Reading Standards of Learning assessment. A comprehensive student data profile including results from universal screeners and formative assessments aligned with content and cognitive level of the Virginia Third Grade Reading Standards of Learning Assessment must be included.
3. The Reading Mastery initiative as implemented at Brook Trout Primary School has resulted in significant growth in student Lexile scores but has not translated to success on the Virginia Third Grade Reading Standards of Learning Assessment.	Continue using the Reading Mastery program to promote student growth in reading, but supplement with instruction that is aligned to the Virginia Curriculum Frameworks. Evaluate the Response to Intervention program to ensure struggling students receive additional instruction and intervention. Data meetings should be held to monitor student progress and to bring attention to the effectiveness of instructional practices.

4. Students remaining in their original placement in the program have demonstrated greater grade level growth. Listed below is the mean Lexile growth/grade level equivalency growth for students accelerated, regrouped to a lower level, or placement not changed in the Reading Mastery program:
    Accelerated – 93.5/0.90,
    Regrouped lower – 213.16/0.70,
    Progressed normally – 232.3 /1.28.
However, because reading grade level growth is not consistent across Lexile scores the achievement effects of accelerating or regrouping students to a lower level in the Reading Mastery program compared to students progressing at a normal rate have proven inconclusive.
	Accelerating or regrouping students to a lower level of the Reading Mastery program will need additional data and analysis with control groups before a recommendation can be made about the effectiveness of this practice. Instruction delivered using the Reading Mastery program should be done in small groups.

Recommendations for Future Research

       To support the current findings and to discover additional impacts implementing the Reading Mastery program might have on student achievement, additional areas of research could be explored, such as:

- The practice of accelerating students or regrouping to a lower level in the Reading Mastery program was limited to one school year and a small sample size. This practice should be investigated further with a larger population over multiple years and should include control groups.

- Literature is scarce when analyzing the Reading Mastery programs impact on assessments that states use to measure accountability. Additional research is needed in Virginia, and in other states, to determine the effects the Reading Mastery program has on student achievement on state accountability measures.

- Reading Mastery is a scripted, fast paced, leveled program used to teach children to read. During implementation at Brook Trout Primary School teachers and administrators noticed a decrease in behavior referrals during the reading instructional block compared to the remainder of the day. This discovery has led to speculation about the cause of this decrease. Discussions amongst school staff suggest that the high level of engagement, the fast pace and or the leveled instruction have led to this decrease, but additional research is needed to confirm these speculations.

- Implementation of the Reading Mastery program at Brook Trout Primary School included on-going support from a coaching consultant. Research

should be conducted to assess the impact the coaching model has had on teacher capacity to implement the Reading Mastery program with fidelity and what impact this might have on student achievement.

- Future research should investigate teacher and or student perceptions of the Reading Mastery program. Specifically, beliefs about the rigidity of the program and how this might impact implementation fidelity and student achievement.

- In the current study, the results of the special education population were included but not analyzed separately because identification was not possible. Future research should specifically look at the impact the Reading Mastery program has on reading achievement of special education students.

- The current study analyzed data for students instructed by the Reading Mastery program and the Corrective Reading program together. Future studies should analyze student data from each program separately to determine the achievement effects of each program.

Summary

Advancement in society, academic success and the ability to sustain oneself are all predicated on reading ability (Schieffer et al., 2002). School leaders, especially at the elementary and primary level, have great responsibility to ensure that students acquire the ability to read. They must be tuned into student data and constantly monitor progress to make necessary instructional, curricular and program adjustments. In this era of standards-based curriculum and high stakes testing and accountability, it is necessary for school leaders to have the capacity to monitor the alignment of the written, taught and

assessed curriculum. They must understand that if alignment between two of the three components is awry that desired outcomes are less likely to be achieved. Additionally, school leaders must be adept at understanding the connections and purposes of assessments used to measure reading achievement and those used to measure curriculum. Understanding these relationships will lead to curricular decisions that increase the likelihood of outcomes being achieved and will facilitate the acquisition of reading skills necessary for success in life.

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