View metadata, citation and similar papers at core.ac.uk

brought to you by CORE

provided by The University of Nebraska, Omaha

University of Nebraska at Omaha
DigitalCommons@UNO

Student Work

10-1-2017

Local Implementation Effectiveness of a Multi-Tier System of Support in Elementary School Settings

Terry P. Houlton
University of Nebraska at Omaha

Follow this and additional works at: https://digitalcommons.unomaha.edu/studentwork

Part of the Education Commons

Recommended Citation

Houlton, Terry P., "Local Implementation Effectiveness of a Multi-Tier System of Support in Elementary School Settings" (2017). *Student Work*. 3641.
https://digitalcommons.unomaha.edu/studentwork/3641

This Dissertation is brought to you for free and open access by DigitalCommons@UNO. It has been accepted for inclusion in Student Work by an authorized administrator of DigitalCommons@UNO. For more information, please contact unodigitalcommons@unomaha.edu.

LOCAL IMPLEMENTATION EFFECTIVENESS OF A MULTI-TIER SYSTEM OF SUPPORT IN ELEMENTARY SCHOOL SETTINGS

by

Terry P. Houlton

A DISSERTATION

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Doctor of Education

Major: Educational Administration

Under the Supervision of Tamara Williams, Ed.D.

Omaha, Nebraska

October, 2017

Supervisory Committee:

Kay A. Keiser, Ed.D.

Elliot Ostler, Ed.D.

Jill F. Russell, Ph.D.

ProQuest Number: 10642929

All rights reserved

INFORMATION TO ALL USERS
The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript
and there are missing pages, these will be noted. Also, if material had to be removed,
a note will indicate the deletion.

ProQuest 10642929

Published by ProQuest LLC (2017). Copyright of the Dissertation is held by the Author.

All rights reserved.
This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

LOCAL IMPLEMENTATION EFFECTIVENESS OF A

MULTI-TIER SYSTEM OF SUPPORT IN

ELEMENTARY SCHOOL SETTINGS

Terry P. Houlton, Ed. D.

University of Nebraska, 2017

Advisor: Dr. Tamara Williams

Abstract

Ensuring all students learn at high levels is demanding. Multi-tier systems of supports (MTSS) has shown promise as a way to promote high levels of learning for all students while catching students who are struggling to learn. However, implementing MTSS models in school districts and schools has seen its challenges. The context of an individual school impacts efforts related to implementation especially related to implementing a system such as MTSS.

During the 2016-2017 school year, using program theory-driven evaluation methods a program theory for MTSS was developed with input from members of the research school district. Then a questionnaire was used with twenty-five elementary schools to ascertain the level of implementation of the research school district's identified MTSS model. Finally, the implementation level for each of the twenty-five elementary schools was compared to several outcome indicators.

Findings from the questionnaire indicate an operationalizing or strong level of implementation of the research school district's MTSS model in the majority of the twenty-five elementary schools. Further evidence of a strong implementation level of the research school district's MTSS model was seen in a five year decrease of special

education child count data for both all special education students and special education students verified with a specific learning disability. This is in contrast to State of Nebraska five year special education child count data which is increasing in both areas. Even though the research school district showed a strong level of implementation of its MTSS model in elementary school settings there was not a correlation between level of implementation and identified outcomes.

Acknowledgements

There have been so many people who have impacted me not only throughout this process but throughout my entire life. Nothing can compare to the love, patience, encouragement, and support that my wife Amy displays daily. You have without complaint taken care of so much to afford me the time for classes and writing while always being an incredibly positive voice and presence. You not only were my guide in keeping life in balance you kept me motivated and on-track through all of the ups and downs.

I also would like to thank my mother and father for their positive support throughout the years no matter what, they have been always there. Many years ago they established an educational foundation for me but more importantly at a very early age they taught me the benefits of hard work and perseverance. I am blessed to be their son.

To Cody, Garrett, and Trent *the boys*, and Sophie it is amazing to experience your continual growth and development through your life journeys. Keep being the incredible individuals you are. I want to especially thank Trent and Sophie for not only their encouragement but their genuine understanding. It was not always easy when I had to direct time away from them but they always provided me support and grace.

My Millard Public Schools family has always believed in me most importantly as a person but also as an educational leader. I have learned and grown so much from the support of so many people at so many levels within the district. I am especially grateful to George who saw something in me that at the time I did not see in myself. Stephanie and the incredible staff at Holling Heights Elementary thank you for being my sounding board and willing to risk, innovate, and try new things that impact student learning.

There are so many colleagues at the district office that have impacted me and continue to impact me daily. Mark and Nancy unselfishly invested so much of their time, energy, and wisdom in me and I would not be the leader I am today without them. My current educational services team is so talented. Thanks Heather, Tony, and Andy for sharing your insight so generously. Jim thanks for believing in me as leader and all the support, insight and understanding you show with our students with disabilities.

My special education team is amazing. I cannot imagine working with more caring, knowledgeable, and passionate people. Ted, Lori, Jean, and Hayley thanks for all of your advice, support, friendship, and leadership.

Everyone at UNO has provided me so many opportunities to risk, reflect, learn and grow. Every professor in each class invested in me as an individual, challenging me to be my best. Dr. Tamara Williams, my advisor, you have been simply incredible throughout this process. I cannot imagine having anyone better suited to support me through this process. Each time I reached out, you were there, not with an answer, but with the guidance I needed to continue on the journey. I am so grateful, thank you. I also want to thank my committee members, Dr. Keiser, Dr. Ostler, and Dr. Russell.

I am privileged to share my success with so many friends, colleagues and family. Their investment in me has been invaluable and for that I am blessed and grateful.

Table of Contents

Abstract *i*

Acknowledgements *iii*

Table of Contents *v*

List of Tables *ix*

Chapter 1 Introduction 1

Federal Legislative Impetus for MTSS 1

Collection of Core Elements 2

Theoretical Framework 4

Purpose Statement 5

Research Questions 6

Definition of Terms 6

Assumptions 9

Limitations 9

Delimitations 10

Significance of the Study 10

Contribution to Research 10

Contribution to Practice 10

Contribution to Policy 11

Outline of the Study 11

Chapter 2 Review of Literature 12

Contextual Factors Behind the Development of MTSS 12

Prevention science 12

Early reading intervention 14

Rise of specific learning disabled identification 15

No child left behind 17

Initial model: Response to intervention 18

RTI formalized as identification option 20

RTI to MTSS 21

MTSS Evidence-Based Practices 22

MTSS as a system 22

Tier I Core 24

Evidence-based curriculum and instruction 24

Data-based 26

Decision-making 28

Tier II Supplemental 31

Evidence-based instruction and intervention 31

Data-based 32

Decision-making 35

Tier III Intensive 36

Evidence-based instruction and intervention 36

Current Results of MTSS 38

Scaling MTSS 39

Chapter 3 Program Theory Development 46

Program Theory Development Process 46

Developing School District's Program Theory 47

Stakeholders 47

Development of program theory first draft 47

First draft presented to stakeholders 49

Plausibility check 49

Finalize program theory 50

Summary 52

Chapter 4 Methodology 53

Research Design 53

Research Questions 53

Participants 54

Data collection 55

Instruments 55

Data Analysis 57

Chapter 5 Results 58

Research Question 1 – Depth of Implementation 58

Research Question 2 – Depth of MTSS Implementation and Outcomes 62

Summary 65

Chapter 6 Conclusion 72

Implementation 74

Outcome Results 75

Discussion 78

Implementation 78

Outcome Results 79

Recommendation for Further Research 82

Summary 83

References 85

Appendix A School District Letter of Authorizing Research 96

Appendix B Questionnaire Tool – Self Assessment of MTSS 97

List of Tables

Table 1 Descriptive Statistics Depth of Implementation Twenty-Five Elementary Schools on the Self-Assessment of MTSS 60

Table 2 Descriptive Statistics Research School District's and the State of Nebraska's Special Education Child Count 61

Table 3 Spearman Rank Order Correlation for Depth of Implementation and Percent of Students in Tier I and Tier II/III Interventions 66

Table 4 Spearman Rank Order Correlation for Depth of Implementation and NWEA MAP School Growth Percentile in Reading 67

Table 5 Spearman Rank Order Correlation for Depth of Implementation and NWEA MAP School Growth Percentile in Mathematics 68

Table 6 Spearman Rank Order Correlation for Depth of Implementation and Number of Students Referred to Special Education 69

Table 7 Spearman Rank Order Correlation for Depth of Implementation and Special Education True Positives 70

Table 8 Spearman Rank Order Correlation for Depth of Implementation and The District Behavior Status Survey 71

Chapter 1 Introduction

Catch them before they fall. This title of a Joseph K. Torgesen (1998) article could summarize the hopes of parents sending their child off to school for the first time in kindergarten. Most have already realized children will fall and learn to pick themselves up, brush themselves off, and move forward. Torgesen (1998) though, is not actually talking about children physically falling, but is referring to children who fall academically behind, in this case in reading. Unlike a child who physically falls, children who fall behind academically and behaviorally often do not pick themselves up, brush themselves off, and move forward. They continue to struggle. Children who fall significantly behind in academic and behavior areas have a more difficult time being successful in school (Batsche et al., 2006). Torgesen (1998) notes, "the poor first-grade reader almost invariably continues to be a poor reader" (p. 1). It is more important than ever in education that at the earliest possible moment when we know a child is falling behind we catch the child through systematic use of prevention and early intervention. Children coming to school need a quality "multi-tier system of support - a comprehensive continuum of evidence-based, systematic practices to support a rapid response to students' needs, with regular observation to facilitate data-based instructional decision making," (ESSA, 2015, p. 399). This study will describe the local implementation effectiveness of a multi-tiered system of support (MTSS) in an elementary setting.

Federal Legislative Impetus for MTSS

Recent iterations of the Elementary and Secondary Education Act (1965) have emphasized annual testing as a main or supplemental vehicle of educational activity. This has created a national environment where continuous school improvement, measured by progress related to student assessments, has become a critical emphasis for

educators. A MTSS model focusing on improving the learning of all students has created significance in the conversation about school improvement and national education reform (Burns, Jimerson, VanDerHeyden, & Deno, 2016; Fuchs & Vaughn, 2012). The Every Student Succeeds Act (2015) (ESSA) describes programs and activities including a MTSS framework that can be used to address the learning needs of all students in meeting "challenging State academic standards" (p. 2095). MTSS influences student achievement by engaging schools in a continuous improvement process focused on a systematic approach to ensure daily high-quality instruction and intervention, proactive early identification, intervention intensity that increases with student need, monitoring student learning, and data-driven decision-making through a problem-solving process (Barnes & Harlacher, 2008; Fletcher & Vaughn, 2009; Fuchs & Fuchs, 2006; Fuchs & Vaughn, 2012; Gibbons & Coulter, 2016; Hosp, Huddle, Ford, & Hensely, 2016; Hughes & Dexter, 2011; Jimerson, Burns, & VanDerheyden, 2016; Torgesen, 2009).

Collection of Core Elements

MTSS is a national concept, with loose direction, that is implemented locally. Therefore, local implementation varies. MTSS is not universally defined nor does the concept mean the same to all users. MTSS is a system with a collection of core elements that varies depending on who and where it is implemented. MTSS models being implemented throughout the country have been shown to be a collection of assorted evidence-based core components (Berkeley, Bender, Peaster, & Saunders, 2009; Fuchs, Fuchs, & Stecker, 2010).

Research related to evidence-based practices can be thought of as a two part process with the first part being efficacy. A practice shown to have efficacy indicates

that research validates its ability to perform as described under ideal conditions. The second part relates to effectiveness which demonstrates that the practice works in diverse real-world settings such as individual classrooms. Just because a practice has been shown to work under ideal conditions does not mean the practice will work in real-world settings.

Burns et al. (2016) reports a variety of MTSS core components have been shown to have efficacy but indicates a unified MTSS model is lacking. They advocate for the need to develop a national MTSS model to ease the issues related to implementation. The acknowledgment that individual MTSS core components have efficacy does not automatically correlate with scaling the practice up and implementing it nationally. There is a need to demonstrate the effectiveness of MTSS in a variety of real-world settings. Even after a decade of varying implementation across the United States there has not been momentum to capture a singular MTSS model. Additionally, there are scaling issues even when implemented well. The thought that a national model will resolve issues of implementation greatly discounts the complexity of the local context found in school environments.

The success of implementing evidence-based practices often depends on how they are received in the local context or fit within a target environment. The availability of organizational resources, structures, culture, staffing, coaching, training, and administration to support implementation is critical (Cook & Odom, 2013; Odom, 2009). To gain a better understanding of how MTSS is being implemented in the real-world, an evaluation of the implementation of a school district's MTSS model and its connection to outcomes is a worthy endeavor.

Theoretical Framework

The successful implementation of evidence-based MTSS practices is ultimately tied to the context within local schools districts. It is important for districts to consider evaluation of implementation. Donaldson's (2007) program theory-driven evaluation is ideal to examine both efficacy and effectiveness of a locally designed, developed, and implemented MTSS model. The usefulness of a school district's MTSS core components can be confirmed through the program theory development stage of the model. Then the effectiveness of the implementation of those core components in elementary school settings and the effects of the level of implementation on desired outcomes can be examined.

A singular MTSS model does not fit well in schools. Schools are open systems with many uncontrollable influences on what occurs within each individual classroom on a daily basis. Equifinality indicates because of the variety of influences there is not a particular way to reach a desired outcome. Open systems theory suggests organizations have several options to reach outcomes and success is related to a components fit with the organization rather than the components fit with external research (Doty et al., 1993; Gresov & Drazin, 1997). Research-based components will not always fit within an organization nor will they always achieve the same result. Once components are shown to have efficacy then the focus shifts to an organization's ability to effectively use the components to impact outcomes (Cook & Odom, 2013). Thus, successful implementation of evidence-based MTSS practices seems ultimately tied to the context within local school districts.

The knowing-doing gap is the gap between intellectually understanding what should be done and actually complying (Pfeffer & Sutton, 2000). The work, as we know it, is the ability of educators at the local level to effectively use the practices to achieve positive outcomes (Odom, 2009; Fullan, 2010; Wallace, Blasé, Fixson, & Naoom, 2008). Even the most effective evidence-based practices are bound to show insignificant results when those practices are partially implemented (Cook & Odom, 2013). In contrast, Durlak & DuPre (2008) found that desired outcomes related to youth mental health programs can still be achieved without a 100% fidelity of implementation. In fact, they showed that 60% implementation with 40% local adaptation is reasonable for achieving desired outcomes. Thus, the research is mixed in the connection between the depth of implementation and outcomes.

Purpose Statement

Schulte (2016) indicates a need to understand how MTSS works in the real-world with little existing research examining MTSS as a working integrated whole. While the efficacy of several core components related to MTSS has been demonstrated, research related to the effective implementation of a MTSS model is valuable (Higgins-Averill & Rinaldi, 2011). Many questions also remain about the effect of implementation and adaptation on outcomes (Durlak & DuPree, 2008; Lendurm & Humphrey, 2012).

Therefore, the purpose of this program theory-driven evaluation was to first identify the plausibility of a school district's program theory for MTSS including core components, the interconnectedness of the core components, and desired outcomes. Furthermore, the evaluation will assess the implementation of that program theory in

elementary school settings, and finally analyze the effects of the depth of implementation on outcomes.

Research Questions

The following research questions were used to examine the implementation of the school district's program theory for MTSS related to identified outcomes.

Research question #1: At what depth of implementation are the MTSS core components being implemented in the elementary school setting?

Research question #2: Is there a correlation between the depth of implementation of the MTSS core components and the observable outcomes?

#2a: outcome of percentage of students in an elementary school in tier I, tier II, and tier III interventions?

#2b: outcome of fall to spring school growth percentile (SGP) on the Northwest Evaluation Association (NWEA) Measure of Academic Progress (MAP)?

#2c: number of students referred to special education?

#2d: true positives or the percentage of students that are identified for initial evaluation for special education and then actually verified as a student with a disability?

#2e outcome of District Behavior Status Survey (MPS-BSS)?

Definition of Terms

Adaptation. Changes to the original evidence-based practices made at the local level during implementation (Durlak & DuPre, 2008).

Data-based decision-making. Process of collecting, analyzing, and summarizing information to answer a question and to guide development, implementation, and

evaluation of an action. Data-based decision making is continuous and regular, and most importantly linked to educational/socially important questions.

Differentiated instruction. Process of designing lesson plans that meet the needs of the range of learners; such planning includes learning objectives, grouping practices, teaching methods, varied assignments, and varied materials chosen based on student skill levels, interest levels, and learning preferences; differentiated instruction focuses on instructional strategies, instructional groupings, and an array of materials.

Efficacy study. How an intervention, program or system performs in real world situations (Donaldson, 2007; McDonald, Keesler, Kauffman, & Schneider, 2006).

Efficiency study. How an intervention, program, or system performs in ideal conditions (Donaldson, 2007; McDonald et al., 2006).

Equifinality. The principal that in open systems a given end state can be reached by many potential means (Gresov & Drazin, 1997).

Evidence-based practices. Effective research-based curriculum, instruction, intervention, practices, and strategies demonstrated to produce outcomes (Stoiber & Gettinger, 2016).

False positive. Percent of students referred for a special education multi-disciplinary team evaluation that are not identified as a student with a disability.

Fidelity. Implementation of an academic intervention, program, or curriculum according to research findings and/or on developers' specifications. Implementation of a Positive-Behavior Intervention Plan (P-BIP) according to the specifications laid out within the plan.

Implementation Science. Process of implementing innovative evidence-based practices in real-world settings (Odom, 2009).

Multi-tier system of supports. A comprehensive continuum of evidence-based, systemic practices to support a rapid response to students' needs, with regular observation to facilitate data-based instructional decisionmaking (Title IX, Sec. 8002(33), page 399).

Prevention Science. "A step-by-step model for solving public health problems" (Herman, Riley-Tillman, Reinke, 2012, p. 306).

Problem-solving process. Process in which a group of education professionals come together to consider student-specific data, brainstorm possible interventions, and develop a plan of action to address a student-specific need.

Program theory-driven evaluation. Use of stakeholder knowledge and context of a program to develop a program theory that is plausible with research literature and scientific methods to determine the merit, worth and significance of the program (Donaldson, 2007).

Response to intervention. Practice of providing high quality instruction and interventions matched to individual student need, monitoring progress frequently to make changes in instruction or goals, and applying child response data to important individual student learning decisions.

Scaling-Up. The practice of introducing evidence-based practices to larger, more diverse populations with similar positive outcomes (McDonald et al., 2006).

Stakeholder. People within an organization that have knowledge as users of the design, implementation, and potential effectiveness of a program.

True positive. Percent of students referred for a special education multi-disciplinary team evaluation that are identified as a student with a disability.

Assumptions

It was assumed in this study that MTSS implementation can be measured using the school context results of the Self-Assessment of MTSS (SAM). Since the SAM is a self-report instrument, it was also assumed that all participants were honest and candid when completing the survey.

It was assumed in this study that outcomes can be measured by the Northwest Evaluation Association (NWEA) Measure of Academic Progress (MAP) and the District Behavior Status Survey (MPS-BSS). It is assumed that the MAP assessment is an effective measure of student academic growth fall to spring. Since the MPS-BSS is a self-report instrument, it was assumed that all participants were honest and candid when completing the questionnaire.

The design of this study has strong features. The school district that was used in this program-theory driven evaluation has over 10 years of background and experiences with the concepts related to MTSS and over 5 years prior to MTSS focused on the aligned practices of the DuFour et al. (2004) model of professional learning communities and differentiated practices. On-going high-level professional development practices were the center-piece with each of these initiatives.

Limitations

This study was limited to one school district with 25 elementary schools in a Midwestern suburban area. The Self-Assessment of MTSS (SAM) is designed to be used in a guided discussion activity with data teams, this was not possible in this study. The

SAM was provided to data team members as an electronic survey. Another limitation is that the evaluator in this study is a central office administrator with the school district and has worked on the development of the MTSS initiative from its beginning stages.

Delimitations

The study was delimited to the elementary level in a suburban school district. Since the study is designed as a program evaluation it was delimited to stakeholders within the school district which may reduce the utility and generalizability of the findings.

Significance of the Study

This study will contribute to research, practice, and policy. The study is of significant interest to educators because there is a focus on finding evidence-based practices that positively impact the learning of students.

Contribution to research. A review of professional literature suggests that more research is needed related to the understanding of how MTSS works in real-world settings. School leaders have few clear examples showing how the integration of components of MTSS come together into a unified construct in a local school district. This study also contributes to the body of knowledge related to how depth of implementation of an evidence-based practice can effect outcomes.

Contribution to practice. As a result of this program theory-driven evaluation a suburban school district may make changes to its current MTSS model. A school district and schools may decide what professional development is needed related to the MTSS model.

Contribution to policy. This program evaluation may provide information about the current concerns, status, and opportunities for the school district's MTSS model.

Outline of the Study

The literature review pertinent to this research study is presented in Chapter 2. The chapter reviews the professional literature related to prevention science, early literacy intervention, response to intervention, MTSS, and implementation science. Chapter 3 describes the school districts' development of its MTSS program theory. Chapter 4 describes the methodology used within the study, research questions, participants, data collection, instruments, and data analysis methods. Results of the study will be presented in Chapter 5 and discussed in Chapter 6.

Chapter 2 Review of Literature

MTSS has become a part of the national conversation related to ensuring high levels of learning for all students. Many of the key components in MTSS models are rooted in a research foundation that stretches over 40 years including; prevention science, early reading intervention, response to the rise in special education identification, testing and accountability culture of No Child Left Behind (NCLB), and the collection of non-systematic practices of response to intervention (RTI). This chapter will review these contextual components that led to MTSS, then discuss the evidence-based practices that currently make up MTSS models, and finally explore the opportunities to scale-up MTSS.

Contextual Factors Behind the Development of MTSS

Prevention science. Public health prevention models related to illness and infectious diseases began to emerge in the 1950s and more recently became the basis for many concepts in a MTSS model (Herman et al., 2012; Schulte, 2016). Prevention science connects the fields of epidemiology, human development, psychopathology, and education using intervention trials to determine the effectiveness of an intervention on risk or protective factors related to mitigating or resolving illness and infectious disease (Coie et al., 1993; Herman et al., 2012; Stormont, Reinke, & Herman, 2009). Coie, et al. (1993) noted that prevention science works within an open systems theory framework acknowledging that human beings interact with various inputs (biological, family, school, peers, work) that influence their health. There is a complexity to prevention science because of the interactive system that individuals live in, the potential multiple causes of illness and infectious disease, and that illness and infectious disease may impact people

differently at different points in their development (Coie et al., 1993; Schulte, 2016). At the core of prevention science is a tiered process that includes: (a) primary prevention or how to prevent healthy people from becoming ill, (b) secondary prevention focused on halting the progress of an illness after potential exposure, and (c) tertiary prevention directed at limiting the impact of an illness once a person was diagnosed (Schulte, 2016). Stormont et al., (2009) describe the levels within the preventative model slightly differently and probably simpler to connect to an education model such as MTSS: (a) universal prevention focused on the whole population, (b) selective prevention targeted a subpopulation based on risk factors, and (c) indicated prevention focused on individuals showing elevated signs of risk. Continuous surveillance is used in prevention science to uncover, analyze, and monitor indications of potential illness or infectious diseases. When an issue is identified, a data-driven problem-solving process is used to determine how to intervene. The ability to make informed decisions at the earliest possible point about how to interrupt the course of an illness or infectious disease is paramount to an effective preventative public health system model (Hawkins et al., 2008; Herman et al., 2012; Stormont et al, 2009). Later in its development, prevention science examined how preventative intervention models could be disseminated so they could be scaled-up for broad adoption, implementation, and sustainment (Schulte, 2016).

Many of the evidence-based practices used within MTSS models can be traced to prevention science including; risk and protection factors, open systems theory framework, tiered process, surveillance, early intervention, and scaling-up of proven practices. The question became, would practices related to prevention science that came out of the development of a public health model work in education?

Early reading intervention. The topic of reading began to show up in the prevention science research literature in the early 1980's (Schulte, 2016). In prevention science, reading proficiency is considered a significant protection factor for school success, overall health, and well-being. Conversely, a lack of proficiency in reading can be a substantial risk factor related to school failure, dropping out, and a bleak job outlook (Torgesen, 2000). During this time, many involved with research related to the prevention of reading failure began to use terms that mimic the public health prevention model including response to treatment, response to remediation, response to instruction, and response to intervention (Fuchs, Fuchs, & Speece, 2002; Schulte, 2016; Torgesen, et al., 1999; Vellutino, et al., 1996).

Torgesen (2000) estimated over 94% of children when provided best instructional practices related to the prevention of reading difficulties would demonstrate adequate reading skills. This included over 50% of the children who were initially identified as being at-risk. Another finding noted by several early reading intervention researchers was that verbal or nonverbal general intelligence quotient (IQ) was not a good predictor of a student's ability to grow in the area of early reading (Torgesen, 2000; Vellutino, et al., 1996). Torgesen (2000) identified three characteristics predictive of reading difficulties including: (a) low levels of phonological language skills, (b) parents with low levels of education and income, and (c) high frequency of problem behaviors of the student in the classroom.

The prevention science concepts of identifying risk factors and providing early intervention were indeed successful in education related to the area of reading. Paralleling the public health model, researchers in early reading interventions were able

to identify risk factors in students suggestive of potential reading difficulties. A surprising result was IQ was not one of the identified risk factors. Once the at-risk students were identified, educators were able to successfully intervene in a large majority of cases.

Rise of specific learning disabled identification. In 1975 Public Law 94-142 the Education of All Handicapped Children Act (1975) was passed. At that time, less than 2% of the United States student population were identified as having a specific learning disability. In contrast, by the late 1990's that number grew to more than 6% (Fuchs & Fuchs, 2006; Prasse, 2014). Since it can cost two to three times more to educate students with disabilities, the costs for providing special education services were becoming extremely concerning (Fuchs & Fuchs, 2006). Issues of over referral and identification, especially related to students with specific learning disabilities, became a critical conversation around special education.

Over referral is due to contextual factors such as child find and a classroom teacher's perspective of special education. The child find requirement within P.L. 94-142 obligates schools to find and evaluate children suspected of having a disability. Initially, child find was critically important since many students with disabilities had been excluded from participating in school. But over time, classroom teachers began to feel obligated to refer students who were more difficult learners in their classrooms to special education. As Prasse (2014) notes, when students were not successful in the general education classroom it was automatically assumed they must have some type of disability without considering the myriad of other possible factors including the quality of teaching and supports within the current classroom. This produced a silo-ed relationship between

general and special education where students were sent from the classroom to special education to be fixed or maintained (Batsche et al., 2006).

Issues of over identification are tied to the role IQ-achievement discrepancy plays in the evaluation of students related to the verification of a specific learning disability. Concerns related to the reliability and validity of IQ-achievement discrepancy were based in: the amount of discrepancy necessary for identification, the consistency of professionals conducting the assessments, and the model's impact on student learning. Under P. L. 94-142 each state was permitted to arbitrarily specify the discrepancy needed between IQ and achievement assessments for special education identification. The size of the discrepancy allowed by states significantly changed the number of students identified. It appeared IQ-achievement discrepancy could also be manipulated by educators and parents, thus producing a lack of consistency across practitioners, schools, and school districts (Batsche et al., 2006; Fuchs & Fuchs, 2006). Beyond the concerns about the sheer number and costs, the most daunting concern related to what was happening with special education identification was the reality that students needed to first fall significantly behind their peers to receive special education supports. This became negatively referred to as a wait-to-fail model. (Batsche et al., 2006; Hosp et al., 2016; Fuchs & Fuchs, 2006).

These events in special education were the antithesis of what was being learned from prevention science and early reading intervention. General and special educators were not working together to identify students who were at-risk for learning issues by screening for risk factors and intervening early. They were waiting until they perceived a large enough discrepancy established between a student's IQ and achievement

performance before identifying them for special education. Because of rising numbers, costs, and the wait-to-fail model, special education professionals began to examine ways to impact referral and identification such as the practices associated with prevention science and early reading intervention.

No child left behind. In 2001, No Child Left Behind (NCLB) mandated that states develop a statewide assessment system to annually measure the progress of all students in grades 3 through 8 and once in high school. The goal of year-to-year adequate yearly progress (AYP) was to guarantee that all students would be proficient by 2012-2013 school year. NCLB also identified the sub-groups of: (a) economically disadvantaged, (b) students with disabilities, (c) English language learners, (d) gender, and (e) race-cultural groups and mandated these subgroups be reported separately and their test score performance must also show the same annual progress.

With legislated focus, analysis of subgroup performance quickly became the standard in all United States school systems. This heightened awareness of subgroup performance under NCLB provided the expectation that all students can show the same growth progress and learn at high levels. Consequences of the NCLB testing focus were noticeable, including transparency of test performance of all students and subgroups to the public, and if subgroups of students did not meet AYP then schools and school districts faced negative corrective actions. To gain the AYP growth related to the NCLB mandate, schools and school districts were expected to: implement scientifically based research practice related to curriculum and instruction, focus on the core academic areas of reading, mathematics, writing, and science, use student assessment to identify at-risk learners, and intervene early (Tilly, 2006).

NCLB initiated a testing and accountability culture in education that many have indicated is flawed. Yet at the same time, NCLB identified several positive opportunities for educators including: the focus on scientifically based research practices, high expectation for continuous growth of all students, including students in subgroups, and the need for early intervention. NCLB became a legislated motivation for educators to examine practices to promote the learning of all students.

Initial model: Response to intervention. Multiple factors were coming together to develop a set of practices which would combine several concepts that had previously seldom been connected: prevention science, early reading intervention, and mandated test performance growth of all subgroups. Batsche et al. (2006) indicated what was needed was a model focused on prevention not student failure. RTI became that initial set of practices with roots in prevention science and early intervention focusing on students receiving appropriate instruction before a large gap in learning developed (Barnes & Harlacher, 2008). An alignment of preventive science concepts and core elements of RTI are identified in Figure 2.1 (Bastche et al., 2006; Schulte, 2016).

Similar to prevention science's tiered process, a three tier RTI model was suggested: (a) tier 1 core focused on a scientifically-based curriculum for all students in the classroom, (b) tier 2 supplemental interventions for subgroups of students based on risk factors, and (c) tier 3 intensive interventions focused on individual students. (Batsche et al., 2006; Fuchs & Fuchs, 2007; Hosp et al., 2016; Tilly, 2006). The concept of continuous surveillance from prevention science in the RTI model became the use of screening of all students three times per year (fall, winter, and spring), and progress

monitoring especially in tiers 2 and 3 (Batsche et al., 2006; Fuchs & Fuchs, 2007; Hosp et al., 2016).

Figure 2.1 Alignment of Preventive Science and Core Elements of RTI

Prevention Science	RTI
Systematic	Initially more isolated practices
Tired approach: • Universal – whole population • Selective – subpopulation based on risk factors • Indicated prevention - individuals	Tiered approach: • Core – classroom all students • Supplemental interventions - subgroups of students based on risk factors • Intensive interventions – focused on individual students
Surveillance	Screening, diagnostic, progress monitoring and summative evaluation
Intervene at Earliest Possible Point	Use of screening data to identify true positives
Risk factors	Student and family demographics
Protective factors	School success
Scale up – dissemination, adoption, implementation, sustainability	Early stage focus on initial efficacy and effectiveness

The RTI model also included a data-driven problem-solving process to determine when and how to intervene (Barnes & Harlacher, 2008). Data from curriculum based measures (CBM) were reviewed by a data team and used to guide changes to the instruction and interventions being used with the student. The basic question data teams tried to answer was whether students were responders or non-responders to intervention (Barnes & Harlacher, 2008; VanDerHeyden, Witt, & Gilbertson, 2006).

At this time the understanding of RTI concepts exceeded what was seen in practice. Special educators became the initial instigators of RTI because they were looking for ways to decrease special education referral and identification rates and to

increase the low performing NCLB subgroup of students with disabilities. These RTI efforts aligned with prevention science using screening tools and early intervention, but were often narrowly focused in the area of reading in kindergarten and first grade (Barnes & Harlacher, 2008, Batsche, 2014). RTI was a loosely grouped set of practices related to screening, progress monitoring, intervention delivery, and data-driven decision-making that was not fully taking advantage of the use of these evidence-based practices with students (Jimerson et al., 2016). General education teachers often did not understand the shift in their practices that would be necessary with a preventive model. This impacted the fidelity of RTI practices. Moving from the separate silos that general and special education had worked in would take time and collaboration.

RTI formalized as identification option. The reauthorization of Public Law 94-142, referred to as the Individuals with Disabilities Education Improvement Act (IDEIA) (2004), included RTI and guidance on several related concepts. The most important was the option for local school districts to use RTI for the identification of student with a disability in the area of specific learning disability (Bastche et al., 2006). This not only gave school districts the chance to move away from the IQ–achievement discrepancy model, but also acknowledge the potential of RTI related to the use of evidence-based practices and early intervention to intervene with at-risk and struggling learners. The ability to intervene early and effectively with struggling learners was the basis of using RTI as a special education identification model. In order to identify a student with a specific learning disability under RTI, a pattern of consistent non-responding to instruction and intervention for a sufficient time must be clearly evident (Tilly, 2006).

The passage of IDEIA (2004) provided further motivation for educators to use RTI practices. But, the current narrow isolated practices being used were not in alignment with the legal defensibility needed to use RTI for the identification of students with disabilities. To demonstrate a pattern that indicated a lack of student learning when scientific based instruction and multiple interventions were used with a student, RTI needed to become a systematic approach lead by general education focused on practices used with all students.

RTI to MTSS.

As more education researchers, states, and school districts worked with RTI concepts, many came to realize the potential for a larger impact of a model like RTI especially related to school improvement, and continuous growth called for under NCLB (Jimerson et al., 2016). A comparison of RTI elements and MTSS elements is offered in Figure 2.2 (Batsche, 2014; Jimerson et al., 2016). A gradual shift began related to looking at RTI more as a school-wide systems approach focused on improving the learning of all students (Barnes & Harlacher, 2008; Batsche, 2014). What began to be seen in practice was a school-wide tiered instruction and intervention system that started in the general education classroom and intensified related to student needs involving both general and special education throughout the entire process (Fletcher & Vaughn, 2009; Hosp et al., 2016). As more schools and school districts began to discuss RTI related to closing the learning gap for all students the leadership for RTI also began to shift from special education to general education (Barnes & Harlacher, 2008; Batsche, 2014). School leaders began to examine the alignment and effectiveness of the core instruction program used in tier I and the interventions used with non-responders in core instruction

Figure 2.2 Comparison of RTI and MTSS Elements

RTI	MTSS
Use of isolated practices or strategies	Systems approach to school improvement and reform
Using data to identify disabilities	Focus on instruction and intervention
Came out of special education	Focuses on general education
Assessment oriented	Emphasizes providing services
Only student-level problem-solving	System, school, and student problem-solving
Related to interventions and specific learning disability evaluations	Focused on accelerating learning of all students
Data collection focused on literacy	Integrated data systems focus on academics and behavior

program used in tier I and the interventions used with non-responders in tiers II and III. Instruction and intervention need to address the learning concerns of all students.

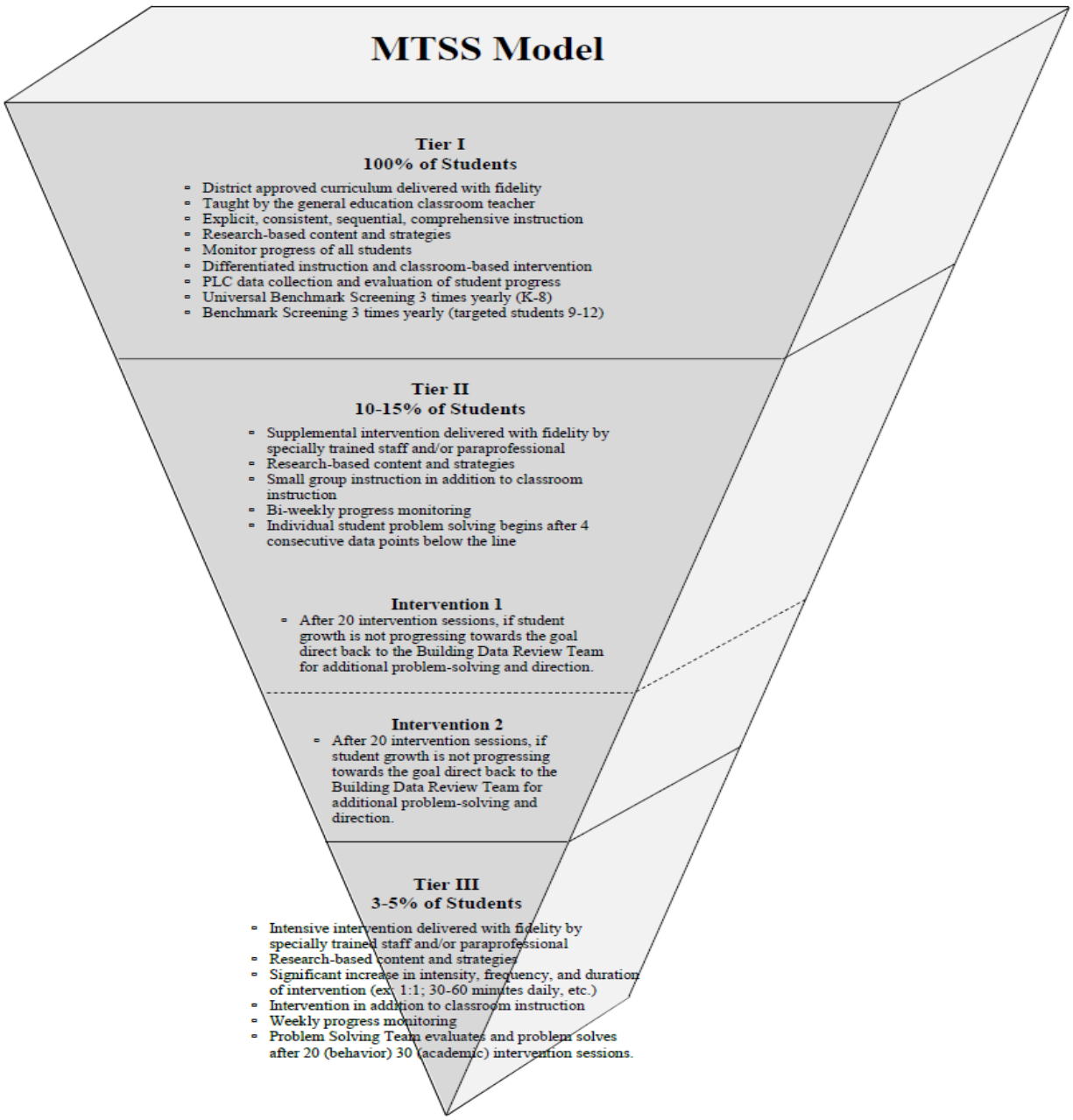
Another trend seen was the integration of behavior, often related to using positive behavior interventions and supports (PBIS), along with academic supports into a singular model (Batsche, 2014; Fletcher & Vaughn, 2009; Higgins-Averill & Rinaldi, 2011). As RTI has merged with school improvement and continuous improvement efforts focused on the learning progress of all students academically and behaviorally, many have begun to refer to the systematic model as multi-tiered systems of support (MTSS) (Jimerson et al., 2016).

MTSS Evidence-Based Practices

MTSS as a system. The three tiered nature of MTSS provides for a system that includes all students and the ability to respond with different intensity levels to meet the needs of individual students, groups of students or the school as a whole. This systems focus on the entire school ties MTSS to school improvement and continuous growth

related to closing the achievement gap (Barnes & Harlacher, 2008). The researched school district's MTSS model is identified in Figure 2.3. It is important for schools and school districts to identify the characteristics of each of the tiers. This should include the

Figure 2.3 School District's MTSS Model



number of students they intend to serve, instructional and/or intervention focus, assessment data to be used, and decision making points to be reviewed in each tier (Batsche, 2013). A student's data showing success or concerns should trigger these decision making points thus providing input regarding next steps. An MTSS model should be fluid in nature with students moving in and out of tiers related to their current needs.

Tier I Core

Evidence-based curriculum and instruction. MTSS tier I is focused on the learning of all students both academically and behaviorally in the general education classroom (Batsche, 2013). Tier I emphasizes the use of high-quality evidence-based curriculum and differentiated instruction in the general education classroom that ensure a match between each student's skills and the instruction being provided (Balcom, 2013; Barnes & Harlacher, 2008). High quality core curriculum is noted to have; (a) explicit instructional strategies, (b) a clear logical organization around an evidence-based learning continuum, and (c) identified instructional routines that provide opportunities for differentiation (Fuchs et al., 2012; Hughes & Dexter, 2011).

Concerns have been identified around tier I core instruction in the following areas: high quality core curriculum, use of evidence-based instructional practices, student access to quality materials, and staffing. Finding high quality core curriculum can be difficult for school districts because publishers often do not spend the money or invest the time to do in-depth research on their curriculum programs (Allington, 2013; Fuchs et al., 2012). This raises the question about basic access to actual evidence-based core curriculum and instructional programs for use in classrooms across the country. MTSS

models are predicated on the use of effective curriculum that meets the needs of the majority of students in tier I.

Even when an evidence-based curriculum is being used, Fuchs and Vaughn (2012) have noted it can be difficult for teachers to use effective evidence-based practices in the general education classroom, especially in their ability to differentiate. Differentiation is related to a teacher's ability to modify the content, process, and products in the classroom to meet individual student's learning needs. Implementing differentiated practices takes professional development, planning time, and skilled teachers.

Allington (2013) has questioned the amount of time struggling readers not only interact with books in the classroom, but the ability of schools to provide reading material at the students' reading level. A student's ability to read a large portion of the material they are given not only increases their abilities in reading but also impacts their acquisition of content. The lack of appropriate materials available to classroom teachers contributes to limitation in their ability to differentiate. MTSS relies on classroom teachers having curriculum materials available so they can differentiate for student needs.

Allington (2013) has also questioned the use of minimally trained paraprofessionals working with students who are struggling to learn how to read in the classroom. In order to meet the needs of all students, teachers may need additional assistance but they also need to examine who is providing the instruction to students of need. Paraprofessional support may be better suited to extending the learning of students who already have a basic understanding of the material rather than students who are struggling to learn to read. There is a need not only to pair the students that struggle to

learn with a qualified teacher, but also the need for teachers to be engaged in high quality, on-going professional development related to curriculum, instruction, and supporting students in the general education classroom (Allington, 2013; Fuchs & Vaughn, 2012).

Even with the noted concerns, research indicates two positive outcomes related to the use of evidence-based and effective instructional practices in tier I which are: fewer students in need of intervention, and a reduction in the referral and placement in special education (Fuchs & Vaughn, 2012; Hosp et al., 2016; Jimerson, et al., 2016; Torgesen, 2009; VanDerHeyden et al., 2006;).

Data-based. Screening is an evidence-based data tool used at the tier I level to identify a subset of students who are at-risk and in need of extra support in core instruction and interventions (Ball & Christ, 2012; Compton et al., 2010). Davis, Lindo, and Compton (2007) identify screening as assessments that: are efficient to administer to a large number of students, taking little time away from instruction, and that provide information related to whether students are responding to core instruction. Fuchs and Vaughn (2012) indicate screening may be the greatest accomplishment of MTSS to date because it has impacted the wait-to-fail model by providing a tool that allows schools to identify at-risk learners at the earliest possible moment or at a time before a large learning gap has been established. Many schools using MTSS universally screen all students both academically and behaviorally three times-per-year then target students that are at-risk of not responding to the general education instructional program with more support through interventions (Fuchs, Fuchs, & Compton, 2012; Hosp, 2016).

Concerns have been identified with one-time brief screenings even when they are used multiple times per year (Davis et al., 2007; Fuchs et al., 2012; Fuchs & Vaughn,

2012; Hosp et al., 2016). These concerns are related to the ability of the screening tool to accurately place students into two groups: responders or students who are able to make progress with the regular instruction, and non-responders or students who are at-risk and need additional supports. Every assessment tool has some level of error of measurement such as indicating a false negative where the assessment tool indicates a student is a responder but they are truly a non-responder and at-risk. Even more concerning is false positives where students are seen at-risk but are truly a responder not in need of intervention (Compton, et al., 2010; Davis et al., 2007; Hosp, 2016). Tier II interventions can be costly and time consuming, so it is critical to MTSS models that methods are used to attempt to reduce false positives and false negatives. Several ideas have been noted to allieviate concerns over false positives and false negatives including: two stage screening, use of multiple measures to make decisions, and screening later, such as in first grade rather than kindergarten (Burns et al., 2016; Davis et al., 2007; Fuchs et al., 2012; Fuchs & Vaughn, 2012; Hosp et al., 2016).

In a two stage screening process students are not moved to tier II interventions but are providing more thorough assessments to assist in making an accurate decision or provide additional targeted differentiated instruction in the classroom for a period of time before a decision is made (Compton et al., 2010). Mellard et al. (2009) indicates that most schools use three or more screening instruments. The use of CBM measures along with more recently developed benchmarking assessments such as Northwest Evaluation Association (NWEA) Measure of Academic Progress (MAP) and a text level reading measure have become more prevalent (Ball & Christ, 2012; Burns et al., 2016). Having multiple data indicators can reduce the chance of error. Davis et al. (2007) connecting

back to early literacy intervention practices suggests including: home environment factors, classroom based attention and behavior rating scales, and socioeconomic status to academic screening data for more accurate decision-making. Having multiple data points from multiple measures increases the accuracy of the decision-making and reduces the potential for false positives and negatives. However, Compton et al. (2010) encourages schools to strike a balance between multiple measures and the time this takes away from instruction.

Decision-making. Through screenings, tier I behavior and academic data is available to make decisions related to two groups responders and nonresponders. Decision-making is the evidence-based practice used within the MTSS model to make decisions about student data. Within the MTSS model there are three noted ways of making decisions: problem-solving protocol, standard protocol or a blending of the two (Berkeley, et al., 2009; Deno, 2016; Fuchs & Fuchs, 2007).

Problem-solving protocol is a process where a multidisciplinary team of school staff such as teachers, reading or math specialists, school psychologist, and the principal, often referred to as a data team, get together to review the data and make a determination on next steps. The most common problem-solving method is a four step model: (a) identify and define the problem, (b) analyze the possible causes and develop a hypothesis, (c) develop and implement a plan, and (d) evaluate the intervention plan (Batsche, 2013, Batsche et al., 2005; Elliot 2013; Erchul & Ward, 2016). The problem-solving process is applied throughout an MTSS model to identify supports for each individual student the data team deems a nonresponder. Since not all students respond equally to instruction or intervention, the problem-solving protocol offers a fluid process

focused on the unique needs of each individual student (Barnes & Harlacher, 2008; Erchul & Ward, 2016).

Problem-solving and data teams have become the primary means to implement decision making within the MTSS model but there are concerns with the use of problem-solving (Erchul & Ward, 2016). The problem-solving process is a very resource and time consuming procedure because a group of professionals needs to come together to examine the needs of individual students. Fuchs and Fuchs (2006) have also identified the need for expertise in data analysis and the use of interventions which may not be available in all schools.

Standard protocol decision-making on the other hand is noted by many as being the most efficient and effective way to make decisions about student data (Berkeley et al., 2009; Deno, 2016). Standard protocol matches the student's identified learning need from the data with an evidence-based intervention known to have a positive impact on that type of learning need. Since research and statistics on learning needs and evidence-based interventions have already identified a best course of action there is no need for a data team to meet and discuss what action to take related to the student (Deno, 2016). Grove and Lloyd (2006) summarize Paul Meehl's research from the 1950s and 1960s which indicates when both clinical (problem-solving protocol), and statistical (standard protocol) problem-solving is available; statistical strongly out performs clinical.

In practice, even though standard protocol has a seemingly stronger evidence-base, many schools and school districts use the problem-solving protocol, or some type of hybrid model using standard protocol, for decision making during parts of the MTSS model and problem-solving protocol during other parts. Burns et al. (2016) indicates

more recent research support the use of both standard protocol and problem-solving protocol. Since it does not involve having a data team meeting, standard protocol seems to be a better fit with decisions about tier I and moves to tier II. It seems appropriate to use the problem-solving protocol by putting a data team together for problem-solving about students who struggle in tier II instruction and intervention and move to tier III.

Another model of tier I problem-solving that has become increasingly more widespread related to school-wide continuous improvement and professional development are professional learning community (PLC) teams (Helman & Rosheim, 2016). Like MTSS, the PLC movement recognizes isolated individual teachers often do not or produce little much related to positive learning results of all students but a school-wide practice of teacher collaboration, problem-solving, and professional development focused on the tier I core curriculum and instructional practices can have a significant impact on all students (DuFour et al., 2004). In a PLC, teachers and specialists from a specific grade level or subject area regularly come together to collaboratively examine data related to the effectiveness of their instruction and to problem solve next steps. DuFour et al. (2004) indicates that PLC teams should be asking four questions: (a) what do we expect our students to learn, (b) how will we know they are learning, (c) how will we respond when they don’t learn, and (d) how will we respond if they already know it. The blending of PLCs with the MTSS process and using a PLC as a tier I data team seems to have many advantages. The process alleviates the concerns about taxing resources because PLC teams meet on a regular basis providing multiple opportunities to problem solve issues of student learning throughout a school year.

Tier II Supplemental

Evidence-based instruction and intervention. Tier II supplemental or secondary prevention is focused on providing students, who did not respond to tier I core instruction, a continuation of core instruction and evidence-based interventions matched to their learning needs (Fuchs et al., 2012). To do this, schools must provide the student greater intensity (narrowing the group size to 3-4), frequency (providing the intervention 3-5 days per week), and duration (substantial length of time such as 20-30 weeks) with evidence-based instruction and intervention (Batsche, 2013; Stecker, Fuchs, & Fuchs, 2008; Vaughn, Denton, & Fletcher, 2010). To provide said intervention, it is important to have teachers trained in the development of reading, math, and behavior.

To assist with the identification of evidence-based interventions, the United States Department of Education invested in the Institute of Education Science to create the What Works Clearinghouse (http://ies.ed.gov/ncee/wwc). The What Works Clearinghouse reviews and summarizes the research around an intervention to identify its evidence basis. While the What Works Clearinghouse provides educators with valuable information, unfortunately many intervention developers and publishers do not make the financial and time investment to truly establish a rigorous research basis for their intervention. Schools and school districts are often left to field test interventions with a small group of students to see if they are effective before expanding their use across the school or school district.

Many schools provide tier II intervention using the teacher in the general education classroom as the interventionist, while others hire reading and math interventionists to provide tier II interventions (Batsche, 2013). The use of

interventionists can add a substantial cost to the MTSS model for schools and school districts, so their use often parallels the funding available to schools.

Furthermore, Allington (2013) expresses a substantial concern with the use of paraprofessionals to provide intervention services. Paraprofessionals can be found in schools as a lower cost alternative to using reading and math interventionists to provide interventions. But to Allington (2013) the cost of using paraprofessionals is born by the students who have been identified as at-risk learners, but are receiving their intervention from the lowest trained staff member in the school. Expertise matters when intervening with students, and while paraprofessionals do not cost as much as teachers and interventionists, they also do not often possess the instructional knowledge to effectively intervene.

Data-based. Progress monitoring is the data tool used at the tier II level to identify students that are making progress in the current instruction and intervention level, and students who are not making progress. Progress monitoring is usually done using a repeated measure such as a CBM and the data is graphed against a trend line of project growth (Hosp et al., 2016). The progress monitoring is done frequently, such as weekly, bi-weekly, or monthly (Batsche, 2013; Hosp et al., 2016). Progress monitoring data is used to determine if the instruction and intervention are effective. If the intervention is effective, a decision will be made related to gradually ending the intervention and moving the student back to tier I. If the intervention is not effective, a decision needs to be made regarding the intervention being used along with the intensity, frequency, and duration for the intervention (Hosp et al., 2016).

Mellard et al. (2009) identified most schools using a MTSS model progress monitor weekly in tier II using a variety of instruments, but most often use CBM for progress monitoring. With over 3 decades of research and use, CBM has been seen as an accurate, inexpensive, and efficient way to monitor student progress (Ardoin, Christ, Morena, Cormier, & Klingbeil, 2012; Ball & Christ, 2012; Shinn, 2007). CBM progress monitoring data is graphed against a trend line for 4-6 weeks to demonstrate whether the student was making progress. The result of each CBM is plotted with points above the trend line showing good progress and points below the trend line showing a lack of progress (Shinn, 2007).

Recently concerns have been expressed related to the validity, reliability, and lack of evidence to support the use of progress monitoring for individual student decisions (Ardoin & Christ, 2009; Ardoin et al., 2012; Ball & Christ, 2012; Deno, 2016; Fuchs et al., 2012; Hosp et al., 2016; Jiban & Wood, 2016; Shapiro, 2012). Technical differences have been identified between a CBM used for screening where student results are compared against a group, and progress monitoring where the same individual student's results are repeatedly compared with their previous performance (Ardoin & Christ, 2009; Ardoin et al., 2012). Progress monitoring has been shown to have excessive measurement error related to several factors including: the variability in the passages used, the number of weeks of data collection, the standardization in the collection of progress monitoring data, and the number of data points used to make decisions (Ardoin & Christ, 2009; Ardoin et al., 2012; Ball & Christ, 2012).

The equivalence of the measures, whether reading passages or sets of math problems, has been questioned (Ardoin & Christ, 2009; Fuchs & Vaughn 2012). Ardoin

et al. (2012) indicates whether a student was shown to be making progress or not was related more closely to unequal passage difficulty than the student's response to instruction and intervention. For progress monitoring to be a useful practice within a MTSS model, the equivalency of passages and sets of math problems will have to be resolved.

The other issue that has been identified related to CBMs is the number of weeks and data points needed to make decisions (Ball & Christ, 2012). Ardoin et al. (2012) identified the original guidance of 4-6 progress monitoring data points would provide inaccuracy related to decision making. They have identified the need to have at least 12 weeks of data and 20 data points before making decisions (Ardoin, et al., 2012). To get 20 data points in 12 weeks, students would need to be progress monitored twice a week in most weeks. This does not align with the current practice of once a week progress monitoring schools typically use (Mellard et al., 2009). This practice would provide for the potential of just one decision making point during an 18 week semester, where previously there was the potential for 4 points in a semester.

Several have offered solutions related to the issue with equivalent reading passages and the number of weeks and data points needed for decision-making. Shapiro (2012) suggests more reliance be placed on universal screening data for tier II decision making rather than on progress monitoring data. This would probably mean schools would wait the full 18 weeks of a semester before making decisions. Data teams then could consider both screening data and progress monitoring data three times per year. It would also be possible to cease progress monitoring and to only examine screening data.

This option may be preferable to schools because of the time commitments of frequent data team meetings.

Ardoin and Christ (2009) provide information on data teams considering not just CBM data which has the potential to produce too many false positives and negatives, but multiple data sources. Jiban and Wood (2016) indicate a basis to go away from CBMs to mastery measures mainly delivered on the computer such as NWEA's MAP and Renaissance Learning's Star measures. Mastery measures place students on a vertical scale from lower mastery of identified skills to higher mastery that would seem to fit well with three times per year benchmark screening. Data teams could examine mastery measure progress or the lack of progress from fall to winter and winter to spring to assist in making decisions. Mastery measures could also be examined along with CBM screening and progress monitoring data.

It is important for the success of MTSS models that more research be done related to progress monitoring because, as Ardion et al. (2012) notes, the current recommendations for the use of CBMs as a progress monitoring tool surpasses the evidence available.

Decision-making. Similar to tier I, after the data is collected related to a student's progress in tier II, instruction and intervention decisions need to be made regarding next steps. If the student is responding to the instruction and intervention then decisions need to be made about how to gradually move that student away from the intensity of tier II instruction and intervention, back to tier I. If the student is not making progress in tier II instruction and interventions, then a decision is made about the intervention being used and the intensity, frequency, and duration so the student can make progress. Because of

the more individualized decisions being made in tier II, the use of problem-solving protocol where a data team would examine the data regarding the student's progress seems prudent (Batsche, 2013). Deno (2016) expresses that despite the concerns identified with progress monitoring, schools use of data-based decision-making is very promising.

Tier III Intensive

Evidence-based instruction and intervention. When a student reaches tier III, they have demonstrated a nonresponsiveness to tier I core differentiated instruction, and tier II small group interventions. Tier III is distinguished by its intensity, individualization, and the need for a long-term outlook (Fuchs et al., 2012; Gandhi et al., 2015; Vaughn et al., 2009). No instruction or intervention program works for all students, so in tier III many recommend moving away from published intervention programs to intensive practices directly focused on the student's most significant concern (Batsche, 2013).

Fuchs, Fuchs, & Vaughn (2014) identified two models for providing tier III. The first model includes intensifying tier II instruction and the second model is the use of data-based individualization. To intensify tier II, practices may include: smaller groups of no more than 3 students, additional time for intervention such as 60 minutes per day, interventions 5 days per week, and an extended timeframe most likely over multiple school years (Hosp et al., 2016; Vaughn et al., 2010; Vaughn et al., 2009). Instruction is very explicit with high levels of engagement and multiple opportunities for students to participate (Vaughn et al., 2010).

Data-based individualization is an evidence-based practice and can be best described as an experimental teaching process tailoring instruction to a student's individual needs (Deno, 2016; Fuchs et al., 2012; Fuchs et al., 2014). Figure 2.4 identifies assumptions related to the use of data-based modification (Deno, 2016). During data-based individualization a skilled interventionist first hypothesizes about a set of intervention practices that will provide student growth. Then those practices are implemented paying attention to fidelity so it is clear the practice was delivered according to prescribed specifications. Effective progress monitoring tools are critical to the use of data-based individualization because of the need to frequently monitor whether the student is making progress. As noted above, there are concerns related to CBMs in regards to progress monitoring but in relation to tier III, CBM is probably the best tool available (Deno, 2016). If the student is not making progress the interventionist changes the intervention practices until growth is seen. The qualities of the teacher related to

Figure 2.4 Assumption of Data-Based Modifications

Assumption #1	interventions for students should be treated as hypotheses
Assumption #2	single-case research design with repeated measurement data to test the hypotheses
Assumption #3	as students move away from tier I core programming the need for more intensive monitoring of progress increases
Assumption #4	single–case design for testing intervention hypotheses requires measures sensitive to progress
Assumption #5	testing intervention hypotheses requires well-trained professionals

intervention knowledge, data analysis, and over all teacher judgement and decision making is critical in regards to data-based individualization (Fuchs et al., 2014).

There is not agreement on who should be providing tier III interventions. Some indicate tier III is special education because of its individual nature, while others feel special education should sit outside of the MTSS model (Fuchs et al., 2014; Stecker et al., 2008). Fuchs et al. (2014) indicated regardless of who is teaching tier III, students with disabilities who need intensive interventions are performing poorly. Because of the lack of professional training, knowledge around data-based individualization, and overall difficulty in implementing tier III, many students, and especially students with disabilities, seemed to not make progress and then returned to tier II or tier I with co-teaching (Fuchs et al., 2014). For MTSS models to be successful there is a need to identify tier III intensive intervention practices and personnel that provide students with continual learning growth.

Current Results of MTSS

Several surveys have noted success related to MTSS models. Many have noted better implementation at tier I and II, in the area of reading, and at the elementary level (GlobalScholar, 2011; Lane, Carter, Jenkins, Dwiggins, & Germer, 2015; Spectrum K12, 2010). Less implementation success has happened at the high school level and with tier III. Reading was often the first area schools focused on as they adopted MTSS, but increases in implementation have been shown related to math and behavior.

Specifically, the Spectrum K-12 Solutions (2010) indicates that 94% of the schools they surveyed specify they are in the process of implementing MTSS. This is up 24% from 2007. Elementary schools reported the highest results related to full implementation, indicating that 80% are fully implemented in at least one area of

academics or behavior. They also indicated school districts using MTSS models reported achievement improvement regarding AYP (Spectrum K12, 2010; GlobalScholar, 2011).

Results related to special education referral and identification were also positive. 8 out of 10 school districts identified a reduction in the number of students referred to special education. Between 2005 and 2014, the United States Department of Education, Education Week Research Center reported a 17% decrease in the number of students identified in the category of specific learning disability. While special education referral and identification reductions could be related to a variety of different factors, it would appear that MTSS has contributed to these decreases. Many schools and school districts that have implemented MTSS have seen positives outcomes and results.

In the Spectrum K-12 Solutions (2010) survey, when schools were asked if they had an example MTSS model they were implementing, less than 50% indicated they did, but as noted above, 94% are in the process of implementing. Burns et al. (2016) finds the result that schools are not implementing off a pre-determined model worrisome. This supports a premise that MTSS is not driven by a national mode,l but as reported in the survey, MTSS models can be successfully developed within the local context of school districts.

Scaling MTSS

Burns et al. (2016) acknowledge a foundation of connected core components of MTSS functioning within “distinctly different models” (p. 730). They go on to express a concern that a lack of a singular MTSS model could threaten implementation integrity and MTSS as a national movement (Burns et al., 2016). It seems like there are other factors involved when the foundational core components of MTSS are well over a decade

old and a singular model has not emerged. There appear to be issues with the concept of scaling-up MTSS.

The term scaling-up refers to the process of bringing evidence-based practices to larger, more diverse populations and achieving similar positive outcomes (McDonald et al., 2006). Scaling-up recognizes the need for two different research processes before an evidence-based practice can be scaled from efficacy and effectiveness research. Efficacy research comes first demonstrating the merits of an evidence-based practices in isolated ideal conditions (Donaldson, 2007; Lendrum & Humphrey, 2012). The researcher is attempting to identify if the practice works in a controlled environment with few other competing initiatives. In education you will see efficacy studies being carried out by graduate students who are highly trained in the evidence-based practice, and then placed in schools for the length of time of the study. Fidelity is measured throughout so it is clear the evidence-based practice was delivered according to the researchers specifications (Harn, Parisi, & Stoolmiller, 2013). But these efficacy studies only show an evidence-based practice works in a particular setting under those particular circumstances (McDonald et al., 2006).

Once the efficacy of the evidence-based practice has been established in an ideal situation, there is a need for effectiveness studies. Effectiveness studies are demonstrations of how the established evidence-based practice works in real world situations (Donaldson, 2007; Lendrum & Humphrey, 2012). McDonald et al. (2006) express the need for field trials in a variety of settings, with a variety of demographics of students, to demonstrate how a practice will work in actual classrooms with classroom teachers as a step towards a successful scale-up. The ability of the evidence-based

practice to work in a variety of different contexts (student, classroom, school, district) predicts its ability to be successful when scaled (McDonald et al., 2006).

When there are similar contextual situations scaling simply happens through replication (McDonald et al., 2006; Tucker, 2009). Where practice "B" is 100% substituted for practice "A" because practice "B" gets better results. But schools and school districts are not simple in regards to context, so replication has little value in education. Schools are open systems where the school environment is highly influenced by multiple inputs such as: the background demographics of their students and families, the make-up and experience of their teachers, and the resources and structure of the school just to name of few (Bastedo, 2004; Cook & Odom, 2013; Penuel, Fishman, Cheng, & Sabelli, 2011; Wallace et al., 2008). The concept that local contextual factors are important is more widespread in other fields, but less so in education (Klinger, Boardman, & McMaster, 2013).

McDonald et al., 2006 advocates for scaling up that focuses on the need to tailor a practice to the context in which it is being implemented. During effectiveness research and scaling-up in open systems such as schools or school districts, Durlak and DuPre (2008) indicate that to expect near perfect implementation similar to what you would see in replication is unlikely. In their research they saw adaptation of practices to the local context similar to the McDonald et al., 2006 notion of tailoring of practices to the context during implementation. Durlak and DuPre (2008) note that 60% implementation is good, with few studies reaching 80% implementation. At the effectiveness research and scaling-up level, a mix of fidelity to the evidence-based practice and adaptation related to the local context not only seems to happen but also can positively contribute to the

outcomes the practice produces. While high implementation (above 60%) showed better overall outcomes, finding the right mix of fidelity and adaptation can also contribute to positive outcomes (Cook & Odom, 2013; Durlak & DuPre 2008; Harn et al., 2013; Lendrum & Humphrey, 2012; Odem, 2009). Evidence-based practices can be improved with input from the people implementing those practices. Lendrum and Humphrey (2012) noted additional benefits to a mix of implementation and adaption such as local ownership and buy-in with the evidence-based practices.

The concept of a balance between fidelity and adaptation in regards to implementation is also supported by the open systems theory principal of equifinality. In an open system such as a school, there are multiple varied inputs (e.g., student-family demographics, teacher characteristics and experience, and availability of resources). Equifinality indicates that outcomes (e.g., student achievement, productive student behavior) can be achieved through the multiple combination of effective practices or that there is no one best way to achieve a result (Bastedo, 2004; Gresov & Drazin, 1997). This reinforces the notion schools and school districts are in the best position to know and understand their context and how additional practices such as evidence-based practices will fit with their current system.

Hap-hazard adapting of evidence-based practices does not seem to be prudent or beneficial. Durlak and DuPre (2008) suggest through efficacy research, core components be identified that need to be implemented with fidelity while identifying other components that could be examined at the local level by skilled teachers and administrators related to potential adaptation. Additionally, Harn et al. (2013) indicated the need to identify active ingredients that need to be delivered with fidelity while

identifying others that could be adapted. The interaction of components within a model is another area where fidelity and adaptation need to be considered.

MTSS is not a singular evidence-based practice but a system of related components that varies depending on the context of who and where it is implemented. At this time the evidence related to MTSS is not in the system, but in the various components which, when connected, form distinctly different MTSS models (Burns et al., 2016; Bineham, Pazey, & Yates, 2014). A construct has several evidence-based elements that cannot stand alone and do not individually define the concept. But when these evidence-based components are put together, they form the construct (Seligman, 2011). Many have indicated the need for a singular model of MTSS but in current practices it is a construct where context impacts the selection and organization of evidence-based components in local settings. The use of the concept of a MTSS construct fits better with the research regarding scaling-up, implementation, and fidelity and adaptation, than the notion of identifying a singular national MTSS model. A national MTSS model leans towards the notion of replication and significantly underestimates the complexity of the open systems context in which schools function.

Approaching MTSS as a construct also fits with Tucker's (2009) concept of industrial benchmarking which denounces the concept of replication as not fitting the education environment. Instead he advocates for industrial benchmarking that takes the best concepts identified through field examinations where teams of experts interact with practitioners actually working within the successful organization being examined. The teams identify concepts that can be brought back to their organization so they are able to outperform the organization being studied. Tucker's (2009) work is related to studying

education in other countries then bringing concepts back to impact the American education system. But the concepts of industrial benchmarking also align well with what has happened with MTSS. School districts examined the components of MTSS, fitting them into a construct that meets their needs at the local level. Once concepts are identified as important components then the implementation that needs to happen is less about the components but becomes more about the school's ability to effectively adapt the component to the local context of the school in order to achieve outcomes.

Efficacy and effectiveness research is costly and time-consuming so many initiatives scale-up without evidence or with little thought about the varied context that the practice will be implemented (Lendrum & Humphrey, 2012). This can be said about MTSS where several core components have a significant basis in research but how these core components work together in the context of a school is less known (Fuchs & Vaughn, 2012). Donaldson (2007) indicates many programs do not experience efficacy and effectiveness evaluation but are later evaluated in the field. At this time a focus on developing a singular national model of MTSS seems unproductive but what is needed is a way to demonstrate the efficacy and effectiveness of the multiple MTSS constructs that are being implemented in several local school district settings around the country. Traditional education research models do not fit this need. Program theory-driven evaluation involving local stakeholders is well suited to examine both the efficiency and effectiveness of a program through its three step approach of; (a) developing the program impact theory, (b) formulating and prioritizing evaluation questions, and (c) using qualitative or quantitative methods to answer the questions (Donaldson, 2007).

Gibbons and Coulter (2016) note national and state efforts can support MTSS but only schools and school districts can implement MTSS. So establishing the efficacy and effectiveness of several MTSS core components through national research while supporting local schools and schools districts in choosing and arranging those core components to fit into their locally developed MTSS construct, seems to be critically important. This would provide educators in schools and school districts with knowledge of their own local context the ability to identify components that positively impact their systems and outcomes.

Chapter 3 Program Theory Development

This chapter describes the development of a program theory related to the program theory-driven evaluation process within the context of the researched school district (Donaldson, 2007). The purpose of this program theory-driven evaluation was to first identify the plausibility of a school district's program theory for MTSS including core components, the interconnectedness of the core components, and desired outcomes; then to examine the implementation of that program theory in elementary school settings; and finally to examine the effects of the depth of implementation on outcomes.

Program Theory Development Process

In developing a program theory-driven evaluation Donaldson (2007) indicates a three-step process that includes local stakeholder input: a) develop program impact theory, b) formulate and prioritize evaluation questions, and c) answer evaluation questions. Because local context is so important, stakeholder input throughout the entire process is critical. The evaluator assists with the program impact theory development by synthesizing the input from stakeholders and examining the stakeholder identified core components within the context of plausibility with research in regards to MTSS. But, in the end it is the stakeholders that reach consensus on the core components related to the way they are defining and implementing MTSS. Once there is consensus regarding the program impact theory, the stakeholders develop and prioritize evaluation questions, and the last step is to answer as many of the identified evaluation questions as possible. Donaldson (2007) indicates that it is critical to develop the program impact theory first, free of the restraints that can come from the development of evaluation questions, and the methods needed and feasibility of answering those questions. It is a linear three part process with each part of the process happening autonomously from the other parts.

Developing School District's Program Theory

Stakeholders. Two existing stakeholder groups within the school district were used to develop the program theory. The MTSS leadership team is made up of central office administrators from the areas of curriculum, student services, staff development, and special education. The leadership team guides the MTSS process for the school district. The MTSS district team is the other group and is made up of the building administrators, curriculum specialists, teachers, school psychologists, counselors, and the central office administrators on the MTSS leadership team. The MTSS district team provides input from the building level perspective related to the design, functionality, and development of the model. The MTSS district team also provides much of the guidance and leadership of the professional development activities related to MTSS.

Development of program theory first draft. Towards the end of the 2016 school year the MTSS leadership team began discussions about a re-examination of the basic philosophical concepts behind and the purpose of MTSS for the school district. During the fall of the 2016-2017 school year the MTSS leadership team guided a process to develop a program theory for MTSS with stakeholder input from the district team to define the school district's MTSS core components and desired outcomes (Donaldson, 2007). The district MTSS team was provided core component examples from a variety of models around the country along with the four fundamental beliefs and eight core principals from the current school district's MTSS model in advance to review.

Donaldson (2007) recommends a backwards design that starts with outcomes and works back to core components. A member of the MTSS leadership team led the discussions and a processing agenda was provided to each stakeholder. In table groups

with individual recording sheets the MTSS district committee members recorded their individual ideas for outcomes for the district MTSS model. Through table discussions groups then identified the table's most significant outcome ideas. A spokesperson for each shared the outcomes with the whole group and two MTSS leadership team members recorded all of the outcome ideas. A similar process was used to identify core components or ways to get to the indicated outcomes. After individual processing time and table group discussion time the core components were shared with the whole group and recorded. In the last activity for the initial input session each stakeholder wrote three to five core components on one side of an index card and two to three outcomes on the other side.

The evaluator then grouped similar identified core components and outcomes from the index cards and the recording sheets. The groupings were reviewed by select members of the MTSS leadership team for congruence of the components and outcomes in each group. Some items were moved to other groups and one additional group was created.

Once the groups were solidified the evaluator labeled each group with a term related to the components or outcomes within that group. The groups of components and outcomes along with the label for each group were reviewed by other members of the MTSS leadership team again for congruence.

The core components and outcomes along with the supporting statements from the index cards and recording sheets were put on a chart by the evaluator. The evaluator met with the entire MTSS leadership team to review the chart of core components and outcomes with supporting statements. Each component and outcome was confirmed by

the MTSS leadership team. Lastly, the MTSS leadership team developed a working definition for each of the identified core components and outcomes.

First draft presented to stakeholders. The chart of the core components and outcomes along with the working definitions and the input statements were sent out in advance of a second meeting with the MTSS district committee. Eight core components were identified; (a) instruction and intervention, (b) assessment tools, (c) common language, (d) data team problem-solving, (e) data-based decision –making, (f) fidelity, (g) professional development, and (h) relationships and parent involvement. Three outcomes were agreed upon; (a) systematic process, (b) students are academically and behaviorally successful, and (c) students receive strong instruction at all tiers. In the second meeting the MTSS district committee provided additional input related to the core components, outcomes, and the working definitions through table discussions and reporting out to the whole group. Minor revisions were recorded at each table and during the whole group report out time. The MTSS district committee indicated consensus on the core components, outcomes, and working definitions.

Plausibility check. With stakeholders providing preliminary consensus, the evaluator examined each core component and outcome for plausibility within the research literature regarding MTSS. Core component are tied to an evidence-based practice area from the research literature and a researcher often linked with that area is identified in Figure 2. The first six core components are well represented in the research literature around MTSS. The last two core components of common language, and relationships and parent involvement have an evidence basis in school improvement research literature but also can be found in several example MTSS models.

Figure 3.1 Core Component Tied to Evidence-based Practices

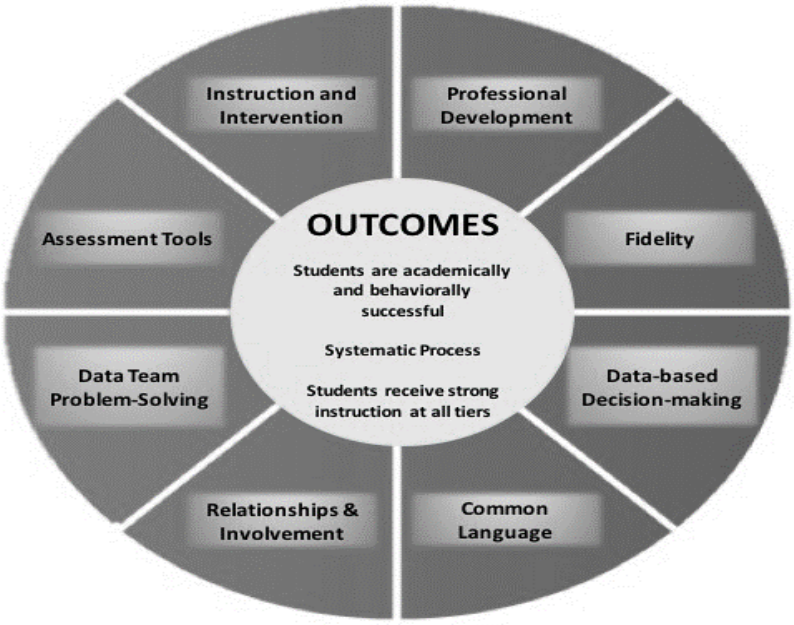
Identified Core Component	Connection to MTSS Evidence-Base Practice	Example Researcher
Instruction & Intervention	Tiered evidence-based curriculum, instruction, and interventions	D. Fuchs, L. Fuchs, S. Vaughn, J. Fletcher, A. VanDerHeyden, G. Batsche, D. Tilly, R. Allington
Assessment Tools	Valid and reliable screening, diagnostic, progress monitoring and summative assessments	S. Deno, S. Ardoin, J. Christ, E. Shapiro, M. Shinn
Data Team Problem-solving	Problem-solving protocol	G. Batsche, W. Erchul, C. Ward
Data-based Decision-Making	Standard protocol	S. Deno, D. Fuchs, L. Fuchs
Fidelity	Instruction, intervention, and implementation	S. Odom, B. Cook, D. Fixsen, K. Blasé
Professional Development	Professional Development: beliefs-attitudes, knowledge, and skill	G. Batsche
Common Language	Common language-model of instruction	R. Marzano
Relationships and parent Involvement	Parent and community involvement	R. Marzano

Each outcome: (a) systematic process, (b) students are academically and behaviorally successful, and (c) students receive strong instruction at all tiers, were also well represented in MTSS research where desired outcomes were identified.

Finalize program theory. The evaluator working away from the stakeholder group developed a graphic representation for the program theory using the identified core components and outcomes. Donaldson (2007) indicates the end goal related to the development of a program theory is to have a parsimonious model and that relationships between concepts are identified. Through discussions with select members of the MTSS leadership team, the notion of a linear program theory model graphic with core

components as inputs on the left side and outcomes represented on the right side was quickly dismissed. A circular model graphic began to develop. The school district's program impact theory graphic is identified in Figure 3.2. An initial circular model graphic was developed with the outcomes in the middle and the core components around the outside. Arrows were used to identify back and forth relationships between the core components. This model graphic was sent to the MTSS district committee before the final meeting.

Figure 3.2 School District's MTSS Program Theory



At the final meeting a facilitator from the MTSS leadership team and the evaluator explained the plausible links between core components and outcomes with MTSS and school improvement research literature. Through table discussions and whole group reporting out regarding the MTSS model graphic much discussion occurred related to the two-way directional arrows between the core components on the draft model graphic. It was decided by the stakeholder group that the directional arrows would be

removed from the model graphic with the representation being the core components of equal weight working together to impact the outcomes.

Summary

Donaldson's (2007) process for developing a program impact theory was used with stakeholder input from two school district groups. The school district's MTSS program impact theory could not have been developed by the evaluator in isolation. The stakeholder input and ownership was seen throughout the entire process of development. The program impact theory is not the evaluators but very much belongs to the stakeholders within the school district that developed it. Evidence of this has been seen by the MTSS program impact theory being shared with others in the school district and it being referenced in multiple conversations during and after its development.

Chapter 4 Methodology

The purpose of this program theory-driven evaluation was to first identify the plausibility of a school district's program theory for MTSS including core components, the interconnectedness of the core components, and desired outcomes; then to examine the implementation of that program theory in elementary school settings; and finally to examine the effects of the depth of implementation on outcomes.

Research Design

This correlational study is designed to determine a relationship, if any, exists between the MTSS implementation level measured by the Self-Assessment of MTSS (SAM) (Appendix A) and the outcome measures of: (a) percentage of students in tier I, tier II, and tier III, (b) fall to spring school growth percentile (SGP) NWEA – MAP, (c) number of students referred to special education, (d) special education multidisciplinary evaluation true positives, and (e) District Behavior Status Survey (MPS-BSS). The independent variable in this study will be MTSS implementation level. The dependent variable will be the observed outcomes.

Research Questions

The following research questions were used to examine the implementation of the school district's program theory for MTSS related to identified outcomes.

Research question #1: At what depth of implementation are the MTSS core components being implemented in the elementary school setting?

Research question #2: Is there a correlation between the depth of implementation of the MTSS core components and the observable outcomes?

#2a: outcome of percentage of students in an elementary school in tier I, tier II, and tier III interventions?

#2b: outcome of fall to spring school growth percentile (SGP) on the Northwest Evaluation Association (NWEA) Measure of Academic Progress (MAP)?

#2c: number of students referred to special education?

#2d: true positives or the percentage of students that are identified for initial evaluation for special education and then actually verified as a student with a disability?

#2e: outcome of District Behavior Status Survey (MPS-BSS)?

Participants

The participants in this study are MTSS multidisciplinary data teams unique to each of the elementary schools within the school district, *N=25*. This number represents naturally formed groups found in a school district's 25 elementary schools with grades kindergarten through fifth. Each elementary school's MTSS data team will be considered a singular participant. Multidisciplinary data team member make-up is a school building decision often made by the principal and is unique to each of the elementary school buildings. Multidisciplinary data team membership often includes 6-8 members and frequently embodies building principal, general and special education teachers, interventionists (reading-math), school psychologists, and counselors.

Elementary schools within the school district currently educate 10,491 students with the smallest elementary school being 234 students and the largest being 603 students. 819 certificated staff are employed within the 25 elementary school buildings with the smallest elementary school staff being 26 and the largest staff being 43.

Data Collection

For the purpose of this program theory-driven evaluation the researcher collected questionnaire, student assessment, and self-reported data. The Self-Assessment of MTSS (SAM) was administered to elementary school data teams in the spring. The District Behavior Status Survey (MPS-BSS) was administered to all certificated staff at elementary buildings in the spring. NWEA MAP assessments were administered in the fall and spring of the school year to elementary students in grades 2-5. Elementary schools self-reported data on: (a) number of students at MTSS tier II and tier III, (b) number of students referred to special education, and (c) true positives number of students referred to special education who verified. The SAM, MPS-BSS and MAP were collected and coded to ensure data was not identified by individual.

Instruments

The Self-Assessment of MTSS Implementation (SAM) was released after a national pilot related to establishing validity and reliability in 2014, and was designed as a measure of school level implementation of MTSS (Stockslager, Castillo, Brundage, Childs, & Romer, 2016). According to the SAM Technical Assistance Manual (2016) the instrument has 39 items in six domains

- developing leadership - 5 items;
- developing the capacity and infrastructure necessary to support implementation -10 items;
- building communication and collaboration structures - 4 items;
- engaging in data-based problem solving – 7 items;
- implementing a three-tiered instruction and intervention model – 6 items;

- building a comprehensive data and evaluation system – 6 items (Stockslager et al., 2016).

Each item is scored on a 4-point rubric scale with possible responses 0 = not started, 1 = emerging/developing, 2 = operationalizing, and 3 = optimizing. "Program evaluation of MTSS initiatives is a critical component of facilitating successful implementation" with the purpose of this instrument being to "assess current implementation levels of an MTSS model to inform schools and districts" (Stockslager et al., 2016, p. 1).

The school district modified the Positive Behavioral Intervention and Supports (PBIS) Self-Assessment Survey (SAS) into the District Behavior Status Survey (MPS-BSS) (Sugai, Horner, & Todd, 2000). A group of five building principals, one assistant building principal, and a student services facilitator was charged with modifying the SAS to better meet the school districts' need for self-reported information from staff at each of the schools related to the status of behavior processes and structures in relation to the school district's strategic plan strategy focused on behavior. The MPS-BSS instrument has 31 questions in 7 sections

- school-wide systems – 7 items;
- classroom management – 7 items;
- data collection – 2 items;
- individual student support – 6 items;
- parental information – 2 items;
- team and staff training – 6 items;
- opened question related to current biggest professional need

Each item is scored related to current status in place, partially in place, and not in place along with priority for improvement yes or no.

The Northwest Educational Association Measures of Academic Progress assessments are computer adaptive assessments in the areas of reading and math. All students in the 25 elementary schools engaged with the general education curriculum grades 2-5 participated in the MAP. Note that a very small number of students with disabilities in grades 2-5 enrolled in the school district's alternate curriculum program did not participate in MAP. Each test included approximately 45 multiple-choice items and was untimed, though most students completed each test within 50 minutes. NWEA (2017) indicates that School Growth Percentile (SGP) describes a school's percentile rank of its fall to spring growth for a given grade and subject.

Data Analysis

Data was analyzed using Spearman's Rank-Order Correlation. The independent variable is the MTSS implementation levels correlation to the dependent variable of observed outcomes. The null hypothesis for the Spearman correlation is H_0: There is no (monotonic) association between level of implementation and the outcome variable.

Chapter 5 Results

Chapter 3 discussed the initial purpose of this program theory-driven evaluation which was the identification of the research school district's program theory for MTSS. This process included working with stakeholders from the research school district to identify their MTSS core components, interconnectedness of the core components, and plausibility of these components within the research literature. Stakeholders also identified potential outcome areas. Chapter 4 described the methodology regarding the measurement of the implementation level of the research school district's MTSS program theory in twenty-five elementary schools. Additionally, chapter 4 described the methods for correlating the depth of implementation and the outcome areas. This chapter presents the results regarding the implementation level of the research school district's MTSS program theory in elementary school settings and the analyzation of the effects of the depth of implementation on outcomes.

Research Question #1-Depth of Implementation

The first hypothesis was tested in two ways by examining the mean score on the Self-Assessment of MTSS (SAM) in the twenty-five elementary schools and trend data for special education child count for the research school district and the State of Nebraska. Table 1 displays the depth of implementation using the SAM for the research school district's MTSS core components in twenty-five elementary schools. Stockslager et al. (2016) indicates a scoring scale for the SAM as (a) 0 not implementing, (b) 1 emerging/ developing, (c) 2 operationalizing, and (d) 3 optimizing. Along with the SAM results, 5 years of the research school district's and State of Nebraska's special education child count data is indicated. Table 2 displays the total number and percent of students

identified with a disability and the total number and percent of students identified as having a specific learning disability.

As seen in Table 1 the research school district's mean score on the SAM was 2.13 with the SAM scoring key indicating an operationalizing level of implementation of the MTSS concepts across the twenty-five elementary schools. Eighteen of the twenty-five elementary schools had scores within the operationalizing implementation level.

Special education child count data across 5 years is seen in Table 2. The research school district's child count data is trending down while the State of Nebraska child count data is trending up. In the research school district fewer students are being identified as students with disabilities and fewer students are being identified as a student with a specific learning disability. This is in contrast to what is occurring in the State of Nebraska where more students are being identified as students with a disability and more students are being identified as a student with a specific learning disability.

Overall, the measured depth of implementation of the research school district's program theory of MTSS in elementary school settings indicated in Tables 1 and 2 is congruent with a strong depth of implementation of the research school district's MTSS program theory.

Table 1

Descriptive Statistics Depth of Implementation Twenty-Five Elementary Schools on the Self-Assessment of MTSS (SAM)

Elementary Building	SAM Mean	SAM Scale
		3 = Optimizing
Elementary Building #15	2.85	
Elementary Building #3	2.66	
Elementary Building #23	2.64	
Elementary Building #10	2.62	
Elementary Building #13	2.40	
Elementary Building #6	2.27	
Elementary Building #14	2.26	
Elementary Building #22	2.17	
Elementary Building #21	2.14	
Elementary Building #25	2.13	Operationalizing
District	2.13	
Elementary Building #1	2.12	
Elementary Building #12	2.11	
Elementary Building #17	2.11	
Elementary Building #11	2.09	
Elementary Building #18	2.09	
Elementary Building #20	2.07	
Elementary Building #7	2.06	
Elementary Building #2	2.03	
Elementary Building #4	1.97	
Elementary Building #5	1.96	
Elementary Building #9	1.88	Emerging/ Developing
Elementary Building #8	1.76	
Elementary Building #24	1.71	
Elementary Building #16	1.63	
Elementary Building #19	1.51	
		0 = Not Implementing

Note: SAM four point survey scale where 0 = not implementing, 1 = emerging/developing, 2 = operationalizing, 3 = optimizing.

Table 2

Descriptive Statistics Research School District's and the State of Nebraska's Special Education Child Count Data

		Total Number of Students	All Students Identified with a Disability		Students Identified with a Specific Learning Disability	
Year	District/ State	Number	Number	Percent	Number	Percent
2012-2013						
	District	22,596	3,034	13.43	875	3.87
	State	289,411	40,185	13.89	14,238	4.92
2013-2014						
	District	22,851	3,011	13.18	837	3.66
	State	292,941	41,610	14.20	14,837	5.06
2014-2015						
	District	23,031	2,957	12.84	798	3.46
	State	297,028	41,876	14.10	14,952	5.03
2015-2016						
	District	23,232	3,132	13.48	801	3.45
	State	299,878	42,241	14.09	15,118	5.04
2016-2017						
	District	23,267	2,980	12.81	783	3.37
	State	299,877	43,132	14.38	15,430	5.15

Note: 5 year special education child count data from the research school district and the State of Nebraska.

Research Question #2 - Correlation between Depth of MTSS Implementation and Outcomes

The second hypothesis was tested using Spearman's rank order correlation. Stakeholders from the research school district identified outcome areas that were checked for plausibility with the research literature. The basic premise being strong implementation of a MTSS model will produce positive effects on outcomes. The outcome areas of (a) percentage of students in tier I and tier II/III, (b) fall to spring school growth percentile on NWEA-MAP, (c) number of students referred to special education, (d) special education multidisciplinary evaluation true positives, and (e) research school district Behavior Status Survey were identified.

The outcome area of percent of students in tier I and tier II/III is pertinent because the research literature indicates that effective MTSS models have at least eighty percent of students being successful in tier I (Balcom, 2013; Barnes & Harlacher, 2008). So elementary school buildings that are strongly implementing the research school districts MTSS model should reflect at least an eighty percent ratio of students in tier I.

As a MTSS model is used to support and intervene with student learning, academic outcomes such as NWEA-MAP results should be positively effected. Hattie (2012) examining over eighty thousand studies related to the use of response to intervention which is analogous with MTSS indicated a 1.07 effect size positive impact on student achievement. A 1.0 effect size increase of student achievement is generally associated with 2-3 years of academic growth (Hattie, 2009). So elementary school buildings that are strongly implementing the research school districts MTSS model should show a positive effect on academic performance.

The research literature around implementing a MTSS model has described not only a decrease in students that verify for special education as was seen in tables 2 for the research school district but also a decrease in the number of students referred for a special education evaluation (Spectrum K-12, 2010; GlobalScholar, 2011). It has also been reported that MTSS produces more true positives or students referred for a special education evaluation that actually qualify for special education services. So elementary school buildings that are strongly implementing the research school districts MTSS model should show fewer students being referred for a special education evaluation and more true positives.

In the area of behavior a two-way relationship has been reported within the research literature. Fewer problematic student behaviors have been tied to better student engagement in learning, school climate, and student well-being (Lewis, Mitchell, Bruntmeyer, & Sugai, 2016). MTSS also provides supports and interventions for students that enables them to be more engaged and often less academically frustrated which provides for less opportunities to demonstrate problematic behavior. So elementary school buildings that are strongly implementing the research school districts MTSS model should also show a positive effect on school-wide behavior.

Research question #2a. Depth of implementation measured by the SAM was correlated with the percentage of students in an elementary building in tier I and tier II/III interventions is displayed in Table 3. As seen in Table 3 there was no significant correlation between the depth of implementation and the percentage of students in tier I and tier II/ III interventions, $r_s = 0.88$, $p = 0.675$.

Research question #2b. Depth of implementation measured by the SAM was correlated with the fall to spring school growth percentile (SGP) on the Northwest Evaluation Association (NWEA) Measure of Academic Progress (MAP) in the areas of reading displayed in Table 4 and mathematics in Table 5. As displayed in Table 4 there was no significant correlation between the depth of implementation and fall to spring school growth percentile on the MAP assessment in the area of reading $r_s = 0.269$, $p = 0.194$. There also was no significant correlation between the depth of implementation and fall to spring school growth percentile on the MAP assessment in the area of mathematics $r_s = 0.306$, $p = 0.137$ as displayed in Table 5.

Research question #2c. Table 6 displays depth of implementation measured by the SAM was correlated with the number of students referred to special education in each of the twenty-five elementary schools. There was no significant correlation between the depth of implementation and percentage of students identified with a disability in the twenty-five elementary school buildings, $r_s = -0.251$, $p = .226$ as seen by table 6.

Research question #2d. Depth of implementation measured by the SAM was correlated with true positives being the percentage of students referred for a special education evaluation that are then identified as a student with a disability in each of the twenty-five elementary schools were displayed in Table 7. As seen in Table 7 there was no significant correlation between the depth of implementation and true positives, $r_s = -0.306$, $p = 0.136$.

Research question #2e. Depth of implementation measured by the SAM was correlated with the research school district's District Behavior Status Survey were displayed in Table 8. As seen in Table 8 there was no significant correlation between the

depth of implementation and the results of the District Behavior Status Survey, $r_s = 0.89$, $p = 0.687$.

Summary

Overall, even though the measures in Tables 1 and 2 are congruent with an operational depth of implementation, this level of implementation did not correlate with the identified outcomes as seen in tables 3-8. Elementary school buildings at a seemingly strong depth of implementation related to the research school district's MTSS program theory do not always have positive results related to outcomes. Similarly, elementary school buildings with a seemingly weaker depth of implementation related to the research school district's MTSS program theory do not always have negative results when it comes to outcomes.

Table 3

Spearman Rank Order Correlation for Depth of Implementation Correlated and Percentage of students in Tier I and tier II/III Interventions

			Implementation Depth	Students in Tier I & Tier II/III
Spearman's rho	Implementation Depth	Correlation Coefficient	1.000	.088
		Sig. (2-tailed)		.675
		N	25	25
	Students in Tier I & Tier II/III	Correlation Coefficient	.088	1.000
		Sig. (2-tailed)	.675	
		N	25	25

Table 4

Spearman Rank Order Correlation for Depth of Implementation Correlated and NWEA MAP School Growth Percentile in Reading

			Implementation Depth	MAP SGP Reading
Spearman's rho	Implementation Depth	Correlation Coefficient	1.000	.269
		Sig. (2-tailed)		.194
		N	25	25
	MAP SGP Reading	Correlation Coefficient	.269	1.000
		Sig. (2-tailed)	.194	
		N	25	25

Note: Fall to spring school growth percentile (SGP) on the Northwest Education Association (NWEA) Measure of Academic Progress (MAP) assessment.

Table 5

Spearman Rank Order Correlation for Depth of Implementation Correlated and NWEA MAP School Growth Percentile in Mathematics

			Implementation Depth	MAP SGP Mathematics
Spearman's rho	Implementation Depth	Correlation Coefficient	1.000	.306
		Sig. (2-tailed)		.137
		N	25	25
	MAP SGP Mathematics	Correlation Coefficient	.306	1.000
		Sig. (2-tailed)	.137	
		N	25	25

Note: Fall to spring school growth percentile (SGP) on the Northwest Education Association (NWEA) Measure of Academic Progress (MAP) assessment.

Table 6

Spearman Rank Order Correlation for Depth of Implementation Correlated and Number of Students Referred to Special Education

			Implementation Depth	Special Education Referrals
Spearman's rho	Implementation Depth	Correlation Coefficient	1.000	-.251
		Sig. (2-tailed)		.226
		N	25	25
	Special Education Referrals	Correlation Coefficient	-.251	1.000
		Sig. (2-tailed)	.226	
		N	25	25

Table 7

Spearman Rank Order Correlation for Depth of Implementation Correlated and Special Education True Positives

			Implementation Depth	True Positives
Spearman's rho	Implementation Depth	Correlation Coefficient	1.000	-.306
		Sig. (2-tailed)		.136
		N	25	25
	True Positives	Correlation Coefficient	-.306	1.000
		Sig. (2-tailed)	.136	
		N	25	25

Note: Special education true positives is the percent of students referred for a special education evaluation that are then identified as a student with a disability.

Table 8

Spearman Rank Order Correlation for Depth of Implementation Correlated and the District Behavior Status Survey

			Implementation Depth	Behavior Status Survey
Spearman's rho	Implementation Depth	Correlation Coefficient	1.000	.089
		Sig. (2-tailed)		.687
		N	23	23
	Behavior Status Survey	Correlation Coefficient	.089	1.000
		Sig. (2-tailed)	.687	
		N	23	23

Chapter 6 Conclusions

The research literature in education is filled with evidence-based practices that impact student learning. It seems so simple, school leaders should educate themselves on practices, *use them*, and celebrate the results. But in schools just because a practice has been shown to work in one place does not mean it will work the same in other places. In regards to evidence-based practices just *use them* is overly simplistic. Conversely to just *use them*, the process of effectively using or implementing evidence-based practices is driven more by how they fit with a school than the evidence basis for the practice. Fit can be described as a school's context. Merriam-Webster Dictionary (n.d.) defines context as the "interrelated conditions in which something exists or occurs". The true question around *use them* or a school's ability to effectively implement evidence-based practices is how the evidence-based practice fits with the school's current context or its resources, structures, culture, and background.

A continuous school improvement strategy that has become a part of many national education reform conversations is MTSS. MTSS is a school-wide system focused on improving the learning of all students. It is an evidence-based systematic approach to ensure daily high-quality instruction and intervention, proactive early identification, intervention intensity that increases with student need, monitoring student learning, and data-driven decision-making through a problem-solving process (Barnes & Harlacher, 2008; Fletcher & Vaughn, 2009; Fuchs & Fuchs, 2006; Fuchs & Vaughn, 2012; Gibbons & Coulter, 2016; Hosp, et al., 2016; Hughes & Dexter, 2011; Jimerson, et al., 2016; Torgesen, 2009).

An examination of MTSS models around the nation indicate some common components. An understanding of these MTSS components is important but Hanna (2013) indicates because each school is different and unique in order for school improvement to occur, systems and strategies must be found that fit each school's distinctive characteristics and context. It is just as important to understand the evidence-based components of a MTSS model as it is to understand the unique context of the school where it is being implemented.

The purpose of this program theory-driven evaluation was to first identify the plausibility of a school district's program theory for MTSS including core components, interconnectedness of the core components, and desired outcomes. Then, assess the implementation of that program theory in elementary school settings, and finally to analyze the effects of the depth of implementation on outcomes. Implementation of MTSS was measured in twenty-five elementary schools using the Self-Assessment of MTSS (SAM). The SAM has 39 items in six domains: leadership, developing capacity, communication and collaboration, data-based problem solving, implementing three-tiered model, and data and evaluation systems (Stockslager et al., 2016). Five year child count trend data was also examined related to the number and percentage of students identified as having a disability and the number and percentage of students identified as a student with a specific learning disability in the research school district and the State of Nebraska.

For the correlation portion of this study, the independent variable is the MTSS implementation level measured by the SAM. The depth of implementation for each of the 25 elementary buildings was correlated to the outcome areas of: (a) percentage of

students in tier I, tier II and III interventions, (b) fall to spring school growth percentile on MAP, (c) number of students referred to special education, (d) true positives, and (e) District Behavior Status Survey.

Implementation

All twenty-five elementary schools took the SAM. Each item from the SAM is scored on a 4-point rubric scale with possible responses of 0 = not started, 1 = emerging/developing, 2 = operationalizing, and 3 = optimizing (Stockslager et al., 2016)

The total mean in 18 of the 25 was above a two or an indication that schools were operationalizing the research school district's MTSS program theory. The mean score for the research school district was 2.13 which was also in the operationalizing category. The lowest elementary school was a 1.51 solidly in the emerging/developing category. The highest building was a 2.85 close to the optimizing category. By all indications from the SAM the research school district's MTSS program theory implementation level is relatively strong in the elementary school settings. Elementary schools are putting the concepts of the MTSS program theory into operation within their schools.

Child count five year trend data for students identified with a disability and students identified with a specific learning disability for the research school district and the State of Nebraska was also examined. Even though the overall number of students being educated in the research school district is increasing in all but one year the students identified with a disability decreased with the percent of students going from 13.40 to 12.80 over the five year period. The same pattern occurred with students identified with a specific learning disability with the percentage decreasing from 3.87 to 3.37 over the five year period.

During the same five year period the State of Nebraska child count numbers for students identified with a disability and students identified with a specific learning disability had a year to year increase over the five year period. The percent of students identified with a disability increased from 13.89 to 14.38 and the percent of students identified with a specific learning disability increased from 4.92 to 5.15 over the five year period.

The results of the research school district's child count five year trend data aligns with what has been seen on the national level with implementation of MTSS. The decrease in both number of students identified with a disability and the number of students identified with a specific learning disability supports the operationalizing category finding on the SAM and indicates strong implementation of the research school district's MTSS model at the elementary school level. In contrast the State of Nebraska's child count trend data across the same five year period shows an increase in both areas. Nebraska's efforts related to MTSS are developing but would not be considered at the level of the research school district. The results on the SAM and the research school district's child count data supports an operationalizing depth of implementation with the identified program theory of MTSS.

Outcome Results

The following conclusions were drawn from the study of the depth of implementation for each of the 25 elementary buildings and the outcome areas of: (a) percentage of students in tier I, tier II and III interventions, (b) fall to spring school growth percentile on MAP, (c) number of students referred to special education, (d) true positives, and (e) District Behavior Status Survey.

The Spearman rank order correlation was used to determine the strength of the relationship between the rank order of the mean for each elementary school results on the SAM and the rank order of percentage of students receiving tier I and tier II and III interventions related to MTSS in each elementary school. No significant rank order correlation was found.

Taken as a whole, even though the depth of implementation as measured in most elementary schools is in the operationalizing category at this time, it is not consistently effecting the number of students that are receiving interventions in each school. A factor that may contribute to this is the school level decision making related to the students who receive interventions, and the number of interventionists the research school district employs. When a school has a teacher assigned to provide interventions there is a tendency to fill that interventionist's caseload with students. Because of the differences in availability of interventionists, students in one school may receive interventions where students in another school performing at a similar academic level may not. An implication of this research study for the research school district may be to evaluate the number of teachers assigned to interventions or the need to set a district level cut score rather than a school level cut score related to the academic profile of students who receive interventions.

The Spearman rank order correlation was used to determine the strength of the relationship between the rank order of the mean for each elementary school results on the SAM and the rank order fall to spring school growth percentile on MAP in both reading and math in each elementary school. No significant rank order correlation was found. NWEA MAP was in the initial year of implementation in the research school district

during this study. The concept of having a fall to spring growth score where students growth is compared to other like students in a norming sample rather than a cut score or a benchmark was novel for all elementary schools. As the elementary schools within the research school district become more familiar with the growth model on the NWEA different results may occur.

The Spearman rank order correlation was used to determine the strength of the relationship between the rank order of the mean for each elementary school results on the SAM and the rank order number of students referred to special education in each elementary school. No significant rank order correlation was found. Factors that may contribute to these results include: (a) parent requests for a special education evaluation, (b) general educator concerns with slow student learning progress, (c) students not closing the gap between their level of learning and grade level standards, and (d) a school's desire for more information on the student, therefore, potentially increasing the number of special education evaluations.

The Spearman rank order correlation was used to determine the strength of the relationship between the rank order of the mean for each elementary school results on the SAM and the rank order true positives or students referred for a special education evaluation that verify. No significant rank order correlation was found. Factors that may contribute to these results include: (a) parent requests for a special education evaluation, (b) general educators concerns with small student learn progress, (c) students not closing the gap between their level of learning and grade level standards and (d) a school's desire for more information on the student, therefore, potentially increasing the number of special education evaluations.

The Spearman rank order correlation was used to determine the strength of the relationship between the rank order of the mean for each elementary school results on the SAM and the rank order mean for each elementary school results on the District Behavior Status Survey. No significant rank order correlation was found. Both the SAM and the District Behavior Status Survey were used for the first time in the research school district during this study. An implication of this research study for the research school district may be to continue the use of these questionnaires. This would give schools an opportunity to identify areas they would like to address and provide for opportunity to analyze results across school years.

Discussion

Implementation

Systems of supports such as MTSS provide the opportunity for schools to impact student learning through prevention, early identification, and intervention. The further a student falls behind grade level standards and peers, the more difficult it is to positively impact that student's learning (Batsche et al., 2006; Torgesen, 1998). Providing supports that immediately impact student learning needs is critical. But, organizing and implementing supports for student learning into a system such as MTSS has been challenging. Schools and school districts are not the same. What works for one school or school district does not seem to work for others. The context and characteristics of a school impacts the fit and success of systems, structures, and strategies used within that school (Hanna, 2013).

Burns et al (2016) have suggested some MTSS core elements that they advocate could be used as the foundation of a national model. Advocating for a national MTSS

model is misguided because it underestimates the powerful effects of local context in schools. The continual identification and development of evidence-based practices around MTSS is definitely critically important. But equally important is the ability of school districts to understand and use their local context, characteristics, and input from their stakeholders to identify how evidence-based practices such as MTSS fit within the their current systems and structures. Regardless of the evidence basis for MTSS practices, each school will implement those practices uniquely informed by how the practices fit with their own local context.

In this study, using a program theory-driven evaluation process a unique MTSS program theory informed by local context and stakeholder input was successfully identified for the research school district. The research school district's MTSS program theory included core components, the interactions of those core components, and desired outcomes. This locally designed MTSS model was found to be operationalized or strongly implemented in the majority of the research school district's elementary schools. Furthermore, the research school district has seen a five year decrease in both child count areas of all students with a disability and students with a specific learning disability. The success seen cannot solely be contributed to the use of evidence-based practices but the pairing of evidence-based MTSS practices along with a true understanding that stakeholders in the research school district have for their local context.

Outcome Results

Program theory-driven evaluation has characteristics of both a formative and summative evaluation model that includes three parts: (a) developing program impact theory, (b) formulating and prioritizing evaluation questions, and (c) answering

evaluation questions (Donaldson, 2007). The formative nature of program theory-driven evaluation is focused on providing information for program improvement and development. The summative nature of the program theory-driven evaluation is focused on using the information found when answering evaluation questions to decide on the worth or merit of the program being evaluated (Donaldson, 2007; Fitzpatrick, Sanders, & Worthen, 2011).

Although the results of the research did not show statistically significant relationships between the implementation levels identified on the SAM and outcome areas, this is not a negative result. Related to the summative nature of program theory-driven evaluation the research school district is often described as a high performing school district with already strong outcome results. The research school district has also been in the process of implementing a MTSS model for over five years. The high performance of the research school district and the number of years involved with implementation may effect the ability to show outcomes tied to single year measures. Along with this the MTSS model is not the only factor involved in influencing the research school districts outcome results. Other factors outside the scope of this research such as the demographic differences of schools within the research school district may also impact outcome results. Although a connection between the MTSS model and outcome results was anticipated, the merit or worth of a MTSS model within the research school district was not seen as a concern and was not the primary focus of this study.

Another factor related to summative judgements related to the research school district's MTSS model would be the stage of implementation. Wallace et al (2008) identify six stages of implementation being: (a) exploration and adoption, (b) installation,

(c) initial implementation, (d) full implementation, (e) innovation, and (f) sustainability. Summative data for a program can be influenced by the stage of implementation. The research school district appears to be in the full implementation stage and potentially moving into the innovation stage. In the innovation stage adaptations to the program continue to be made to improve the fit of the evidence-based practices to the local context. This aligns with current efforts within the research school district to streamline their MTSS model. The feedback of stakeholders has indicated that the MTSS model is very complex and that there is a need to simplify the model.

A more impactful way for the research school district to look at outcome results may be through a continuous improvement formative lens. The level of implementation of the research school district's MTSS model was encouraging. Since stakeholders are involved from the start of the program theory-driven evaluation process continuing to include them when examining the outcome results related to evaluation questions is important. This is especially true when the outcome results can be presented in a way that informs continuous program improvement and development. An important next step will be to share the outcome results in a formative continuous improvement method with the stakeholders within the research school district. Sharing the results of the SAM with stakeholders in the school district and individual school buildings will allow school staff to use this information to inform their practices. Connecting information related to depth of implementation and outcome results will be important to share.

As results are shared a balance between formative and summative evaluation information is important. Formative information will allow for the improvements and strengthening during the development stages of the program being evaluated and

summative information will guide whether the program has hit its mark or is in need of revision (Fitzpatrick, Sanders, & Worthen, 2011). As the results of this study are examined through a balance of formative and summative evaluation information, the outcome results indicate potential additional innovation related to the research school districts MTSS model should be considered.

Recommendations for Further Research

While there is a growing body of research around the efficacy of many evidence-based components of MTSS, there is less agreement in the field of education about how to effectively put components together into MTSS models that make a difference in the real world of schools. This program theory-driven evaluation supports the research around the real world implementation of a MTSS model in a school district setting.

The need to continue research around the efficacy of evidence-based components that inform educators using MTSS models is critical. Some components of MTSS have not been fully investigated and other components have been shown to be in need of additional research to support their use.

Program theory-driven evaluation was chosen for the current study but an investigation of a school district's MTSS model using other research designs also seem relevant. Along with this is the need for research that examines both level or stage of implementation and the depth of implementation's effect on outcomes over multiple years.

The research school district used for this program theory-driven evaluation was a Midwestern, suburban school district. It would be worth studying MTSS models in a variety of urban and rural settings.

Most imperative related to further research is additional efforts related to educator decision-making regarding the introduction of evidence-based practices such as MTSS within a school or school district. There is much written in the research literature about the topic of implementation and steps that need to be taken in order for implementation to occur. More research needs to be focused on methods to assist stakeholders within school districts to identify the context in which a school district functions. Then how to use this knowledge to inform decisions related to the selection and implementation of evidence-based practices that will not only stretch but also fit with a school district's current context.

Summary

A common belief of educators is that all students can learn. In most cases students do learn at appropriate rates but what should transpire in a school when a student is not learning? It is more important than ever in education that all educators are aware and prepared for when students do not learn. Schools need predetermined systems and structures to support students that struggle to learn. These school-wide systems of support should focus on prevention, early identification, and intervention. At the earliest possible moment when we know that a student is not learning educators should be ready to impact the student's progress. Research supports these beliefs. This study found statistical support for these beliefs.

Schools are like individual people, they are unique. Their context is shaped by past experiences, beliefs, and leadership which then impact the systems, structures, and norms regarding the way a school functions. When new systems and structures are introduced the school's context will effect the success of the implementation. To be

successful the implementation of a new system or structure needs to be tailored, customized, or fit to the context or uniqueness of the school. The importance of context in schools and a school district was supported in this program theory-driven evaluation with the research school district demonstrating an ability to develop their own program theory for MTSS that fit within their context. This was further supported by the operationalizing level of the implementation of that MTSS model in twenty five elementary schools and the five year decrease in the research school district's special education child count data.

MTSS is important because it is a systematic process that can maximize the performance of all students while proactively catching and intervening with students who are struggling to learn. In order for a MTSS model to be successful it must fit the context of the school setting where it is being implemented. MTSS should look different in each school district and school that it is implemented. Multi-tiered system of supports is important. Understanding context of a school is important. School district and school-based implementation of a MTSS model is worth the time to study and improve for the benefit of all engaged with schools.

References

Allington, R. L. (2013). What really matters when working with struggling readers. *The Reading Teacher,66*(7), 520-530.

Ardoin, S. P., Christ, T. J., Morena, L. S., Cormier, D. C., & Klingbeil, D. A. (2013). A systematic review and summarization of the recommendations and research surrounding curriculum-based measurement of oral reading fluency (CBM-R) decision rules. *Journal of School Psychology,51*(1), 1-18.

Averill, O. H., & Rinaldi, C. (2011). Multi-tier system of supports. *District Administration, 47*(8), 91-94. Retrieved from http://search.ebscohost.com.leo.lib.unomaha.edu/login

Balcom, F., (2013). RtI, rti^2, mtss: Establishing clarity. *The SpecialEdge*, 26(3), 1-2.

Ball, C. R., & Christ, T. J. (2012). Supporting valid decision making: Uses and misuses of assessment data within the context of RTI. *Psychology in the Schools,49*(3), 231-244.

Barnes, A. C., & Harlacher, J. E. (2008). Clearing the confusion: Response-to-intervention as a set of pinciples. *Education and Treatment of Children*, 31(1), 417-431.

Bastedo, M. N. (2004). Open systems theory. *Encyclopedia of Educational Leadership and Administration*.

Batsche, G. (2013). Multi-tiered systems of support: A single system for ALL students. *The SpecialEdge, 26*(3), 2-6.

Batsche, G., (2014, June). *RTI: then and now a decade of development*. Symposium conducted at the Midwest Educational Leadership Conference, Breckenridge, CO.

Batsche, G., Elliott, J., Garden, J. L., Grimes, J., Kovaleski, J. F., Prasse, D., Reschly, D. J., Schrag, J., & Tilly, W. D. (2006). *Response to intervention: policy considerations and implementation*. Alexandria, VA: National Association of State Directors of Special Education.

Berkeley, S., Bender, W. N., Peaster, L. G., & Saunders, L. (2008). Implementation of response to intervention: A snapshot of progress. *Journal of Learning Disabilities,42*(1), 85-95.

Bineham, S., Shelby, L. Pazey, B. L., & Yates, J. R. (2014). Response to intervention: Perspectives of general and special education professionals. *Journal of School Leadership*, 24(2), 230-252

Burns, M. K., Jimerson, S. R., VanDerHeyden, A. M., Deno, S. L. (2016). Toward a unified response to intervention model: Multi-tiered systems of support. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp. 719-732). New York, NY: Springer.

Christ, T. J., & Ardoin, S. P. (2009). Curriculum-based measurement of oral reading: Passage equivalence and probe-set development. *Journal of School Psychology,47*(1), 55-75.

Coie, J. D., Watt, N. F., West, S. G., Hawkins, J. D., & Al, E. (1993). The science of prevention: A conceptual framework and some directions for a national research program. *American Psychologist,48*(10), 1013-1022.

Compton, D. L., Fuchs, D., Fuchs, L. S., Bouton, B., Gilbert, J. K., Barquero, L. A., Crouch, R. C. (2010). Selecting at-risk first-grade readers for early

intervention: Eliminating false positives and exploring the promise of a two-stage gated screening process. *Journal of Educational Psychology,102*(2), 327-340.

Context. (n.d.). In Merrian Webster Online, Retrieved September 24, 2017, from https://www.merriam-webster.com/dictionary/context.

Cook, B. G., & Odom, S. L. (2013). Evidence-based practices and implementation science in special education. *Exceptional Children,79*(2), 135-144.

Davis, G. N., Lindo, E. J., & Compton, D. L. (2007). Children at risk for reading failure; Constructing an early screening measure. *TEACHING Exceptional Children,39*(5), 32-37.

Deno S. L. (2016). Data-based decision-making. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp. 9-28). New York, NY: Springer.

Donaldson, S. I. (2007). *Program theory-driven evaluation science: strategies and applications*. New York: Lawrence Erlbaum Associates.

Doty, D. H., Glick, W. H., & Huber, G. P. (1993). Fit, equifinality, and organizational effectiveness: A test of two configurational theories. *Academy of Management Journal,36*(6), 1196-1250.

DuFour, R., DuFour, R., Eaker, R., and Karhanek, G. (2004). W*hatever it takes: how professional learning communities respond when kids don't learn.* Bloomington, IN: National Educational Service.

Durlak, J. A., & Dupre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41(3-4), 327-250.

Erchul, W.P., & Ward, C. S. (2016). Problem-solving consultation. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp. 73-86). New York, NY: Springer.

Education of All Handicapped Children Act of 1975, Pub. L. No. 94-142

Elliott, J. (2013). The new normal: Leading with data. *The SpecialEdge*, 26(3), 6-7.

Every Student Succeeds Act of 2015, Title IX, Section, 8002(33), page 399.

Fitzpatrick, J.L., Sanders, J. R., & Worthen, B. R. (2011). *Program evaluation: alternative approaches and practical guidelines*. Boston, MA: Pearson.

Fletcher, J. M., & Vaughn, S. (2009). Response to intervention: Preventing and remediating academic difficulties. *Child Development Perspectives,3*(1), 30-37.

Fuchs, D., & Fuchs, L. S. (2006). Introduction to response to intervention: What, why, and how valid is it? *Reading Research Quarterly,41*(1), 93-99.

Fuchs, D., Fuchs, L. S., & Compton, D. L. (2012). Smart RTI: A next-generation approach to multilevel prevention. *Exceptional Children,78*(3), 263-279.

Fuchs, D., Fuchs, L. S., & Stecker, P. M. (2010). The "blurring" of special education in a new continuum of general education placements and services. *Exceptional Children,76*(3), 301-323.

Fuchs, L. S., & Fuchs, D. (2007). A model for implementing responsiveness to intervention. *Teaching Exceptional Children*, 39(5), 14-20.

Fuchs, L. S., Fuchs, D., & Speece, D. L. (2002). Treatment validity as a unifying construct for identifying learning disabilities. *Learning Disability Quarterly,25*(1), 33-45.

Fuchs, D., Fuchs, L. S., & Vaughn, S. (2014). What is intensive instruction and why is it important? *TEACHING Exceptional Children,46*(4), 13-18.

Fuchs, L. S., & Vaughn, S. (2012). Responsiveness-to-intervention: A decade later. *Journal of Learning Disabilities*, 45(3), 195-203.

Fullan, M. (2010). *Motion leadership: the skinny on becoming change savvy*. Thousand Oaks, CA: Corwin.

Gandhi, A. G., Vaughn, S., Stelitano, L., Scala, J., & Danielson, L. (2015). Lessons learned form district implementation of intensive intervention: A focus on students with disabilities. *Journal of Special Education Leadership,28(1), 39-49*

Gibbons, K. & Coulter, W. A. (2016). Making response to intervention stick: Sustaining implementation past your retirement. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp. 641-660). New York, NY: Springer.

Gresov, C., & Drazin, R. (1997). Equifinality: Functional equivalence in organization design. *The Academy of Management Review,22*(2), 403.

Hanna, R. (2013) Common Strategies for Uncommon Achievement. Retrieved September 17, 2017 from http://www.apericanprogress.org/issues/education/reports

Harn, B., Parisi, D., & Stoolmiller, M. (2013). Balancing fidelity with flexibility and fit: What do we really know about fidelity of implementation in schools? *Exceptional Children,79*(2), 181-193.

Hattie, J. (2010). *Visible learning: a synthesis of over 800 meta-analyses relating to achievement.* London: Routledge.

Hattie, J. (2012). *Visible learning for teachers: maximizing impact on learning.* London: Routledge.

Hawkins, J. D., Brown, E. C., Oesterle, S., Arthur, M. W., Abbott, R. D., & Catalano, R. F. (2008). Early effects of communities that care on targeted risks and initiation of delinquent behavior and substance use. *Journal of Adolescent Health,43*(1), 15-22.

Helman, L., & Rosheim, K. (2016). The role of professional learning communities in successful response to intervention implementation. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp. 89-101). New York, NY: Springer.

Herman, K. C., Riley-Tillman, T. C., & Reinke, W. M. (2012). The role of assessment in a prevention science framework. School Psychology Review, 41, 306-314.

Hosp, J. L., Huddle, S., Ford, J. W., & Hensley, K (2016). Learning disabilities/special education. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp. 43-58). New York, NY: Springer.

Hughes, C. A., & Dexter, D. D. (2011). Response to intervention: A research-based summary. *Theory Into Practice,50*(1), 4-11.

Jiban, C., & Wood, J. (2016). From general outcome measurement to mastery measurement: A case for instructionally useful information. *NWEA Research Brief.* Retrieved from https://www.nwea.org/

Jimerson, S. R., Burns, M. K., & VanDerHeyden, A. M. (2016). From response to

intervention to multi-tiered systems of support: Advances in the science and practices of assessment and intervention. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp. 1-6). New York, NY: Springer.

Klingner, J. K., Boardman, A. G., & Mcmaster, K. L. (2013). What does it take to scale up and sustain evidence-based practices? *Exceptional Children,79*(2), 195-211.

Lane, K.L., Carter, E.W., Jenkins, A., Dwiggins, L., & Germer, K. (2015). Supporting comprehensive, integrated, three-tiered models of prevention in schools. *Journal of Positive Behavior Interventions*, 17(4) 209-222.

Lendrum, A., & Humphrey, N. (2012). The Importance of studying the implementation of interventions in school settings. *Oxford Review of Education,* 38(5) 635-652.

Lewis, T.J., Mitchell, B.S., Bruntmeyer, D.T., & Sugai, G. (2016). School-wide positive behavior support and response to intervention: System similarities, distinctions, and research to date at the universal level of support. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp. 703-717). New York, NY: Springer.

Marzano, R. J. (2003). *What works in schools: translating research into action*. Alexandria, VA: Association for Supervision and Curriculum Development.

Mcdonald, S., Keesler, V. A., Kauffman, N. J., & Schneider, B. (2006). Scaling-up exemplary interventions. *Educational Researcher,35*(3), 15-24.

Mellard, D. F., Mcknight, M., & Woods, K. (2009). Response to intervention screening

and progress-monitoring practices in 41 local schools. *Learning Disabilities Research & Practice,24*(4), 186-195.

Odom, S. L. (2008). The tie that binds: evidence-based practice, implementation science, and outcomes for children. *Topics in Early Childhood Special Education, 29*(1), 53-61.

Penuel, W. R., Fishman, B. J., Cheng, B. H., & Sabelli, N. (2011). Organizing research and development at the intersection of learning, implementation, and design. *Educational Researcher,40*(7), 331-337.

Pfeffer, J., & Sutton, R. I. (2008). *The knowing-doing gap: how smart companies turn knowledge into action*. Boston, MA: Harvard Business School Press.

Prasse, D.P. (2014). Why adopt an RTI model? Retrieved from http://www.rtinetwork.org/

Schooling, P., Toth, M., & Marzano, R. (2013) The critical importance of a common language of instruction. Retrieved from http://www.marzanocenter.com

Schulte, A. C. (2016). Prevention and response to intervention: Past, present, and future. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp. 59-71). New York, NY: Springer.

Seligman, M. E. (2011). *Flourish: a visionary new understanding of happiness and well-being*. New York: Free Press.

Shapiro, E. S. (2013). Commentary on progress monitoring with CBM-R and decision making: Problems found and looking for solutions. *Journal of School Psychology,51*(1), 59-66.

Shinn, M. R. (2007). Identifying students at risk, monitoring performance, and

determining eligibility within response to intervention: Research on educational need and benefit form academic intervention. School Psychology Review, 36, 601-617.

Stecker, P. M., Fuchs, D., & Fuchs, L. S. (2008). Progress monitoring as essential practice within response to intervention. *Rural Special Education Quarterly,27*(4), 10-17.

Stockslager, K., Castillo, J., Brundage, A., Childs, K., & Romer, N. (2016). *Self-assessment of mtss (sam) technical assistance manual.* Florida's Problem Solving/Response to Intervention Project and Florida's Positive Behavior Intervention and Support Project, University of South Florida.

Stoiber, K. C., & Gettinger, M. (2016). Multiple-tiered systems of support and evidence-based practices. S. R. Jimerson, M. K. Burns, A. M. VanDerHeyden (Eds.), *Handbook of response to Intervention: The science and practice of multi-tiered systems of support* (pp.121-142). New York, NY: Springer.

Stormont, M., Reinke, W. M., & Herman, K. C. (2009). Introduction to the special issue: Using prevention science to address mental health issues in schools. *Psychology in the Schools*.

Tilly, W. D. (2006). Diagnosing the learning enabled: The promise of response to intervention. Perspectives (Gerontological Nursing Association (Canada)), 32(1), 29-34.

Torgesen, J. K. (1998). Catch them before they all: Identification and assessment to prevent reading failure in young children. *American Educator/American Federation of Teachers*, 1-8.

Torgesen, J. K. (2000). Individual Differences in Response to Early Interventions in Reading: The Lingering Problem of Treatment Resisters. *Learning Disabilities Research and Practice,15*(1), 55-64.

Torgesen, J. K. (2009). The Response to Intervention Instructional Model: Some Outcomes From a Large-Scale Implementation in Reading First Schools. *Child Development Perspectives,3*(1), 38-40.

Torgesen, J. K., Wagner, R. K., Rashotte, C. A., Rose, E., Lindamood, P., Conway, T., & Garvan, C. (1999). Preventing reading failure in young children with phonological processing disabilities: Group and individual responses to instruction. *Journal of Educational Psychology,91*(4), 579-593.

Tucker, M. S. (2009). Industrial benchmarking: A research method for education. In *Change wars* (pp. 116-133). Bloomington, IN: Solution Tree.

Vanderheyden, A. M., Witt, J. C., & Gilbertson, D. (2007). A multi-year evaluation of the effects of a Response to Intervention (RTI) model on identification of children for special education. *Journal of School Psychology,45*(2), 225-256.

Vaughn, S., Denton, C. A., & Fletcher, J. M. (2010). Why intensive interventions are necessary for students with severe reading difficulties. *Psychology in the Schools*.

Vellutino, F. R., Scanlon, D. M., Sipay, E. R., Small, S. G., & Al, E. (1996). Cognitive profiles of difficult-to-remediate and readily remediated poor readers: Early intervention as a vehicle or distinguishing between cognitive and experiential deficits as basic causes of specific reading disability. *Journal of Educational Psychology,88*(4), 601-638.

Wallace, F., Blase, K., Fixsen, D., & Naoom, S. (2008). *Implementing the findings of*

research: bridging the gap between knowledge and practice. Alaxandria, VA.: Educational Research Service.

Appendix A

School District Letter Authorizing Research

Letter is on file and available upon request.

Appendix B

Questionnaire Tools

Questionnaire tools are on file and available upon request.