QUANTITATIVE ANALYSIS OF IMPACT OF RESPONSE TO INTERVENTION ON 2019 SIXTH-GRADE RURAL PUBLIC MIDDLE SCHOOL MISSOURI ASSESSMENT PROGRAM PERFORMANCE BY FREE AND REDUCED-PRICE LUNCH ELIGIBILITY

A Dissertation

Presented to

The Faculty of the Graduate School

at the University of Missouri-Columbia

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

---

by

TIFFANI J. COLLINS

Dr. Timothy J. Wall, Dissertation Supervisor

MAY, 2020

The undersigned, appointed by the dean of Graduate School, have examined the

dissertation entitled

QUANTITATIVE ANALYSIS OF IMPACT OF RESPONSE TO INTERVENTION ON 2019 SIXTH-GRADE RURAL PUBLIC MIDDLE SCHOOL MISSOURI ASSESSMENT PROGRAM PERFORMANCE BY FREE AND REDUCED-PRICE LUNCH ELIGIBILITY

Presented by Tiffani J. Collins

a candidate for the degree of doctor of education

and hereby certify that, in their opinion, is worth of acceptance.

_____

Dr. Timothy Wall

_____

Dr. Nissa Ingraham

_____

Dr. Victoria Seeger

_____

Dr. Jennee Gregory

DEDICATION

First, I would like to acknowledge my husband and son. You have sacrificed our time together so that I might pursue this dream. Thank you for pushing me through the tough times, providing encouragement, and understanding the dedication the doctoral degree requires. You are both the way God intended for you to be. Thank you for being a blessing in my life. I love both of you in a special way.

To my parents, all four of them, your support has been incredible. From the financial assistance to the late nights to the commuting phone calls, I would not be this far without your reassurance. My love for you is never ending.

To my brothers, thanks for the encouraging messages throughout this process. While we were not physically together to celebrate, I could feel your excitement in our conversations and texts. I love all three of you.

To my grandparents, your lives have influenced my decisions. Thanks for being a part of who I am today.

To my nieces and nephews, seek God's purpose for your life. When you trust Him, your path will lead to where it should. Hear His voice above all others as you enjoy this blessing we call life. "Submit yourselves, therefore, to God. Resist the devil and he will flee from you." James 4:7 NIV

To my mother-in-law and fathers-in-law, you each hold a special place in my heart. Thank you for welcoming me to the family as a true daughter. I have always felt valued and appreciated.

To my sisters-in-law and my brothers-in-law, your laughter and support got me through the tough times. Keep finding the good in what you do. You are making a difference.

To my friends, colleagues, Dr. Mike McBride, local library and historical society staff, and fellow Northwest Missouri State University Cohort 11 members and staff, I appreciate your time and encouraging words throughout this process. Your patience and understanding provided a solid foundation on which I could build. Thank you for your work with me over the last few years.

"Be joyful in hope, patient in affliction, and faithful in prayer." Romans 12:12 NIV

ACKNOWLEDGEMENTS

I would like to thank Dr. Tim Wall. Thank you for the guidance for the past three years. Your persistence and encouragement has been greatly appreciated. I would also like to thank Dr. Nissa Ingraham. I find value in how you facilitate learning. Your verbiage and calm demeanor deliver a strong message. Finally, I would like to thank Dr. Victoria Seeger, Dr. Jennee Gregory, and the University of Missouri-Columbia and Northwest Missouri State University staffs for their guidance an instruction throughout this process.

TABLE OF CONTENTS

LIST OF TABLES

Table

LIST OF FIGURES

Figures

ABSTRACT

This study focused on the impact of response to intervention on 2019 sixth-grade rural public middle school Missouri Assessment Program performance by free and reduced-price lunch eligibility. Response to intervention was used to decrease learning gaps for students. Missouri Assessment Program performance was used as an accountability measure for Missouri public school students.

The researcher used the Missouri Assessment Program, a standardized assessment given to Missouri public school students in grades three through eight. The annual test includes mathematics and English language arts in grades three through eight and science in grades five and eight. This research focused on mathematics in grade six.

This study concluded that there were significant differences in student scores based on: free and reduced lunch eligibility; race and ethnicity; response to intervention received; and response to intervention level. Moreover, the researcher found that students in response to intervention Level 2 are effectively identified to receive academic assistance. This seemed to be a stronger identifier than free and reduced-lunch eligibility and race.

SECTION ONE

INTRODUCTION TO THE BACKGROUND OF THE STUDY

Background of the Study

Although student performance on state assessments can provide some feedback to educators, low socioeconomic factors, such as family income, can negatively affect a child's achievement in school (Boykin & Noguera, 2011; Hattie, 2012; Morrissey, Hutchinson, & Winsler, 2014). Some schools provide a range of interventions for students that may include before-, during-, and after-school tutoring, modified assignments and instruction, and modifications of specific learning standards. As a result, many students who come from low-income families without intervention may be vulnerable to scores in the lower percentiles on state assessment reports. The researcher attempted to address the gap in existing research on the impact of response to intervention (RTI) and state academic-performance assessment in Jonah, Missouri. In this study, the researcher applied and built on previous research as it applies to RTI implementation effects on middle school performance levels on the Missouri's Assessment Program (MAP). Of interest was a disaggregated group of students eligible for free and reduced-price lunch (FRL).

Throughout the United States in 2018, 56.6 million students attended prekindergarten and kindergarten through Grade 12 (National Center for Education Statistics [NCES], 2018). Of those students, 50.7 million attended public schools and were assessed using state-specific performance assessments (NCES, 2018). In the State of Missouri, public school students in Grades 3 through 8 are assessed annually in mathematics and English Language Arts and in Grades 5 and 8 in Science (Missouri

Department of Elementary and Secondary Education [DESE], 2017b, 2018a). At Jonah Middle School (JMS, pseudonym), 98.5% of the students completed the 2018 mathematics MAP test.

Public schools serve students from all socioeconomic backgrounds. According to many scholars, addressing the learning gap of students in poverty has many effects inside and outside the school setting (Epstein, 2010; Hattie, 2012; Noguera, 2011). Students identified as eligible for FRL have barriers that can hinder their learning when compared to state assessment scores of students who are not eligible for FRL (Bolshakova, Johnson, & Czerniak, 2011; Cameron, Grimm, Steele, Castro-Schilo, & Grissmer, 2015; Graves, Brandon, Duesbery, McIntosh, & Pyle, 2011). For example, students eligible for FRL do not have equitable access to resources such as access to food at home and healthcare (Nord & Economic Research Service, 2009). As a result, health and attendance are risk-factors (Morrissey et al., 2014; Nord & Economic Research Service, 2009).

When comparing students in sixth-, seventh-, and eighth grades throughout Missouri who took the mathematics portion of the MAP in 2018, 27.3% scored in the top two performance levels, Advanced and Proficient (DESE, 2019a). In contrast, 44.9% of students scored Advanced and Proficient (DESE, 2019a). See Table 1 for the statistics. At JMS, 48% of students were eligible for FRL in 2018 (DESE, 2019j). According to DESE (2019a), 37.5% sixth-grade JMS students eligible for FRL scored in the top two performance levels for mathematics. Mathematics teachers set a goal to increase the number of students scoring Advanced or Proficient on the MAP test. When compared to other grade levels at JMS, sixth-grade mathematics scores remained low. Therefore, the researcher chose this grade level and content area.

Table 1

Students in Grade 6 at Jonah Middle School Compared to Missouri in 2018 Data for Missouri Assessment Program Achievement Levels of Proficient and Advanced

Category	Percent
Students in Missouri scoring in Proficient or Advanced categories	27.3
Students in JMS score in Proficient or Advanced categories	44.9

Note. JMS = Jonah Middle School, adapted from *Achievement level 4 report: Public,* by Missouri Department of Elementary and Secondary Education, 2019a, retrieved from https://apps.dese.mo.gov /MCDS/Reports/SSRS_Print.aspx.

This research study provided an assessment of whether RTI strategies targeting specific learning standards had a relationship to JMS MAP performance. Early academic interventions impact educational performance as students progress through each grade (O'Dwyer, Lee-St. John, Raczek, Luna Bazaldua, & Walsh, 2016). Along each grade level at JMS, educators identify learning gaps and provide educational reinforcement to meet the diverse needs of individual learners. From tutoring to differentiated instruction, schools use intervention strategies to improve student learning. Starting with the analysis of student learning, teachers at each grade level can identify what students already know and can do, and then facilitate learning to meet the instructional needs of individuals and groups of students. Students and teachers engage in the learning process by adjusting and amending instruction, providing deliberate practice and problem solving determined by individual needs, based on performance (Buffum, Mattos, & Malone, 2018; Hattie & Yates, 2014).

Educators in the Jonah School District monitor student learning. Based on student performance on the Missouri Learning Standards for mathematics and English language arts (ELA), students receive instruction based on their current learning level. At JMS

specifically, if students do not demonstrate mastery of learning objectives, additional time and remediation are provided during the school day.

Using state-assessment results, school administrators and teachers monitor student growth and make curriculum adjustments. The researcher attempted to identify gaps in student performance on the MAP and how focused school-wide interventions could impact students who are eligible for FRL. This scholarly research focuses on the impact of schoolwide RTI on 2019 sixth-grade mathematics state-assessment student achievement for students qualifying for FRL at JMS. In this section, the study significance, details of the present study, literature, and research design are addressed.

Statement of the Problem

The problem in practice is that there is a gap in knowledge of the impact of RTI on students attending JMS who are eligible for FRL. It is unknown if RTI will impact students eligible for FRL on the MAP test. The learning gap is accentuated for students eligible for FRL (Cameron et. al., 2015; G. Duncan & Brooks-Gunn, 1997). According to the NCES (2019e) from the 2000–2001 to the 2014–2015 school years, public school students eligible for FRL in the United States went from 38.3% to 51.8%. Students eligible for FRL commonly struggle with behavior, classroom assessments, and state assessments. With over half of the U.S. public school student population eligible for FRL and knowing an academic performance gap exists, educators adjust instructional practices to enhance learning opportunities for all (Ladd, Noguera, Reville, & Starr, 2016).

Interventions in public schools can include before- and after-school tutoring, reassessments, reteaching, peer tutoring, and altered assignments (Visible Learning, 2017). Hattie listed 252 effective and research-based intervention strategies that include

positive student–teacher interactions such as tutoring, reassessments, reteaching, peer tutoring, and enrichment (Visible Learning, 2017). Included on the same lists are less effective influences such as distance learning and school calendars.

According to the National Center for Education Evaluation and Regional Assistance (2009, April), a systematic approach to instructing students about mathematical operations and their inverses can impact student learning. The report also emphasized the importance of tracking student learning to determine the tier of intervention needed. Explicit instruction must also be present (Hattie, 2012; National Center for Education Evaluation & Regional Assistance, 2009; Visible Learning, 2017).

Specifically, JMS has offered RTI in Grades 7 and 8 for at least 5 years, but only began to offer students in Grade 6 RTI in the fall of 2018. As JMS prepares for student placement in RTI classes, educators consider state assessments. With a recent inconsistent timeline for student-achievement scores, JMS is using additional information to screen students for learning interventions. Teachers also use classroom assessments, benchmark assessments, and teacher observations to make preliminary placements.

Other states have studied intervention strategies (Graves et al., 2011; O'Dwyer et al., 2016). However, despite several interventions applied at JMS, no research has been conducted there. Instructional processes include RTI, MAP tutoring, and in-class small-group instruction. No research has been conducted at JMS to determine if tracking RTI strategies impact state-assessment scores for students eligible for FRL.

Purpose of the Study

The purpose of this study was to identify if RTI impacts 2019 schoolwide sixth-grade mathematics state-assessment student achievement by FRL eligibility at JMS.

Decades of research in effective interventions and RTI suggest a positive relationship between RTI and student achievement (Buffum et al., 2018; Hattie & Yates, 2014; Visible Learning, 2017). Research by Buffum et al. (2018) anchored the RTI process for this research through the three-tiered system.

To establish a relationship between RTI and an increase in sixth-grade MAP student-achievement scores, at JMS a positive relationship was hypothesized at JMS. Scholarly research showed a relationship in other settings. Visible Learning (2017) indicated that RTI has an effect-size of 1.29; Because an effect size of 0.4 equates to a year of learning, RTI can affect student learning by more than 3 years of knowledge gained. The Visible Learning (2017)findings indicated that targeted learning instructions act not only as interventions, but as preventions as well. Hence, the researcher chose RTI as the focus for in-school interventions.

Cameron et al. (2015) and O'Dwyer et al. (2016) supported early interventions in student learning. As a result, the researcher chose sixth grade, which contains the youngest aged students at JMS. Educators commonly use state assessment to measure student success of learning standards (Early et al., 2016). As a result, MAP was chosen to measure growth in student achievement. In contrast, Kohn (2000) advocated eliminating standardized testing to measure student achievement. Kohn (2000) suggested allowing educators to create assessments to measure student growth. Finally, the practitioner-based research for this study addressed the gap in research at JMS for RTI and increased student achievement for students eligible for FRL. As a result, from the data gathered in this research, recommendations were developed to make decisions based on available MAP data.

Theoretical Framework: Datnow and Park's Data-Driven Decision Making Theory

Data-driven decision-making (DDDM) is a systematic process used to make decisions (Gilbert, 1978; Krapfl, 1982). The tenets of DDDM are to collect data, identify a gap, provide intervention, monitor progress, complete a post-assessment, and reflect on the outcome (Carnegie Foundation for the Advancement of Teaching, 2019; Datnow & Park, 2014). Based on Datnow and Park's (2014), data-driven leadership theory informed decisions, beginning with data collection and analysis. To facilitate education reform, this theory encompasses a systematic approach to gathering and reviewing data, finding patterns, and interpreting results (Center on Response to Intervention at American Institutes for Research, 2019; Feldman, Lucey, Goodrich, & Frazee, 2003; Feldman & Tung, 2001; Mandinach, 2012). A focus on systematic implementation could lead to educational reform when applying DDDM to student learning (Mandinach, (2012).

Leadership should be distributed among educators with expertise in a shared work environment (Datnow & Park, 2014). Data can drive the organization, structural changes, and improvement of an entity (Feldman & Tung, 2001; Marsh & Farrell, 2015; Spillane, 2012). Therefore, DDDM can have a secondary impact beyond student learning, affecting structural components as well.

External influences, such as family income, also affect student learning (Epstein, 2010; Hattie, 2012; Visible Learning, 2017). Datnow and Park (2014) identified this mindset as detrimental when trying to effectively apply data. With the plethora of data available, educators must ask questions about the available materials. To develop a systematic process to track data for instructional use with a focus on improving student achievement, educators must access multiple sources of data (Datnow & Park, 2014;

Mandinach, 2012). Such data could include classroom performance, teacher observation, and annual state standardized testing.

Key Pillars

Response to Intervention in the Middle School

For an explicit definition of RTI, see the *Definition of Key Terms* section. For the purpose of this study, RTI is a schoolwide approach that is available to all students and occurs more than two times a week during a 45-minute class period that does not involve new learning standards (Buffum et al., 2018). Former U.S. Secretary of Education Duncan stated, in a speech on June 23, 2011, "Educators now widely recognize the middle grade years, from the ages of 10 to 15, as a special, critical period of adolescent development" (para. 6). Middle schools house students attending Grades 6 through 8. A schoolwide RTI approach creates a learning environment where unmastered standards can be reinforced on a daily basis.

State Standardized Assessment

Standardized assessments monitor academic performance for children in public schools (National Education Association, 2019; ProCon.org, 2018). As a result, educators began grouping students. The purpose of standardized assessment changed to measuring intelligence level (U.S. Congress, 1992). For over more than 150 years, standardized assessments have become the norm for educational accountability throughout the United States, differing for each state.

According to the DESE (2019b) Assessment Principles, schools in Missouri provide summative assessments in Grades 3 through 8 and throughout various content courses in high school to measure college- and career readiness. The DESE Assessment

Principles (2019b) specify that students are assessed in reading, writing, literacy, speaking, listening, and mathematics. The MAP is the yearly spring assessment issued by the State of Missouri to public school students enrolled in Grades 3 through 8 for which student achievement results "focus on progress to readiness … [and provide] timely data that informs instruction" (DESE, 2019b, p. 2). This study focused on students who score Proficient or Advanced on the MAP test.

State standardized assessments represent part of the evaluation of school and district performance (DESE, 2019h). Four categories encapsulate the Annual Performance Review (APR) process: academic achievement, subgroup achievement, college and career readiness, and attendance. Achievement, subgroup achievement, and college and career readiness are three groups where standardized assessments measure success. As a result, the district can improve, decrease, or maintain their status with the DESE. The DESE also shares the information with the public and the local population. Building-level administrators work with a team of teachers to create plans for school improvement (DESE, 2013). A continual decline over time could provide a reason for the principal to be terminated. Associated with school performance, state standardized assessment influences accountability.

Free and Reduced-Price Lunch

FRL eligibility follows the definition provided by the U.S. Department of Agriculture (USDA), according to the Child Nutrition Programs: Income Eligibility Guidelines, effective between July 1, 2018 and June 30, 2019 (USDA, 2018). In the United States, more than half of the student population qualifies for FRL (Ladd et al.,

2016) and more than half of the student population of Missouri qualifies for FRL (NCES, 2019b, 2019c). At JMS in 2019, 48% of students were eligible for FRL (DESE, 2019j).

Design of Study

The research design section includes information on the setting, participants, data collection, and data analysis. This quantitative study used a quasi-experimental design measured by a *t*-test, chi-square test, and ANOVA (Field, 2018). Quasiexperimental researchers undertake an experiment with groups that are not randomized (Creswell, 2014). Because the study is quantitative, a year's worth of student performance was analyzed for sixth-grade students at JMS who took the MAP test in the spring of 2019 in mathematics. The independent variable was RTI; the dependent variable was the MAP achievement level. The control variable was students eligible for FRL. Sixth-grade mathematics 2019 MAP student-achievement levels and analysis methods were used to interpret the research. This section provides a delineation of the research questions, setting, participants, data-collection tools, data-analysis method, limitations, delimitations, assumptions, design controls, and definitions of terms.

Research Questions

In this scholarly study, the researcher worked to answer seven research questions. Table 2 identifies the questions, the hypotheses, and the null hypotheses for each question. Table 3 identifies the research questions, variables, and analysis information for this research study. Continuous variables for this study are MAP test scores. A *t*-test and ANOVA were used to analyze the continuous variables. Categorical data were also used (as in Field, 2018). Categorical data points are a student's FRL eligibility, a student's

SRT status, and the student's level of RTI. Like C. E. Peterson (2013), these data points were tested through a chi-squared test, as two variables were tested for independence.

Setting

All research for this study was conducted at JMS for students in sixth grade in 2019. At the time of this research, JMS had enrolled 413 students, with 136 students in the sixth grade (PowerSchool, 2019). According to the DESE (2019c) building demographic data, 49% of JMS students received FRL.

JMS is a rural school located at the intersection of two highways in Jonah, Missouri. It is about a 30-minute drive from two metropolitan areas in northwest Missouri. Students at JMS live in the designated attendance boundaries, in and outside of city limits. The district has four buildings serving Grades Prekindergarten through 2 at the elementary school level, 3 through 5 at the intermediate school level, 6 through 8 at the middle school level, and 9 through 12 grades at the high school level.

Participants

Study participants included sixth-grade JMS students for the 2017–2018 and 2018–2019 school years. For the 2017–2018 school year, the school housed 145 sixth-grade students. These students did not have access to RTI. One student did not take the MAP test; therefore, the sample size for this population was 144 students (PowerSchool 2019). For the 2018–2019 school year, the school had 136 sixth-grade students. These students did have access to Levels 1 and 2 of RTI. Two of those students took the MAP-A test; therefore, the sample size for this population is 134 students (PowerSchool, 2019). When combined, the total sample size for both years was 278.

Table 2

Research Questions and Null Hypotheses

Research questions	Hypothesis	Null hypothesis
1. What are the descriptive statistics for students when disaggregated by gender, FRL status, and minority status?		
2. At JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test between student eligibility for FRL and level of RTI received?	H2: A statistically significant different exists in performance on the sixth-grade 2019 mathematics MAP test between student eligibility for FRL and level of RTI received.	Ho2: No statistically significant different exists in performance on the sixth-grade 2019 mathematics MAP test between student eligibility for FRL and level of RTI received.
3. At JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test for student identifying as White, non-Hispanic receiving Level 1 RTI, students identifying as White, non-Hispanic receiving Level 2 RTI, and students identifying as not White?	H3: A statistically significant difference exists in performance on the sixth-grade 2019 mathematics MAP test for student identifying as White, non-Hispanic receiving Level 1 RTI, students identifying as White, non-Hispanic receiving Level 2 RTI, and students identifying as not White.	Ho3: No statistically significant difference exists in performance on the sixth-grade 2019 mathematics MAP test for student identifying as White, non-Hispanic receiving Level 1 RTI, students identifying as White, non-Hispanic receiving Level 2 RTI, and students identifying as not White.

Note. FRL = free and reduced-price lunch, JMS = Jonah Middle School, MAP = Missouri Assessment Program, RTI = response to intervention.

Table 3

Research Questions, Variables, and Analyses

Research questions	Independent variable	Dependent variable	Data type	Statistical analysis
1. What are the descriptive statistics for students when disaggregated by gender, FRL status, and minority status?			Categorical	Descriptive
2. At JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test between student eligibility for FRL and level of RTI received?	FRL eligibility Level of RTI	MAP score	Continuous	ANOVA
3. At JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test for student identifying as White, non-Hispanic receiving Level 1 RTI, students identifying as White, non-Hispanic receiving Level 2 RTI, and students identifying as not White?	Student ethnicity Level of RTI	MAP score	Continuous	ANOVA

Note. FRL = free and reduced-price lunch, JMS = Jonah Middle School, MAP = Missouri Assessment Program, RTI = response to intervention.

According to Creswell (2014), this is a stratification of the population, as the target population includes only students enrolled in Grade 6. According to the DESE

(2019j), 48% of students in 2019 receive FRL. More than 5% of the student population identified as historically marginalized (NCES, 2019a). Therefore, JMS is not considered racially/ethnically homogenous (Field, 2018). See Table 4 for disaggregated data for sixth-grade students at JMS for 2018 and 2019.

Table 4

2018 and 2019 Disaggregated Data for Sixth-Grade Students at Jonah Middle School

Category	Number of students	Percent of students
Students enrolled	278	100.0
Male	153	55.0
Female	125	45.0
Eligible for free lunch	101	36.3
Eligible for reduced-price lunch	38	13.7
Combined eligible for free or reduced-price lunch	139	50.0
Not eligible for free or reduced-price lunch	139	50.0
Students identified as historically marginalized	23	8.3
Students identifying as White, non-Hispanic	255	91.7

Note: Retrieved from JMS student records, 2019.

Studies show that the younger the students receive learning interventions, the more likely educational growth can be documented (Cameron et al., 2015; Early et al., 2016; O'Dwyer et al., 2016). At JMS, students in sixth-grade are the youngest. Therefore, the research was conducted for students in Grade 6.

The current study used sixth-grade mathematics MAP data from the 2018 and 2019 school years for students at JMS. The data collected specifically identifies academic-achievement levels for students identified as FRL and non-FRL scoring in Proficient and Advanced levels on the MAP test throughout the state and at JMS (DESE, 2017b). Student-achievement categories guided the research questions (Hattie, 2012) and

standards-based assessment (Marzano, 2010). The DESE published the achievement-level descriptors (DESE, 2018c).

Data-Collection Tools

According to the Assessment Principles provided by the DESE (2018b), summative assessments are given starting in Grade 3. The assessment should prepare students for college and careers by aligning with College- and Career-Readiness Standards and the reports should yield data on student progress (DESE, 2018c). The MAP test is given to students in Grades 3 through 8 in the subject areas of mathematics and ELA. Students in Grades 5 and 8 take a MAP test in science. This study focused only on mathematics for sixth-grade students during the 2018–2019 school year. Tier level of RTI was considered a variable.

A quasiexperimental research design (as suggested by Creswell, 2014; Field, 2018) was used to obtain anonymous MAP and FRL data from the DESE state-assessment online resource portal when it became available after July 2019. This research was quasiexperimental because it involved an intervention comparing two groups in a target population (as in Creswell, 2014; Field, 2018). Also, data was accrued using the district data tracker. The researcher completed the institutional review board process. Data are kept in a locked location. This process ensures the research is secure and inaccessible to others. In doing so, the researcher protects student anonymity.

Data Analysis

Results examination involved data on 2018 and 2019 students eligible for FRL and ineligible for FRL, students in RTI and students not in RTI, and students who are eligible for FRL but are not receiving RTI. This design allowed a comparison and

contrasting of the results, as the data-collection processes were completed separately (as in Creswell, 2014). Independent *t*-tests, chi-square test, and ANOVA test were used for data analysis (aligned with Field, 2018). With the comparison of two population groups, the independent *t*-test guided analysis (as suggested by Field, 2018; Kenton, 2019; Siegle, 2019). Student anonymity was preserved by coding student identities and descriptive statistics categorically (Field, 2018).

Data analysis took place using SPSS through correlation of descriptive statistics (as in Field, 2018). The chosen descriptive statistics were gender, eligibility for FRL, students identified as historically marginalized, students identified as White non-Hispanic, eligibility for RTI, ineligibility for RTI, and MAP performance. The Pearson coefficient determined any statistically significant and positive/negative correlations (see Field, 2018; Kenton, 2019; Siegle, 2019). See Table 4 for descriptive statistics.

By synthesizing the data for one grade level at one school, the researcher created a small-sample study, comparing and contrasting commonalities and differences (aligned with Creswell, 2014). Newcomer, Hatry, and Wholey (2015) identified a small-sample as part of a population in only one location. Validity and reliability confirm uniformity in the assessment over time. According to Field (2018), validity "measures what it sets out to measure" and reliability "can be interpreted consistently across different situations" (p. 13). The Data Recognition Corporation's (DRC, 2017) report to the DESE emphasized validity and reliability of the MAP test through internal and external assessment procedures. Validity and reliability of the MAP test was important to this study because the MAP test was used as an indicator for student performance. Therefore, the assessment had fidelity.

Limitations

Student effort on the MAP test was not considered for this research. This was not taken into account as the focus of this study was RTI, not student effort. For example, if a student rushed through the assessment or randomly selected answers, test results would be skewed. Because student behavior is not a factor, this possibility was treated as a limitation.

The level of teacher implementation of RTI was not considered a factor for this research. Teachers were able to determine which Missouri Learning Standards guided instruction. Intentional focus on learning standards implemented throughout grade levels is considered best practice (Buffum et al., 2018). Teacher commitment to RTI was also part of this the identified limitation.

Teacher quality and instructional strategies comprised another limitation. Because teachers had the autonomy to determine the instructional needs of the students, teacher choice was not considered in this research. As a result, teacher implementation was considered a limitation.

Like Morrissey et al. (2014), in this research the researcher did not consider changes in family income. Therefore, if students became ineligible for FRL after the paperwork had been completed, the student would continue to receive the services. In that case, their data was not removed from the data.

Principal effectiveness, culture and climate, teacher effectiveness, attendance, and grades were not measured through this study, which is an additional limitation. Bias must be considered a limitation for this study as the researcher is also the principal of JMS. Knowing the history, goals, and the intention to use the results for improvement influence

researcher bias (see Creswell, 2014). This risk was mitigated by using the Jonah district data tracker to monitor student progress.

The assistant superintendent and the researcher ran state reports. The JMS principal and secretary ran local reports through the student-information system. All factors listed here could cause additional variance. Findings and recommendations were shared with staff upon completion of the research. The superintendent and assistant superintendent supported the research because state standardized assessments are part of the APR, and improvement in sixth-grade mathematics has been identified.

Delimitations

The population for this study was students in the sixth-grade. Due to the design of the district, students in the sixth-grade are the youngest aged students in the middle school building. This student population at JMS ranges in age from 11 to 13.

The district has four buildings. Middle school students for the Jonah School District are in Grades 6 through 8. The Jonah School District is located in rural northwest Missouri.

At JMS, all students, except those enrolled in gifted or functional special education, have the ability to take RTI class. To be in RTI, a student's academic performance must be below or significantly below mastery on the targeted learning standard. Each RTI classroom had no more than 25 students. The class was offered daily, lasting 45 minutes. Students not taking RTI class are either in Project Lead the Way class or enrichment class.

Assumptions

The assumptions of this study focused on the Missouri annual state standardized test given to students in sixth grade. The MAP test, as required by the DESE in the State of Missouri, is valid and reliable (DRC, 2017). In the December 2017 report to the DESE, DRC presented "evidence of construct-related validity through studies of test reliability, evaluation of internal test structure, and evaluation of the relationship of test scores with external variables" (p. 152). Validity means that the assessment measures what it was created to measure, whereas reliability measures consistency across time (Creswell, 2014; Field, 2018). Therefore, the MAP test is considered valid and reliable.

Although the assessment covers ELA and mathematics, the current scholarly research focused on student performance of sixth-grade mathematics because of previously low scores. The data collected were archival. This study did not consider other grade levels or content areas nor did the researcher contact other schools, inside or outside the district, to gather student data.

Second, the implementation of the research-based intervention took place on a daily basis, during RTI class offered to all students (Buffum et al., 2018). The discussion that took place between teachers regarding the data tracker, student learning, and instructional delivery involved all sixth-grade teachers. These conversations occurred at least once a week during plan time documented in the team notes of the data tracker.

Design Controls

Missouri partners with DRC for state testing. As a result, the MAP is considered valid and reliable (DRC, 2017). According to Field (2018), tests are valid when the assessment measures are reliable and can be applied consistently. By strategically

focusing on sixth grade, the researcher targeted one grade level. Instead of looking at all content areas tested, the researcher focused on mathematics. The results included all students: regular education and special education. Because the students attending gifted education classes did not have RTI class, their results are not included. Students in functional special-education classes take the MAP-A test, not the MAP test, and were not included in this study.

The research focused on sixth-grade middle school mathematics, RTI, FRL eligibility, and performance on the Missouri annual standardized test. By considering academic performance on state standardized assessments in mathematics, the researcher can determine if a statistically significant difference emerged in measured student learning (as in Cleary, Velardi, & Schnaidman, 2017). Student learning was monitored through daily RTI class and measured through the MAP test.

Definition of Key Terms

Core instruction. Core teachers provide instruction in ELA, mathematics, science, and social studies (Great Schools Partnership, 2013). Mathematics was the focus core class for this research.

Department of Elementary and Secondary Education (DESE). The DESE is the government department that oversees the public schools. Each state in the United States has a separate department for an educational system that operates as a branch of the U.S. Department of Elementary and Secondary Education. The DESE is headed by Commissioner Vandeven and the Board of Education (DESE, 2019e).

Equity. Equity refers to equal access to resources for all students. According to the Missouri Equity Plan (DESE, 2017a), the quality of educators and administrators

affect the equity of instruction in the classroom. The plan also identifies that schools high in poverty, minority, and in rural areas lack equity in resources and quality educators.

Every Student Succeeds Act (ESSA). ESSA is federal legislation passed in 2015 that supersedes the No Child Left Behind (NCLB, 2001) Act. This act requires schools to show data regarding their achievement performances as an evaluation tool.

Free and reduced-price lunch (FRL). Considered a socioeconomic-status proxy, researchers frequently use eligibility for FRL. Families who apply can qualify for FRL eligibility if the household income is at a certain level. The family completes the application through a self-reporting form. Financial assistance is provided under the National School Lunch Program, directed by the USDA (2019a).

Middle school. Common throughout the United States, researchers frequently use middle school as a way to identify students attending Grades 5 through 9 (A. Duncan, 2011). Middle school is sometimes referenced as junior high school. For this research, middle school references Grades 6 through 8.

Missouri Assessment Program (MAP). The MAP is a standardized test given to students enrolled in public schools throughout the state annually. The DESE provides districts a time frame during which the assessment must be completed. The MAP is the annual state standardized test given to public school students in Grades 3 through 8 in the content areas of mathematics and ELA (DESE, 2019b). Students in Grades 5 and 8 also take the assessment in science. For this research, Grade 6 mathematics was the focus. This is different from the NWEA Map, which is a resource available to schools to purchase. The NWEA monitors student learning across a continuum of standards (NWEA, 2019). DRC (2017) is the testing vendor. Students complete this test using a

computer through a secured, online portal. Question types include technology enhanced, constructed response, multiple choice, short answer, and multiple select (DESE, 2019e).

Poverty. According to the U.S. Census Bureau (2019), a person is considered at the poverty level when the threshold income of the household exceeds that of the actual income. This research will identify poverty according to the United States Department of Agriculture (2019b). Students are eligible for free lunch if they live in a household that is 130% below poverty level, while students are eligible for reduced-price lunch if they live in a household that is below poverty level by 130% to 185% (USDA, 2019b).

Response to Intervention (RTI). RTI is a 45-minute class offered to all students at least twice a week (Buffum et al., 2018). RTI has three levels. Schools rotate students in and out of RTI classes based on pre- and post-assessments given approximately every two to four weeks. Teachers create and grade their own assessments. With an effect size of 1.29 (Visible Learning, 2017), RTI is tiered instruction that takes place during the school day. An effect size of 0.4 should demonstrate a year's worth of learning growth. Therefore, the effect size of RTI should reach 0.4 over 3 years in one school year (Hattie, 2012). Offered to any student who performed below grade level on learning standards, mathematics content was the focus for this study.

Scale score. Previous researchers used state assessment data to compare student achievement (Morrissey et al., 2014; Reddy, Fabiano, Dudek, & Hsu, 2013). For this research, the Proficient level was defined as achieving a score in the proficient range on the MAP assessment. The Advanced level was defined as achieving a score in the advanced range on the MAP assessment. DRC's Guide to Interpreting Results for 2018 and 2019 determined the scoring range for each grade level and content area assessed. In

2018, the scoring range for Below Basic is 260 to 387, Basic is 388 to 416, Proficient is 417 to 437, and Advanced is 438 to 580. The ranges in each category are not consistent. In 2019, the scoring range for Below Basic is 260 to 387, Basic is 388 to 416, Proficient is 417 to 437, and Advanced is 438 to 580. The ranges in each category are not consistent. Figure 1 displays the information set by DRC for the 2019 assessment. This scholarly research focused on Proficient and Advanced scores.

Figure 1. 2019 sixth-grade Missouri Assessment Program score range set by the Data Recognition Corporation.
Note. From Missouri assessment program grade-level assessments: Guide to interpreting results, by Data Recognition Corporation, 2019, retrieved from https://dese.mo.gov/sites /default/files/asmt-gl-gir-spring-2019.pdf

This section provided a foundation for consistent vocabulary. The researcher applied these terms throughout the research process and the analysis of the results. Documentation for each term was provided.

Significance of the Study: Response to Intervention in Sixth-Grade Mathematics

This study is significant to professional practice because, although some teachers at JMS have provided RTI instruction, it was not offered at all grade levels and to all

students. This created an education environment that was not equitable to all students at JMS. Additionally, not all schools in the United States offer RTI. As a result, RTI being offered as some schools and not offered at all schools should be considered a barrier.

A gap exists in research on RTI when studying mathematics, specifically at the sixth-grade level. Researchers suggested that special-education teachers and regular-education teachers provide explicit instructional time through the systematic approach of RTI (Vaughn & Fuchs, 2003; Visible Learning, 2017). Because of a difference in 2015 through 2018 mathematics MAP scores for students identified as eligible to receive RTI and those ineligible at JMS (DESE, 2017a, 2017b), Jonah School District administration created a structural change to allow most students to have access to RTI in the school day.

Studies showed a performance gap for students eligible for FRL across the United States (Cameron et al., 2015; G. Duncan & Brooks-Gunn, 1997; Morrissey et al., 2014; Payne, 1996). For example, researchers described how students learn (Reddy et al., 2013), how instruction can affect student performance (Bolshakova et al., 2011; Graves et al., 2011), and the effects of attendance on student performance (Cleary et al., 2017; Morrissey et al., 2014). A negative correlation exists between student academic performance on state standardized tests and family resources such as finances, time for communication regarding education, and family involvement (Epstein, 2010; Hattie, 2012). The above examples provide additional evidence that students eligible for FRL have additional learning barriers compared to students who do not qualify for FRL.

G. Duncan and Brooks-Gunn (1997), Cameron et al. (2015), and Morrissey et al. (2014) studied poverty and its effects on children; however, studies completed in Jonah

on poverty and state assessment are limited. This scholarly research study contributes insight for educational leaders who plan to implement RTI as an improvement strategy to measure the effect on state assessment scores for students eligible for FRL. The researcher has made suggestions to district leaders on the implementation of RTI in the district, based on the evidence of the research.

Summary

Multiple factors can impact student learning. The current research effect size of RTI is for more than 2 years of learning occurring in a single year (Hattie, 2012; Visible Learning, 2017). With such a high educational impact, early intervention is necessary. Research indicates that the younger the age, the more likely students respond positively to learning mediations (Cameron et al., 2015; Early et al., 2016; O'Dwyer et al., 2016).

Educators measure student learning in a variety of ways at different ages. In the United States, middle school students are typically between the ages of 10 and 15 (A. Duncan, 2011). Public school students take state and national standardized testing as one method of assessing student learning. Educators have used feedback from state-level assessments to guide interventions that impact district accountability (Reddy et al., 2013; Securro, Jones, Cantrell, & Blackwell, 2006).

This study took place at JMS. The purpose of this quantitative research was to identify if an impact emerges from schoolwide RTI on 2019 sixth-grade mathematics state-assessment student achievement for students eligible for FRL at JMS. The theory supporting this research is data-informed decision-making (Datnow & Park, 2014). The researcher used this scholarly research to contribute to public school educational decisions and policies in Jonah.

SECTION TWO

PRACTITIONER SETTING FOR THE STUDY IN JONAH SCHOOL DISTRICT

Initially associated with special education, RTI was initiated early in the 21st century (Individuals with Disabilities Education Act, 2004). Through the many changes in the United States, educational reforms such as the Individuals with Disabilities Act, NCLB, and Every Student Succeeds Act [ESSA], the national focus has broadened to include all levels of learners (Buffum et al., 2018). This research is grounded in the studies of Buffum et al. (2018). The definition of RTI can be found in the section of this research titled *Definition of Key Terms*.

DESE does not require schools to offer RTI, but does monitor student learning through a state assessment, the Missouri Assessment Program (MAP). The MAP test is given each spring to public school students in Grade 3 through 8 in the subjects of mathematics and English Language Arts. Grades 5 and 8 also take the MAP in science. The focus of this study was in Grade 6 mathematics (DESE, 2018d). Each year, DESE evaluates districts through an Annual Performance Report (DESE, 2019e). As a result, districts can compare performance and begin to dialogue about strengths and needed growth opportunities (DESE, 2019e).

The Jonah School District requires the four schools in the district to address the needs of all learners. As a result, schools put interventions in place to monitor and guide student learning. At JMS, students who do not master grade-level learning objectives are provided additional time in the school day for remedial instruction through RTI.

History of Organization

History of Schools in Jonah

Established in 1855 (Jonah Missouri History, n.d.), Jonah was built to grow with the railroad system. During the town's initial population boom, the population went from about 100 to over 3,000 in less than 20 years (The City of Jonah, n.d.). The town grew with the railroad industry and manufacturing warehouses. When the railroad in Jonah ceased to exist, the population began to level out. In 2019, some employers in Jonah included a state penitentiary, a trucking warehouse, several nation-wide and local stores and several nation-wide and local restaurants.

In 1843, the first school established was in Sherry (pseudonym) Township just over a mile out of Jonah city limits ("School buildings show development," 1984). As the town and surrounding communities began to grow, the district began to grow. In 1871, the Board of Education was formed, closely followed by the opening of a new school building in 1873 ("School buildings show development," 1984). The district then encompassed a first through 12th-grade school along with several other one-room school houses outside city limits. In 1914, two schools located inside city limits provided services to more than 700 students in Grades 1 through 12 (Zimmerman, 2005).

As growth continued, the district built a new elementary school in 1923 ("School buildings show development," 1984). This building brought all students in Grades 1 through 6 together. All but one of the schools served only students who identified as White. Students identified as Black went to the Douglas school until 1955 ("School buildings show development," 1984; Zimmerman, 2005). The *Brown v. Board of*

Education (1954) Supreme Court decision required school districts to do away with segregation in schools.

In 1963, the district built a new high school (Zimmerman, 2005). Several additions were added to this building throughout its more than 50 years of existence. In 1974, elementary students relocated to another new building (Zimmerman, 2005). In the 1990s, continued growth led to a new middle school for Grades 5 through 8, causing the elementary school to serve students in Grades K through 4.

The most recent addition to the Jonah School District occurred in 2015 with the addition of a new middle school, now known as JMS. Although JMS is not high-poverty nor high-minority, it is a rural middle school in which equity of resources is affected. Therefore, the application of this study to a school with high-poverty or high-minority could be a barrier. Currently, the district houses four schools. An elementary building serves students in Grades K through 2, an intermediate school serves students in Grades 3 through 5, a middle school houses students in Grades 6 through 8, and a high school serves those in Grades 9 through 12.

Disaggregated Data of Jonah

Currently, the two largest populations of people identify as either White/Caucasian or Black/African American (*World Population Review,* 2019). According to *World Population Review* (2019), in Jonah more than over 87% of adults identified as White have a high school diploma, whereas about 14% have a bachelor's degree. In contrast, 72% of adults identified as Black have a high school diploma, and less than 1% have a bachelor's degree. The average income for an adult in Jonah is

$31,176 (*World Population Review*, 2019). Additionally, the overall poverty rate in Jonah is 19.38% (*World Population Review*, 2019). See Figure 2 for the demographics of Jonah.

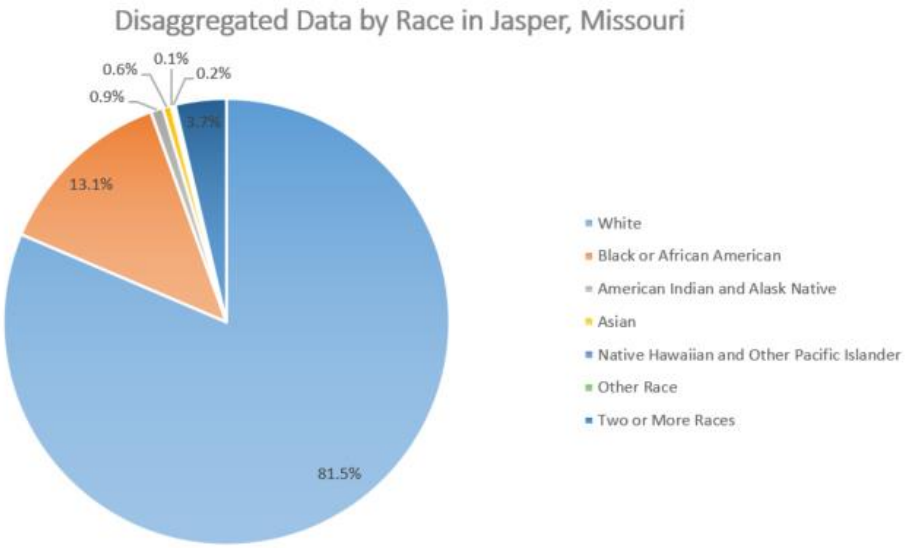


Figure 2. Disaggregated data by race for Jonah, Missouri.
Note. Adapted from Jonah, Missouri population 2019, by *World Population Review*, 2019, retrieved from http://worldpopulationreview.com/us-cities/Jonah-mo-population/

Jonah, Missouri's location at the intersection of two highways provided growth in the population, as was hoped when the town was settled (The City of Jonah, n.d.). As evidenced by the disaggregated data, the town of Jonah has diversity in its population. As identified in Table 4, student demographic data is similar to the adult population identified in Figure 2. The majority of both populations are White. JMS has neither high nor low poverty rate when compared to students throughout Missouri, with about half of the students eligible for FRL 2019 (NCES, 2019b, 2019c). The town also has a history of supporting new additions to the school district.

Table 5 displays the teaching assignments and disaggregated data for the 2019 teachers at JMS. Please note that special education teachers are included with core teacher numbers. For example, the Grade 6 ELA special education teacher is included in the number with all Grade 6 ELA teachers. It should also be noted that Grades 7 and 8

share a math teacher and Grades 6, 7, and 8 share a mathematics special education teacher. Because non-core teachers teach all three grade levels, they are not associated with one grade level in Table 5. See the *Definition of Key Terms* for the explicit description of core teacher.

Table 5

2019 Teaching Assignments and Disaggregated Data for Jonah Middle School

Category	Number of teachers	Percent of teachers
Teachers	30	100.0
Male	11	36.7
Female	19	63.3
Core Teachers	19	63.3
Non-Core Teachers	11	36.7
Grade 6 Core Teachers	6	20.0
Grade 7 Core Teachers	7	23.3
Grade 8 Core Teachers	7	23.3
Teachers identifying as White, non-Hispanic	30	100.0

Note: Grade 7 Core teacher includes the shared Grade 7 and 8 mathematics teacher. Grade 8 Core Teacher includes the shared Grade 6, 7, and 8 mathematics special education teacher.

The teacher population at JMS reflects the student population of JMS, with 90% of the student population identifying as White, non-Hispanic and 100% of the teacher population identifying as White, non-Hispanic. The population of teachers identifying as male, 36.7%, does not reflect the population of students identifying as male, 52.2%. The population of teachers identifying as female, 63.3%, does not reflect the population of students identifying as female, 47.8%. Refer to Table 4 for disaggregated data for students at JMS.

Annual Standardized Testing, National Education Policy, Missouri Education Policy and Free and Reduced-Price Lunch Scores

History of standardized testing in the United States. In the United States, standardized dates back to 1840. One view of standardized testing is that "schools changed their mission from servicing the elite to educating the masses" (National Education Association, 2019). In contrast, schools use standardized testing to determine student learning and ability objectively (ProCon.org, 2018).

Originally, examinations were conducted orally, but changed to written examinations as the population of children attending school increased (U.S. Congress, 1992). Achievement level and age guided student groupings. Assessments were also used to monitor the effectiveness of schools. As testing evolved, in 1917 around the same time of World War I, assessments determined work placement based on intelligence level; during World War II, assessment outcomes determined where resources would be provided (U.S. Congress, 1992).

In 1929, Iowa became the first state to use statewide standardized testing (U.S. Congress 1992). In theory, the Iowa Test of Basic Skills determined the effectiveness of student knowledge and provided data to evaluate schools. However, the Iowa Test succeeded in the new area of implementing assessments throughout the state at a justifiable cost. Iowa's test began to be used throughout the nation. As a result, schools used standardized testing for more than monitoring student and school progress.

Not all educators support the use of standardized testing. A proponent against standardized testing, Kohn (2000), wrote about this perspective regarding what

standardized tests reveal. Kohn argued that using standardized testing to measure student knowledge is not possible.

> The main thing they tell us is how big the students' houses are. Research has repeatedly found that the amount of poverty in the communities where schools are located, along with other variables having nothing to do with what happens in classrooms, accounts for the great majority of the difference in test scores from one area to the next. (Kohn, 2000, p. 7)

Nonetheless, throughout the United States, students enrolled in public schools continue to take standardized assessments at the state level, such as the MAP, and at the national level, such as the American College Testing.

National education policy. In 1965, Congress passed the Elementary and Secondary Education Act (1965) in conjunction with President Johnson's focus on poverty. The legislation required the federal government and state governments to use educational funding to eliminate poverty. In turn, states became more involved in the implementation and making of education policies to reach equal educational all.

In 1983, *A Nation at Risk* (National Commission on Excellence in Education) compared student performance in the United States with student performance in countries across the globe. This report accused the U.S. educational system of substandard performance when compared to other countries. The 1983 report claimed students were unable to make high-order decisions, scores on the national standardized Scholastic Aptitude Test were dropping, and illiteracy had increased. Not wanting to ignore the concerns, President Reagan took action. Changes focused on "four important aspects of the educational process: content, expectation, time, and teaching" (National Commission

on Excellence in Education, 1983, p. 17). As a result, the United States became competitive in education.

Educational policies continue to be a focus for U.S. presidents. Signed by former President G. W. Bush in 2002, the NCLB became law. The purpose of NCLB included increasing the academic performance of students in poverty and those who were historically underrepresented. By reinforcing the Elementary and Secondary Education Act of 1965 through NCLB, the federal government increased its role in public education again. To monitor school progress, focus enlarged on learning and achievement, measured through standardized testing. Educators placed students into categories identified as subgroups, including student classification by race, eligibility for FRL, and special education.

APR calculated school progress and success as part of NCLB. The APR report includes student performance for the current year, comparing scores to previous years. It also monitors the growth of subgroups as disaggregated data, special education, and FRL eligibility. Schools showing growth would be rewarded whereas those consistently underperforming would be penalized (NCLB, 2001).

In 2011, the Obama administration began the Race to the Top Act (RTTT). RTTT allowed state governments to request funds for assistance (U.S. Department of Education, 2009). This was a grant funded program, not a federal mandate. Begin grant funded, RTTT required schools to apply for funding based on different phases. Different states could apply during the three phases. Scores were given to the applications, which in turn determined funding (U.S. Department of Education, 2009). Missouri did not apply for the RTTT grant.

The primary purpose of RTTT was to decrease the performance gap in subgroups and increase student achievement, measured by state standardized testing and high school graduation rates (U.S. Department of Education, 2009). A secondary purpose included a focus on the application of science and mathematics through curriculum while targeting the audience of "underrepresented groups and of women and girls in the areas of science, technology, engineering, and mathematics" (U.S. Department of Education, 2009, p. 4). Other desired outcomes focused on Grades Prekindergarten through 3 to support preparation for school. Finally, states developed data-collection systems to track the learning progress of subgroups and postsecondary education. Finally, curriculum alignments across content areas and through all grade levels was expected to take place at the national, state, and local levels.

Unlike RTTT, ESSA was a federal mandate. This meant that participation was not optional and there was no application for funding. See the *Definition of Terms* section for the explicit definition of ESSA. President Obama's continued focus on education was also evident through the ESSA of 2015. This was another example of reinstating President Johnson's Elementary and Secondary Education Act. ESSA required, by law, that high academic standards are taught to students in public school. Reinforcing the pillars of RTTT, ESSA focused on early childhood learning, monitoring the progress of students who are historically marginalized, and accountability for underperforming schools. Statewide standards assessments monitor state, district, and student progress toward these requirements.

Missouri education policy. DESE collects data, as directed by national policies. Although MAP was taken by students prior to ESSA, the data collected includes progress

monitoring of students through disaggregated data. Public school students in Grades 3 through 8 take the MAP test each year in the spring. The annual standardized assessment focuses on mathematics and ELA. Students in Grades 5 and 8 also take the MAP in science. This research focused on Grade 6 mathematics.

The State of Missouri has changed learning expectations four times since 2014 (DESE, 2018d). According to the DESE (2018d), the timeline when state-assessment results are provided to schools differs by year. For example, in 2017, MAP assessment results became available in August of 2017; in 2018, assessment results became available in November.

Teachers use state assessments to identify student learning gaps. Additionally, teachers align their curriculum with local and state assessments (Barley & Beesley, 2007). When the timeline for receiving test results is inconsistent, such as in the case of Missouri for the 2017–2018 school year, a delay occurs when applying results to timely focused school improvement. With assessment results received as late as November, teachers are challenged to apply the most current assessment data to implement RTI and adjust student placement for instruction.

Missouri also uses APR (DESE, 2018b). DESE applies the data from the MAP, academics, subgroup achievement, attendance, college and career readiness, and graduation rates for up to 7 years. Through this process, the state department compares current data with the same information from the previous 2 years. Based on findings, each measured category is identified as exceeding, on track, approaching, or floor (DESE, 2018b). The results of the APR guide individual district to identify any areas of strength or needed growth. At JMS in the sixth-grade, the only state assessment that is

given is the MAP test. Hence, the MAP assessment is used as a monitoring tool for this research. APR is another progress monitoring tool that provides data for ESSA.

In summary, the national government influenced state education. Through incentives, penalizations, and funding, states must show evidence of how student learning takes place. In turn, each state monitors student learning through standardized testing.

Eligibility for free and reduced-price lunch in Missouri. State-mandated standardized testing in Missouri is referenced as the MAP. Online reports for annual state standardized testing can be found on the DESE website starting in 2006 (DESE, 2019a). In 2006, 25% of the students identified as FRL scored in the Proficient and Advanced categories on the sixth-grade mathematics annual state assessment, whereas in JMS, 11% of students eligible for FRL scored Proficient or Advanced. This is a difference of 14%.

Since 2013, the annual state standardized testing for Missouri has used several different testing vendors including Smarter Balanced and DRC (DESE, 2019d). In 2014, students in Missouri public school took the annual state standardize test entirely online (DESE, 2019d). Additionally, Missouri experienced a change in teaching standards. Until 2014, Missouri's educators followed the Missouri Grade Level Expectations and Blueprints. From 2015 to 2017, Missouri schools followed the Common Core State Standards. Beginning in 2018, Missouri Learning Standards (MLS) were put in place (DESE, 2019g). The MLS were heavily influenced by the CCSS. Due to the changing of test vendors and instructed standards, monitoring progress through state standardized testing was a barrier for schools.

According to the DESE Achievement Level 4 Report: Public (2019a), students in the sixth-grade mathematics at JMS who are eligible for FRL have increased in number

from 2006–2014. The Achievement Level 4 Report: Public indicated there was “no data available or cell value is too small” for students eligible for FRL scoring in the Advanced category from 2006 to 2014. During this time period, state assessments are comparable, as the test covered the same state standards. Figure 3 compares the results for students at JMS eligible and not eligible for FRL who scored in the Proficient category on the MAP test between 2006 and 2012.

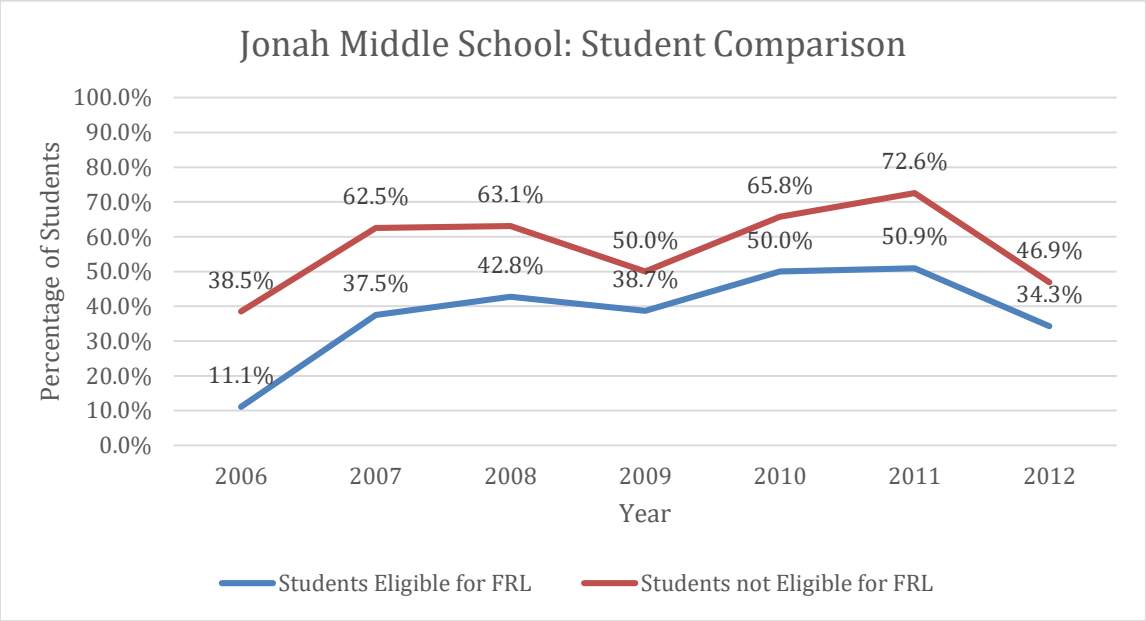


Figure 3. 2006–2014 Achievement level results for sixth grade mathematics for Jonah, Missouri.
Note. Adapted from *Achievement Level 4 Report: Public*, by Missouri Department of Elementary and Secondary Education, 2019a, retrieved from https://apps.dese.mo.gov /MCDS/Reports/SSRS_Print.aspx

From 2015 to 2017, students eligible for FRL at JMS consistently scored above the state average on the annual assessment. During this time period, state assessments are comparable, as the test covered the same state standards. Previous years are not comparable due to the assessment covering different learning standards. JMS scored 6.9% higher in 2015, 19.5% higher in 2016, and 4.8% higher in 2017. Figure 4 provides a

comparison between JMS and the State of Missouri overall MAP scores for 2015 through 2017.

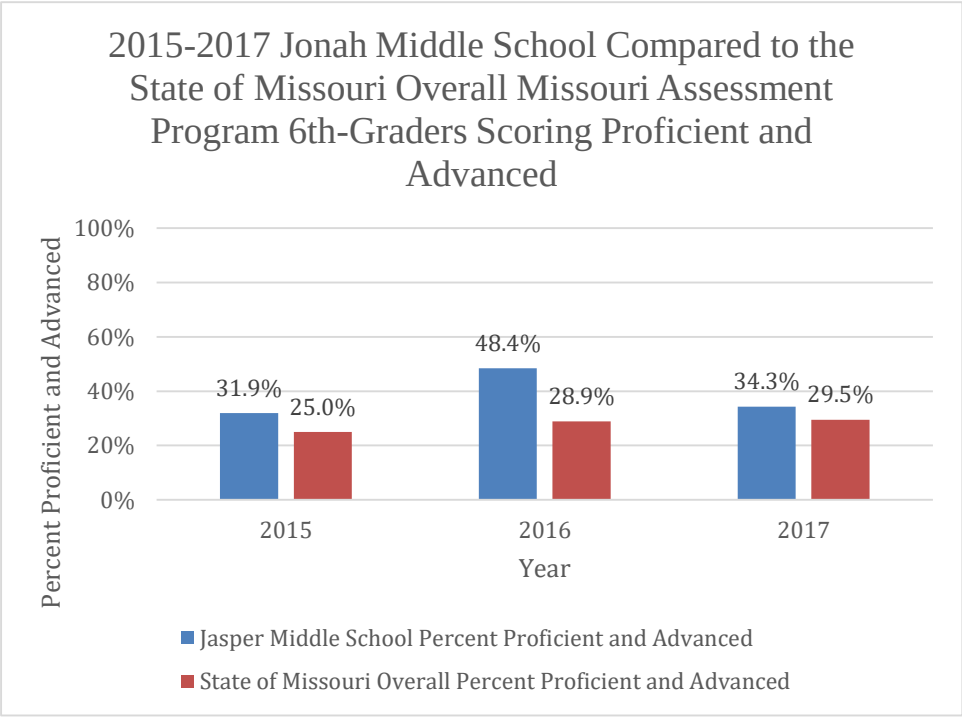


Figure 4. 2015–2017 Jonah Middle School compared to the State of Missouri overall Missouri Assessment Program test scores.
Note. Adapted from *Achievement Level 4 Report: Public*, by Missouri Department of Elementary and Secondary Education, 2019a, retrieved from https://apps.dese.mo.gov /MCDS/Reports/SSRS_Print.aspx

Data from 2018 and 2019 cannot be compared to previous data, as the assessment covers different learning standards. In 2018, students at JMS eligible for FRL scored 0.2% higher when compared to the state average. In 2019, students eligible for FRL at JMS scored 3.6% below the state average. This decrease in performance is discussed further in the recommendations section. See Figure 5 for a comparison between JMS and the State of Missouri overall MAP scores.

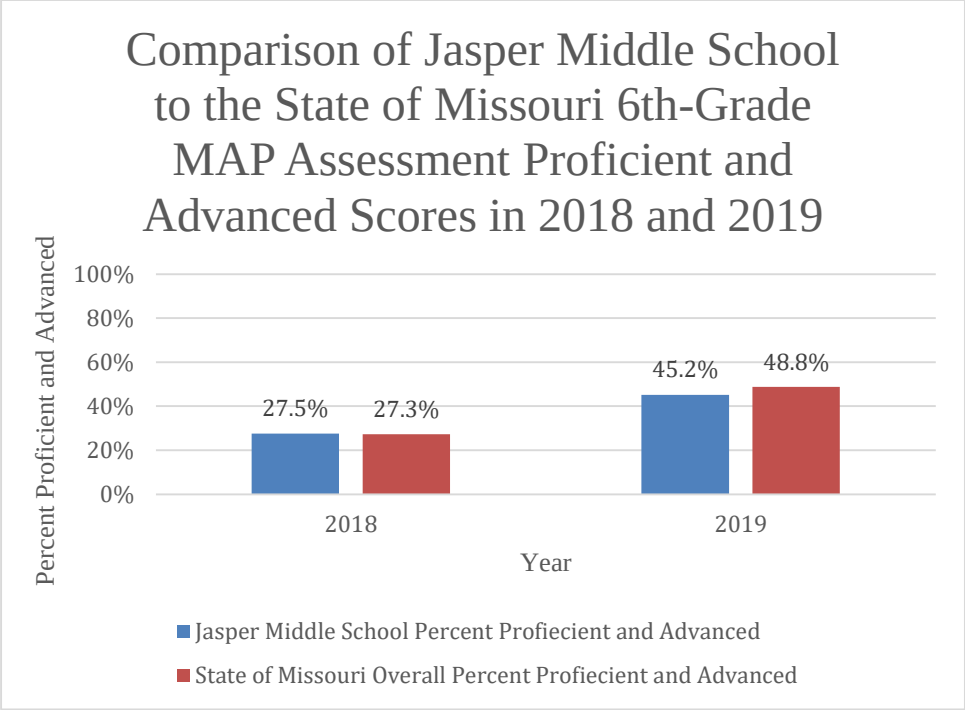


Figure 5. 2018–2019 Jonah Middle School scores compared to the State of Missouri overall Missouri Assessment Program test scores.
Note. Adapted from *Achievement Level 4 Report: Public*, by Missouri Department of Elementary and Secondary Education, 2019a, retrieved from https://apps.dese.mo.gov /MCDS/Reports/SSRS_Print.aspx

Organizational Analysis

Like the construction of a building, many external influences affect a public school system. Using the Bolman and Deal (2013) framework, the public school system can be seen through structural, political, human resources, and symbolic frames. First, the structure of the school district must have a firm foundation. Then, as the district honors adjustment and new ideas, it must consider political influences. With so many ideas for improvement and changes, voices need a place to be honored through human resources. Finally, like the insignia of a company, the school is a symbol to the public of what traditions are valued and where the future will lead the community through its younger generations.

Bolman and Deal's Structural Frame

Jonah School District. The school district, as a whole, provides educational opportunities to students in Prekindergarten through 12th grade. The district provides equal opportunity for education to all students in the district boundaries. Employees for the district live in and outside city limits.

JMS aligns with a traditional Missouri and U.S. K–12 public school educational system. It has a school board consisting of seven elected individuals and has one superintendent and one assistant superintendent. These members are expected to follow the statutes set at the national, state, and local levels. Building administrators take direction from school board members and superintendents in the hierarchy of the school system. These administrators lead a building of students grouped by age and grade, along with certified and uncertified employees.

The building principal and assistant principal lead JMS. All staff members, curriculum work, and the application of board procedures and policies fall directly under the supervision of the principal, whereas the assistant principal primarily supervises student behavior and building operations. To support the structural frame of the district, responsibilities of administration align with the hierarchy of building responsibilities.

Although JMS groups students according to grade level, it also groups teachers according to grade level taught. Teachers have two planning periods. Because a double plan time does not occur in all school, this should be considered a barrier when applying this research to schools with one plan time. This grouping allows teachers to meet daily during plan time to discuss students, discuss cross-curricular implementation in all subject areas, and to discuss other building wide programs, policies, and procedures.

During the team planning time, the assistant principal meets weekly with teachers at each grade level to discuss discipline strategies; the counselor meets weekly with teams to discuss student concerns; and the principal meets weekly with teams to discuss grading practices, curriculum, and RTI class. Additionally, grade-level teachers have a second planning time to prepare lessons, align curriculum, grade papers, and contact parents. See Figure 6 for the hierarchy structure of Jonah School District.

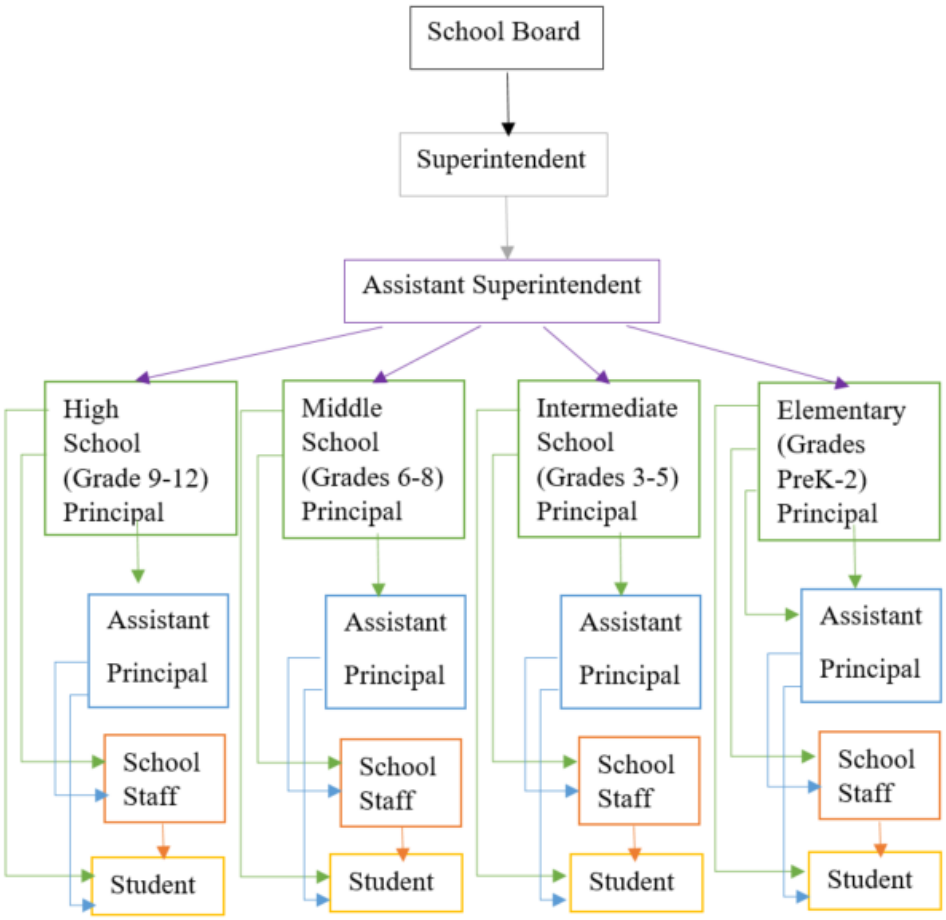


Figure 6. Jonah School District hierarchy.

Response to Intervention (RTI). RTI is a 45-minute class period offered to all students at JMS except those enrolled in self-contained special-education and gifted classrooms. Teachers at each grade level use state and classroom assessments to

determine individual student progress, based on the Missouri Learning Standards (MLS). Curriculum for RTI builds on the content-area scope and sequence for the learning standards.

Bolman and Deal's Human-Resources Frame

If a student is performing below grade level in mathematics or ELA, they are assigned to attend either mathematics or ELA RTI for a 2-week time period. At the end of the time period, teachers reassess student learning. Then, teachers either relocate students to a different classroom or the student remains in the focused-content-area classroom.

RTI classrooms are separated five ways. Two rooms provide mathematics intervention and two rooms provide ELA intervention. Rooms are also divided in that one classroom is performing slightly below grade level while the other is significantly below grade level in the respective content areas. The other classroom has students who have met the learning standards for both content areas and are working on enrichment learning through mathematics and ELA content. See Figure 7 for the five classroom RTI structure at JMS.

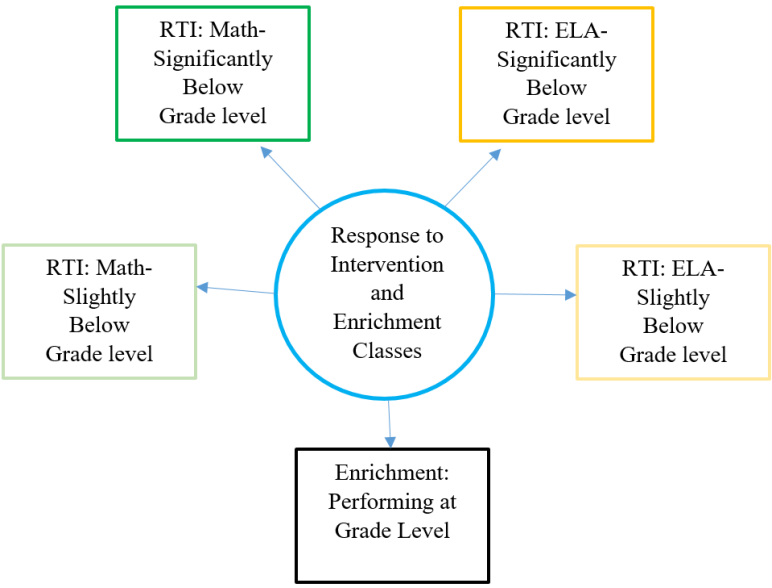


Figure 7. Jonah Middle School's five-classroom response-to-intervention structure.

Bolman and Deal's Political Frame

Like many other public school districts in the United States, Jonah School District has a governing board led by elected members. As people campaign for votes, candidates find issues important to their target audience. Looking at the political aspect of the Board of Education, members are expected to focus on the best interest of students. However, sometimes campaigned promises can become an individual's goal such that an individual advocates their own agenda and ideas to be submitted and approved. As a result, coalitions can form. To overcome the emergence of coalitions, the board holds administrators accountable and administrators hold the board accountable.

The Jonah School District Board of Education votes to approve the district and individual-building financial resources on a yearly basis. Although the superintendent sets the district budget, specific principals set building budgets. To ensure the board, superintendent, and principals are good stewards of their financial resources,

administrators report monthly to the board of progress in the building. Using this system of checks and balances, the district can monitor and regulate finances.

As directed by the assistant superintendent, building principals are responsible for reporting on student-learning progress. The MAP is a state standardized assessment used as a student-learning indicator throughout Missouri for public schools. The JMS building principal reports to the assistant superintendent, superintendent, and school board regarding these scores. Information shared includes scores of the prior year and current building scores, compared to the state average.

Bolman and Deal's Symbolic Frame

JMS mirrors other middle schools in the United States. The school services students in Grades 6 through 8. JMS values leadership. Students have leadership roles through morning announcements, building wide assemblies, grade-level presentations, and extracurricular activities, such as sports and clubs. Because teachers are encouraged to bring their passion to their role as instructor, they may serve outside the classroom. Almost all teachers coach or volunteer to serve on at least one committee. Bolman and Deal (2013) indicated that combining the strengths and passions of all people involved, while honoring the greatness of individuality, identity, and cooperation, schools may be more effective.

As a result, students and teachers find opportunities to celebrate individual, grade level, and building wide successes. When all members of the JMS family work together, synergy emerges. JMS operates through individuals taking ownership through leadership.

Leadership Analysis

When a group of people, led by an individual, begin with a common goal and work together to achieve the goal, leadership comes to fruition (Northouse, 2016). As a result, different leadership approaches occur in multiple arenas, including public schools. Therefore, those placed in leadership positions by vote, choice, or contract must work together to maximize student potential.

Stogdill's Trait Approach

Galton (1869) identified traits of leadership focused on the effect of leaders on their surroundings, and specific characteristics of individual leaders. Stogdill (1974) identified traits common among people in leadership roles. Findings revealed themes including the ability to complete a task, taking risks, and intrinsic motivation. Bryman (1992) described the trait approach as personality characteristics. As a result, this approach focuses on relationships in the social setting. Because organizations can have many different social settings, the trait approach can change from one setting to the next.

In the Jonah School District, leaders are traditionally viewed as the superintendent, assistant superintendent, principals, and assistant principals. These individuals adjust their leadership styles to meet the needs of those with whom they are working. As a result, each practices leading and being led, to enhance learning opportunities. The JMS principal exhibits the trait approach. By focusing on fact finding and follow through, the principal gathers information to determine who is the most capable to lead or share leadership, based on the needs of the group.

At JMS, however, teachers and students also serve in a leadership capacity. By the nature of the profession, teachers facilitate student learning, making them leaders by

position. Students, in contrast, determine their capacity to lead. For example, when offered an opportunity to work in a group setting, students combine their individual responsibilities to ensure the overall objective is met.

George's Authentic Approach

Authentic leadership has a practical and theoretical approach. According to George (2003), authentic leaders understand who they are, have values and relationships, and are disciplined and passionate. The four parts of theoretical authentic leadership are being self-aware, looking at situations from a moral perspective, self-regulation, and being transparent (Northouse, 2016). Through the overlap stands authentic leadership.

The assistant superintendent for the Jonah School District exhibits authentic leadership traits. The assistant superintendent considers the opinions of others when disseminating information. Relying strongly on understanding the difference between right and wrong while speaking up for those without a symbolic voice, the assistant superintendent leads the district with confidence.

The principal at JMS also demonstrates authentic leadership qualities. By having a strong sense of self and being grounded in morality, the principal guides others. As a result, the principal depends on other members of the school community to implement a system of checks and balances to attempt to ensure the principal is honoring the needs of others.

Spears's Servant Approach

Greenleaf (1970) initially researched the notion of servant leadership. This style of leader focuses on people practice leadership through the viewpoint of the leader. Servant leadership means being conscientious of the needs of others, while nurturing and

encouraging growth and development (Northouse, 2016). Using Spears's (2002) list of servant-leader characteristics, the approach includes listening, empathy, healing, awareness, persuasion, conceptualization, foresight, stewardship, and a commitment to people and the community. The Jonah School District superintendent exhibits this leadership approach.

The superintendent needs to understand the political needs of the school board, the structural needs of the district, the expectations of the staff, and the desires of the community (Bolman & Deal, 2013). The superintendent's responsibilities include viewing the district as a whole and through its parts. To do so, the superintendent uses personal strengths of persuasion and awareness to empathize when needed. By gathering opinions of the community, the superintendent can guide others through conceptualization and foresight for committees to work toward an agreed common goal.

The superintendent meets with head principals on a monthly basis to hold building leaders accountable. During this time, the superintendent listens to the needs of individual buildings and facilitates solution-oriented thinking. Like a true servant leader, the superintendent uses empathy by acknowledging needs and wants throughout the school district, balancing the needs of honoring the political and diverse demands of the community.

Implications for Research in the Practitioner Setting

Because of this study, additional research could lead to building-wide RTI in middle schools using DDDM theory. Additionally, policy changes could enhance focus during RTI on Missouri Learning Standards.

Datnow and Park's Data-Driven Decision-Making Theory

Using student data to drive instruction is part of the reflective process for educators. How people interact, how policies influence intended and unintended consequences, common practices for schools, and finding patterns in data all influence educational reform (Carnegie Foundation for the Advancement of Teaching, 2019; Datnow & Park, 2014; Holmes, 2010). Gilbert's (1978) process of measuring human competence produced a results-focused view of behaviors, which is the essence of DDDM: reform through reflection by looking at the systems in place, determining how inputs effect outputs, reflecting, and making change in a cyclical pattern (Datnow & Park, 2014; Gilbert, 1978; Mandinach, 2012). DDDM theory could provide a guiding structure for policy reform. If applied, this theory could drive learning interventions for students and facilitate instructional changes for educators.

Nationally, and in Missouri, stakeholders increasingly advocate rigor throughout schools (ESSA, 2015; Mandinach, 2012). Mandinach (2012) wrote, "an abyss has been created between data for compliance and data to inform teaching and learning" (p. 72). Applying data to school reform creates newly discovered opportunities to improve.

Considerations of Educator Time for Planning

Planning for effective instruction to provide effective remediation can be cumbersome for teachers. As a result, additional research should be conducted to determine the amount of additional daily time needed for lesson planning to develop a sufficient RTI program (Vaughn & Fuchs, 2003). Ideas to consider should include time to collaborate with other grade-level and content teachers and time to reflect on individual student-learning progress and goals (Buffum et al., 2018; Hattie, 2009, 2012). Schools

should provide an hour for planning each week for all core instructional teachers (Buffum et al., 2018). Because all teachers are responsible for knowing individual student strengths and needed growth, it is a non-negotiable expectation for all teachers to review student-learning data. Further research should determine which subjects should be included in the intervention process and which subject should be excluded, if any.

Considerations for Collaboration for Student Needs

Through the lens of DDDM, teachers need to collaborate to discuss student learning needs. Time should be imbedded for teachers to share student progress. Data should be visible in order to facilitate trust in conversations between teachers. Goals should be set and reviewed in frequent intervals (Hattie, 2012). Within the collaboration time, instructional strategies should be discussed (Buffum et al., 2018; Hattie, 2012). With the focus of the collaboration on student achievement, the teachers can support "…the long-term goals of equity and excellence" (Reeves, 2011, p. 24). By tracking student progress, instructional strategies applied, and reflecting on the results, the data cycle should then be repeated (Datnow & Park, 2014; Hattie, 2012).

Summary

Jonah School District leaders have many leadership styles including trait, authentic, and servant. These leadership tendencies guide the district to enhanced learning for students and staff. The district has a structural organization similar to other districts in the United States.

Through RTI processes of data collection and teacher reflection, the focus centers on learning and growing for students and staff. Through the reflection process, changes in

practice lead to policy reform. The combination of leadership practices, data collection, and reflection create a prosperous environment for learning.

SECTION THREE

SCHOLARLY REVIEW

Introduction to the Problem

This study provides a quantitative analysis of the impact of RTI on 2019 sixth-grade rural public middle school MAP performance by FRL eligibility. The conceptual underpinnings to this research are RTI, annual state standardized testing, and FRL. Using the theoretical underpinning of Datnow and Park's (2014) DDDM, the conceptual frameworks overlap.

Review of Extant Literature

Defining Response to Intervention (RTI)

According to Buffum et al. (2018), RTI is a class offered during the school day to all students at least twice a week for 45 minutes where new learning objectives are not instructed. See the *Glossary of Terms* for a more concise definition. Not all schools in the United States offer RTI. As a result, not all interventions offered from district to district and school to school are equitable. This means that not all students have equitable access to intervention services. RTI uses a three-tiered approach. See Figure 18 for the ideal structure for the tiered approach.

Tier 1 includes establishing a baseline of performance on learning objectives while providing whole group interventions for 2 or more weeks (Buffum et al., 2018; D. W. Peterson et al., 2019; RTI Action Network, 2019). Tier 2 interventions take place in a small-group setting, supporting current learning standards through additional instruction time lasting 2 to 4 weeks. Tier 3 interventions provide intensive focus on specific deficit skills for individual students. Assessments, such as checking for mastery of the learning

objective, should be ongoing. As a result, a student is placed in the RTI setting upon demonstrating the student has not mastered the learning, but would be removed from the RTI setting upon demonstrating the learning has been mastered. Teachers closely monitor student learning through daily in-class assessments and provide instruction through research-based strategies (D. W. Peterson et al., 2019; RTI Action Network, 2019). See Figure 8 for the ideal response to intervention structure. Although researchers have studied the tiered approach to learning interventions, a gap persists in research regarding RTI in sixth-grade middle school mathematics at rural middle schools.

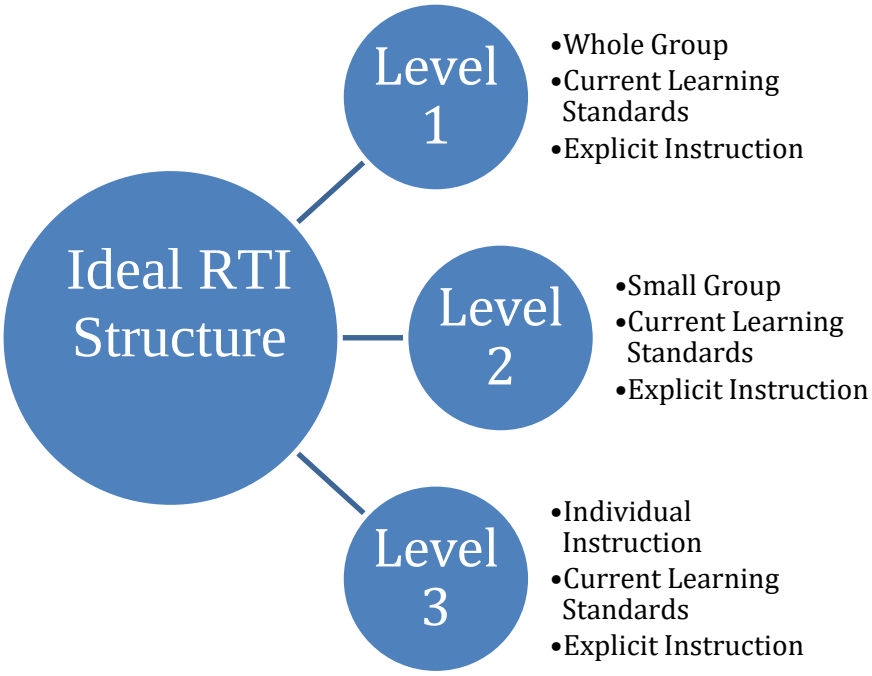


Figure 8. Ideal response to intervention structure.
Note. Adapted from *Taking Action: A Handbook for RTI at Work*, by A. Buffum, M. Mattos, & J. Malone, 2018, Bloomington, IN, US, Solution Tree Press.

Students move through the different tiers based on progress monitoring of the learning targets. For example, when student performance shows that a Tier 2 student needs additional intense remediation, the student will transition to Tier 3. As a result, student mobility throughout the tiers is fluid, but based on data.

History of response to intervention (RTI). Studying the effect of interventions on student behavior is not new to the world of education. Kratochwill and Bijou (1987) focused on the impact of the learning environment on student behavior. In its most basic form, the influence of what is happening around the student impacts the individual's reaction or learning outcome. Introduced in 2004, RTI was tied to the reauthorization of the Individuals with Disabilities Act (Special Education Guide, 2019). This meant that schools throughout the United States would need to use interventions prior to testing students for special education. As a result, RTI connected to students in special-education, but schools were discouraged from using RTI with all students. However, subsequent research showed that RTI can impact all students at a variety of learning levels (Buffum et al., 2018; Graden, Stollar, & Roth, 2019; RTI Action Network, 2019).

Principals perceive that a systematic structure to support student learning is important (Barley & Beesley, 2007). This type of reinforcement could help schools develop models of effectiveness. Hattie's research showed an effect size of 1.29 for RTI (Hattie, as cited in Killan, 2017). A 0.4 effect size is defined as the hinge point representing an average achievement gain in a single school year (Hattie, 2012). Therefore, the effect size of 1.29 for RTI would represent an impact of almost 3 years of achievement in a single school year.

Tenets of response to intervention. Refer to the *Definition of Key Terms* for the explicit definition of RTI. Table 6 defines each tier of intervention.

Table 6

Definition of Tiered Instruction for Response to Intervention

Tier	Definition
1	Research-based instructional intervention provided to all students, providing a baseline for student learning
2	Occurs in a small group setting. Reinforces current learning standards
3	Intense one-on-one instruction targeted to deficits in skills for individual students

Note. Adapted from *Taking Action: A Handbook for RTI at Work*, by A. Buffum, M. Mattos, & J. Malone, 2018, Bloomington, IN, US, Solution Tree Press; "The Illinois Flexible Service Delivery Model: A Problem-Solving Model Initiative, by D. W. Peterson, D. P. Prasse, M. R. Shinn, & M. E. Swerdlik, 2019, in A. Jimerson, M. Burns, & A. VanDerHeyden (Eds.), *Handbook of Response to Intervention: The Science and Practice of Assessment and Intervention*, pp. 288–289, New York, NY, US, Springer; *What is RTI?*, by RTI Action Network, 2019, retrieved from http://www.rtinetwork.org/learn/what/whatisrti.

The first tier includes research-based strategies used by all instructors for all students (Buffum et al., 2018; RTI Action Network, 2019). Students in Tier 1 receive scientifically based instruction, focused on grade-level learning standards. Teachers screen students at designated intervals to identify students that are struggling on an ongoing basis.

According to Buffum et al. (2018), the first tier incorporates instruction on academic and social behaviors. See Table 7 for examples of behaviors.

Table 7

Tier 1 Academic and Social Behaviors

Academic behaviors	Social behaviors
Metacognition	Responsible for interactions with others
Self-concept	Language
Self-monitoring	Respect for materials and property
Motivation	Staying on task independently
Strategy	Attendance

Note: Adapted from *Taking Action: A Handbook for RTI at Work*, by A. Buffum, M. Mattos, & J. Malone, 2018, Bloomington, IN, US, Solution Tree Press, p. 139.

At the second tier, teachers provide more instructional time to students to support the learning standards that students have not yet mastered. Buffum et al. (2018) referenced this tier as “Interventions and Extensions” (p. 26). At JMS, students in Tier 2 receive extra time in the school day to remediate identified skills, content, and behavior deficits. Graves et al. (2011) identified a significant statistical difference in the effects of Tier 2 interventions on 100% of the students eligible for FRL included in their study.

Tier 2 interventions also address skill versus will. This means teachers must address grade-level learning standards while also addressing the behavioral needs of student will. Therefore, Tier 2 includes intervention taking place more than twice a week for at least 30 minutes, available for all students (Buffum et al., 2018). As a result, this process takes place during the school day, not only before or after school.

In the third tier, teachers provide acute interventions, such as tailored one-on-one assistance. As a result, only students who need additional reinforcement after working through Tiers 1 and 2 will receive Tier 3 instruction. This level incorporates a *site intervention team* that “primarily focuses on the individual needs of the most at-risk students” (Buffum et al., 2018, p. 234). The team views the student differently from regular-classroom teachers and should help identify ways to facilitate student success. Students identified as needing Tier 3 intervention should be considered for the students identified as most at-risk, who might also qualify for special-education services, and should reinforce the importance for special- and regular-education teachers to communicate about student learning (Graves et al, 2011; RTI Action Network, 2019).

Response to intervention at Jonah Middle School. Prior to the 2018–2019 school year, formalized RTI support only occurred in Grades 7 and 8 at JMS. Due to

scheduling conflicts, student in sixth-grade did not receive RTI. In August of 2018, however, that changed. The JMS principal developed a way to make the building schedule work for the 2018–2019 school year.

Providing interventions at a young age matters (Cameron et al., 2015; Early et al., 2016; Graves et al., 2011). As a result, it is vital for schools to intervene as soon as educators identify learning deficits. Therefore, students in sixth-grade are the youngest at JMS and were the focus of this research.

All students except gifted and functional education students were offered RTI. As a result, almost all students had equitable access to intervention services. According to the Missouri DESE (2015), JMS is considered rural as it is more than 25 miles away from a city which influence equitable access to resources.

See Figure 9 for a graphic representation of RTI at JMS. The implementation of RTI was intentionally instituted through a scaffold. RTI Level 1 occurred within the normal class-time setting. Instruction was provided to all students following the MLS.

RTI Level 2 occurred at a different time. While some students were receiving Level 2 RTI, gift students attended the gifted class. Students who performed at or above grade level attended enrichment class, as a result they did not receive RTI during that time. Level 2 RTI remained fluid in that students moved in and out of RTI class every two weeks. Instruction was based on previously taught learning standards. Class was 45-minutes and was offered daily.

It is important to note that Tier 3 RTI is not currently offered at JMS, which should be considered a barrier when applying this research. Tier 3 is not offered due to logistical challenges.

Mathematics and ELA teachers determine which Missouri Learning Standards need to be the main focus for certain times of the year. For the purpose of this study, mathematics will be the focus for RTI. Based on those learning objectives, educators assess students to determine their progression. To receive RTI instruction, students must perform below mastery on the learning objective.

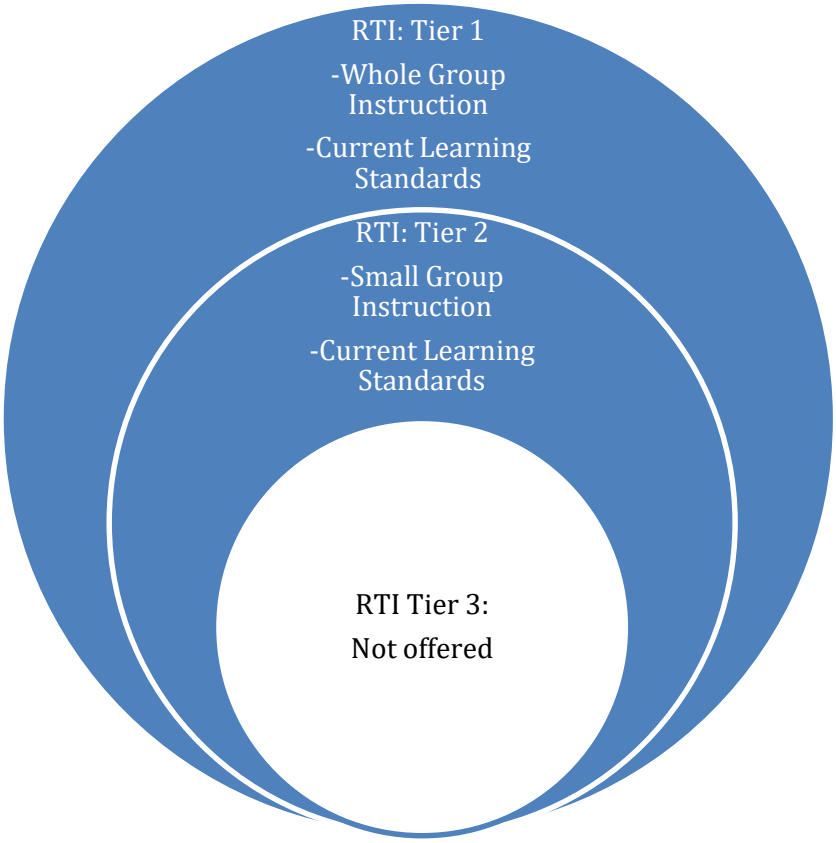


Figure 9. Jonah Middle School response to intervention structure.

Once a week, grade-level teachers meet to discuss student learning for 45 minutes. During the meeting, teachers discuss student learning while reviewing student work samples. They discuss trends in student data and teacher instruction. Data reviewed includes students' current classroom performance and state-assessment performance. See Table 8 for specific topics of discussion during the weekly RTI data team meeting.

Table 8

Student Data and Instructional Reflection Categories Used During Weekly Response to Intervention Data Team Meetings at Jonah Middle School

Student trends	Teacher trends
Strengths	Instructional Strategies
Learning misconceptions	Additional Interventions Needed
Mastery/Nonmastery of learning objective	

By synthesizing the needs of students across the grade level in mathematics and ELA, RTI class rosters are changed at least every two weeks. Therefore, if a student demonstrates mastery over the targeted learning objective, the student will be removed from the RTI classroom and placed in a different location. In contrast, if a student demonstrates additional intervention time is needed beyond the two-week suggested time frame, placement will not change. Finally, if a student needs intervention in mathematics and ELA, teachers have the autonomy to use additional data points, such as state testing, to determine where the student will be placed. Teachers also have the autonomy to alternate the students RTI placement every 2 weeks, if consistent intervention is needed in mathematics and ELA.

Annual Standardized Testing

Annual standardized testing impacts teachers and curriculum. Students eligible for FRL face barriers such as lower scores on state standardized-assessment (Cameron et al., 2015; G. Duncan & Brooks-Gunn, 1997; Morrissey et al., 2014; Payne, 1996). Like the rest of the nation, students eligible for FRL score lower on the MAP test required of all public school students enrolled in Grades 3 through 8 (DESE, 2019e). Kohn (2000) would contradict this notion by reinforcing the idea that a standardized test

does not reflect student knowledge; rather it reflects the financial status of the family. It is also common for students eligible for FRL to have less family involvement in the educational process (Epstein, 2010; Hattie, 2012). Because educators use state standardized testing to measure growth for schools and districts, curriculum design and implementation remain a focus.

Supervisors identify teachers of high-quality through evaluations (Reddy et al., 2013). These identified high-quality teachers, not surprisingly, have students with higher state test scores. Barley and Beesley (2007) wrote, "Alignment of curriculum and assessments with standards was named as a key component of student success in secondary schools" (p. 4). Systematic observations and professional development also had a positive impact on improving high school performance on state assessments in mathematics (Early et al., 2016). Interestingly, the inverse situation emerged on English assessment scores (Early et al., 2016).

Annual state standardized testing in Missouri. State standardized testing occurs in the spring in Missouri. Students attending public schools in Grades 3 through 8 are assessed in mathematics and English Language Arts, while only Grades 5 and 8 are also assessed in science (DESE, 2019b). For the purpose of this research, mathematics in Grade 6 will be the focus.

State standards, corresponding assessment vendors, and assessment in Missouri have changed since 2014 (DESE, 2019g). In 2014, the MAP test aligned with Missouri's Grade-Level Expectations (GLE). From 2015 to 2017, Missouri adopted the Common Core State Standards. Throughout this time, the state hired two different testing vendors: Smarter Balanced and DRC.

In 2017, Missouri law required teachers to follow the newly developed Missouri Learning Standards, replacing the use of Common Core State Standards (DESE, 2019g). Mandated by law in 2017, teachers implemented the Missouri Learning Standards. However, the state development timeline for a new assessment did not provide adequate time to design and write state assessment items fully aligned with the Missouri Learning Standards. Once again, a modified assessment administered in schools prohibited comparative analysis of longitudinal scores. DRC assessments and the new Missouri Learning Standards alignment occurred in 2018 (DRC, 2017, 2019). In turn, this alignment created the baseline for all future assessments.

MAP results are considered an indicator in Missouri's APR (DESE, 2018b). State assessment is used as one measurement indicator for the State Systematic Improvement Plan (DESE, 2018b). The Missouri School Improvement Plan is the result of a process of evaluating the effectiveness of schools. The APR is part of that plan. The APR has four categories, depending on when data were collected: academic achievement, subgroup achievement, college and career readiness, and attendance (DESE, 2018b). Using APR data, districts create a comprehensive improvement plan addressing districtwide goals. From there, buildings create a targeted improvement plan. For example, one of the goals for JMS is for staff and students to electronically track learning on formal and informal assessments throughout the school year. A specific area the state is monitoring through the MAP test is "the percent of students with disabilities in grades three to eight and in their test grade in high school who performs at proficiency levels in English Language Arts" (DESE, 2018b, p. 7). Therefore, because the only state-level assessment given to students in sixth-grade is the MAP, that is the only assessment used in this research.

Although individuals like Kohn (2000) have evidence to support the notion that standardized test scores take away from the needed focus on student learning, testing remains a major indicator of student achievement in the public education system of the United States. Specifically, at JMS, students spend a minimum of 9 days taking practice assessments that reflect the MAP test. JMS students in sixth-grade also spend 75 to 165 minutes on ELA and 95 to 135 minutes on mathematics testing for the MAP (DESE, 2019f). DESE data results indicate a gap exists across the state between the MAP scores of students qualified for FRL and students who do not qualify for FRL (Lang, 2018; DESE, 2017a). Scores indicated a 27% gap in MAP scores for the FRL disaggregated group. (DESE, 2017a).

Mathematics

In the United States, each individual state is permitted to create their own learning standards for each content area. In Missouri, they are called the Missouri Learning Standards (MLS; DESE, 2018d). This study focused on Grade 6 mathematics. See Table 9 for a list of mathematical strands instructed at the sixth-grade level.

Table 9

2019 Mathematical Learning Strands for Grade 6

Content strand	Abbreviation
Ratios and proportional relationships	RP
Number sense and operations	NS
Expressions, equations, and inequalities	EEI
Geometry and measurement	GM
Data analysis, statistics, and probability	DSP

Note. Adapted from *6-12 Mathematics Grade-Level Expectations,* by Missouri Department of Elementary and Secondary Education, 2016, retrieved from https://dese.mo.gov/sites/default/files/curr-mls-standards-math-6-12-sboe-2016.pdf

Mathematics at JMS. Students who attended JMS in 2019 received instruction aligned to the MLS. All students had a 45-minute class period dedicated to new learning on a daily basis. This course was taught by two certified math teachers. Instructional strategies and delivery were determined by the classroom teacher. For students enrolled in the sixth-grade, class size ranged from 8 to 21.

Free and Reduced Lunch (FRL)

Current literature identifies a learning gap for students who are eligible for food assistance, such as FRL (Cameron et al., 2015; G. Duncan & Brooks-Gunn, 1997; Epstein, 2010; Jyoti, Frongillo, & Jones, 2005; Lang, 2018; Morrissey et al., 2014). Among other factors, a lack of equity in resources for students eligible for FRL creates a disadvantage in the classroom, such as lower performance on state testing.

Definition of free and reduced-price lunch. FRL is used as a proxy for subgroup achievement. It is part of the National School Lunch Program (NSLP). In 1946, President Truman signed the National School Lunch Act, which included reduced-price or free lunches to students who are eligible (USDA, 2019b). NSLP allows all public school students to receive a meal that is nutritionally balanced.

The school district provides free or reduced-cost lunch to any student who has the necessary paperwork completed and on file. As a result, many students who might qualify, do not receive FRL for several reasons. Examples include that parents did not submit the paperwork, errors in entering information in the data-tracking system, households not aware of NSLP, or households choosing not to participate in NSLP. To receive free lunch, children must reside in a household that has a combined income at or below 130% of poverty (USDA, 2019b). To receive reduced-cost lunch, children must

reside in a household that has a combined income between 130% and 185% of poverty (USDA, 2019b).

Free and reduced-price lunch impacts education in the United States. Noguera (2010) identified that there is a gap in word knowledge for incoming kindergarten students when comparing middle- and poor-classes. Poverty affects children by creating food insecurities (G. Duncan & Brooks-Gunn, 1997; Jyoti et al., 2005). The more time a child spends in poverty, the greater the negative effects of cognitive ability (G. Duncan & Brooks-Gunn, 1997). Additionally, behavioral and emotional struggles occur more in children who are considered poor (G. Duncan & Brooks-Gunn, 1997; Morrissey et al., 2014).

Childhood hunger has adverse developmental effects on children, including "poorer mathematics scores, grade repetition, absenteeism, tardiness, visits to a psychologist, anxiety, aggression, psychosocial dysfunction, and difficulty getting along with other children" (Jyoti et al., 2005, p. 2831). Hunger and nutrition impact student learning (Jyoti et al, 2005; Williams & Noguera, 2010). When dietary needs are not met, either through lack of quantity or lack of quality, students with food insecurities consistently do not achieve on state assessments when compared to students who are food-secure, affecting learning scaffolds built into the school day.

According to the USDA (2019b), NSLP, students are eligible for free lunch if they live in a household that is 130% below poverty level. Likewise, students are eligible for reduced-price lunch if they live in a household that is below poverty level by 130% to 185% (USDA, 2019b). In 2018, close to 3.7 million FRLs were served in the United States (USDA, 2019b). By following NSLP guidelines, this study follows practices of

previous research (Gottfried, 2011; Morrissey et al., 2014; Reynolds, Weissberg, & Kasprow, 1992). Food-insecure households with children in the United States comprise 16% of the population (Coleman-Jensen, McFall, & Nord, 2009).

Finkelstein, Hill, and Whitaker (2008) concluded that as students move through the educational system, healthy food choices offered to students decline. The USDA (2019b) countered this claim by ensuring the NSLP guidelines follow federal guidelines. One side effect of this legislation is that school districts are encouraged to use produce from local farms. As a result, 40% of schools in the United States reported they served local foods from 2013 to 2015 (USDA, 2019b).

Issues of FRL eligibility, food securities in students, and existing government interventions provide limited resources to schools to improve academic achievement. For U.S. middle schools to facilitate learning for students, addressing the basic need of hunger is a significant aspect that beckons further system considerations. Therefore, FRL stands as a pillar to this research.

Free and reduced-price lunch in Missouri. According to the DESE (2019a) Achievement Level 4 Report: Public, Missouri public school student in sixth-grade eligible for FRL who took the MAP test in mathematics demonstrated an increase in scores from 2006 through 2014. Figure 10 represents students eligible for FRL in Missouri who took the MAP test for sixth-grade mathematics and scored in the Proficient and Advanced categories.

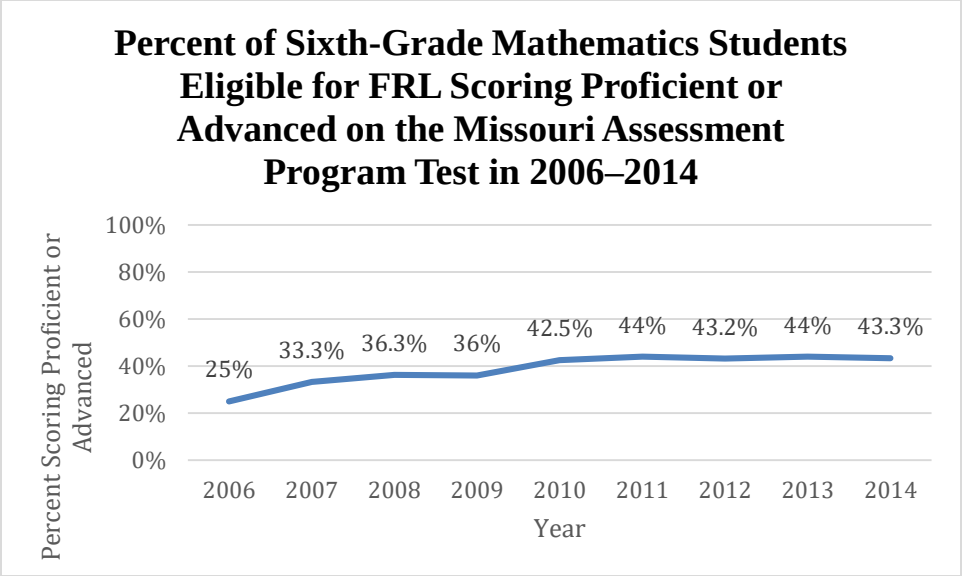


Figure 10. Percent of sixth-grade mathematics students eligible for free and reduced lunch scoring Proficient or Advanced on the Missouri Assessment Program test 2006–2014.
Note. Adapted from *Achievement Level 4 Report: Public*, by Missouri Department of Elementary and Secondary Education, 2019a, retrieved from https://apps.dese.mo.gov /MCDS/Reports/SSRS_Print.aspx

However, when comparing students eligible for FRL and students not eligible for FRL, discrepancy emerges. Figure 11 shows the discrepancy between students eligible and students not eligible for FRL in Missouri who took the MAP test for sixth-grade mathematics and scored in the Proficient and Advanced categories from 2006 to 2014.

From 2015 to 2017, the trend showed a continual increase as well for students eligible for FRL (DESE, 2019a). However, those not eligible for FRL demonstrated a decline. Again, a discrepancy emerged when comparing students who are eligible and students who are not eligible for FRL from 2015 to 2017. Figure 12 shows the gap between students eligible and students not eligible for FRL in Missouri who took the MAP test for sixth-grade mathematics and scored in the Proficient and Advanced categories in 2015–2017.

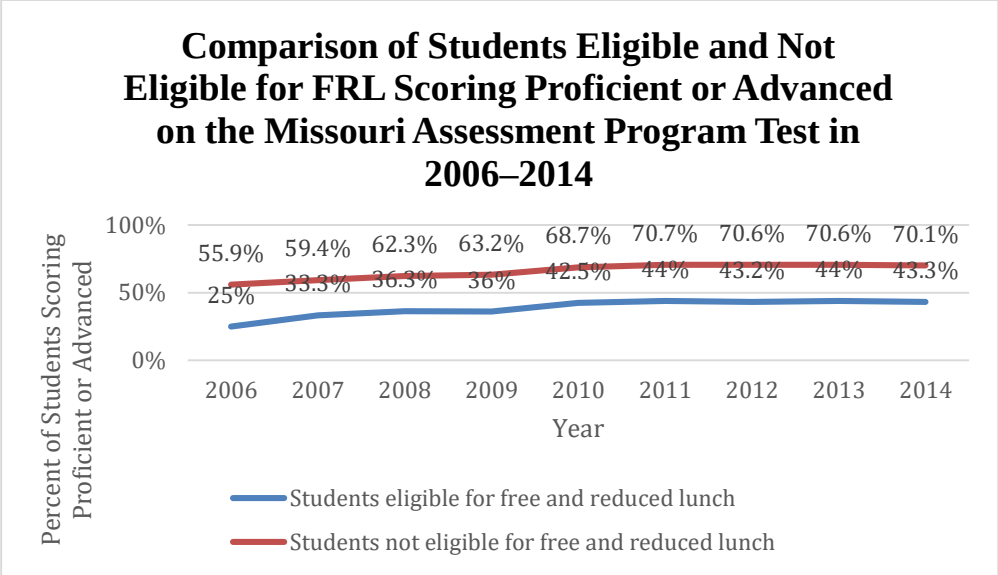


Figure 11. Comparison of students eligible and not eligible for free and reduced-price lunch scoring Proficient or Advanced on the Missouri Assessment Program test 2006–2014.

Note. Adapted from *Achievement Level 4 Report: Public*, by Missouri Department of Elementary and Secondary Education, 2019a, retrieved from https://apps.dese.mo.gov /MCDS/Reports/SSRS_Print.aspx

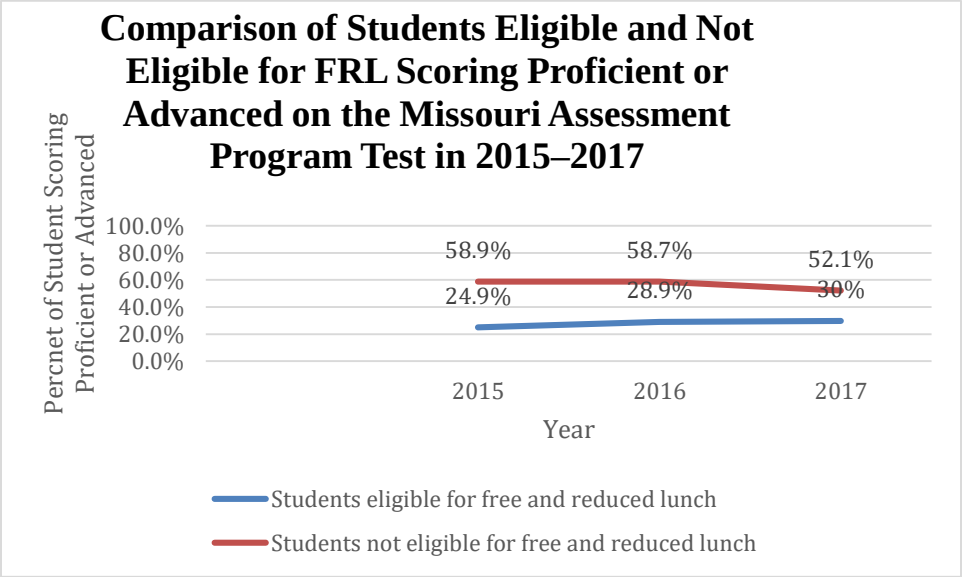


Figure 12. Comparison of students eligible and not eligible for free and reduced-price lunch scoring Proficient or Advanced on the Missouri Assessment Program test 2015–2017.

Note. Adapted from *Achievement Level 4 Report: Public*, by Missouri Department of Elementary and Secondary Education, 2019a, retrieved from https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx

Student FRL eligibility and ethnicity at JMS compared to Missouri. The FRL rate at JMS is 48% (DESE, 2019j). When compared to the average of Missouri which, according to NCES (2019b), was 50.47%, JMS aligns with the average. However, 90% of the students at JMS identify was White non-Hispanic (NCES, 2019a). Missouri's student population consists of 71.6% of students identifying as White non-Hispanic (NCES, 2019b). While both JMS and Missouri student populations are predominately White non-Hispanic, the population at JMS is almost 20% higher than the state. These statistics should be considered barriers when applying this research where the data does not align.

Summary

At Jonah Middle school, RTI takes place during the school day and is available to all students, except those enrolled in functional special education and gifted. Researchers shows that tiered interventions impact student learning (Buffum et al., 2018; Graves et al., 2011; D. W. Peterson et al., 2019; RTI Action Network, 2019). A learning gap persists between students eligible and students not eligible for FRL (Cameron et al., 2015; G. Duncan & Brooks-Gunn, 1997; Epstein, 2010; Jyoti et al., 2005; Lang, 2018; Morrissey et al., 2014). Teachers use state assessments to write, revise, and align curriculum and provide instructional interventions in the classroom (Barley & Beesley, 2007). In the State of Missouri, most public school students in third through eighth grades take the MAP test to measure student learning.

Theoretical Framework and Key Pillars

Datnow and Park's (2014) Data-Driven Decision Making Theory

History of data-driven decision making. DDDM began in 1978 with Gilbert, focused on human competency. Gilbert's (1978) study resulted in a focus on the product

of worthy behaviors and accomplishments through the application of data. Gilbert's target audience included business leaders and educational leaders, such as teachers and administrators. As a result, the Gilbert study provided an opportunity for analysis and intervention to intertwine (as cited in Krapfl, 1982).

Data-driven leadership involves people, culture, and statistics (Datnow & Park, 2014; Holmes, 2010). In a school setting, students and staff are the focus. In addition, the culture surrounding a school includes the parents, the immediate community, state policies, and local and state politicians. As suggested by the Data Quality Campaign (2019), what is measured and how it is measured matters.

Determine what data to collect and why. The DDDM provides a multistep process involving people, purpose, data analysis, intervention, and cyclical evaluation (Carnegie Foundation for the Advancement of Teaching, 2019; Center on Response to Intervention at American Institutes for Research, 2019; Datnow & Park, 2014; Feldman et al., 2003; Feldman & Tung, 2001). The DDDM aligns with *The Six Core Principles of Improvement* suggested by the Carnegie Foundation for the Advancement of Teaching (2019). The first principle of the process involves identifying a specific group of participants: for this study, students eligible for FRL. To incorporate people, culture, and statistics into decision-making, policymakers and stakeholders consider what the data represent, the demographics of those included in the data, if possible, how the data will be applied to practice, and what could be left out of the data.

The second Carnegie principle for improvement is to identify not only what will work and the best practices to implement it, but to determine what works for whom and under what set of conditions (Carnegie Foundation for the Advancement of Teaching,

2019). Datnow and Park (2014) overlapped with the same concept by writing, “Data-informed leadership cannot be divorced from the setting in which it is practiced because the context structures how data are actually used” (p. 31). Positioning the collection and analysis of data connected to the scholarly research at JMS directly aligns with this principle in the context of a grade-level teaching team that tracks individual student performances, as well as selected teaching strategies (Center on Response to Intervention at American Institutes for Research, 2019; Feldman et al., 2003; Feldman & Tung, 2001).

Systematic implementation and data tracking. Moving from the mindset of individualism to collectivism also requires a focus on culture (Gilbert, 1978). The change must be clear and interventions transparent (Carnegie Foundation for the Advancement of Teaching, 2019). School-wide implementation of interventions driven by the DDDM involves all staff in the change process, including targeted professional development geared to improving RTI strategy and DDDM processes (Bambrick-Santoyo, 2010; Center on Response to Intervention at American Institutes for Research, 2019; Feldman et al., 2003; Feldman & Tung, 2001).

Data tracking involves the student and the teacher (Datnow & Park, 2014). Because this study is based on student performance, it is advisable to consider student input. With an effect size of 0.92, addressing student self-efficacy (Hattie, 2012) becomes a critical ingredient in implementing a successful RTI process. If an effect size of 0.4 measures an average year of growth, 0.92 means more than 2 years of growth is expected (Hattie, 2012). As a result, including students and teachers in the data-collection process of RTI becomes imperative.

Reflect and revise. Using data for more than teacher accountability has purpose (Datnow & Park, 2014; Mandinach, 2012). Mandinach (2012) wrote, “For educators to use data effectively, they must acquire skills and knowledge of data literacy” (pp.). Teachers must interpret data in a way that is applicable to the classroom. If the data are arbitrary or ambiguous, the application of those data will be meaningless. Feldman et al. (2003) reinforced the importance that data collection starts with a plan and includes interventions, reviewing results, and reflecting on the effectiveness of the results. Barley and Beesley (2007) pushed this concept further, applying it to the strengths and weaknesses in instructional practices delivery, including differentiation.

Part of the cyclical process of using data to drive change is to identify what processes worked, what processes did not work, and what can be done differently to make changes even more effective (Carnegie Foundation for the Advancement of Teaching, 2019; Feldman et al., 2003). The opportunity to reflect can often be overlooked in the world of education (Datnow & Park, 2014). Reflection and change are embedded in the DDDM (Carnegie Foundation for the Advancement of Teaching, 2019; Center on Response to Intervention at American Institutes for Research, 2019; Datnow & Park, 2014; Feldman et al., 2003; Feldman & Tung, 2001).

Just as the Carnegie Foundation (2019) encouraged educators to study outside entities, the DDDM should drive teachers to “adopt, adapt, or disregard” classroom practices of other professionals (Datnow & Park, 2014, p. 29). Yet, listening to invoke learning improvement in networked communities is extremely difficult, especially without structure. The steps involved in the DDDM process require trust, deep and intense listening, reflection, and collective planning and action (Center on Response to

Intervention at American Institutes for Research, 2019; Feldman et al., 2003; Feldman & Tung, 2001). They also provide educators a consistent format for collaborating, listening to filter and assimilate ideas, and testing ideas to improve student achievement.

Data-Driven Decision Making at Jonah Middle School

At JMS, teachers meet weekly for 40 minutes to discuss trends in student learning. Each content area identifies a specific Missouri Learning Standard (DESE, 2019g) and assesses student learning through formal or informal tests. Based on student performance, each learner is placed in an RTI or enrichment class. Small-group instruction occurs using research-based strategies. Teachers monitor student learning for 2 weeks. Based on post-assessment outcomes, teachers revisit student placement.

Teacher reflection occurs during the weekly data meeting as well. As a result, teachers discuss what instructional strategies worked for different learning groups. Through a high-trust environment, teachers provide each other with feedback and suggestions for specific learners in the classroom. Prior to setting the next RTI class roster, teachers match student-learning needs with instructional strategies that will bolster academic performance on the intended learning target.

The data cycle for JMS teachers involves data collection, identifying a need, and creating and implementing a plan. Then, teachers collect data on student performance in the RTI and regular-classroom settings. Based on student performance and post-assessments, the data collected determine where the student will be placed for the next cycle of intervention. All grade-level teachers reflect on standards taught, based on instructional strategies used. Teachers revisit and repurpose changes in placement and teacher interventions. As a result, the data process continues through the next cycle.

Summary

FRL, annual standardized testing, RTI, and DDDM have a natural intersection in education. Over the past decades, researchers indicated students eligible for FRL services perform lower on assessments when compared to students who do not receive FRL services (G. Duncan & Brooks-Gunn, 1997; Finkelstein et al., 2008; Morrissey et al., 2014). Close to 20% of U.S. households include students considered food insecure (Coleman-Jensen et al., 2009). As a result, students can struggle behaviorally and academically.

Educators use state assessments throughout the United State to measure and monitor student learning. By law, states must use assessments to evaluate student learning progress. State-assessment data affect curriculum decisions at all levels of the K–12 education system.

RTI is a three-tiered approach to learning interventions (Buffum et al., 2018). RTI begins by identifying academic and behavioral expectations while creating a systematic process to implement state standards and meet individual learning needs. RTI incorporates opportunities to receive instructional interventions during the school day for all students. Finally, students who are considered most at-risk, at Tier 3 receive specific intensive instructional interventions.

Datnow and Park's (2014) description of the DDDM, coupled with the Carnegie Foundation's Six Core Principles of Improvement (2019), focus on the importance of creating a compelling need to implement change, have a process to monitor progress, reflect to make changes as the process is applied, and use the data to justify change and evaluate effectiveness. The three pillars of this research are the achievement gap for

students qualifying for FRL, annual state standardized test, and RTI. Administrators and their staff members might consider how this study could specifically apply, transfer, justify, or spur additional research in these areas. Efforts to build specific improvement and implementation plans targeted to increased achievement for students eligible for FRL could impact student learning. The DDDM supports the pillars by relying on data and reflection to influence change.

SECTION FOUR

CONTRIBUTION TO PRACTICE

Plan for Dissemination of Practitioner Contribution

Who: Attendees of the state level Missouri Association of Secondary School Principals (MASSP) Conference are administrators, directors, administrators, and aspiring administrators and directors.

When: Annual Conference on October 4-6, 2020; As of December 2019, proposals are not yet being accepted. https://moassp.org/

How: A slide show presentation of the scholarly research will be presented to attendees signed up to attend the session.

Type of Document

The document was a slide show presentation. The research process, data, and results were shared. Looking through the lens of a rural public school community, participants were shown the learning gaps, the implementation of RTI, and what the data show when comparing student eligible and ineligible for FRL, measured by the MAP. The scholarly research-based presentation encompassed the setting, participants, limitations, findings, and recommendations suggested by the data and research. Participants were presented with data that answer each research question.

1. What are the descriptive statistics for students when disaggregated by gender, FRL status, and minority status?
2. At JMS, does a difference exist in performance between students eligible for FRL and not eligible for FRL on the sixth-grade mathematics MAP test?

3. At JMS, does a difference exist in performance between students who and did not receive RTI on the sixth-grade mathematics MAP test?
4. When considering students eligible for FRL at JMS, does a difference exist in performance on the MAP test between students who receive RTI and students who do not receive RTI?
5. When considering students eligible for FRL at JMS, is there a difference in MAP scores between students who receive Level 1 RTI and Level 2 RTI?

Rationale

The focus of Missouri Association of Secondary School Principals is to provide support and professional learning. This group works with MCCTA Missouri Career Center Technical Administrators for the fall conference. At the time of this proposal, MASSP does not have a theme for this conference. However, this scholarly research presentation will provide insight about research-based interventions and strategies that are currently being implemented in the classroom. This scholarly research proposal will be a strong, data-driven addition to the conference.

Outline of Proposed Contents

- The background of RTI and the history of JMS
- The research on FRL
- The impact of DDDM
- Findings (quantitative analysis of RTI and Missouri annual state assessment)
    - Student achievement and interventions
    - Implications for policy and concerns
- Recommendations for JMS

Rural Middle School RTI Efforts Impact Students of Poverty on State Assessment Performance

Mrs. Tiffani Collins
Cameron Veterans Middle School Principal
Email: tcollins@cameronschools.org

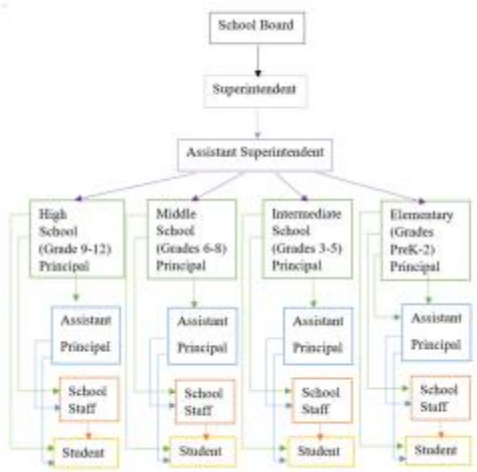
Intro: Penny for Your Thoughts

Agenda:

6 Topics

- School District Design
- What is Response to Intervention?
- Standardized Testing
- Free/Reduced Price Lunch
- Research Questions and Results
- Data-Driven Decision Making (Datnow & Park, 2014)
- Recommendations

School District Design



RTI...what do you know?

Turn to your shoulder partner or person behind you and tell them 1-2 things you think you know about RTI.

If you're brand new to RTI, share that, too!

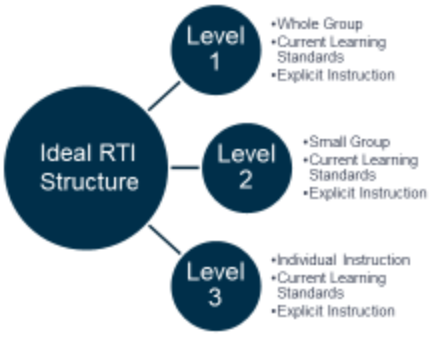
What *is* RTI? What *is not* RTI?

IS	IS NOT
3 Tiers (Buffum, Mattos, and Malone, 2018)	Special Education (IDEA, 2004)
Fluid Movement (Buffum, Mattos, and Malone, 2018; Hattie, 2012)	Permanent Intervention (Buffum, Mattos, and Malone, 2018)
Driven by Student Data + Teacher Input (Buffum, Mattos, and Malone, 2018; Marzano, 2010)	Only Teacher Input (Buffum, Mattos, and Malone, 2018; Marzano, 2010)

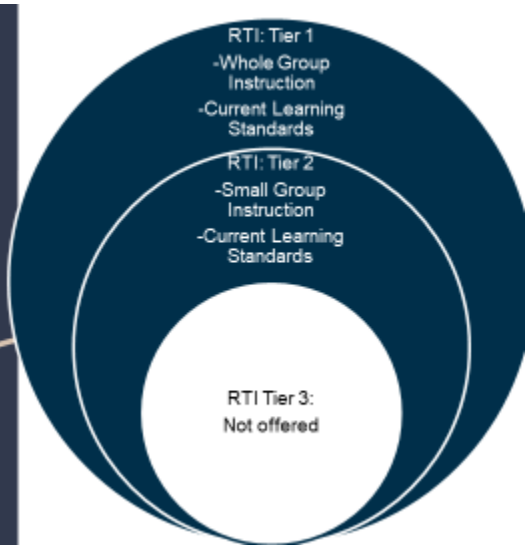
What *is* RTI?
What *is not* RTI?

IS	IS NOT
1.29 Effect Size (Visible Learning, 2017)	Past or Upcoming Learning Standards (Buffum, Mattos, and Malone, 2018)
Strategic/Research Based Instructional Strategie (Hattie, 2012, 2018)	Reteaching using original strategies (Buffum, Mattos, and Malone, 2018)
During the school day, at least twice a week for 45 minutes (Buffum, Mattos, and Malone, 2018)	Before/after school tutoring

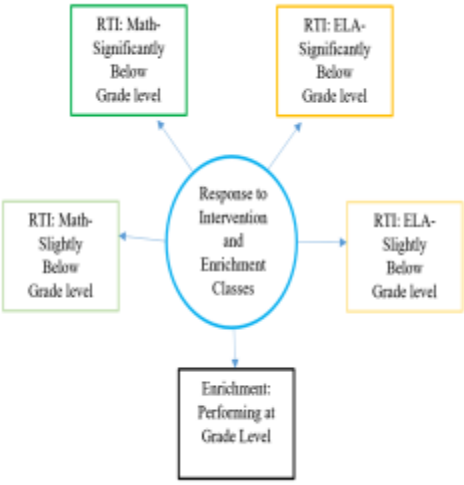
Ideal RTI Structure



JMS RTI Structure



RTI Layout at CVMS



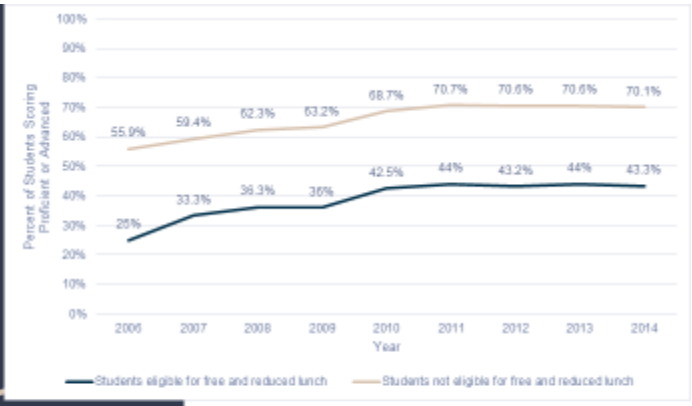
Standardized Testing

Standards	Years	Test/Vendor
Grade Level Expectations	2006-2014	MAP
Common Core State Standards	2015-2017	Smarter Balanced and DRC
Missouri Learning Standards	2018-Present	DRC

Free/Reduced Price Lunch

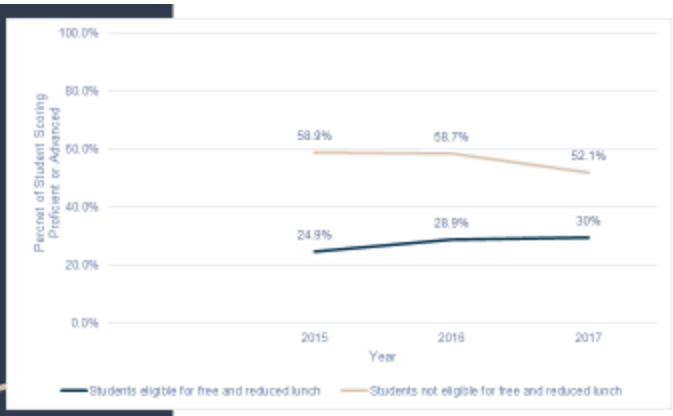
- Why use FRL as a proxy?
  - Current literature identifies a learning gap for students who are eligible for food assistance, such as FRL (Cameron et al., 2015; Duncan & Brooks-Gunn, 1997; Epstein, 2010; Jyoti, Frongillo, & Jones, 2005; Lang, 2018; Morrissey et al., 2014)
- What is FRL?
  - Part of National School Lunch Act under President Truman (USDA, 2019)
  - To receive free lunch, children must reside in a household that has a combined income at or below 130% of poverty (USDA, 2019). To receive reduced-cost lunch, children must reside in a household that has a combined income between 130% and 185% of poverty (USDA, 2019)

Comparison of students eligible and not eligible for FRL scoring Proficient or Advanced on MAP in 2006-2014



- *Note.* Adapted from *Achievement Level 4 report: Public*, by Missouri Department of Elementary and Secondary Education, 2019d, retrieved from https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx

Comparison of students eligible and not eligible for FRL scoring Proficient or Advanced on MAP in 2015-2017



Note. Adapted from *Achievement Level 4 report: Public*, by Missouri Department of Elementary and Secondary Education, 2019d, retrieved from https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx

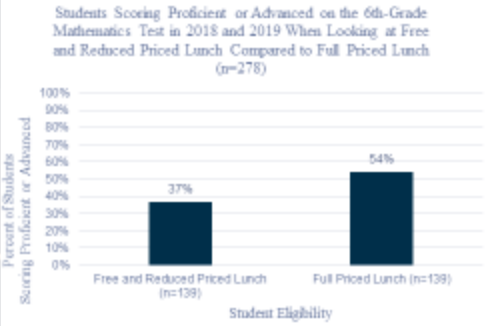
Proxy: Students Eligible for Free and Reduced Lunch (FRL) 2019

- Missouri: 50.47% (DESE, 2019f)
- JMS FRL: 48% (DESE, 2019e)
- JMS 6th Grade: 48% (DESE, 2019e)

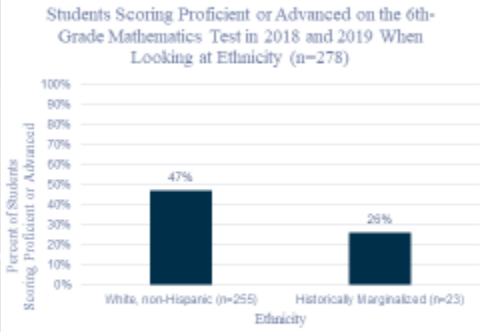
Missouri Assessment Program: JMS Results- 6th Grade Math 2019

Whole Building	Students Receiving FRL
TOP TWO LEVELS	TOP TWO LEVELS
45.5%	36.5%
Advanced 19.4%	Advanced 25.4%
Proficient 26.1%	Proficient 11.1%

Question 1: What are the descriptive statistics for students when disaggregated by gender, FRL status, and minority status?



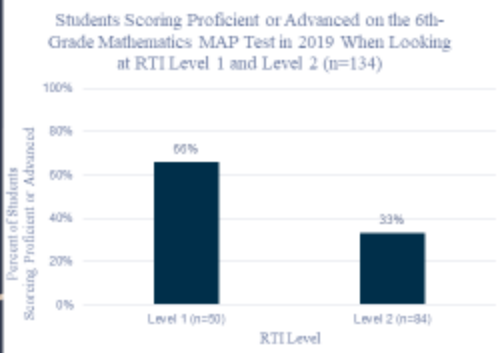
Ethnicity



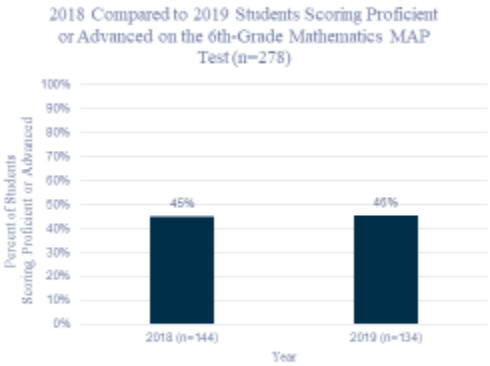
2018 Compared to 2019 Students Scoring Proficient or Advanced on the 6th-Grade Mathematics MAP Test

Sample	N	Percent of Students Scoring Proficient or Advanced
2018	144	45%
2019	134	46%
Total	278	48%

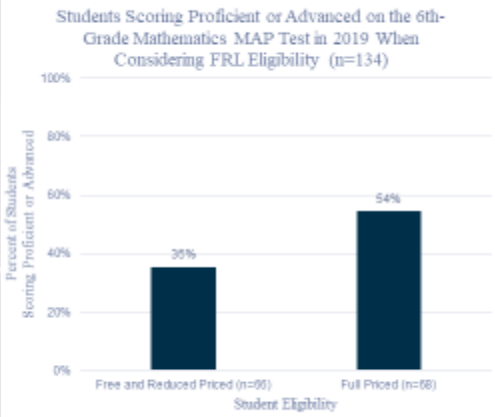
2019 RTI Level



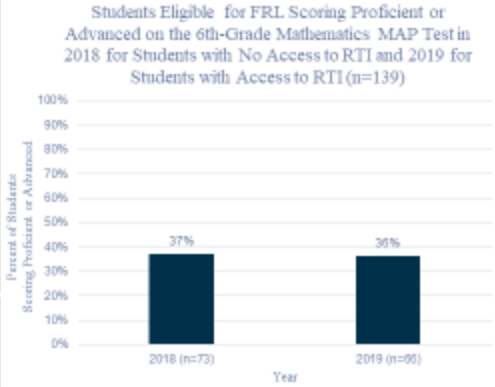
Question 2: At JMS, is there a difference in performance for 6th-grade students on the mathematics MAP test when comparing 2018 students who did not have RTI and 2019 who did have access to RTI?



Question 3:
At JMS, is there a difference in performance for 6th-grade students on the mathematics MAP test between students eligible for FRL and those not eligible for FRL when all students have access to RTI?



Question 4:
At JMS, is there a difference in performance for 6th-grade students on the mathematics MAP test among students eligible for FRL when comparing students who did not have access to RTI in 2018 versus students who used RTI in 2019?

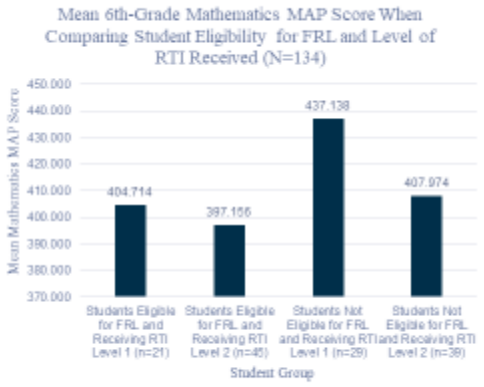


Question 5:
When considering students eligible for FRL at JMS, is there a difference in MAP scores between students who receive Level 1 RTI and Level 2 RTI?

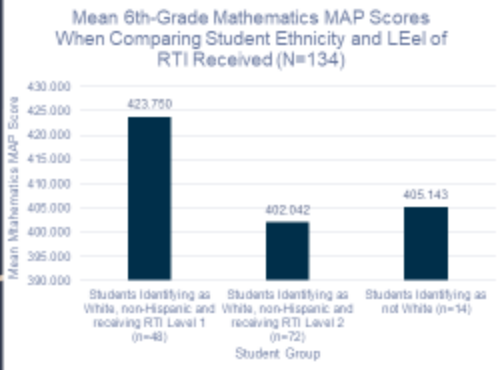
- Independent *t*-test

Level of RTI	N	Mean MAP Score	Standard Deviation	Standard Error Mean
1	21	404.71	39.189	8.552
2	45	397.16	32.607	4.861

Question 6: At JMS, is there a difference in performance on the 6th-grade 2019 mathematics MAP test between student eligibility for FRL and level of RTI received?



Question 7: At JMS is there a difference in performance on the 6th-grade 2019 mathematics MAP test for students identifying as Whit, non-Hispanic receiving Level 1 RTI, students identifying as Whit, non-Hispanic receiving Level 2 RTI, and students identifying as not White?



Data-Driven Decision Making (Datnow & Park, 2014)

Goals

Data

Intervention: Definition of Tiered Instruction for Response to Intervention

Tier	Definition
1	Research-based instructional intervention provided to all students, providing a baseline for student learning
2	Occurs in a small group setting. Reinforces current learning standards
3	Intense one-on-one instruction targeted to deficits in skills for individual students

Note. Adapted from *Taking action: A handbook for RTI at work*, by A. Buffum, M. Mattos, & J. Malone, 2018, Bloomington, IND, US, Solution Tree Press; "The Illinois flexible service delivery model: A problem-solving model initiative, by D. W. Peterson, D. P. Prasse, M. R. Shinn, & M. E. Swerdlik, 2019, in A. Jimerson, M. Burns, & A. VanDerHeyden (Eds.), *Handbook of Response to Intervention: The Science and Practice of Assessment and Intervention*, pp. 288–289, New York, NY, US, Springer; *What is RTI?*, by RTI Action Network, 2019, retrieved from http://www.rtinetwork.org/learn/what/whatisrti.

Analyze: Student Data and Instructional Reflection Categories Used During Weekly RtI Data Team Meeting

Student trends	Teacher trends
Strengths	Instructional Strategies
Learning misconceptions	Additional Interventions Needed
Mastery/Nonmastery of learning objective	

Action Plan

Make a conjecture...

What do you think the outcomes were for CVMS *besides* impact on MAP scores?

Outcomes

- Progression through learning levels
- Teacher reflection on strategies
- Specific focus on student learning
- Cross-Curricular communication and applications
- Vertical discussions
- Tracker Shared with Elective Teachers

Now What?

Keys to Success

Questions?

Image from https://theworddegree.wordpress.com/2015/03/29/personas-writing-for-your-audience/

Reflection:
2 Things I learned,
1 Thing I'll share

Something I learned...

Something I learned...

Something I'll share...

Image from: http://corleycentreyear7.blogspot.com/2012/10/2-stars-and-wish-marking.html

Thank you for your time!!

Tiffani Collins

Principal, Cameron Veterans MS

teollins@cameronschools.org

Image from: https://englishlive.ef.com/blog/english-in-the-real-world/5-ways-say-thank-english/

Resources

Bambrick-Santoyo, P. (2010). *Driven by data: A practical guide to improve instruction.* San Francisco, CA, US: Jossey-Bass.

Barley, Z. A., & Beesley, A. D. (2007). Rural school success: What can we learn? *Journal of Research in Rural Education, 22*(1), 1–16. Retrieved from https://cep .org.au/wpcontent/blogs.dir/884/files/2010/11/Rural-School-Success-What-can -we-learn.pdf

Buffum, A., Mattos, M., & Malone, J. (2018). Taking action: A handbook for RTI at work. Bloomington, IN, US: Solution Tree Press.

Cameron, C. E., Grimm, K. J., Steele, J. S., Castro-Schilo, L., & Grissmer, D. W. (2015). Nonlinear gompertz curve models of achievement gaps in mathematics and reading. *Journal of Educational Psychology, 107,* 789–804. https://doi.org/10 .1037/edu/0000009

Resources

Carnegie Foundation for the Advancement of Teaching. (2019). *The six core principles of improvement.* Retrieved from https://www.carnegiefoundation.org/our-ideas/six -core-principles-improvement/

Center on Response to Intervention at American Institutes for Research. (2019). *Title of the article.* Retrieved from https://www.rti4success.org/essential-components-rti/data-based-decision-making

Datnow, A., & Park, V. (2014). *Data-driven leadership.* San Francisco, CA, US: Jossey-Bass.

Duncan, G., & Brooks-Gunn, J. (Eds.). (1997). *Consequences of growing up poor.* New York, NY, US: Russell Sage Foundation.

Epstein, J. L. (2010). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan, 92*(3), 81–96. https://doi.org/10.1177 /003172171009200326

Resources

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Thousand Oaks, CA, US: Sage.

Feldman, J., Lucey, G., Goodrich, S., & Frazee, D. (2003). Developing an inquiry-minded district. Educational Leadership, 60(5). Retrieved from https://www.nyccharterschools.org/sites/default/fil es/resources/Developing_an_Inquiry-Minded_District1.pdf

Feldman, J., & Tung, R. (2001, April). Whole school reform: How schools use the data based inquiry and decision making process. Paper presented at the 82nd annual meeting of American Educational Research Association, Seattle, WA, US.

Resources

Gilbert, T. F. (1978). *Human competence: Engineering worthy performance.* New York, NY, US: McGraw-Hill.

Gottfried, M. A. (2011). The detrimental effects of missing school: Evidence from urban siblings. *American Journal of Education, 117,* 147–182. https://doi.org/10.1086/657886

Hattie, J. A. C. (2012). Visible learning for teachers: Maximizing impact on learning. London, England: Routledge.

Hattie, J., & Yates, G. (2014). *Visible learning and the science of how we learn.* London, England: Routledge.

Holmes, T. (2010). The hierarchy of epistemological beliefs: All ways of knowing are not created equal. *Studies in Meaning, 4,* 281–315. Retrieved from https://www.thefreelibrary.com/The+hierarchy+of+epistemological+beliefs%3A+all+ways+of+knowing+are+not...-a0281112138

Resources

Jyoti, D. F., Frongillo, E. A., & Jones, S. J. (2005). Food insecurity affects school children's academic performance, weight gain, and social skills. *Journal of Nutrition, 135,* 2831–2839. https://doi.org/10.1093/jn.135.12.2831

Lang, C. (2018). A quantitative analysis of high school sports participation intensity and breadth: Relationships with academic achievement in a rural Missouri high school (Unpublished doctoral dissertation). University of Missouri. Columbia.

Marzano, R. J. (2010). *Formative assessment & standards-based grading.* Bloomington, IN, Marzano Research Laboratory.

Mandinach, E. (2012). A perfect time for data use: Using data-driven decision making to inform practice. *Educational Psychologist, 47*(2), 71–85. https://doi.org/10.1080/00461520.2012.667064

Resources

Missouri Department of Elementary and Secondary Education. (2017). *Ensure equitable access to excellent educators.* Retrieved from https://dese.mo.gov/sites/default/files/Educator-Equity-Plan-June2018.pdf

Missouri Department of Elementary and Secondary Education. (2019d, May). *Achievement level 4 report: Public.* Retrieved from https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx

Missouri Department of Elementary and Secondary Education. (2019e, May). *State of Missouri reports and resources.* Retrieved from https://apps.dese.mo.gov/MCDS/home.aspx

Missouri Department of Elementary and Secondary Education. (2019f, June). *Assessment principles.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-principles.pdf

Resources

Missouri Department of Elementary and Secondary Education. (2019g, June). *Missouri learning standards.* Retrieved from https://dese.mo.gov/college-career readiness/curriculum/missouri-learning-standards

Morrissey, T. W., Hutchison, L., & Winsler, A. (2014). Family income, school attendance, and academic achievement in elementary school. *Developmental Psychology, 50,* 741–753. https://doi.org/10.1037/a0033848

Peterson, D. W., Prasse, D. P., Shinn, M. R., & Swerdlik, M. E. (2019). The Illinois flexible service delivery model: A problem-solving model initiative. In. A. Jimerson, M. Burns, & A. VanDerHeyden (Eds.), *Handbook of response to intervention: The science and practice of assessment and intervention* (pp. 288–289). New York, NY, US: Springer.

Resources

Reeves, D. (2011). *Finding your leadership focus*. New York: Teachers College Press.

Reynolds, A. J., Weissberg, R. P., & Kasprow, W. J. (1992). Prediction of early social and academic adjustment of children from the inner city. *American Journal of Community Psychology, 20,* 599–624. https://doi.org/10.1007/bf00941774

RTI Action Network. (2019). *What is RTI?* Retrieved from http://www.rtinetwork.org /learn/what/whatisrti

Resources

U.S. Department of Agriculture. (2019b). *National School Lunch Program.* Retrieved from https://www.ers.usda.gov/topics/food-nutrition-assistance/child-nutrition-programs/national-school-lunch-program.aspx

Visible Learning. (2017). *Hattie ranking: 252 Influences and effect sizes related to student achievement.* Retrieved from https://visible-learning.org/hattie-ranking-influences-effect-sizes-learning-achievement/

Williams, J., & Noguera, P. (2010, Winter). Poor schools or poor kids? *Education Next, 10*(1). Retrieved from https://www.educationnext.org/poor-schools-or-poor-kids/

SECTION FIVE

CONTRIBUTION TO SCHOLARSHIP

Target Journal

The *NASSP Bulletin* is the target journal for publication. The *NASSP Bulletin* is the official journal for the National Association of Secondary School Principals, through Sage Publishing.

Rationale

The *NASSP Bulletin* publishes research-based articles focused on the middle school and high school levels. The journal has a target audience of educators, specifically principals, assistant principals, and administrators, interested in critical literature reviews and practices that effect student learning in the school setting. Articles can focus on administrative leadership and applied research in the secondary setting. The *NASSP Bulletin* uses a multistep blind-review process including an editorial review, peer review of at least two board members, followed by a last editor. Articles are published quarterly.

Outline for Proposed Contents

- Manuscript
- Author contact information
- Abstract (60 to 80 words)
- Key Words (3–5)
- Cover letter
- Tables
- Figures
- Introduction

- Hypotheses
- Method
- Results
- Discussion
- References
- Appendices (if needed)

Plan for Submission

Who: *NASSP Bulletin*, published through National Association of Secondary School Principals

When: Spring 2020

How: Online submission through Sage Track at http://mc.manuscriptcentral.com/bul.

February 29, 2020

Dear NASSP Bulletin and Sage Publications,
As a middle school principal, I value the need to scholarly research and purpose-driven, data-based change in education. As a doctoral student for the University of Missouri-Columbia, I am seeking the opportunity to share my research with like-minded individuals. Please accept this letter as a commitment to publish in NASSP Bulletin. Within the enclosed submission, you will find the article Impact of Response to Intervention on Rural Public Middle School State Assessment Performance: Six-Grade Students by Free and Reduced-Price Lunch Eligibility. Below you fill find a short biography paragraph about my education and service. Thank you for your time and consideration. I look forward to partnering with you.

Biography: Dr. Tim Wall is Dean and School Director of the Northwest Missouri State University School of Education. Research includes: teacher preparation; assessment; diversity, equity and inclusion; standardized testing; accreditation; policy analysis; quantitative and qualitative research. He is a dissertation advisor and faculty member in the Missouri-Columbia/Northwest Ed.D in Educational Leadership and Policy Analysis.

Biography: Tiffani Collins is a rural middle school principal in Missouri. She plans to complete her Educational Doctorate in May 2020 in Education Leadership and Policy Analysis from the University of Missouri-Columbia. She taught middle school math for 12 years and has been a secondary principal for 7 years.

Educationally Yours,

Dr. Tiffani Collins
Cameron Veterans Middle School Principal
Ed.D (student) in Educational Leadership and Policy Analysis at the University of Missouri-Columbia
Projected Completion Date: May 2020
11286 NE Highway 69
Cameron, MO 64429
Cell 816.809.9649
Work 816.882.1041
Fax 816.882.1042
tcollins@cameronschools.org

Dr. Tim Wall
Dean and School Director of Northwest Missouri State University School of Education
229 Brown Hall
Maryville, MO 64468
Work 660.562.1179
Fax 660.562.1561
timwall@nwmissouri.edu

Title

Impact of Response to Intervention on Rural Public Middle School State Assessment Performance: Six-Grade Students by Free and Reduced-Price Lunch Eligibility

Abstract

This quantitative study explored the impact of response to intervention (RtI) on Missouri rural public middle school sixth grade mathematics student annual state assessment performance. Of interest was a disaggregated group of students eligible for free and reduced-price lunch (FRL). Using the ANOVA, chi-square and *t*-tests, findings show that FRL eligibility, ethnicity, and level of RTI received matters. Data-driven decision making was applied to the RtI process.

Keywords: response to intervention, free and reduced lunch, data-driven decision making, middle school

Introduction

State standardized assessment is one method public schools use to monitor student learning and progress. Although student performance on state assessments can provide some feedback to educators, it is important to note that low socioeconomic factors, such as family income, can negatively affect a child's achievement in school (Boykin & Noguera, 2011; Hattie, 2012; Morrissey, Hutchinson, & Winsler, 2014). Some schools provide a range of interventions for students that may include before-, during-, and after-school tutoring, modified assignments and instruction, and modifications of specific learning standards. As a result, many students who come from low-income families without intervention may be vulnerable to scores in the lower percentiles on state assessment reports. The researcher attempted to address the gap in existing research in

Jonah, Missouri (pseudonym), on the impact of response to intervention (RtI) and state academic-performance assessment. In this study, the researcher used previous research as it applies to RtI implementation effects on middle school performance levels on the Missouri's Assessment Program (MAP). Of interest was a disaggregated group of students eligible for free and reduced-price lunch (FRL). It is important to note that state assessment in Missouri is referenced as the MAP, which is different than NWEA Map.

Public schools serve students from all socioeconomic backgrounds. According to many scholars, addressing the learning gap of students in poverty has many effects inside and outside the school setting (Epstein, 2010; Hattie, 2012, Noguera, 2011). Students identified as eligible for FRL have barriers that can hinder their learning when compared to state assessment scores of students who are not eligible for FRL (Bolshakova, Johnson, & Czerniak, 2011; Cameron, Grimm, Steele, Castro-Schilo, & Grissmer, 2015; Graves, Brandon, Duesbery, McIntosh, & Pyle, 2011). For example, students eligible for FRL do not have equitable access to resources such as food at home and healthcare (Nord & Economic Research Service, 2009). As a result, health and attendance are risk-factors (Morrissey et al., 2014; Nord & Economic Research Service, 2009).

When comparing the students in sixth-, seventh-, and eighth-grade throughout Missouri who took the mathematics portion of the MAP in 2018, 27.3% scored in the top two performance levels, advanced and proficient (DESE, 2019c). Conversely, 44.9% of students scored advanced and proficient (DESE, 2019c). See Table 1 for the layout of statistics. At JMS, 48% of students were eligible for FRL in 2018 (DESE, 2019a). According to DESE (2019c), 37.5% sixth-grade JMS students eligible for FRL scored in the top two performance levels for mathematics. Mathematics teachers set a goal to

increase the number of students scoring advanced or proficient on the MAP test. When compared to other grade levels at JMS, sixth-grade mathematics scores remained low. Therefore, the researcher chose this grade level and content area.

Table 1

Students in Grade 6 at Jonah Middle School Compared to Missouri in 2018 Data for Missouri Assessment Program Achievement Levels of Proficient and Advanced

Category	Percent
Students in Missouri scoring in Proficient or Advanced categories	27.3
Students in JMS score in Proficient or Advanced categories	44.9

Note. Adapted from *Achievement Level 4 Report: Public*, by Missouri Department of Elementary and Secondary Education, 2019c), retrieved from https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx

At JMS specifically, if students do not demonstrate mastery of learning objectives, additional time and remediation is provided within the school day. Using state-assessment results, school administrators and teachers monitor student growth and make curriculum adjustments. In 2018, students at JMS eligible for FRL scored 0.2% higher when compared to the state average. In 2019, students eligible for FRL at JMS scored 3.6% below the state average. See Figure 1 for a comparison between JMS and the State of Missouri overall MAP scores.

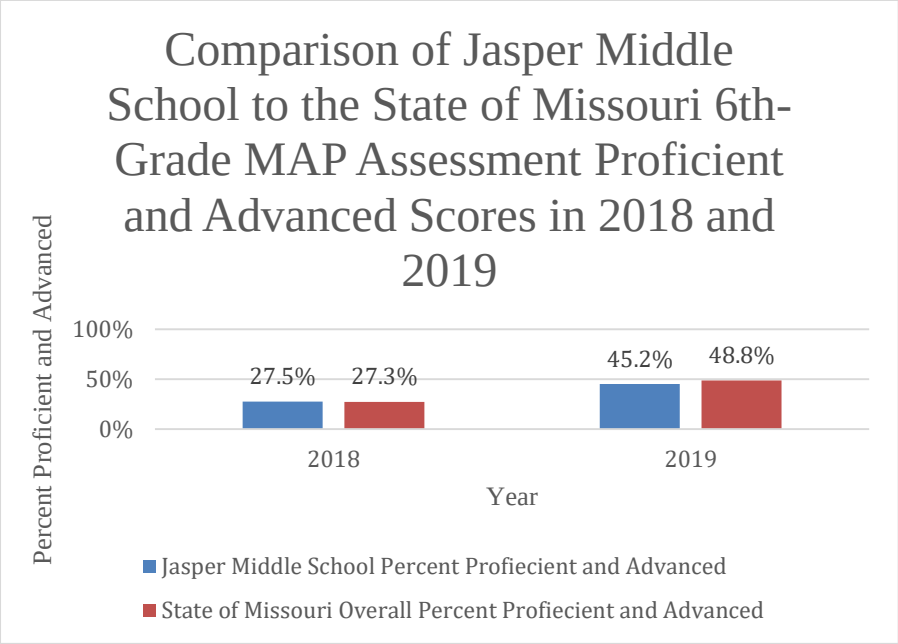


Figure 1. 2018–2019 Jonah Middle School scores compared to the State of Missouri overall Missouri Assessment Program test scores.
Note. Adapted from *Achievement Level 4 Report: Public*, by Missouri Department of Elementary and Secondary Education, 2019b, retrieved from https://apps.dese.mo.gov /MCDS/Reports/SSRS_Print.aspx

The researcher attempted to identify gaps in student performance on the MAP and how focused schoolwide interventions could impact students who are eligible for FRL. This scholarly research focuses on the impact of students not offered RtI in 2018 and the schoolwide implementation of RtI on 2019 sixth-grade mathematics state-assessment student achievement for students qualifying for FRL at JMS.

Please note: The names used in this article are pseudonyms.

Literature Review

Datnow and Park's (2014) data-driven decision-making theory. Using student data to drive instruction is part of the reflective process for educators. How people interact, how policies influence intended and unintended consequences, common practices for schools, and finding patterns in data all influence educational reform (Carnegie Foundation for the Advancement of Teaching, 2019; Datnow & Park, 2014;

Holmes, 2010). DDDM theory could provide a guiding structure for policy reform. If applied, this theory could drive learning interventions for students and facilitate instructional changes for educators.

Data tracking involves the student and the teacher (Datnow & Park, 2014). Because this study is based on student performance, it is advisable to consider student input. With an effect size of 0.92, addressing student self-efficacy (Hattie, 2012) becomes a critical ingredient in implementing a successful RtI process. If an effect size of 0.4 measures an average year of growth, 0.92 means more than 2 years of growth is expected. As a result, including students and teachers in the data-collection process of RtI becomes imperative.

Using data for more than teacher accountability has purpose (Datnow & Park, 2014; Mandinach, 2012). Teachers must interpret data in a way that is applicable to the classroom. If the data are arbitrary or ambiguous, the application of those data will be meaningless. Barley and Beesley (2007) pushed this concept further, applying it to the strengths and weaknesses in instructional practices delivery, including differentiation.

Part of the cyclical process of using data to drive change is to identify what processes worked, what processes did not work, and what can be done differently to make changes even more effective (Carnegie Foundation for the Advancement of Teaching, 2019; Feldman et al., 2003). Reflection and change are embedded in the DDDM (Carnegie Foundation for the Advancement of Teaching, 2019; Center on Response to Intervention at American Institutes for Research, 2019; Datnow & Park, 2014; Feldman et al., 2003; Feldman & Tung, 2001).

Just as the Carnegie Foundation (2019) encouraged educators to study outside entities, the DDDM should drive teachers to "adopt, adapt, or disregard" classroom practices of other professionals (Datnow & Park, 2014, p. 29). Yet, listening to invoke learning improvement in networked communities is extremely difficult, especially without structure. The steps involved in the DDDM process require trust, deep and intense listening, reflection, and collective planning and action (Center on Response to Intervention at American Institutes for Research, 2019; Feldman et al., 2003; Feldman & Tung, 2001).

Annual standardized testing impacts teachers and curriculum. Students eligible for FRL face barriers such as lower scores on state standardized-assessment scores (Cameron et al., 2015; Duncan & Brooks-Gunn, 1997; Morrissey et al., 2014; Payne, 1996). Like the rest of the nation, students eligible for FRL score lower on the MAP test required of all public school students enrolled in Grades 3 through 8 (DESE, 2019b). In the State of Missouri, public school students in Grades 3 through 8 are assessed annually in mathematics and English Language Arts and in Grades 5 and 8 in Science (Missouri Department of Elementary and Secondary Education [DESE], 2017a, 2018a). Because educators use state standardized testing to measure growth for schools and districts, curriculum design and implementation remain a focus.

Response to Intervention. According to Buffum et al. (2018), RtI is a class offered during the school day to all students at least twice a week for 45 minutes where new learning objectives are not instructed. See the glossary of terms for a more concise definition. Not all schools in the United States offer RTI. As a result, not all interventions offered from district to district and school to school are equitable. This means that not all

students have equitable access to intervention services. RtI uses a three-tiered approach. See Figure 2 for the ideal structure for the tiered approach.

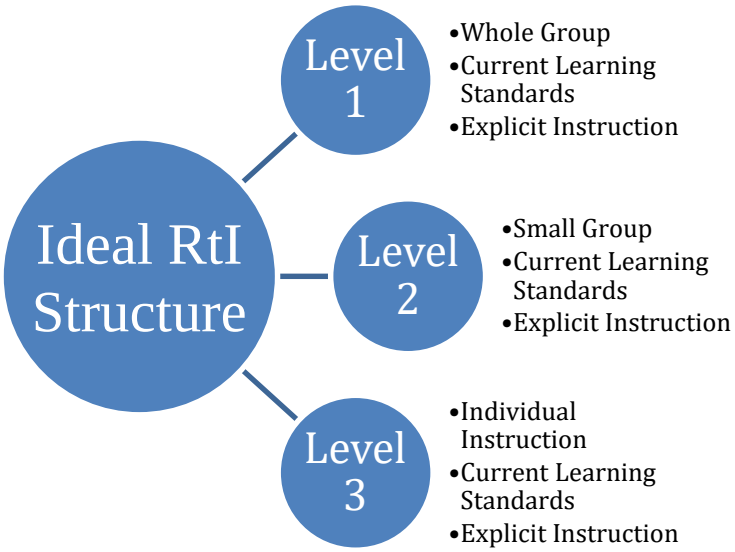


Figure 2. Ideal response to intervention structure.
Note. Adapted from *Taking Action: A Handbook for RtI at Work*, by A. Buffum, M. Mattos, & J. Malone, 2018, Bloomington, IND, US, Solution Tree Press

Tier 1 includes establishing a baseline of performance on learning objectives while providing whole group interventions for 2 or more weeks (Buffum et al., 2018; D. W. Peterson, Prasse, Shinn, & Swerdlik, 2019; RTI Action Network, 2019). Tier 2 interventions take place in a small-group setting, supporting current learning standards through additional instruction time lasting 2 to 4 weeks. Tier 3 interventions provide intensive focus on specific deficit skills for individual students. Assessments, such as checking for mastery of the learning objective, should be ongoing. As a result, a student is placed in the RtI setting upon demonstrating the student has not mastered the learning, but would be removed from the RtI setting upon demonstrating the learning has been mastered. Teachers closely monitor student learning through daily in-class assessments and provide instruction through research-based strategies (D. W. Peterson et al., 2019; RTI Action Network, 2019). Although researchers have studied the tiered approach to

learning interventions, a gap persists in research regarding RtI in sixth-grade middle school mathematics at rural middle schools.

Background

Mathematics. In the United States, each individual state is permitted to create their own learning standards for each content area. In Missouri, they are called the Missouri Learning Standards (MLS) (DESE, 2018d). This study focused on Grade 6 mathematics. Strands for sixth grade mathematics include ratios and proportional relationship, number sense and operations, expressions, equations, and inequalities, geometry and measurement, and data analysis, statistics, and probability (DESE, 2016).

Free and Reduced-Priced Lunch. FRL is used as a proxy for subgroup achievement. It is part of the National School Lunch Program (NSLP). In 1946, President Truman signed the National School Lunch Act, which included reduced-price or free lunches to students who are eligible (USDA, 2019). NSLP allows all public school students to receive a meal that is nutritionally balanced.

The school district provides free or reduced-cost lunch to any student who has the necessary paperwork completed and on file. As a result, many students who might qualify, do not receive FRL for several reasons. Examples include they did not submit the paperwork, errors in entering information in the data-tracking system, households not aware of NSLP, or households choosing not to participate in NSLP. By following NSLP guidelines, this study follows practices of previous research (Gottfried, 2011; Morrissey et al., 2014; Reynolds, Weissberg, & Kasprow, 1992).

Childhood hunger has adverse developmental effects on children, including "poorer mathematics scores, grade repetition, absenteeism, tardiness, visits to a

psychologist, anxiety, aggression, psychosocial dysfunction, and difficulty getting along with other children" (Jyoti et al., 2005, p. 2831). Hunger and nutrition impact student learning (Jyoti et al, 2005; Williams & Noguera, 2010). When dietary needs are not met, either through lack of quantity or lack of quality, students with food insecurities consistently do not achieve on state assessments when compared to students who are food-secure, affecting learning scaffolds built into the school day.

Issues of FRL eligibility, food securities in students, and existing government interventions provide limited resources to schools to improve academic achievement. For U.S. middle schools to facilitate learning for students, addressing the basic need of hunger is a significant aspect that beckons further system considerations. Therefore, FRL stands as a pillar to this research.

Response to intervention at Jonah Middle School. Prior to the 2018–2019 school year, formalized RtI support only occurred in Grades 7 and 8 at JMS due to scheduling conflict. In August of 2018, however, the JMS principal developed a way to make the building schedule work for the 2018–2019 school year. All students except gifted and functional education students were offered RTI. As a result, almost all students had equitable access to intervention services.

According to the Missouri DESE (2015), JMS is considered rural as it is more than 25 miles away from a city which influence equitable access to resources. See Figure 3 for a graphic representation of RtI at JMS.

The implementation of RTI was intentionally instituted through a scaffold. RTI Level 1 occurred within the normal class-time setting. Instruction was provided to all students following the MLS.

RTI Level 2 occurred at a different time. While some students were receiving Level 2 RTI, gift students attended the gifted class. Students who performed at or above grade level attended enrichment class, as a result they did not receive RTI during that time. Level 2 RTI remained fluid in that students moved in and out of RTI class every two weeks. Instruction was based on previously taught learning standards. Class was 45-minutes and was offered daily.

It is important to note that Tier 3 RTI is not currently offered at JMS, which should be considered a barrier when applying this research. Tier 3 is not offered due to logistical challenges.

Mathematics and ELA teachers determine which Missouri Learning Standards need to be the main focus for certain times of the year. For the purpose of this study, mathematics will be the focus for RtI.

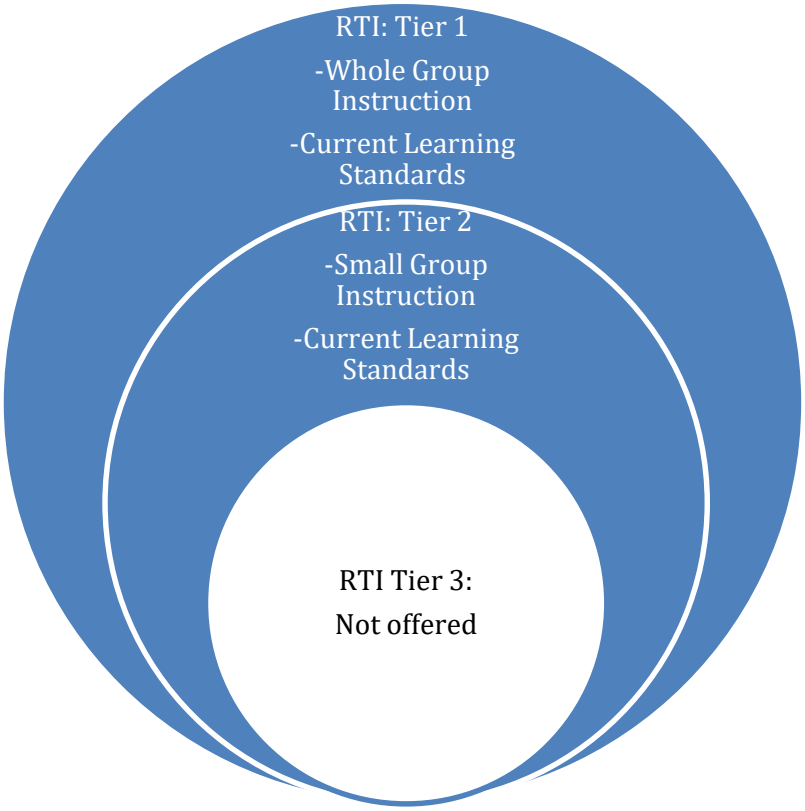


Figure 3. Jonah Middle School response to intervention structure.

Once a week, grade-level teachers meet to discuss student learning for 45 minutes. During the meeting, teachers discuss student learning while reviewing student work samples. They discuss trends in student data and teacher instruction. Data reviewed includes students' current classroom performance, state-assessment performance, learning strengths and misconceptions, level of mastery on learning objective, and instructional strategies.

By synthesizing the needs of students across the grade level in mathematics and ELA, RtI class rosters are changed at least every 2 weeks. Therefore, if a student demonstrates mastery over the targeted learning objective, the student will be removed from the RtI classroom. In contrast, if a student demonstrates additional intervention time is needed beyond the 2-week suggested time frame, placement will not change. Finally, if

a student needs intervention in mathematics and ELA, teachers have the autonomy to use additional data points, such as state testing, to determine where the student will be placed.

This research study provided an assessment of whether RtI strategies targeting specific learning standards had a relationship to JMS MAP performance. Early academic interventions impact educational performance as students progress through each grade (O'Dwyer, Lee-St. John, Raczek, Luna Bazaldua, & Walsh, 2016). Along each grade-level at JMS, educators identify learning gaps and provide educational reinforcement to meet the diverse needs of individual learners. From tutoring to differentiated instruction, schools use intervention strategies to improve student learning. Starting with the analysis of student learning, teachers at each grade level can identify what students already know and can do, and then facilitate learning to meet the instructional needs of individuals and groups of students. Students and teachers engage in the learning process by adjusting and amending instruction, providing deliberate practice and problem solving determined by individual needs, based on performance (Buffum, Mattos, & Malone, 2018; Hattie & Yates, 2014).

Method

In this scholarly study, the researcher worked to answer three research questions. Table 2 identifies the research questions, variable and analyses information for this study. Continuous variables for this study are MAP test scores. ANOVA was used (Field, 2018).

Table 2

Research Questions, Variables, and Analyses

Research questions	Independent Variable	Dependent Variable	Data Type	Statistical Analysis
1. What are the descriptive statistics for students when disaggregated by gender, FRL status, and minority status?			Categorical	Descriptive
2. At JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test between student eligibility for FRL and level of RTI received?	FRL eligibility Level of RTI	MAP score	Continuous	ANOVA
3. At JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test for student identifying as White, non-Hispanic receiving Level 1 RTI, students identifying as White, non-Hispanic receiving Level 2 RTI, and students identifying as not White?	Student ethnicity Level of RTI	MAP score	Continuous	ANOVA

Note. FRL = free and reduced-price lunch, JMS = Jonah Middle School, MAP = Missouri Assessment Program, RtI = response to intervention.

Participants

Study participants included sixth-grade JMS students for the 2017–2018 and 2018–2019 school years. For the 2017–2018 school year, there were 145 sixth grade students. These students did not have access to RTI. One student did not take the MAP test; therefore, the sample size for this population is 144 students (PowerSchool, 2019). For the 2018–2019 school year, there were 136 sixth grade students. These students did have access to Levels 1 and 2 of RTI. Two of those students took the MAP-A test; therefore, the sample size for this population is 134 students (PowerSchool, 2019). When combined, the total sample size for both years is 278.

According to Creswell (2014), this is a stratification of the population, as the target population includes only students enrolled in Grade 6. According to DESE (2019c), 48% of students receive FRL. More than 5% of the student population identified

as historically marginalized (NCES, 2019a). Therefore, JMS is not considered race/ethnicity homogenous (Field, 2018). JMS has neither high nor low poverty rate when compared to students throughout Missouri, with about half of the students eligible for FRL 2019 (NCES, 2019b, 2019c). See Table 3 for disaggregated data for sixth-grade students at JMS.

Table 3

2018 and 2019 Disaggregated Data for Sixth-Grade Students at Jonah Middle School

Category	Number of students	Percent of students
Students enrolled	278	100.0
Male	153	55.0
Female	125	45.0
Eligible for free lunch	101	36.3
Eligible for reduced-price lunch	38	13.7
Combined eligible for free or reduced-price lunch	139	50.0
Not eligible for free or reduced-price lunch	139	50.0
Students identified as historically marginalized	23	8.3
Students identifying as White, non-Hispanic	255	91.7

Note: Retrieved from JMS student records, 2019.

Studies show that the younger the students in learning interventions, the more likely educational growth can be documented (Cameron et al., 2015; Early et al., 2016; O'Dwyer et al., 2016). At JMS, students in sixth-grade are the youngest. Therefore, the research was conducted for students in Grade 6.

The current study used sixth-grade mathematics MAP data from the 2018 and 2019 school years for students at JMS. The data collected specifically identifies academic-achievement levels for students identified as FRL and non-FRL scoring in Proficient and Advanced levels on the MAP test throughout the state and at JMS (DESE, 2017b).

Student-achievement categories guided the research questions (Hattie, 2012) and standards-based assessment (Marzano, 2010). Missouri's DESE published the achievement-level descriptors (DESE, 2018c).

Data Collection

According to the Assessment Principles provided by DESE (2018b), summative assessments are given starting in Grade 3. The assessment should prepare students for college and careers by aligning with College- and Career-Readiness Standards and the reports should yield data on student progress (DESE, 2018c). The MAP test is given to students in Grades 3 through 8 in the subject areas of mathematics and English-language arts (ELA). Students in Grades 5 and 8 take a MAP test for science. This study focused only on mathematics for sixth-grade students during the 2018–2019 school year. Tier level of RtI will be considered a variable.

Data Analysis

Results examination involved data on students eligible and ineligible for FRL, students in and not in RtI, students who are eligible for FRL but are not receiving RtI, and student ethnicity. This design allowed a comparison and contrasting of the results, as the data-collection processes were completed separately (as in Creswell, 2014). ANOVA tests were used for data analysis (aligned with Field, 2018). Student anonymity was preserved by coding student identities and descriptive statistics categorically (Field, 2018).

By synthesizing the data for one grade level at one school, the researcher created a small-sample study, comparing and contrasting commonalities and differences (aligned with Creswell, 2014). Validity and reliability confirm uniformity in the assessment over

time. The Data Recognition Corporation's (DRC, 2017) report to Missouri DESE emphasized validity and reliability of the MAP test through internal and external assessment procedures. Validity and reliability of the MAP test was important to this study because the MAP test was used as an indicator for student performance. Therefore, the assessment had fidelity.

Limitations

Student effort on the MAP test was not considered for this research. For example, if a student rushed through the assessment or randomly selected answers, test results would be skewed. Because student behavior is not a factor, this possibility was treated as a limitation.

The level of teacher implementation of RtI was not considered a factor for this research. Teachers were able to determine which Missouri Learning Standards guided instruction. Intentional focus on learning standards implemented throughout grade levels is considered best practice (Buffum et al., 2018).

Teacher quality and instructional strategies comprised another limitation. Because teachers had the autonomy to determine the instructional needs of the students, teacher choice was not considered. As a result, teacher implementation was a limitation.

Like Morrissey et al. (2014), in this research the researcher did not consider changes in family income. Therefore, if students became ineligible for FRL after the paperwork had been completed, the student would continue to receive the services and their data was not removed from the data.

Principal effectiveness, culture and climate, teacher effectiveness, attendance, and grades were not measured through this study, which is an additional limitation. Bias must

be considered a limitation for this study as the researcher is also the principal of JMS. Knowing the history, goals, and the intention to use the results for improvement influence researcher bias (see Creswell, 2014). This was mitigated by using the Jonah district data tracker for monitoring student progress.

Findings

Research Question 1. Figure 1 shows students performing in the proficient or advanced ranges on the MAP test when combing students eligible for free and reduced cost lunch compared to full priced lunch. The sample size was 278. There is a difference in performance when comparing students who are eligible for FRL and those who do not. There is a gap of 17% between groups.

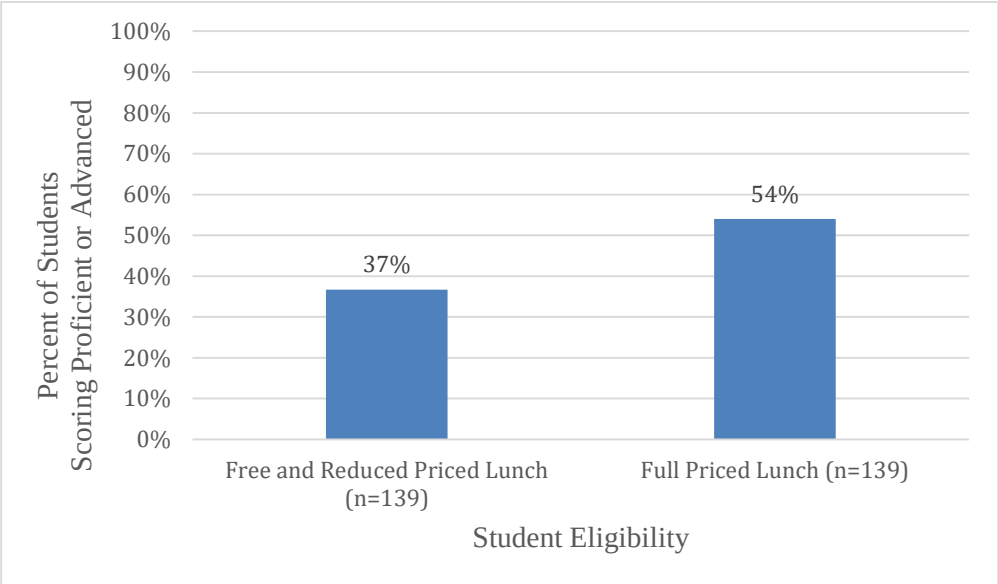


Figure 1. Students scoring Proficient or Advanced on the sixth-grade mathematics Missouri Assessment Program test in 2018 and 2019 when looking at students eligible for free and reduced-price lunch and students not eligible (*N* = 278).

Figure 2 shows students performing in the proficient or advanced ranges on the MAP test when looking at ethnicity. The sample size is 278. There is a difference in

performance when comparing students who identify as white, non-Hispanic and students who do not. There is a gap of 21% between groups.

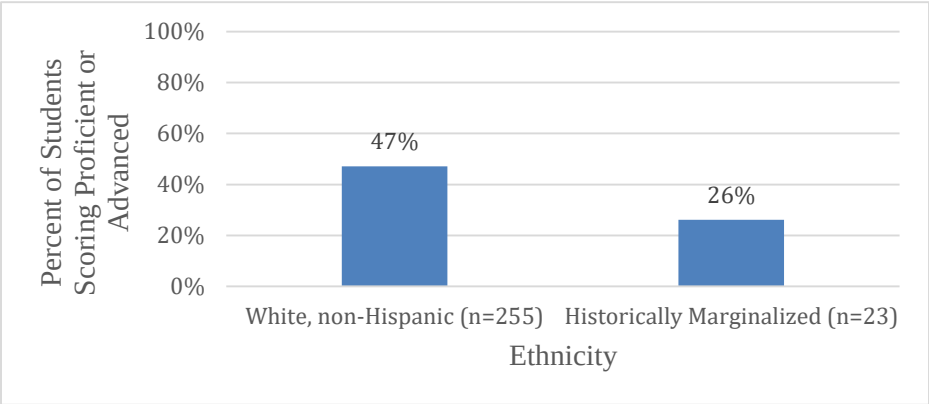


Figure 2. Students scoring proficient or advanced on the sixth-grade mathematics Missouri Assessment Program test in 2018 and 2019 when looking at ethnicity (*N* = 278).

Figure 3 shows students performing in the proficient or advanced ranges on the 2019 mathematics MAP test when looking at students who received RTI Level 1 or Level 2. The sample size is 278. There is a difference in performance when comparing 2019 students who received RTI Level 1 and Level 2. Students receiving Level 2 RTI scored lower that students receiving Level 1 RTI.

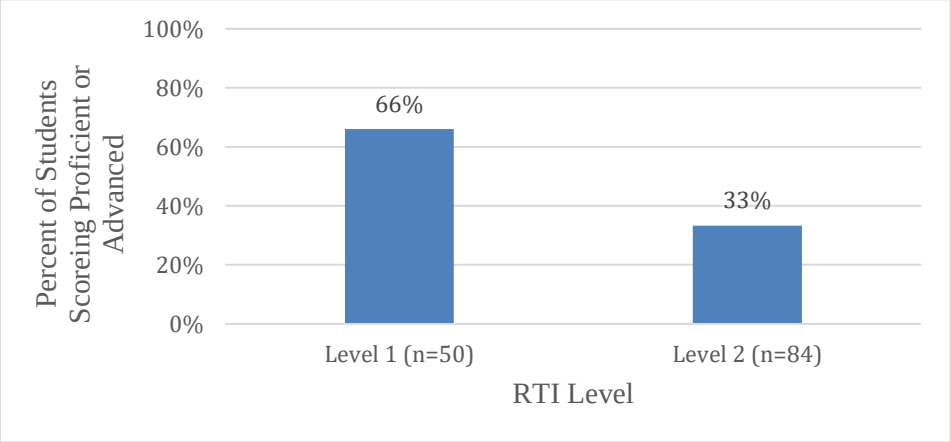


Figure 3. Students scoring proficient or advanced on the sixth-grade mathematics Missouri Assessment Program Test in 2019 when looking at response to intervention Level 1 and Level 2 (*N* = 278).

Research Question 2. The sample size was 134. Findings indicated the *F*-statistic = 11.458, degree of freedom = 3, $p = .000$, and eta squared = 0.209. These results were statistically significant, as $p < .001$. As a result, the researcher rejected the null hypothesis and accepted the alternative hypothesis: A statistically significant different exists in performance on the sixth-grade 2019 mathematics MAP test between student eligibility for FRL and level of RTI received. These results allowed the researcher to identify why a student earned their score in 2019. See Figure 4 for results.

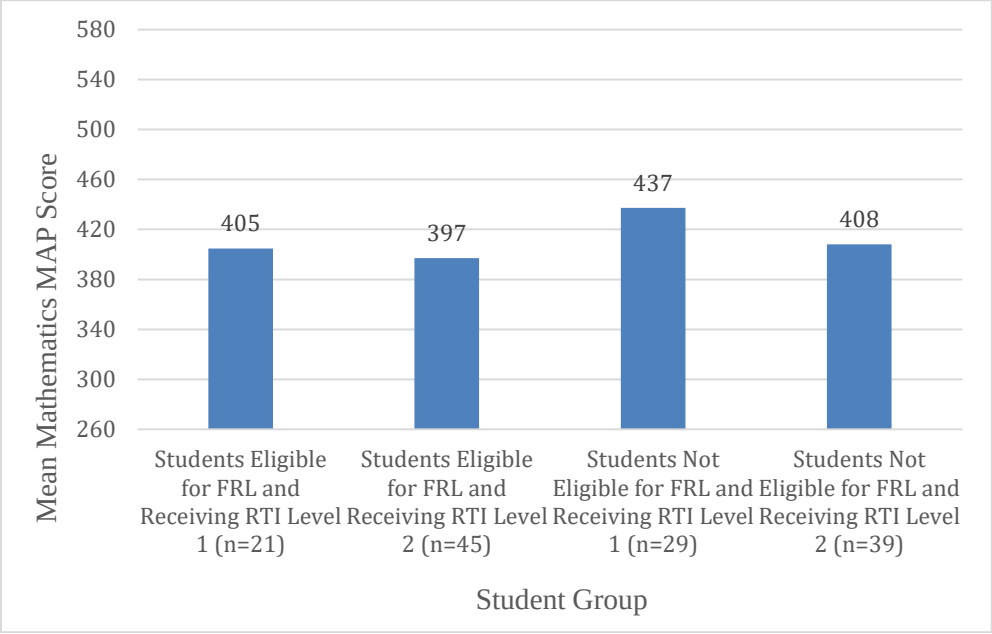


Figure 4. Mean sixth-grade mathematics Missouri Assessment Program scores when comparing student eligibility for free and reduced-price lunch and level of response to intervention received (*N* = 134).

Research Question 3. The sample size was 134. Findings indicated the *F*-statistic = 7.188, degree of freedom = 2, $p = .001$, and eta squared = 0.209. These results were statistically significant, as $p < .005$. As a result, the researcher rejected the null hypothesis and accepted the alternative hypothesis: A statistically significant difference exists in performance on the sixth-grade 2019 mathematics MAP test for student identifying as

White, non-Hispanic receiving Level 1 RTI, students identifying as White, non-Hispanic receiving Level 2 RTI, and students identifying as not White. See Figure 5 for results.

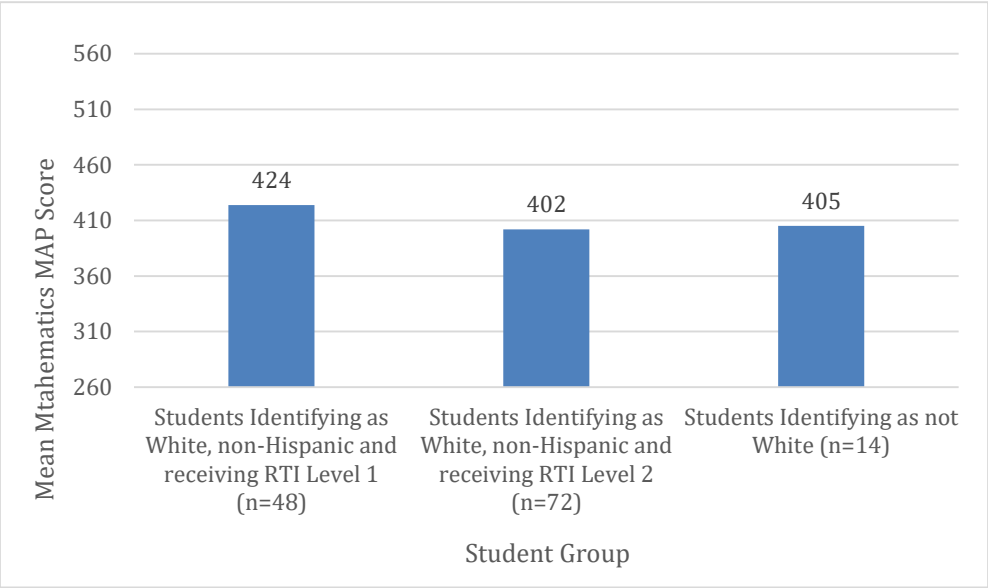


Figure 5. Mean sixth-grade mathematics Missouri Assessment Program scores when comparing student ethnicity and level of response to intervention received (N = 134).

Recommendations

Research Question 1. When looking at the disaggregated data, students eligible for free or reduced lunch score lower than students who are not eligible. Students who identify with a minority ethnic background score lower than students who identify as White, non-Hispanic. Scores between 2018 and 2019 are very similar. Students receiving Level 2 RTI score lower than students receiving Level 1 RTI.

What interested the researcher was that 2018 and 2019 student performance was basically the same, as shown previously in Figure 4. The results indicated that there was a 1% difference in 2018 students who did not received RTI than the 2019 students who did have access to RTI throughout the school year. These results led to the need for Research

Question 2. Additionally, Figure 2 previously identified a disparity that led to the need for Research Question 3.

Research Question 2. Students eligible for FRL at RTI Levels 1 and 2 and students eligible for full priced lunch at RTI Level 2 need assistance. This could be used as a way to determine who has learning gaps. Eta Squared showed the researcher that 20% of the students score is based on FRL status and RTI level. For example, if a student scored 437, then 87 of those points represent their FRL status and RTI level. So, for students receiving full priced lunch at RTI Level 1, they should score 20% higher than the other three groups.

Research Question 3. Students identifying as White, non-Hispanic at RTI Level 2 and students identifying as not White need assistance. This could be used as a way to determine who has learning gaps. Eta Squared showed the researcher that 9.9% of the students score is based on ethnicity and RTI level. For example, if a student scored 437, then 43 of those points represent their ethnicity and RTI level. So, for students identifying as White, non-Hispanic at RTI Level 1, they should score 9.9% higher than the other two groups.

Conclusion

This study has similarities and differences compared to previous research. While JMS did have an increase in state standardized assessment scores in 2019 as previously discussed, the researcher is unable to conclude that RtI had a statistically significant difference in student performance. Students in RTI Level 2 are effectively identified to receive academic assistance. This seems to be a stronger academic identifier than free and reduced-lunch eligibility and race.

Declaration of Conflicting Interests

The researcher is also the principal at JMS.

Funding

The author received no funding support for the research, authorship, and/or publication of this article.

References

Bambrick-Santoyo, P. (2010). *Driven by data: A practical guide to improve instruction.* San Francisco, CA, US: Jossey-Bass.

Barley, Z. A., & Beesley, A. D. (2007). Rural school success: What can we learn? *Journal of Research in Rural Education, 22*(1), 1–16. Retrieved from https://cep.org.au/wpcontent/blogs.dir/884/files/2010/11/Rural-School-Success-What-can-we-learn.pdf

Bolshakova, V. L. J., Johnson, C. C., & Czerniak, C. M. (2011). "It depends on what science teacher you got": urban science self-efficacy from teacher and student voices. *Cultural Studies of Science Education, 6,* 961–997. https://doi.org/10.1007/s11422-011-9346-2

Boykin, A. W., & Noguera, P. (2011). *Creating the opportunity to learn: Moving from research to practice to close the achievement gap.* Washington, DC, US: Association for Supervision and Curriculum Development.

Buffum, A., Mattos, M., & Malone, J. (2018). *Taking action: A handbook for RTI at work.* Bloomington, IN, US: Solution Tree Press.

Cameron, C. E., Grimm, K. J., Steele, J. S., Castro-Schilo, L., & Grissmer, D. W. (2015). Nonlinear gompertz curve models of achievement gaps in mathematics and reading. *Journal of Educational Psychology, 107,* 789–804. https://doi.org/10.1037/edu/0000009

Carnegie Foundation for the Advancement of Teaching. (2019). *The six core principles of improvement.* Retrieved from https://www.carnegiefoundation.org/our-ideas/six-core-principles-improvement/

Center on Response to Intervention at American Institutes for Research. (2019). *Title of the article.* Retrieved from https://www.rti4success.org/essential-components-rti/data-based-decision-making

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA, US: Sage.

Data Recognition Corporation. (2017). *Missouri assessment program grade-level assessments: Grades 3–8 English language arts and mathematics Grades 5 and 8 science: Technical Report 2017.* Retrieved from https://dese.mo.gov/sites /default/files/asmt-gl-tech-report-2017.pdf

Datnow, A., & Park, V. (2014). *Data-driven leadership.* San Francisco, CA, US: Jossey -Bass.

Duncan, G., & Brooks-Gunn, J. (Eds.). (1997). *Consequences of growing up poor.* New York, NY, US: Russell Sage Foundation.

Early, D. M., Berg, J. K., Alicea, S., Si, Y., Aber, J. L., Ryan, R. M., & Deci, E. L. (2016). The impact of every classroom, every day on high school student achievement: Results from a school-randomized trial. *Journal of Research on Educational Effectiveness, 9*(1), 3–29. https://doi.org/10.1080/19345747.2015 .1055638

Epstein, J. L. (2010). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan, 92*(3), 81–96. https://doi.org/10.1177 /003172171009200326

Every Student Succeeds Act, 20 USC 6301 et seq. (2015).

Feldman, J., Lucey, G., Goodrich, S., & Frazee, D. (2003). Developing an inquiry-minded district. *Educational Leadership, 60*(5). Retrieved from https://www .nyccharterschools.org/sites/default/files/resources/Developing_an_Inquiry -Minded_District1.pdf

Feldman, J., & Tung, R. (2001, April). *Whole school reform: How schools use the data based inquiry and decision making process.* Paper presented at the 82nd annual meeting of American Educational Research Association, Seattle, WA, US.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Thousand Oaks, CA, US: Sage.

Finkelstein, D. M., Hill, E. L., & Whitaker, R. C. (2008). School food environments and policies in US public schools. *Pediatrics, 122*(1), e251–e259. https://doi.org/10 .1542/peds.2007-2814

Gilbert, T. F. (1978). *Human competence: Engineering worthy performance.* New York, NY, US: McGraw-Hill.

Gottfried, M. A. (2011). The detrimental effects of missing school: Evidence from urban siblings. *American Journal of Education, 117,* 147–182. https://doi.org/10.1086 /657886

Graves, A. W., Brandon, R., Duesbery, L., McIntosh, A., & Pyle, N. B. (2011). The effects of tier 2 literacy instruction in sixth grade: Toward the development of a response-to intervention model in middle school. *Learning Disability Quarterly, 34*(1), 73–86. https://doi.org/10.1177/073194871103400105

Hattie, J. A. C. (2009). Visible learning for teachers: A synthesis of over 800 meta-analyses relating to achievement. London, England: Routledge.

Hattie, J. A. C. (2012). *Visible learning for teachers: Maximizing impact on learning.* London, England: Routledge.

Hattie, J. A. C., & Yates, G. (2014). *Visible learning and the science of how we learn.* London, England: Routledge.

Holmes, T. (2010). The hierarchy of epistemological beliefs: All ways of knowing are not created equal. *Studies in Meaning, 4,* 281–315. Retrieved from https://www.thefreelibrary.com/The+hierarchy+of+epistemological+beliefs%3A+all+ways+of+knowing+are+not...-a0281112138

Jyoti, D. F., Frongillo, E. A., & Jones, S. J. (2005). Food insecurity affects school children's academic performance, weight gain, and social skills. *Journal of Nutrition, 135,* 2831–2839. https://doi.org/10.1093/jn.135.12.2831

Kenton, W. (2019, October). *T-test.* Retrieved from https://www.investopedia.com/terms/t/t-test.asp

Killan, S. (2017, September 24). *Hattie's 2017 updated list of factors influencing student achievement.* Retrieved from http://www.evidencebasedteaching.org.au/hatties-2017updated-list/

Mandinach, E. (2012). A perfect time for data use: Using data-driven decision making to inform practice. *Educational Psychologist, 47*(2), 71–85. https://doi.org/10.1080/00461520.2012.667064

Marzano, R. J. (2010). *Formative assessment & standards-based grading.* Bloomington, IN, US: Marzano Research Laboratory.

Missouri Department of Elementary and Secondary Education. (2016). *6–12 Mathematics grade-level expectations.* Retrieved from http://dese.mo.gov/sites/default/files/curr-mls-standards-math-6-12-sboe-2016.pdf

Missouri Department of Elementary and Secondary Education. (2017a). *Ensure equitable access to excellent educators*. Retrieved from https://dese.mo.gov/sites/default/files/Educator-Equity-Plan-June2018.pdf

Missouri Department of Elementary and Secondary Education. (2017b). *State assessment.* Retrieved from https://mcdssecured.dese.mo.gov/quickfacts/Pages/State-Assessment.aspx

Missouri Department of Elementary and Secondary Education. (2018a). *Assessment updates.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-dtc-memo-102518.pdf

Missouri Department of Elementary and Secondary Education. (2018b). *Comprehensive guide: MSIP5.* Retrieved from https://dese.mo.gov/sites/default/files/MSIP-5-2018-Comprehensive-Guide%20(3).pdf

Missouri Department of Elementary and Secondary Education. (2018c). *High-quality summative assessment principles for ELA/literacy and mathematics assessment aligned to college- and career-readiness standards.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-principles.pdf

Missouri Department of Elementary and Secondary Education. (2018d). *Mathematics.* Retrieved from https://dese.mo.gov/college-career-readiness/curriculum/mathematics

Missouri Department of Elementary and Secondary Education. (2019a). *Achievement level 4 report: Public*. Retrieved from https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx

Missouri Department of Elementary and Secondary Education. (2019b). *Homepage.* Retrieved from https://dese.mo.gov

Missouri Department of Elementary and Secondary Education. (2019c). *State of Missouri reports and resources*. Retrieved from https://apps.dese.mo.gov/MCDS/home.aspx

Morrissey, T. W., Hutchison, L., & Winsler, A. (2014). Family income, school attendance, and academic achievement in elementary school. *Developmental Psychology, 50,* 741–753. https://doi.org/10.1037/a0033848

National Center for Education Statistics. (2018). *Back to school statistics.* Retrieved from https://nces.ed.gov/fastfacts/display.asp?id=372

National Center for Education Statistics. (2019a). *Education demographic and geographic estimates.* Retrieved from https://nces.ed.gov/Programs/Edge/ACSDashboard/2907020#

National Center for Education Statistics. (2019b). *The nation's report card: Data tools: State profiles.* Retrieved from https://www.nationsreportcard.gov/profiles/stateprofile?chort=1&sub=MAT&sj=&sfj=NP&st=MN&year=2019R3

National Center for Education Statistics. (2019c). *The nation's report card: Mathematics 2011 state snapshot report: Missouri Grade 8 public schools.* Retrieved from https://nces.ed.gov/nationsreportcard/pdf/stt2011/2012451MO4.pdf

Newcomer, K. E., Hatry, H. P., & Wholey, J. S. (2015). *Handbook of practical program evaluation* (4th ed). Hoboken, NJ, US: Jossey-Bass.

Noguera, P. (2010, September 20). Accept it: Poverty hurts learning: Schools matter, but they're not all that matters. *Motion Magazine.* Retrieved from https://inmotionmagazine.com/er/pn_acceptit10.html

Noguera, P. A. (2011). A broader and bolder approach uses education to break the cycle of poverty. *Phi Delta Kappan, 93*(3), 8–14. https://doi.org/10.1177/003172171109300303

Nord, M. & Economic Research Service. (2009). *Food insecurity in households with children: Prevalence, severity, and household characteristics* (Economic Information Bulletin Number 56). US Department of Agriculture. Retrieved from http://proxy.mul.missouri.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED508211&site=eds-live&scope=site

Northouse, P. G. (2016). *Leadership: Theory and practice* (7th ed.). Los Angeles, CA, US: Sage.

NWEA. (2019). *NWEA Home.* Retrieved from http://nwea.org

O'Dwyer, L. M., Lee-St. John, T., Raczek, A. E., Luna Bazaldua, D. A., & Walsh, M. (2016). Examining the role of early academic and non-cognitive skills as mediators of the effects of city connects on middle school academic outcomes. Available from ERIC database. (ED567236)

Payne, R. K. (1996). *A framework for understanding poverty.* Highlands, TX, US: Aha Process.

Peterson, C. E. (2013). *High school physical education and sport participation: Impact on young adult physical activity behaviors* (Unpublished doctoral dissertation). University of Missouri, Columbia.

Peterson, D. W., Prasse, D. P., Shinn, M. R., & Swerdlik, M. E. (2019). The Illinois flexible service delivery model: A problem-solving model initiative. In. A. Jimerson, M. Burns, & A. VanDerHeyden (Eds.), *Handbook of response to intervention: The science and practice of assessment and intervention* (pp. 288–289). New York, NY, US: Springer.

PowerSchool. (2019). Retrieved from https://Jonah.powerschool.com/admin/home.html

ProCon.org. (2018, October 23). *History of standardized tests.* Retrieved from https://standardizedtests.procon.org/history-of-standardized-tests/

Reynolds, A. J., Weissberg, R. P., & Kasprow, W. J. (1992). Prediction of early social and academic adjustment of children from the inner city. *American Journal of Community Psychology, 20,* 599–624. https://doi.org/10.1007/bf00941774

RTI Action Network. (2019). *What is RTI?* Retrieved from http://www.rtinetwork.org /learn/what/whatisrti

Siegle, D. (2019, October). *Educational research basics.* Retrieved from https:// researchbasics.education.uconn.edu/t-test/#

U.S. Department of Agriculture. (2019). *National School Lunch Program.* Retrieved from https://www.ers.usda.gov/topics/food-nutrition-assistance/child-nutrition-programs/national-school-lunch-program.aspx

Vaughn. S., & Fuchs, L. (2003, June). Redefining learning disabilities as inadequate response to instruction: The promise and potential problems. Learning Disabilities Research & Practice, 18(3), 137–146. https://doi.org/10.1111/1540-5826.00070

Visible Learning. (2017). Hattie ranking: 252 Influences and effect sizes related to student achievement. Retrieved from https://visible-learning.org/hattie-ranking-influences-effect-sizes-learning-achievement/

Williams, J., & Noguera, P. (2010, Winter). Poor schools or poor kids? *Education Next, 10*(1). Retrieved from https://www.educationnext.org/poor-schools-or-poor -kids/

Author Biography

Dr. Tim Wall is the Dean and School Director of the Northwest Missouri State University School of Education and a Professor. His research interests include: teacher preparation; assessment; diversity, equity and inclusion; standardized testing; accreditation; policy analysis; quantitative and qualitative research. He serves as a dissertation advisor and faculty member in the Misssouri-Columbia/Northwest Ed.D in Educational Leadership and Policy Analysis.

Tiffani Collins is the principal at a rural middle school in Missouri. She plans to complete her Educational Doctorate in May 2020 in Education Leadership and Policy Analysis from the University of Missouri-Columbia. She taught middle school math for 12 years and has been a secondary principal for 7 years.

SECTION 6

SCHOLARLY PRACTITIONER REFLECTION

Learning, Leading, Changing: These are the three supporting pillars of the Educational Leadership and Policy Analysis doctoral program at the University of Missouri-Columbia. Students begin their journey identifying who they are as learners. As participants navigate their learning throughout the program, the focus highlights a collection of leadership styles. The curriculum combines learning theory and leadership styles to influence who students are as change agents. The incredible journey culminates in the spring of 2020 as I revisit my identified Gallup strengths, identify where I want to continue to grow, and determine how I can facilitate profound change in my school organizations and in myself.

Some would say leadership theory and practice sit in juxtaposition, like fact and fiction. The variety of leadership styles—transformational, authentic, and servant (Northouse, 2016)—suggest that for the application of those theories to become practice, members must understand their purpose and role to work together to make an impact (Levi, 2017). The marriage of theory and practice ignite when leadership teams overcome struggles and go beyond a compromise to find a third option: one that creates success for the team, not individuals.

The analysis of an organization takes time and dedication. Levi (2017) focused on the importance of honoring traditions, understanding how personalities affect growth, understanding power shifts, and the importance of speaking to “both the mind and the heart” (p. 243). Change agents must rely on each of these frameworks to impact change in an organization.

Policy analysis weighs the risks of change with the risks of not changing (Bardach & Patashnik, 2016). Policy analysis is both a political tactic and a social interaction. Therefore, researchers must be cognizant and perceptive of both within the organization of practice.

Leadership assessments provide valuable feedback on strengths in differing leadership styles (Northouse, 2016). The identification and acknowledgement of strengths and growth opportunities is essential for leaders. Therefore, not only should the content be valued, but also the context of its application. True leaders build an atmosphere that ignites a need for change while enjoying the journey.

Leadership Theory and Practice

A learner obtains knowledge through multiple avenues. Experience, research, and study account for the fundamentals of acquiring leadership development. In the realm of education, experience includes kinesthetic or tactile learning (Cleaver, 2019). Cleaver also acknowledges the importance of activating both sides of the brain. The group assignments of this cohort gave me cause to observe, apply, synthesize, and write about the chosen locations while applying classroom lessons. Identified as an “arranger,” I discovered that this label is quite accurate. I use my resources, such as colleagues outside my work environment, to enhance the learning process. I intuitively strive to use my time wisely (Gallup, 2017). I make lists and prioritize items on that list. Using field experiences as a form of learning has allowed me to engage and work with other leaders, to observe theory in practice, and to reflect on and evaluate the entire process. These experiences also enhanced further application of research and study.

To me, experiencing the research process has been the most enriching part of the doctoral program. As a learner, I found the actual research process, and the acquisition of its findings, instructive and enlightening. According to Merriam and Bierema (2014), this motivation identifies me as a "*learning-oriented learner*" (p. 151). I learn because I love to learn, I am intuitively drawn to do so.

My second highest Gallup (2017) strength is "analytical." The term analytical means this strength drives my entire system of thinking (Gallup, 2017). As a leader in my building, I have moved from believing someone at their word to having a curiosity and yearning to understand from where their thoughts come. I wonder how research and other experts and colleagues might support a peer-suggested thought and what counterclaims might be available because cognitive-motivation theory confirms that an analytical trait that guides our behavior usually results in a desirable outcome (Merriam & Bierema, 2014). This strength serves me well as a researcher.

Study is the third aspect of learning (Cleaver, 2019). Among other things, study involves how to listen and converse with colleagues. Throughout the doctoral coursework, the many assigned readings and assigned study groups provided opportunities to enhance my study skills in a variety of formats. Enhancing my professional connections with my cohort members enabled me to "establish higher and broader moral purposes" (Northouse, 2016, p. 347). Though sometimes overwhelming, the writing assignments were informative, practical, and very applicable. Not only did I defy my expectations of being able to complete the work, but I also found myself holding others accountable to our tasks as we engaged in the process of peer review.

Reviewing literature has become a newly forced habit that caused me to manipulate my normal time management. Participating in group work and collaborative conversations requires new dimensions of understanding and application. Bruffee (1999) wrote about how the initial aspect of change can be difficult, but that colleague perceptions and challenges left a lasting impression. I have been uniquely challenged by some of the beliefs, values, and ideas of my colleagues. Keeping a focus on individual morals and values is a key component of leadership (Northouse, 2016). Here, I use my consistency strength (Gallup, 2017). I try to remain focused on my own performance and to remain true to the expectations of the assignments. I attempt to treat everyone with the same fairness and respect while acknowledging that bias is inevitable (Merriam & Bierema, 2014).

As I maneuver through the curriculum of the doctoral program, I find myself more and more aware how all three of these aspects of learning converge: experience, research, and study. Without the all-inclusive opportunities to personally consider and synthesize the literature, to converse and reflect on the literature together, and to collaborate with colleagues on the course projects, the doctoral learning process would come up short. Mastering that synthesis with application remains an ever-changing system.

Organizational Analysis

My first and most prevalent strength on the StrengthsQuest survey (Gallup, 2017) is “discipline.” I organize and plan for learning opportunities every day. In the workplace, each grade-level team in my building has a designated day for team discussion topics. For example, every Thursday, teams discuss student data and identify trends; each Friday

they receive online or targeted in-house professional development such as trainings about dyslexia or online programs used in the workplace. Merriam and Bierema (2014) supported this intentionality by writing, “it requires us to plan and facilitate learning activities with the goal of developing learners’ ability to think critically” (p. 228). Northouse (2016), would classify this as “Team Management” (p. 77). In an attempt to inspire staff to achieve personal and professional goals and as a result of providing multiple opportunities for my staff to organize and plan together, teachers and administrators experience a routine process that fosters critical thinking and teaming that collaboratively targets teaching and learning strategies for student improvement (Merriam & Bierema, 2014; Northouse, 2016).

I never rank high in the category of empathy, no matter what personality-assessment tool I have taken. Therefore, I identify it as a growth opportunity. I do not naturally sense the emotions of others around me and I do not, at first blush, see the world through another’s eyes. Even my boss identified this as a growth area for me. Merriam and Bierema (2014) addressed “helping learners build competence in this area while working with challenging concepts is fundamental to the critical thinking process” (p. 232). Unfortunately, I often view empathy as the opposite of being disciplined. Learning to listen with emotion instead of listening to create a solution makes me feel I am pulling against my desire to have a clear path to success. Northouse (2016) believed that adaptive leadership should to be applied. I “…have to be cautious to listen and be open to the ideas of people who may be at the fringe, marginalized, or even deviant in the group or organization” (Northouse, 2016, p. 271). I now recognize that to be a strong leader, I need to demonstrate that I understand how my staff is feeling.

Already, I have targeted a goal for myself. I use results from staff culture surveys to reflect and create action plans. It is now in the forefront of my mind to listen first, ask clarifying questions, and work with others to find the solution that works best for as many involved as possible. As I help others commit to an action, I will also check in with them about how they feel about the issues involved. Asking others for help to identify their feelings is a part of this goal.

Merriam and Bierema's (2014) "six steps to courageous resistance" resonated with me (p. 233). First, I recognize that I need to strategically provide opportunities for people to build relationships, such as accountability partners. Next, as communication with others occurs, I need to acknowledge their feelings without robbing them of an opportunity to find their own solutions. By coordinating, coaching, and learning as a team of adults, empathy is bound to become more natural. Northouse (2016) suggested, "The challenge for leaders is to strike a balance between being open and candid while monitoring what is appropriate to disclose in a particular situation" (p. 346). As I listen to others, I notice growth in me. I am seeking to respond compassionately and to show that I am actively listening to their voices.

Building relationships with others who do not hold the same beliefs is an area that my staff and I both need to address. Bryk (2015) wrote how learning is difficult when an individual feels uncomfortable or judged. Creating an environment where people feel safe to make mistakes and learn can be challenging for leaders and learners alike. With the focus on individuals and the organization becoming altered, a transformational change could take place (Merriam & Bierema, 2014). It is so much easier and more comfortable to be surrounded with like-minded individuals. Levi (2017) wrote, "Positive benefits

accrue when a team learns how to overcome the challenges created by diversity" (p. 268). Levi furthered this thought by reinforcing that, in an environment that embraces diversity, healthy disagreements will occur. Stretching ourselves into new experiences and networks will help us build a healthy culture and provide new learning opportunities for personal and academic growth.

Applying the new knowledge we encounter together is the final step. Because people want to know intended outcomes and can be resistant to change, many adults seek clear expectations for behaviors (Levi, 2017). I have spent some time recently reflecting on how I practice new learning and wondering how my process differs from that of my staff. What are the perceptions we have of each other as we apply what we have learned? Noticing these differences is not enough. I need to target a plan of action to address these differences. Levi (2017) suggested having evaluations, specific measures, a clear process, and to acknowledge bias in the system. Levi wrote, "the purpose of measurement is to provide feedback and improve performance" (Levi, 2017, p. 330). Therefore, creating a way for teachers to partake in the feedback process is a key step in my plan. This process would provide insight as to whether the staff is actually inspired.

Policy Analysis

I have never enjoyed discussing politics. In fact, I avoid it. The thought of policy analysis had me anxious from the beginning of this program. I found out, however, that policy is only one part of politics that I have grown to appreciate.

Policy for the principle of action values evidence (Bardach & Patashnik, 2016). Research requires attention to detail, finding applicable sources, and acknowledging scholarly literature. Policy aligns with authentic leadership, position, and approach.

Northouse (2016) described this style as “a complex process that emphasizes the development of qualities that help leaders to be perceived as trustworthy and believable by their followers” (p. 206). Hence, policy is the application of evidence from system reflections and feedback.

Having an analytical personality, I value fact finding and follow through actions (Gallup, 2017). Recently, I was part of a leadership team in my district. We were challenged to create a building wide reassessment procedure. The procedure could be used when student performance on an assessment did not reach mastery. Our goal was to have a policy that was easy for teachers, students, and parents to understand, but focused on students mastering learning objectives. With targeted input from staff and multiple revisions, the procedure was eventually created. This task took more than a year.

Reflecting on the process, we unknowingly applied the “Eightfold Path” (Bardach & Patashnik, 2016). Our problem, as we discovered it, was inconsistency throughout the building. Some teachers were requiring students to reassess, parent contact was different, and core class teachers, such as those in mathematics and science, had different expectations from non-core teachers of band and art. As we gathered our evidence, we learned that our teachers all wanted students to master the learning objective, but lacked clarity as to what works best for the students, parents, and teachers.

Levi (2017) wrote about the importance of honoring team-member voices, averring that conflict during the process of change is inevitable. As we asked for teachers to identify their ideal reassessment procedure, we discovered that many criteria overlapped. The qualitative data through the teacher generated plans was overwhelming. Themes emerged that showed consistency (Merriam & Tisdell, 2015; Newcomer, Hatry,

& Wholey, 2015). The team discovered that teachers wanted a timeframe to complete the process and clear expectations for parent contact and student effort.

Based on feedback from teachers, the leadership team used a rough draft of procedures to identify what possible outcomes could occur (aligned with Bardach & Patashnik, 2016). For example, what happens when a student who has achieved mastery wants to reassess to demonstrate knowledge at a higher level? What happens when a student refuses to reassess? What happens when there is no parental support at home or at school? As a result, we had to determine what were non-negotiable factors for the process.

Table 10 shows the expectations for a student who is required to retake an assessment. This means that the student demonstrated multiple misconceptions in their learning and needed additional instruction.

Table 10

Mandatory Summative Reassessment Procedure 2019–2020

Concept	Action to Be Taken
Scores 0, 0.5, and 1	Teacher initiated mandatory reassessment procedures
Reassessment process	Any extra practice, reflections, plans, retest surveys, revisions, tutoring sessions, etc. as assigned by the teacher
Mandatory reassessment and parent contact	0, 0.5, 1 Mandatory Reassessment Parents should be contacted by phone for students who do not reassess Make a comment in the grade book
Testing window	Students may need an extended time beyond the 1–2 week window to make significant growth or achieve mastery

Table 11 shows the expectations for a student who has the option to retake an assessment. This means that the student demonstrated misconceptions in their learning, but came close to mastering learning objectives.

Table 11

Student Initiated Summative Reassessment Procedure 2019–2020

Concept	Action to be taken
Scores between 1.25 and 2.75	Reassessment not required Student initiated
Reassessment process	Student must initiate reassessment process as listed below, if not a mandatory reassessment Any extra practice, reflections, plans, retest surveys, revisions, etc. as assigned by the teacher
Reassessment	Any standard under a 3 (1.25-2.75) Reassessment is completed only for standards not mastered The maximum level available on a retest is a 3
Suggested window	1–2 weeks from the time the summative is returned Appointment to retake should happen within this window
Amount of reassessments	Until they hit proficiency within the suggested window
Students who do not reassess	Make a comment in the grade book Parents could be contacted

Tables 10 and 11 were shared with teachers in May 2019. When this was presented to the staff, teachers reflected by discussing with each other what aspects of the plan they were already doing and what aspects were new. These tables demonstrate how the team worked in conjunction with all the teachers in the building to narrow our focus and implement new practices. Because the 2019–2020 school year will be the first year of implementation, the team understands some areas will work well and other areas will require improvement. Throughout the year, the team will connect with small groups of teachers to address these areas. In doing so, teachers' voices will be heard, clarity and application will be addressed, and an opportunity for feedback will be provided (Bardach & Patashnik, 2016; Gill, 2010; Levi, 2017; Merriam & Bierema, 2014).

Content and Context for Learning

By acknowledging that each individual brings strengths to different situations, I can begin to identify how to highlight and foster growth. Gill (2010) focused on reflection when fostering a culture influenced by learning, posing three action steps: "reflection-on-action …. reflection-in-action … [and] reflection-for-action" (p. 84). Through these steps, Gill emphasized the need for self- and group awareness, reflecting on what actions were taken, if they were effective, and what could be done differently. Attending to reflections also helps in identifying our assumptions, biases, and guiding principles (Levi, 2017; Merriam & Bierema, 2014). Finally, attending to empathy and identifying learning experiences completes the cycle for building self- and group awareness (Levi, 2017; Northouse, 2016).

As I focus on becoming an agent for positive change, I value the importance of dialogue and am now noticing how we choose our words in conversations and messaging. Unfortunately, if I am honest, others may see my analytical personality characteristic as an attempt to debate rather than dialogue (Gallup, 2017). Gill (2010) identified that the intent for dialogue has a shared goal: "Listening to the other person is the key to dialogue" (Gill, 2010, p. 89). Often, I see others' suggestions or possible solutions as attacks on my character or ideas. As I share with teachers, questions asked during observations are not accusatory in nature. Rather, they are inquiry questions. I should do a better job of practicing what I preach. On my journey to being a successful change agent, I need to embrace conflict and challenge as opportunities to listen, seek mutually beneficial solutions, and lead by example (Gill, 2010; Merriam & Bierema, 2014).

Part of being a change agent is to create a bit of discomfort and ignite the need for positive transformations. Leader–Member-Exchange theory focuses on empowering leaders and followers to achieve the same goal (Northouse, 2016). Applying Bolman and Deal's (2013) symbolic framework, I think of it as making music. If all musicians and instruments played the same note at the same time, the sound would lack depth. When notes and sounds complement and contradict the message, the volume increases and decreases, intensity and resolution are created. The same takes place during the change process. When people in an organization all teach or learn the same way, the composition has no depth. By creating learning opportunities that challenge participants to think and respond outside their normal comfort zones, ideas begin to percolate. Gill (2010) wrote, "Both learning and control are important, but organization change depends on learning, not control" (p. 155). Merriam and Bierema (2014) went a step farther: "Our individual and collective culture affect our attitudes and opportunities for learning, as well as our expectations for the roles of learners and educators" (p. 254). A single note might create change, but by playing in unison, through harmony and discord, a different and more powerful change will occur.

Summary

As this program resonates in the growth mindset, the driving forces of student learning, leading, and changing remain constant. As a learner, I pull on my strengths and surround myself with people who can help with my weaknesses. As a leader, I need a leadership view that is not only close by and immediate, but expanded and long-term. Leading *with* others will have a stronger impact than merely leading others. I never viewed myself as a change agent, nor did I ever think I wanted to be. I have changed my

mind. The phrase *catalyst of change* no longer has a negative connotation for me. Through the application of learning, leading, and changing, I now have a desire to be the impetus and adjuvant for change in the hopes of impacting not only my work environment, but my personal milieu as well.

REFERENCES

Bambrick-Santoyo, P. (2010). *Driven by data: A practical guide to improve instruction.* San Francisco, CA, US: Jossey-Bass.

Bardach, E., & Patashnik, E. M. (2016). *A practical guide for policy analysis* (5th ed.). Thousand Oaks, CA, US: CQ Press.

Barley, Z. A., & Beesley, A. D. (2007). Rural school success: What can we learn? *Journal of Research in Rural Education, 22*(1), 1–16. Retrieved from https://cep.org.au/wpcontent/blogs.dir/884/files/2010/11/Rural-School-Success-What-can-we-learn.pdf

Bolman, L. G., & Deal, T. E. (2013). *Reframing organizations: Artistry, choice, & leadership* (5th ed.). San Francisco, CA, US: Jossey-Bass.

Bolshakova, V. L. J., Johnson, C. C., & Czerniak, C. M. (2011). "It depends on what science teacher you got": Urban science self-efficacy from teacher and student voices. *Cultural Studies of Science Education, 6,* 961–997. https://doi.org/10.1007/s11422-011-9346-2

Boykin, A. W., & Noguera, P. (2011). *Creating the opportunity to learn: Moving from research to practice to close the achievement gap.* Washington, DC, US: Association for Supervision and Curriculum Development.

Brown v. Board of Education of Topeka, 347 U.S. 483 (1954).

Bruffee, K. A. (1999). *Collaborative learning: higher education, interdependence, and the authority of knowledge*. Baltimore, MD, US: Johns Hopkins University Press. Retrieved from http://proxy.mul.missouri.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=cat04885a&AN=merlin.b4441382&site=eds-live&scope=site

Bryman, A. (1992). *Charisma and leadership in organizations.* London, England: Sage.

Buffum, A., Mattos, M., & Malone, J. (2018). *Taking action: A handbook for RTI at work.* Bloomington, IN, US: Solution Tree Press.

Cameron, C. E., Grimm, K. J., Steele, J. S., Castro-Schilo, L., & Grissmer, D. W. (2015). Nonlinear gompertz curve models of achievement gaps in mathematics and reading. *Journal of Educational Psychology, 107,* 789–804. https://doi.org/10.1037/edu/0000009

Carnegie Foundation for the Advancement of Teaching. (2019). *The six core principles of improvement.* Retrieved from https://www.carnegiefoundation.org/our-ideas/six-core-principles-improvement/

Center on Response to Intervention at American Institutes for Research. (2019). *Title of the article.* Retrieved from https://www.rti4success.org/essential-components-rti/data-based-decision-making

The City of Jonah. (n.d.). *Jonah, Missouri.* Retrieved from http://www.Jonah-mo.com

Cleary, T. J., Velardi, B., & Schnaidman, B. (2017). Effects of the self-regulation empowerment program (SREP) on middle school students' strategic skills, self-efficacy, and mathematics achievement. *Journal of School Psychology, 64,* 28–42. https://doi.org/10.1016/j.jsp.2017.04.004

Cleaver, S. (2019, January). Hands-on is minds-on. *Scholastic*. Retrieved from http://www.scholastic.com/browse/article.jsp?id=3751901&scrlybrkr=df46da21

Coleman-Jensen, A., McFall, W., & Nord, M. (2009). *Food insecurity in households with children: Prevalence, severity, and household characteristics* (Economic Information Bulletin Number 56). Washington, DC, US: U.S. Department of Agriculture. Retrieved from https://www.ers.usda.gov/webdocs/publications/43763/37672_eib-113.pdf?v=41424

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA, US: Sage.

Data Quality Campaign. (2019). *Make data work for all students.* Retrieved from https://dataqualitycampaign.org/why-education-data/make-data-work-students/

Data Recognition Corporation. (2017). *Missouri assessment program grade-level assessments: Grades 3–8 English language arts and mathematics Grades 5 and 8 science: Technical Report 2017.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-gl-tech-report-2017.pdf

Data Recognition Corporation. (2018). *Missouri assessment program grade-level assessments: Guide to interpreting results.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-gl-gir-spring-2018.pdf

Data Recognition Corporation. (2019). *Missouri assessment program grade-level assessments: Guide to interpreting results.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-gl-gir-spring-2019.pdf

Datnow, A., & Park, V. (2014). *Data-driven leadership.* San Francisco, CA, US: Jossey-Bass.

Duncan, A. (2011). *Making the middle grades matter. Secretary Arne Duncan's remarks at the National Forum's Annual Schools to Watch Conference.* Retrieved from https://www.ed.gov/news/speeches/making-middle-grades-matter

Duncan, G., & Brooks-Gunn, J. (Eds.). (1997). *Consequences of growing up poor.* New York, NY, US: Russell Sage Foundation.

Early, D. M., Berg, J. K., Alicea, S., Si, Y., Aber, J. L., Ryan, R. M., & Deci, E. L. (2016). The impact of every classroom, every day on high school student achievement: Results from a school-randomized trial. *Journal of Research on Educational Effectiveness, 9*(1), 3–29. https://doi.org/10.1080/19345747.2015.1055638

Elementary and Secondary Education Act, 20 U.S.C. *et seq.* (1965).

Epstein, J. L. (2010). School/family/community partnerships: Caring for the children we share. *Phi Delta Kappan, 92*(3), 81–96. https://doi.org/10.1177/003172171009200326

Every Student Succeeds Act, 20 USC 6301 et seq. (2015).

Feldman, J., Lucey, G., Goodrich, S., & Frazee, D. (2003). Developing an inquiry-minded district. *Educational Leadership, 60*(5). Retrieved from https://www.nyccharterschools.org/sites/default/files/resources/Developing_an_Inquiry-Minded_District1.pdf

Feldman, J., & Tung, R. (2001, April). *Whole school reform: How schools use the data based inquiry and decision making process.* Paper presented at the 82nd annual meeting of American Educational Research Association, Seattle, WA, US.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Thousand Oaks, CA, US: Sage.

Finkelstein, D. M., Hill, E. L., & Whitaker, R. C. (2008). School food environments and policies in US public schools. *Pediatrics, 122*(1), e251–e259. https://doi.org/10.1542/peds.2007-2814

Gallup, I. (2017). *StrengthsQuest.* Retrieved from http://www.strengthsquest.com/home/default.aspx

Galton, F. (1869). *Hereditary genius.* New York, NY, US: Appleton.

George, B. (2003). *Authentic leadership: Rediscovering the secrets to creating lasting value.* San Francisco, CA, US: Jossey-Bass.

Gilbert, T. F. (1978). *Human competence: Engineering worthy performance.* New York, NY, US: McGraw-Hill.

Gill, S. J. (2010). *Developing a learning culture in nonprofit organizations.* Los Angeles, CA, US: Sage.

Gottfried, M. A. (2011). The detrimental effects of missing school: Evidence from urban siblings. *American Journal of Education, 117,* 147–182. https://doi.org/10.1086/657886

Graden, J. L. Stollar, S. A., & Poth, R. L. (2019). The Ohio integrated systems model: Overview and lessons learned. In A. Jimerson, M. Burns, & A. VanDerHeyden (Eds.), *Handbook of response to intervention: The science and practice of assessment and intervention*. (pp. 288–289). New York, NY, US: Springer.

Graves, A. W., Brandon, R., Duesbery, L., McIntosh, A., & Pyle, N. B. (2011). The effects of tier 2 literacy instruction in sixth grade: Toward the development of a response-to intervention model in middle school. *Learning Disability Quarterly, 34*(1), 73–86. https://doi.org/10.1177/073194871103400105

Great Schools Partnership. (2013, August 29). *Core course of study.* Retrieved from https://www.edglossary.org/core-course-of-study/

Greenleaf, R. K. (1970). *The servant as leader.* Westfield, IN, US: Greenleaf Center for Servant Leadership.

Hattie, J. A. C. (2009). *Visible learning for teachers: A synthesis of over 800 meta-analyses relating to achievement.* London, England: Routledge.

Hattie, J. A. C. (2012). *Visible learning for teachers: Maximizing impact on learning.* London, England: Routledge.

Hattie, J. A. C., & Yates, G. (2014). *Visible learning and the science of how we learn.* London, England: Routledge.

Holmes, T. (2010). The hierarchy of epistemological beliefs: All ways of knowing are not created equal. *Studies in Meaning, 4,* 281–315. Retrieved from https://www.thefreelibrary.com/The+hierarchy+of+epistemological+beliefs%3A+all+ways+of+knowing+are+not...-a0281112138

Individuals with Disabilities Education Improvement Act, 20 U.S.C. § 1400 et seq. (2004).

Jonah Missouri history. (n.d.). Retrieved from https://Jonahhistory.com/index.html

Jyoti, D. F., Frongillo, E. A., & Jones, S. J. (2005). Food insecurity affects school children's academic performance, weight gain, and social skills. *Journal of Nutrition, 135,* 2831–2839. https://doi.org/10.1093/jn.135.12.2831

Kenton, W. (2019, October). *T-test.* Retrieved from https://www.investopedia.com/terms/t/t-test.asp

Killan, S. (2017, September 24). *Hattie's 2017 updated list of factors influencing student achievement.* Retrieved from http://www.evidencebasedteaching.org.au/hatties-2017updated-list/

Kohn, A. (2000). *The case against standardized testing: Raising the scores, ruining the schools.* Portsmouth, NH, US: Heinemann.

Krapfl, J. E. (1982). A review of Gilbert's human competence: Engineering worthy performance [Review of the book *Human Competence: Engineering Worthy Performance*, by Thomas Gilbert]. *Behavior Analyst, 5*, 199–204. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2742053/pdf/behavan00071-0095.pdf

Kratochwill, T. R., & Bijou, S. W. (1987). The impact of behaviorism on educational psychology. In J. Glover & R. Ronning (Eds.), *Historical foundations of educational psychology* (p. 131-157). Boston, MA, US: Springer.

Ladd, H., Noguera, P., Reville, P., & Starr, J. (2016). Student poverty isn't an excuse; It's a barrier. *Education Week, 35*(30). Retrieved from https://www.edweek.org

Lang, C. (2018). *A quantitative analysis of high school sports participation intensity and breadth: Relationships with academic achievement in a rural Missouri high school* (Unpublished doctoral dissertation). University of Missouri. Columbia.

Levi, D. J. (2017). *Group dynamics for teams* (5th ed.). Los Angeles, CA, US: Sage.

Mandinach, E. (2012). A perfect time for data use: Using data-driven decision making to inform practice. *Educational Psychologist, 47*(2), 71–85. https://doi.org/10.1080/00461520.2012.667064

Marsh, J., & Farrell, C. (2015). How leaders can support teachers with data-driven decision making: A framework for understanding capacity building. *Educational Management Administration & Leadership. 43,* 269–289. https://doi.org/10.1177/1741143214537229

Marzano, R. J. (2010). *Formative assessment & standards-based grading.* Bloomington, IN, US: Marzano Research Laboratory.

Merriam, S. B., & Bierema, L. L. (2014). *Adult learning: Linking theory and practice.* San Francisco, CA, US: Jossey-Bass.

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation* (4th ed.). San Francisco, CA, US: Jossey-Bass.

Missouri Department of Elementary and Secondary Education. (2013). *Principal growth guide.* Retrieved from https://dese.mo.gov/sites/default/files/02-PrinGrowthGuide.pdf

Missouri Department of Elementary and Secondary Education. (2016). *6–12 Mathematics grade-level expectations.* Retrieved from http://dese.mo.gov/sites/default/files/curr-mls-standards-math-6-12-sboe-2016.pdf

Missouri Department of Elementary and Secondary Education. (2017a). *Ensure equitable access to excellent educators*. Retrieved from https://dese.mo.gov/sites/default/files/Educator-Equity-Plan-June2018.pdf

Missouri Department of Elementary and Secondary Education. (2017b). *State assessment.* Retrieved from https://mcdssecured.dese.mo.gov/quickfacts/Pages/State-Assessment.aspx

Missouri Department of Elementary and Secondary Education. (2018a). *Assessment updates.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-dtc-memo-102518.pdf

Missouri Department of Elementary and Secondary Education. (2018b). *Comprehensive guide: MSIP5.* Retrieved from https://dese.mo.gov/sites/default/files/MSIP-5-2018-Comprehensive-Guide%20(3).pdf

Missouri Department of Elementary and Secondary Education. (2018c). *High-quality summative assessment principles for ELA/literacy and mathematics assessment aligned to college- and career-readiness standards.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-principles.pdf

Missouri Department of Elementary and Secondary Education. (2018d). *Mathematics.* Retrieved from https://dese.mo.gov/college-career-readiness/curriculum/mathematics

Missouri Department of Elementary and Secondary Education. (2018e). *State assessment results MSIP with grade level.* Retrieved from https://mcdssecured.dese.mo.gov/quickfacts/Pages/State-Assessment.aspx

Missouri Department of Elementary and Secondary Education. (2018f). *State systematic improvement plan.* Retrieved from https://dese.mo.gov/sites/default/files/ssipphaseiiireport.pdf

Missouri Department of Elementary and Secondary Education. (2019a). *Achievement level 4 report: Public*. Retrieved from https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx

Missouri Department of Elementary and Secondary Education. (2019b). *Assessment principles.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-principles.pdf

Missouri Department of Elementary and Secondary Education. (2019c). *Building demographic data*. Retrieved from https://apps.dese.mo.gov/MCDS/Reports/SSRS_Print.aspx?Reportid=6c5b805c-5af7-4c33-be41-dc2b83ded4aa

Missouri Department of Elementary and Secondary Education. (2019d). *Guide to the Missouri Assessment Program.* Retrieved from https://dese.mo.gov/college-career-readiness/assessment/guide-missouri-assessment-program

Missouri Department of Elementary and Secondary Education. (2019e). *Homepage.* Retrieved from https://dese.mo.gov

Missouri Department of Elementary and Secondary Education. (2019f). *Missouri Assessment Program.* Retrieved from https://dese.mo.gov/sites/default/files/asmt-gl-g6-em-1920.pdf

Missouri Department of Elementary and Secondary Education. (2019g). *Missouri learning standards.* Retrieved from https://dese.mo.gov/college-careerreadiness/curriculum/missouri-learning-standards

Missouri Department of Elementary and Secondary Education. (2019h). *Missouri releases 2019 annual performance reports*. Retrieved from https://dese.mo.gov/communications/news-releases/missouri-releases-2019-annual-performance-reports

Missouri Department of Elementary and Secondary Education. (2019i). *Powerful learning conference: Building strong systems.* Retrieved from https://dese.mo.gov/quality-schools/powerful-learning-conference

Missouri Department of Elementary and Secondary Education. (2019j). *State of Missouri reports and resources*. Retrieved from https://apps.dese.mo.gov/MCDS/home.aspx

Morrissey, T. W., Hutchison, L., & Winsler, A. (2014). Family income, school attendance, and academic achievement in elementary school. *Developmental Psychology, 50,* 741–753. https://doi.org/10.1037/a0033848

National Center for Education Evaluation. (2009). *Assisting students struggling with mathematics: Response to intervention (RtI) for elementary and middle schools.* Retrieved from https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/rti_math_pg_042109.pdf

National Center for Education Statistics. (2018). *Back to school statistics.* Retrieved from https://nces.ed.gov/fastfacts/display.asp?id=372

National Center for Education Statistics. (2019a). *Education demographic and geographic estimates.* Retrieved from https://nces.ed.gov/Programs/Edge/ACSDashboard/2907020#

National Center for Education Statistics. (2019b). *Missouri demographics (2016–2017).* Retrieved from https://www.nationsreportcard.gov/profiles/stateprofile/overview/MO?cti=PgTab_Demographics&chort=2&sub=MAT&sj=MO&fs=Grade&st=MN&year=2019R3&sg=Gender%3A+Male+vs.+Female&sgv=Difference&ts=Single+Year&tss=2015R3-2019R3&sfj=NP

National Center for Education Statistics. (2019c). *The nation's report card: Data tools: State profiles.* Retrieved from https://www.nationsreportcard.gov/profiles/stateprofile?chort=1&sub=MAT&sj=&sfj=NP&st=MN&year=2019R3

National Center for Education Statistics. (2019d). *The nation's report card: Mathematics 2011 state snapshot report: Missouri Grade 8 public schools.* Retrieved from https://nces.ed.gov/nationsreportcard/pdf/stt2011/2012451MO4.pdf

National Center for Education Statistics. (2019e). *Table 204.10. Number and percentage of public school students eligible for free or reduced-price lunch, by state: Selected years, 2000–01 through 2014–15.* Retrieved from https://nces.ed.gov /programs/digest/d16/tables/dt16_204.10.asp

National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform.* Washington, DC, US: Author. Retrieved from https://www.edreform.com/wp-content/uploads/2013/02/A_Nation_At_Risk _1983.pdf

National Education Association. (2019). *History of standardized testing in the United States.* Retrieved from http://www.nea.org/home/66139.htm

Newcomer, K. E., Hatry, H. P., & Wholey, J. S. (2015). *Handbook of practical program evaluation* (4th ed). Hoboken, NJ, US: Jossey-Bass.

No Child Left Behind Act, 20 U.S.C. & 6301 et seq. (2001).

Noguera, P. (2010, September 20). Accept it: Poverty hurts learning: Schools matter, but they're not all that matters. *Motion Magazine.* Retrieved from https:// inmotionmagazine.com/er/pn_acceptit10.html

Noguera, P. A. (2011). A broader and bolder approach uses education to break the cycle of poverty. *Phi Delta Kappan, 93*(3), 8–14. https://doi.org/10.1177 /003172171109300303

Nord, M. & Economic Research Service. (2009). *Food insecurity in households with children: Prevalence, severity, and household characteristics* (Economic Information Bulletin Number 56). US Department of Agriculture. Retrieved from http://proxy.mul.missouri.edu/login?url=http://search.ebscohost.com/login.aspx ?direct=true&db=eric&AN=ED508211&site=eds-live&scope=site

Northouse, P. G. (2016). *Leadership: Theory and practice* (7th ed.). Los Angeles, CA, US: Sage.

NWEA. (2019). *NWEA Home.* Retrieved from http://nwea.org

O'Dwyer, L. M., Lee-St. John, T., Raczek, A. E., Luna Bazaldua, D. A., & Walsh, M. (2016). *Examining the role of early academic and non-cognitive skills as mediators of the effects of city connects on middle school academic outcomes.* Available from ERIC database. (ED567236)

Payne, R. K. (1996). *A framework for understanding poverty.* Highlands, TX, US: Aha Process.

Peterson, C. E. (2013). *High school physical education and sport participation: Impact on young adult physical activity behaviors* (Unpublished doctoral dissertation). University of Missouri, Columbia.

Peterson, D. W., Prasse, D. P., Shinn, M. R., & Swerdlik, M. E. (2019). The Illinois flexible service delivery model: A problem-solving model initiative. In. A. Jimerson, M. Burns, & A. VanDerHeyden (Eds.), *Handbook of response to intervention: The science and practice of assessment and intervention* (pp. 288–289). New York, NY, US: Springer.

PowerSchool. (2019). *Title of this article.* Retrieved from https://Jonah.powerschool.com /admin/home.html

ProCon.org. (2018, October 23). *History of standardized tests.* Retrieved from https:// standardizedtests.procon.org/history-of-standardized-tests/

Reddy, L. A., Fabiano, G. A., Dudek, C. M., & Hsu, L (2013). Predictive validity of the classroom strategies scale—Observer form on statewide testing scores: An initial investigation. *School Psychology Quarterly, 28,* 301–316. https://doi.org/10.1037 /spq0000041

Reeves, D. (2004). *Accountability for learning: How teachers and school leaders can take charge.* Alexandria, VA, US: Association for Supervision and Curriculum Development.

Reeves, D. (2011). *Finding your leadership focus*. New York, NY, US: Teachers College Press.

Reynolds, A. J., Weissberg, R. P., & Kasprow, W. J. (1992). Prediction of early social and academic adjustment of children from the inner city. *American Journal of Community Psychology, 20,* 599–624. https://doi.org/10.1007/bf00941774

RTI Action Network. (2019). *What is RTI?* Retrieved from http://www.rtinetwork.org /learn/what/whatisrti

School buildings show development. (1984, August 9). *Jonah Citizen Observer,* G7–G8.

Securro, S., Jones, J. D., Cantrell, D., & Blackwell, J. (2006). Intervention that adds up: The impact of merit software on standardized achievement test scores of middle school students. *Journal on School Educational Technology, 2*(1), 47–53. Available from ERIC database. (EJ1066117)

Seidman, I. (2012). *Interviewing as qualitative research: A guide for researchers in education and the social sciences* (4th ed.). New York, NY, US: Teachers College Press.

Siegle, D. (2019, October). *Educational research basics.* Retrieved from https:// researchbasics.education.uconn.edu/t-test/#

Spears, L. C. (2002). Tracing the past, present, and future of servant-leadership. In L. C. Spears & M. Lawrence (Eds.), *Focus on leadership: Servant-leadership for the 21st century* (pp. 1–16). New York, NY, US: Wiley.

Special Education Guide. (2019). *Response to intervention.* Retrieved from https://www.specialeducationguide.com/pre-k-12/response-to-intervention/

Spillane, J. (2012, February). Data in practice: Conceptualizing the data-based decision making phenomena. *American Journal of Education*, *118*(2), 113–141. https://doi.org/10.1086/663283

Statistics. (2019). *Merriam-Webster*. Retrieved from https://www.merriam-webster.com/dictionary/statistics

Stogdill, R. M. (1974). *Handbook of leadership: A survey of theory and research.* New York, NY, US: Free Press.

University of Technology Sydney. (2015, November 22). *Learning to improve: Professor Anthony Bryk* [Video file]. Retrieved from https://www.youtube.com/watch?v=4YsnuHlJZco&scrlybrkr=dfdaeb93

U.S. Census Bureau. (2019, August 27). *How the Census Bureau measures poverty*. Retrieved from https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html

U.S. Congress, Office of Technology Assessment. (1992). *Testing in American schools: Asking the right questions* (OTA-SET-519). Washington, DC, US: U.S. Government Printing Office. Retrieved from https://www.princeton.edu/~ota/disk1/1992/9236/9236.PDF

U.S. Department of Agriculture. (2019a). *Feeding the future with healthy school lunches.* Retrieved from https://www.fns.usda.gov/nslp

U.S. Department of Agriculture. (2019b). *National School Lunch Program.* Retrieved from https://www.ers.usda.gov/topics/food-nutrition-assistance/child-nutrition-programs/national-school-lunch-program.aspx

U.S. Department of Agriculture, Food and Nutrition Service. (2018). *Child nutrition programs—Income eligibility guidelines (July 1, 2018–June 30, 2019).* Retrieved from https://www.fns.usda.gov/school-meals/fr-050818

U.S. Department of Education. (2009, November). *Race to the Top program: Executive summary.* Retrieved from https://www2.ed.gov/programs/racetothetop/executive-summary.pdf

Vaughn. S., & Fuchs, L. (2003, June). Redefining learning disabilities as inadequate response to instruction: The promise and potential problems. *Learning Disabilities Research & Practice, 18*(3), 137–146. https://doi.org/10.1111/1540-5826.00070

Visible Learning. (2017). *Hattie ranking: 252 Influences and effect sizes related to student achievement.* Retrieved from https://visible-learning.org/hattie-ranking-influences-effect-sizes-learning-achievement/

Williams, J., & Noguera, P. (2010, Winter). Poor schools or poor kids? *Education Next, 10*(1). Retrieved from https://www.educationnext.org/poor-schools-or-poor-kids/

World Population Review. (2019). *Jonah, Missouri population 2019.* Retrieved from http://worldpopulationreview.com/us-cities/Jonah-mo-population/

Zimmerman, M. S. (2005). Schools. In N. Beck, M. Bottorff, P. Sharp, R. L. Peterson, C. Scott, M. S. Zimmerman, l. … P. Compton (Eds.), *Jonah, Missouri Sesquicentennial 1855–2005* (pp. 68–82). Jonah, MO, US: Jonah Sesquicentennial History Book Committee.

APPENDIX A

Institutional Review Board Exemption Letter

Institutional Review Board
University of Missouri-Columbia
FWA Number: 00002876
IRB Registration Numbers: 00000731, 00009014

482 McReynolds Hall
Columbia, MO 65211
573-882-3181
irb@missouri.edu

March 02, 2020

Project #2019061
Project Title: QUANTITATIVE ANALYSIS OF THE IMPACT OF RESPONSE TO INTERVENTION ON 2019 6TH GRADE RURAL PUBLIC MIDDLE SCHOOL MISSOURI ASSESSMENT PROGRAM PERFORMANCE BY FREE AND REDUCED LUNCH ELIGIBILITY
Principal Investigator: tjd257
Primary Contact: tjd257

Dear Investigator,

The MU Institutional Review Board reviewed your application and supportive documents. It has been determined that this project does not constitute human subjects research according to the Department of Health and Human Services regulatory definitions. As such, there are no further IRB requirements.

If you have questions, please feel free to contact the MU IRB office at 573-882-3181 or email at muresearchirb@missouri.edu.

Sincerely,

MU Institutional Review Board

Sincerely,

Christine A Hueske
COMPLIANCE SPECIALIST I
5738823181
hueskec@missouri.edu

CC:

APPENDIX B

The below information was removed from the article submission to meet the requirements for submission. For submission, the article included only three. The researcher identified the three most impactful questions for educators and educational reform. Below you will see the original methodology, table of research questions, findings, discussion, and recommendations.

Method

In this scholarly study, the researcher worked to answer a total of seven research questions. Questions 4 through 7 are included in this section. Table 12 identifies the research question, hypothesis and null hypothesis. Table 13 identifies the research questions, variable and analyses information for this study. Continuous variables for this study are MAP test scores. ANOVA and *t*-tests were used to analyze the continuous variables. Categorical data was also used (Field, 2018). Categorical data points are RtI availability and MAP achievement level. Like C. E. Peterson (2013), these data points will be tested through a chi-squared test when testing two variables for independence.

Table 12

Research Questions and Null Hypotheses

Research questions	Hypothesis	Null hypothesis
4. At JMS, is there a difference in performance for sixth-grade students on the mathematics MAP test when comparing 2018 students who did not have RTI and 2019 students who did have RTI?	H4: A statistically significant difference exists in performance for sixth-grade students on the MAP test when comparing 2018 students who did not have RTI and 2019 students who did have RTI.	Ho4: No statistically significant difference exists in performance for sixth-grade students on the MAP test when comparing 2018 students who did not have RTI and 2019 students who did have RTI.
5. At JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test between students eligible for FRL and those not eligible for FRL when all students have access to RTI?	H5: A statistically significant difference exists in performance on the sixth-grade 2019 mathematics MAP test between students eligible for FRL and those not eligible for FRL when all students have access to RTI.	Ho5: No statistically significant difference exists in performance on the sixth-grade 2019 mathematics MAP test between students eligible for FRL and those not eligible for FRL when all students have access to RTI.
6. At JMS, is there a difference in performance on the sixth-grade mathematics MAP among students eligible for FRL when comparing students who did not have access to RTI in 2018 and students who used RTI in 2019?	H6: A statistically significant difference exists in performance on the sixth-grade mathematics MAP among students eligible for FRL when comparing students who did not have access to RTI in 2018 versus students who used RTI in 2019.	Ho6: No statistically significant difference exists in performance on the sixth-grade mathematics MAP among students eligible for FRL when comparing students who did not have access to RTI in 2018 versus students who used RTI in 2019.
7. When considering 2019 students eligible for FRL at JMS, is there a difference in MAP scores between students who received Level 1 RTI and Level 2 RTI?	H7: A statistically significant difference exists in performance in 2019 MAP scores between students who received Level 1 RTI and Level 2 RTI.	Ho7: No statistically significant difference exists in performance in 2019 MAP scores between students who received Level 1 RTI and Level 2 RTI.

Note. FRL = free and reduced-price lunch, JMS = Jonah Middle School, MAP = Missouri Assessment Program, RTI = response to intervention.

Table 13

Research Questions, Variables, and Analyses

Research questions	Independent Variable	Dependent Variable	Data Type	Statistical Analysis
4. At JMS, is there a difference in performance for sixth-grade students on the mathematics MAP test when comparing 2018 students who did not have RTI and 2019 students who did have RTI?	RTI availability	MAP achievement level	Categorical	Chi-square
5. At JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test between students eligible for FRL and those not eligible for FRL when all students have access to RTI?	FRL eligibility	MAP achievement level	Categorical	Chi-square
6. At JMS, is there a difference in performance on the sixth-grade mathematics MAP among students eligible for FRL when comparing students who did not have access to RTI in 2018 versus student who used RTI in 2019?	RTI availability	MAP achievement level	Categorical	Chi-square
7. When considering 2019 students eligible for FRL at JMS, is there a difference in MAP scores between students who received Level 1 RTI and Level 2 RTI?	Level of RTI	MAP score	Continuous	*t*-test

Note. FRL = free and reduced-price lunch, JMS = Jonah Middle School, MAP = Missouri Assessment Program, RtI = response to intervention.

Findings

This section includes the findings for each research question. For each question, the results are discussed and displayed through a table or figure. The research identified if the null hypothesis was rejected or failed to be rejected based on statistical significance.

Research Question 1 Additional Information

The first research question was *What are the descriptive statistics for students when disaggregated by gender, FRL status, and minority status?* The sample size was 278 students. Figure 13 shows students performing in the Proficient or Advanced ranges on the MAP test when looking at student eligibility for free, reduced, and full-priced

lunch. The sample size is 278. Students eligible for free lunch (35%) performed differently from students eligible for reduced-price lunch (42%), and students who pay full price for lunch (54%).

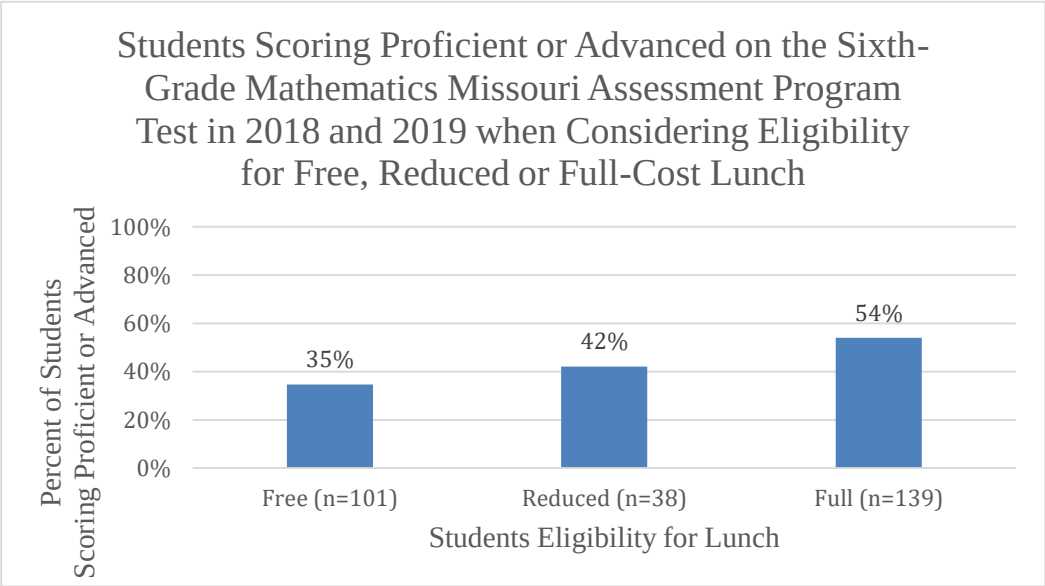


Figure 13. Students scoring Proficient or Advanced on the sixth-grade mathematics Missouri Assessment Program test in 2018 and 2019 when considering eligibility for free or reduced-cost lunch (*N* = 278).

Figure 14 shows students performing in the Proficient or Advanced ranges on the MAP test when considering gender. The sample size is 278. Performance differs slightly when comparing students who identify as male versus female.

Table 13 shows students performing in the Proficient or Advanced ranges on the mathematics MAP test when comparing 2018 and 2019 students. The sample size was 278. Performance differed little when comparing 2018 and 2019 student performance, leaving a gap of 1% between groups.

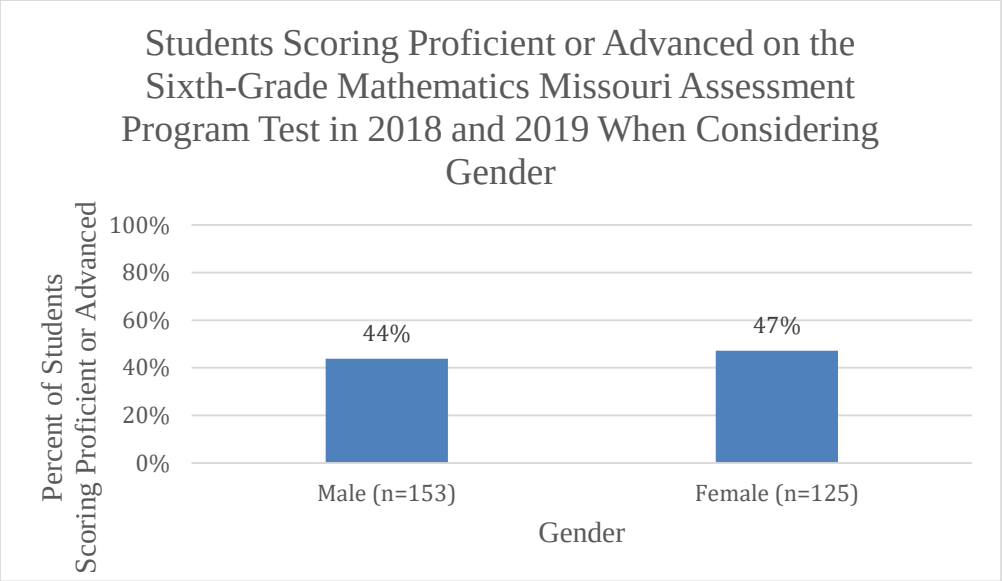


Figure 14. Students scoring Proficient or Advanced on the sixth-grade mathematics Missouri Assessment Program test in 2018 and 2019 when considering gender (*N* = 278).

Table 13

2018 Compared to 2019 Students Scoring Proficient or Advanced on the Sixth-Grade Mathematics Missouri Assessment Program Test

Sample	*N*	Percent of students scoring Proficient or Advanced
2018	144	45
2019	134	46
Total	278	48

Research Question 2 Additional Information

The second research question was, a*t JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test between student eligibility for FRL and level of RTI received?* The sample size was 134. An ANOVA test was conducted. As recommended by Field (2018), this allowed the researcher to compare means between 3 or more groups. The groups were students eligible for FRL receiving RTI Level 1,

students eligible for FRL receiving RTI Level 2, students not eligible for FRL receiving RTI Level 1 and students not eligible for FRL receiving RTI Level 2.

Eta squared indicated a high effect size. Post hoc *t*-tests were conducted on the four groups. Only students who did not qualify for FRL and received RTI Level 1 had a higher average mathematics MAP score. The other groups showed minimal difference between each other. So, a student receiving FRL at RTI Level 1 or Level 2 scored the same as a student receiving full priced lunch receiving RTI Level 2. See Figure 7 for results.

Research Question 3 Additional Information

The third research question was, a*t JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test for student identifying at White, non-Hispanic receiving Level 1 RTI, students identifying as White, non-Hispanic receiving Level 2 RTI, and students identifying as not White?* The sample size was 134. An ANOVA test was conducted. As recommended by Field (2018), this allowed the researcher to compare means between 3 or more groups. The three different groups compared were students identifying at White who received RTI Level 1, students identifying at White who received RTI Level 2, and student not identifying as White receiving RTI Levels 1 or 2. The reason students not identifying as White were in one group was due to the group size of 14 students.

Eta squared indicated a high effect size. Post hoc *t*-tests were conducted on the three groups. Only students who identified as White and received RTI Level 1 had a higher average mathematics MAP score. The other groups showed minimal difference between each other. So, a student identifying as White receiving RTI Level 2 scored the

same as a student identifying as not White receiving RTI Level or Level 2. See Figure 8 for results.

Research Question 4

The fourth research question was, *at JMS, is there a difference in performance for sixth-grade students on the mathematics MAP test when comparing 2018 students who did not have RTI and 2019 students who did have RTI?* The independent variable was RTI availability. The dependent variable was MAP achievement level. The sample size was 278, which included all JMS students who took the mathematics MAP test in 2018 and 2019. A chi-square analysis was performed to determine if a difference existed in performance for sixth-grade students in 2018 who did not have RTI and 2019 students who did have RTI. See Figure 15 for results.

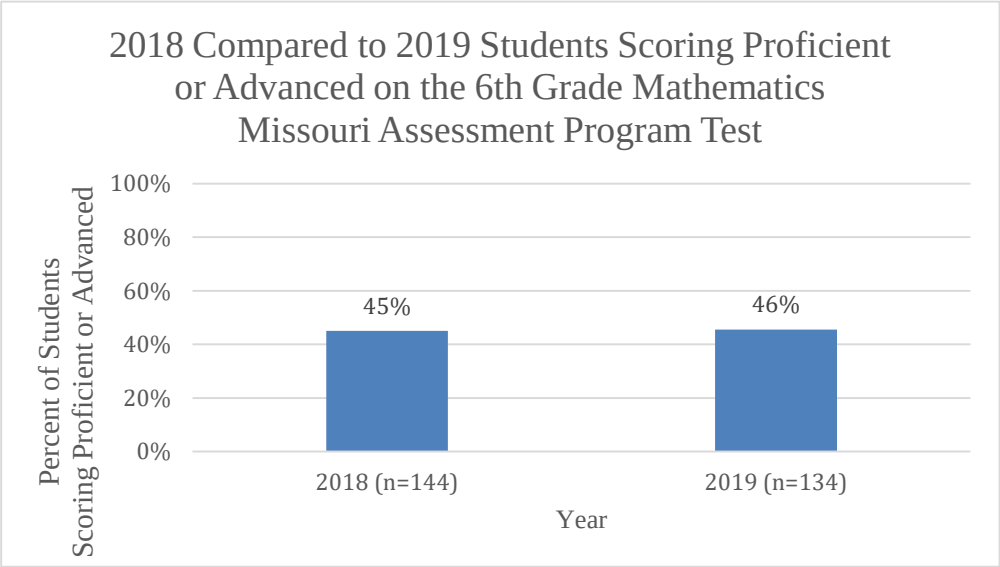


Figure 15. 2018 compared to 2019 students scoring Proficient or Advanced on the sixth-grade mathematics Missouri Assessment Program test (*N* = 278).

Results indicated that $\alpha = .05$, $p = .949$, and χ_2 (1) = 0.004 with 1 degree of freedom. The results are not considered statistically significant, as $p = .949$ was more

than α = .05 (Field, 2018). The researcher failed to reject the null hypothesis: No statistically significant difference existed in performance of sixth-grade students on the MAP test when comparing 2018 students who did not have RTI and 2019 students who did have RTI.

Research Question 5

The fifth research question was, *at JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test between students eligible for FRL and those not eligible for FRL when all students have access to RTI?* The independent variable was FRL eligibility. The dependent variable was the MAP achievement level. The sample size was 134, which included all JMS students who took the mathematics MAP Test in 2018 and 2019. A chi-square analysis was performed to determine if a difference existed in performance for sixth-grade students on the 2019 mathematics MAP test between students eligible for FRL and students not eligible for FRL when all students have access to RTI. See Figure 16 for results.

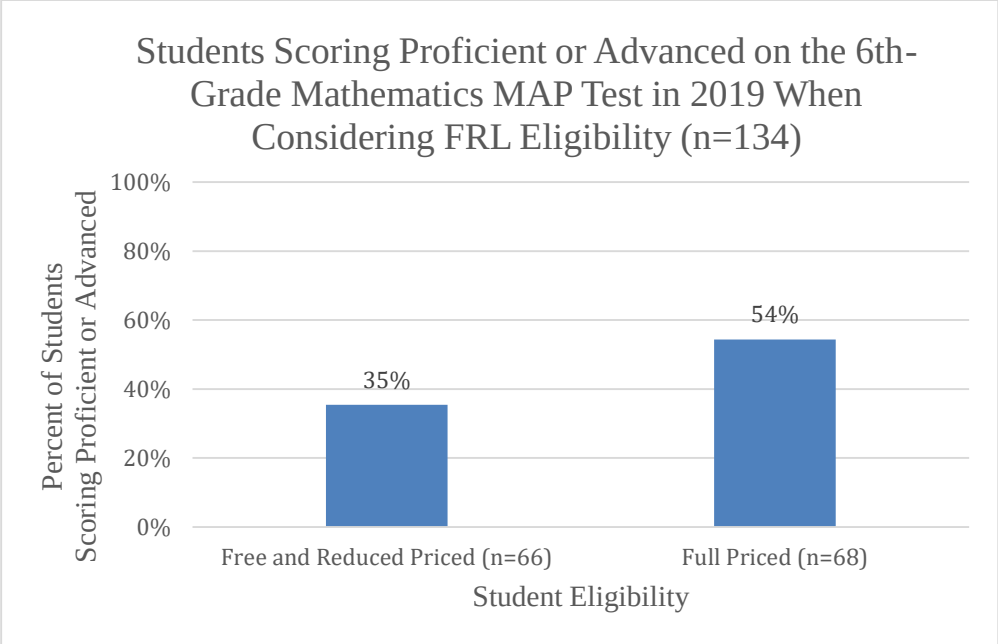


Figure 16. Students scoring Proficient or Advanced on the sixth-grade mathematics Missouri Assessment Program test in 2019 when considering free and reduced-price lunch eligibility (*N* = 278).

Results indicated that $\alpha = .05$, $p = .036$, and χ_2 (1) = 4.300 with 1 degree of freedom. The results are considered statistically significant, as $p < .05$ (Field, 2018). The researcher rejected the null hypothesis and accepts the alternative hypothesis: A statistically significant difference exists in performance on the sixth-grade mathematics MAP test between students eligible for FRL and those not eligible for FRL when all students have access to RTI.

Research Question 6

The sixth research question was, *at JMS, is there a difference in performance on the sixth-grade mathematics MAP among students eligible for FRL when comparing students who did not have access to RTI in 2018 and students who used RTI in 2019?* The independent variable was RTI availability. The dependent variable was the MAP achievement level. The sample size was 139, which included all JMS students who took

the mathematics MAP Test in 2018 and 2019 who were eligible for FRL. A chi-square analysis was performed to determine if a difference existed in performance for sixth-grade students eligible for FRL on the mathematics MAP test when comparing student who did not have access to FRI in 2018 and students who used RTI in 2019. See Figure 17 for results.

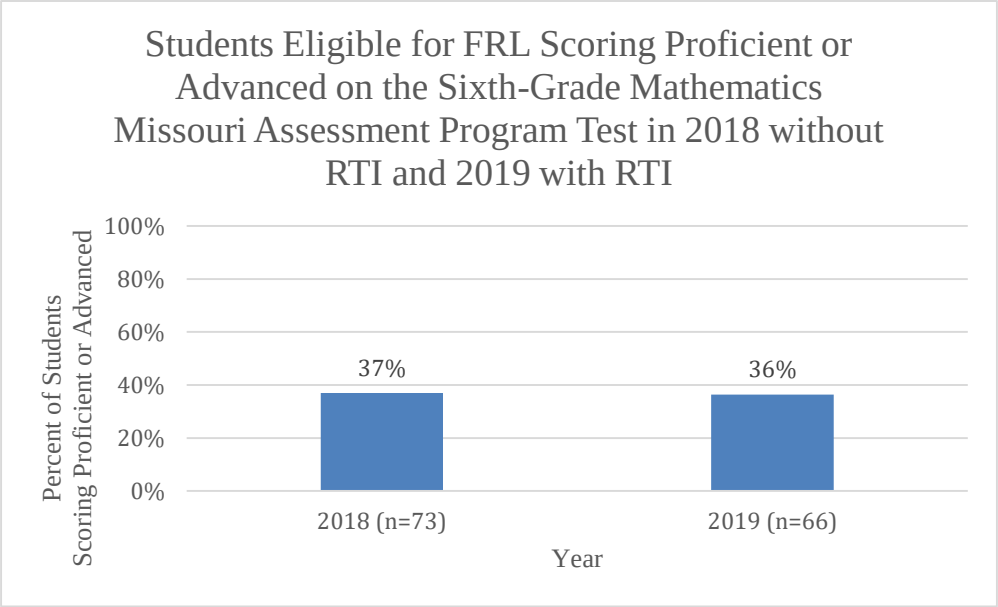


Figure 17. Students eligible for free and reduced-price lunch scoring Proficient or Advanced on the sixth-grade mathematics Missouri Assessment Program test in 2018 for students with no access to response to intervention and 2019 for students with access to response to intervention (N = 139).

Results indicated that $\alpha = .05$, $p = .939$, and χ_2 (1) = 0.006 with 1 degree of freedom. The results are not considered statistically significant, as $p > .05$ (Field, 2018). The researcher failed to reject the null hypothesis: No statistically significant difference exists in performance on the sixth-grade mathematics MAP among students eligible for FRL when comparing students who did not have access to RTI in 2018 versus students who used RTI in 2019.

Research Question 7

The seventh research question was, *when considering 2019 students eligible for FRL at JMS, is there a difference in MAP scores between students who receive Level 1 RTI and Level 2 RTI?* The independent variable was the level of RTI. The dependent variable was the MAP score. The sample size was 66, which included all JMS students eligible for FRL who took the mathematics MAP Test in 2019 who received Level 1 (n = 21) or Level 2 (n = 45) RTI. An independent t-test was conducted. Results indicated $t(66) = 0.822$ and $p = .414$. Because $p > .05$, the results are not statistically significant (Field, 2018). See Table 14 for results. The researcher failed to reject the null hypothesis: No statistically significant difference exists in performance in 2019 MAP scores between students who received Level 1 RTI and Level 2 RTI.

See *Definition of Key Terms* for specific scoring ranges for each proficiency level for 2019. The average scores of students receiving Levels 1 and 2 RTI differ by 7.55 points.

Table 14

Comparison for Students Receiving Levels 1 and 2 Response to the Intervention on 2019 Mathematics Missouri Assessment Program Test

Level of RTI	*N*	Mean MAP score	Standard deviation	Standard error mean
1	21	404.71	39.189	8.552
2	45	397.16	32.607	4.861

Note. MAP = Missouri Assessment Program.

The independent t-test also showed that students who received RTI Level 1 had a mean MAP score of 404.71, which is in the Basic scoring range. Students who received

RTI Level 2 have a mean MAP score of 397.16, which is also in the Basic scoring range. See Table 15 for details.

Table 15

Independent t-Test for Students Eligible for Free and Reduced-Price Lunch on the mathematics 2019 Missouri Assessment Program Test for Students Who Received Level 1 Response to Intervention and Level 2 Response to Intervention

	N	*t*	*df*	*p*
MAP Score	139	0.822	1	.414

Note. MAP = Missouri Assessment Program.

Discussion

This study was meaningful as the findings had similarities to and differences from other research. In this section, results for each question are discussed and compared to previous research.

Research Question 2 Additional Information

After ANOVA found a statistical difference, the Post Hoc test was run to find which of the four groups were different. The only difference was found in the group of students who was not eligible for FRL receiving RTI Level 1. They had a higher average mathematics MAP score.

Research Question 3 Additional Information

After ANOVA found a statistical difference, the Post Hoc test was run to find which of the three groups were different. The only difference was found in the group of students identifying as White receiving RTI Level 1. They had a higher average mathematics MAP score. The reason students identifying as non-White were not

separated into RTI levels was because of the sample size of 14. There was not a statistically significant difference based on race and ethnicity, but there was with RTI level. This indicates that RTI was a strong predictor of MAP performance compared to race and ethnicity for JMS. However, a larger sample size of non-White should be used.

Research Question 4

The fourth research question was, *at JMS, is there a difference in performance for sixth-grade students on the mathematics MAP test when comparing 2018 students who did not have RTI and 2019 students who did have RTI?* This research question compared student performance on the mathematics MAP test in 2018 for students who did not have access to RTI with students in 2019 who received RTI. A 1% difference emerged in students scoring in the Advanced or Proficient ranges.

For this research, 144 students did not have access to RTI in 2018. In 2019, 134 students did have access to RTI. In contrast to previous research, results were not statistically significant. Researchers showed that when focused interventions occur on a daily basis during the regular school day, student academic performance increases (Buffum et al., 2018). JMS did not exhibit such results. The researcher recommends further research in this area.

Research Question 5

The fifth research question was, *at JMS, is there a difference in performance on the sixth-grade 2019 mathematics MAP test between students eligible for FRL and those not eligible for FRL when all students have access to RTI?* This research question compared the 2019 sixth-grade mathematics MAP test scores of students eligible for FRL and students ineligible. Results were statistically significant.

Students eligible for FRL scored lower than students ineligible. The literature supported these findings. A difference emerged in performance between students eligible for FRL and ineligible for FRL (Brooks-Gunn & Duncan, 1997; Cameron et al., 2015; Noguera, 2011; Ready et al., 2013). JMS students who took the 2019 sixth-grade mathematics state assessment MAP test had similar results.

Research Question 6

The sixth research question was *at JMS, is there a difference in performance on the sixth-grade mathematics MAP among students eligible for FRL when comparing students who did not have access to RTI in 2018 versus student who used RTI in 2019?* This question compared the performance on the sixth-grade mathematics MAP test of students eligible for FRL who did not have access to RTI in 2018 with students eligible for RTI who received RTI in 2019. Results were not statistically significant.

Previous researchers indicated that students who receive RTI should have an increase in academic performance (Buffum et al., 2018). In fact, the 2019 data showed a drop of 1% when comparing it to the 2018 data. It appears that RTI did not have an impact on performance among students eligible for FRL. The researcher recommends further research in this area.

Research Question 7

The seventh research question was, *when considering 2019 students eligible for FRL at JMS, is there a difference in MAP scores between students who receive Level 1 RTI and Level 2 RTI?* The population of students for this question were only those who were eligible for FRL. This question compared the 2019 sixth-grade mathematics MAP test scores of students who received Level 1 RTI with the scores of students who received

Level 2 RTI. For students eligible for FRL, 21 received Level 1 RTI and 45 received Level 2 RTI. This showed that students needing assistance received assistance.

Students receiving RTI Level 2 have more weaknesses in their learning than those receiving Level 1 (Buffum et al., 2018). In agreement with Buffum et al. (2018), a mean difference of 7.55 emerged between the two groups. However, despite the existence of this difference, the *t*-test found it was not statistically significant.

However, when focused interventions occur on a daily basis during the regular school day, student academic performance should increase (Buffum et al., 2018). By using a systematic approach with an explicit focus on instructional standards and learning progression (Vaughn & Fuchs, 2003; Visible Learning, 2017), Tier 2 RTI was implemented throughout the building at JMS. When discussions about student learning are based on data, student academic performance increases (Hattie, 2009, 2012; D. W. Peterson et al., 2019). The data demonstrated results inconsistent with previous literature regarding RTI.

Recommendations

By highlighting the impact of RTI at JMS, the researcher was able to make recommendations. These proposals include the application of DDDM and future research for JMS. Each recommendation is addressed in this section.

Application of Data-Driven Decision Making

As educators implement the data cycle, student academic performance increases (Datnow & Park, 2014). This research indicated that when focused RTI is implemented with conversations about collected data-taking place, action plans should be created. As educators set and revisit goals as part of the DDDM process, reflection and change must

follow (Carnegie Foundation for the Advancement of Teaching, 2019; Datnow & Park, 2014). With data tracking and reflection built into the JMS school structure, RTI was a natural fit for teachers.

The DDDM process should continue to be implemented. JMS teachers and administrators should consider what learning targets are being tracked to determine if an adjustment should be made on the standard being tracked. Cross-referencing the JMS curriculum scope and sequence with state expectations for standards covered on the MAP test should take place. DESE provides Grade Level Expectations to use as a resource for alignment (DESE, 2016). By tracking learning aligned with state standards, teachers could determine standards where students excel and where additional reinforcement is needed.

Future Research at JMS

Literature suggests RTI is effective (Buffum et al., 2018; RTI Action Network, 2019; Visible Learning, 2017). For JMS, more research is needed. However, methods used to determine levels of RTI are effective in determining which students need more assistance in their learning. Students in RTI Level 2 were effectively identified to receive academic assistance. At JMS, this seemed to be a stronger identifier than FRL or race.

The researcher recommends using this data as preliminary data. This study would best be done as a longitudinal study. Longitudinal studies focus on measuring the same variables over an extended period of time (Field, 2018).

Specifically, for JMS, the researcher recommends replicating this study for when students are in Grades 7 and 8. Implementing a longitudinal study would give the researcher more confidence in the results.

Conclusion

Because results for some research question results aligned with current research and some not, recommendations are in order. Continuing to focus on DDDM could have a lasting impact on student learning and academic progress (Carnegie Foundation for the Advancement of Teaching, 2019; Datnow & Park, 2014). Because some results did not align with prior research, a longitudinal study is recommended. Field (2018) described considering the same population over an extended period of time. The researcher commends conducting this research again, when this group of students completes seventh-grade and again after completing eighth-grade mathematics MAP tests.

VITA

Tiffani J. Collins was born and raised in Houston, Texas. After high school she graduated from Central Missouri State University with a Bachelor's degree in Middle School Education and a minor in Mathematics. She received her Master of Arts degree from the University of Missouri-Kansas City in 2005. She is planning to graduate in May 2020 with her Educational Doctorate from the University of Missouri-Columbia. She spent twelve years teaching mathematics to sixth, seventh, and eighth grade students. She began her administration career in 2013. She was a high school principal for two years and has been a middle school principal for five years.

Tiffani has presented several times at the Powerful Learning Conference in Missouri. Presentation topics include Professional Learning Communities, data-driven decision making and student-led conferences.

Tiffani and John were married in 2003. They have one child. Jaxon was born in 2006. She enjoys walks with her family, gatherings with families, traveling, Zumba, and attending church.