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Staff Perceptions of Data Collection and Analysis during Multitiered Systems of Support in a Public Montessori Charter School

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the review committee have been made.

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Walden University
2024

Abstract

Staff Perceptions of Data Collection and Analysis during Multitiered Systems of Support

in a Public Montessori Charter School

by

LuAnna Bellairs Salemi

MSE, University of Central Arkansas, 1983

BSE, University of Central Arkansas, 1982

Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

Walden University

August 2024

Abstract

A problem exists in NC Montessori schools with effective data analysis for specific learning disabilities (SLD) placement. The purpose of this study was to identify administrators' and teachers' perceptions of data collection and analysis within multitiered systems of support (MTSS) in a Montessori school. Fixsen's implementation science theory was the framework for examining participants' descriptions of MTSS methods. The first research question for this study sought to identify implementation methods administrators and teachers used during data collection and analysis within MTSS as a component of SLD eligibility in a public Montessori charter school. The second question explored the components of Montessori pedagogy administrators and teachers identified as impacting their ability to implement MTSS. Interview responses from 12 teachers and administrators were coded using open and axial coding via a basic qualitative design. Four themes emerged from data analysis. Staff recognized MTSS implementation components, the importance of data as part of MTSS, the impact of pedagogy, and the impact of other school factors. The current study contributed to social change in special education by adding to the research base regarding MTSS implementation in public Montessori charter schools. Specifically, it identified staff perceptions of data collection and analysis and described possible reasons for the gap between MTSS literature and practice.

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Charter School

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Dedication

This work is dedicated to my parents who have encouraged me and inspired my desire to be a lifelong learner. Your encouragement and prompting throughout this journey continue to inspire me.

Acknowledgments

I would like to begin by thanking my committee members, Dr. DeSoto and Dr. Ross, who patiently waited for me to complete each section of this project. I would also like to thank my student success advisor, Sarah Janssen, for the multiple emails and phone calls of support. To the other supportive Walden University staff who have helped me locate articles, learn to conduct qualitative research, and guided me through the writing process I offer my thanks.

Thank you to the students who inspired me to begin this journey, as well as to the staff members implementing MTSS. Your perseverance and productive struggle inspired my interest in data-based decision-making. Although this project is coming to an end, my interest in this topic will continue thanks to you.

Thank you to the participants in this study. Without your support, there would continue to be a hole in the knowledge base regarding MTSS in Montessori programs.

To my daughter Emily, thank you for pursuing your doctoral degree. Without your encouragement, I would not have started down this path again. And to my daughter Hannah, thank you for reading and rereading this project. To my daughter Lisa and my granddaughters, thank you for the distractions you provided when I was overwhelmed.

Finally, thank you to my wonderful husband, Steven. You have cooked, cleaned, done laundry, and put up with my rants, tears, and laughter. Without your encouragement, I never would have completed this study.

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Chapter 1: Introduction to the Study

According to the National Center for Montessori in the Public Sector (NCMPS, 2021), there were 579 public Montessori programs in the United States. In 2020, the Montessori census identified 20 public Montessori schools in North Carolina (NCMPS, 2021). Programs take the form of district run schools, magnet schools, and charter schools. The North Carolina Department of Public Instruction (NC-DPI, n.d.d) stated charter schools have open enrollment, are tuition free, and are not obligated to comply with regulations governing other public schools. Further, the NC-DPI holds publicly funded schools accountable for the college and career readiness of all students, including those attending charter schools. To facilitate college and career readiness for all students, the NC-DPI (n.d.a) recommended public schools implement multi-tiered systems of support (MTSS).

Beginning in the 2020-2021 school year, the NC-DPI required North Carolina public schools make eligibility decisions for special education in the category of specific learning disability (SLD) using "a systematic, problem-solving process based on the child's response to scientific research-based interventions (RTI/MTSS) and the evaluation of data (i.e. progress monitoring data) documenting the child's response to instruction and scientific research-based intervention" (NC-DPI, 2016d, p. 7). MTSS requires team members develop skills needed to interpret student-specific data and make data-based instructional changes.

In preparation for changes in eligibility determination for students with SLD, NC public Montessori charter schools began MTSS between 2017-2018 and 2022-2023

school years. As they implemented tiered intervention, staff members in one eastern NC school struggled to demonstrate skills that were required to make data-based decisions regarding instructional changes. Because data analysis is critical to adjusting levels of tiered intervention within MTSS, administrators and teachers must develop the ability to collect and analyze data at all instructional tiers. Thematic analysis of interview data was used to identify administrators' and teachers' perceptions of data collection and analysis during MTSS within the research site. Further, I identified features of MTSS that participants considered important, as well as those they felt negatively impacted sustainable use of MTSS as a component of special education eligibility.

Findings of this study resulted in positive social change within the research site and similar public Montessori charter schools that collect and analyze data to adjust tiered interventions within MTSS. Because the current study centers on describing staff perceptions of data collection and analysis, I identified participants' knowledge and perspectives of components that are critical to MTSS implementation within the research site. I used themes to explain participants' responses regarding knowledge of tiered interventions and their ability to base instructional changes on analysis of progress monitoring data at the research site. I also identified components of MTSS that enhanced or prevented staff members' ability to use effective tiered intervention for students with diverse learning needs in public Montessori charter schools. Further, I identified potential modifications to current practices identified by participants. Finally, themes emerging from this basic qualitative study may lead to insights for administrators and teachers in

similar public Montessori charter schools as they develop skills that are required for sustained use of MTSS.

Results also filled an identified gap in literature about MTSS practices in Montessori schools. Current research describes MTSS in traditional educational settings (Belmonte -Mulhall & Harrison, 2023; Charlton et al., 2018; Schildkamp Smit, & Blossing, 2019; Supovitz & Sirinides, 2018). However, there is a paucity of peer-reviewed articles regarding MTSS within Montessori settings. Weaver (2018) described MTSS as a method of supporting all students within public Montessori settings, including those who require specially designed instruction. However, Gerker (2023) reported Montessori teachers have difficulty implementing regulations that are perceived to be at odds with pedagogy. As required by the NC-DPI, the research site began using MTSS at least 5 years prior to this study. Thus, it is representative of public Montessori charter schools using MTSS as a component of special education eligibility determination in NC. This study filled a gap in practice, as well as a gap in literature, about MTSS practices in Montessori schools by identifying administrators' and teachers' perceptions of data collection and analysis and current MTSS implementation methods that are used in a public Montessori charter school in NC.

In this chapter, I review supporting research, problem statement, and the conceptual framework. Additionally, I address the overall nature of the study, operational definitions of terms, assumptions, scope, delimitations, and limitations of the study. Finally, I discuss the significance of this research.

Background

Prior to passage of the Individuals with Disabilities Education Act (IDEA, 2004), eligibility for special education services in the category of SLD required students to exhibit severe discrepancies between intellectual ability and achievement. Subsequently, the IDEA (2004) removed the requirement to demonstrate significant discrepancies between intellectual ability and achievement and allowed states to use alternative research-based procedures, including student responses to intervention, as a part of eligibility determination for SLD. Although some states such as Washington and Kansas continue to allow use of the discrepancy model to determine eligibility, the NC-DPI (2015b) stated this model was not appropriate for establishing students' eligibility for specialized instruction because of a lack of supporting research. Policy changes began in 2015 and resulted in an addendum to Policies Governing Services for Children with Disabilities (NC-DPI, 2016d). Effective on July 1, 2020, criteria for eligibility determination for SLD required consideration of multiple data sources, including data that were collected and analyzed via MTSS. The NC-DPI (2016d) defined SLD as:

> A disability in one or more of the basic processes involved in understanding or in using language, spoken or written, that may manifest itself in the impaired ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The disability substantially limits academic achievement so that the child does not learn at an adequate rate when provided sustained, high quality instruction and scientific research-based intervention. (p. 2)

Because of these policy changes, all publicly funded schools in NC, including charter schools, implemented assessment systems that provided for collection and analysis of data using a multi-tiered problem-solving framework. To achieve this, school administrators and teachers needed to develop knowledge and abilities to base instructional changes on data analysis.

To support successful implementation of MTSS, the NC-DPI (n.d.c) defined MTSS as "a multi-tiered framework, which promotes school improvement through engaging, research-based academics and behavioral practices. MTSS employs a systems approach using data-driven problem-solving to maximize growth for all" (para. 1). According to the NC-DPI (n.d.a., n.d.c), implementation of MTSS is based on six components: leadership, building capacity and infrastructure, communication and collaboration, data-based problem-solving, three-tiered instructional/intervention model, and data evaluation. The NCMPS (2015) described elements of Montessori pedagogy that support MTSS implementation, including one-on-one or small group instruction, individually based data collection through multiple measures, observations, and data-based problem-solving.

The director of special education at an eastern NC public Montessori charter school indicated teachers were adept at collecting data to document students' overall academic progress but struggled to analyze individual student progress data when making changes to tiered interventions. Jimerson and Wayman (2015) and Gerzon (2015) identified a range of knowledge and skills required to move past summarizing data to using data to set instructional goals and establish intervention intensity and frequency.

However, research indicates that teachers in the initial stages of MTSS implementation do not analyze data when making instructional decisions (Al Otaiba et al., 2019; Arden et al., 2017; Oslund et al., 2021). A gap in practice exists in terms of skills and knowledge that are required to collect and analyze data as well as teachers' ability to use data to make instructional decisions, particularly during the early stages of MTSS implementation. Lack of understanding of skills that are required to use data and adjust instruction results in unsustainable program changes (Bertram et al., 2015). Specifically, administrators must support teachers as they develop understanding of and the ability to collect and analyze data within MTSS as a component of SLD eligibility consideration in NC public schools.

Problem Statement

The problem in this study was the apparent lack of consistent data collection and analysis during MTSS in eastern NC public Montessori charter schools. MTSS requires analysis of data to adjust levels of instructional intensity using evidence-based practices (Arden & Pentimonti, 2017). Further, problem-solving teams use student performance data as part of comprehensive evaluations to identify students who require more intense levels of intervention, including those who require specially designed instruction by special education staff (NC-DPI, 2016d). Teachers do not effectively analyze and use data to adjust tiered interventions (Al Otaiba et al., 2019; Arden et al., 2017; Nelson et al., 2015; Oslund et al., 2021Visscher, 2021). Blumenthal et al. (2021) reported teachers focus on data at the classroom level which may impact their ability to adjust tiered interventions at the student level. Further, administrators, teachers, and MTSS teams who

have not developed the ability to systematically analyze data cannot make valid decisions regarding the need to adjust instructional intensity (Beck & Nunnaley, 2021; Nelson et al., 2015).

Teachers use instructional interventions but do not use data to make changes to tiered interventions (Al-Otaiba et al., 2019; Arden et al., 2017; Oslund et al., 2021). Similarly, the special education director at one of the NC public Montessori charter schools under study reported teachers do not collect and analyze data when making decisions as part of MTSS. Because NC public schools began using data that were collected via MTSS as the basis for SLD eligibility decisions during the 2020-2021 school year (NC-DPI, 2016c), it is critical that staff members within the research site demonstrate the ability to collect and analyze student progress data as the basis for instructional change, including special education.

Purpose of the Study

The purpose of this basic qualitative study was to identify administrators' and teachers' perspectives of the data collection and analysis components of MTSS in a public Montessori charter school. Because the NC-DPI requires consideration of MTSS data when determining eligibility in the category of SLD, administrators and teachers must develop the capacity to use data to adjust tiers of intervention. Within MTSS, teachers implement tiered interventions, collect student-specific data, and report data to the school-based problem-solving or MTSS team who then analyze data, set student performance goals, and make changes in terms of frequency and intensity of tiered interventions. However, the director of special education at one of the NC public

Montessori charter schools under study indicated teams struggled to demonstrate skills to analyze the effectiveness of evidence-based practices and make decisions regarding the need to change tiered interventions. Without these skills, problem-solving teams cannot analyze students' response to tiered interventions and use MTSS as a component of special education eligibility in the category of SLD.

Although analysis of progress monitoring data is critical to determine the presence of specific learning disabilities, teachers have difficulty effectively using data within MTSS (Al Otaiba et al., 2019, Nelson et al., 2015; Oslund et al., 2021). Further, Bertram et al. (2015) indicated that lack of effective implementation, such as lack of collection and analysis of student performance data, resulted in unsustainable program changes. Although the research site initiated MTSS during the 2017-2018 school year, remote learning during the global COVID-19 pandemic may have impacted staff members' ability to implement MTSS during the 2019-2020 and 2020-2021 school years. Thus, the research site may still be considered in the early stages of MTSS implementation. Staff members at the research site may not have the knowledge base to analyze data and make instructional changes. Themes identified during analysis of interview data revealed participants' perspectives regarding data collection and analysis during MTSS. Further, data were used to describe possible reasons for gaps between MTSS research and practice. Finally, this study contributed to literature regarding data collection and analysis within MTSS as a component of special education eligibility consideration in public Montessori charter schools.

Research Questions

RQ1: What implementation methods do administrators and teachers use during data collection and analysis within MTSS as a component of SLD eligibility in a public Montessori charter school?

RQ2: What components of the Montessori pedagogy do administrators and teachers identify as impacting their ability to implement MTSS?

Conceptual Framework

I used implementation science as the conceptual framework for this research. According to the National Implementation Research Network (NIRN, 2015), implementation science is defined as "the study of factors that influence the full and effective use of innovations in practice" (para. 3). Although implementation science is a conceptual framework that began in the health industry, researchers use this conceptual lens to examine MTSS implementation in education (Douglas et al., 2015; Fixsen et al., 2016; Forman et al., 2009; Goldstein & Olszewski, 2015). Fixsen et al. (2009) stated researchers examining the implementation of evidence-based practices in terms of fields of service should consider stages of implementation and implementation drivers. Fixsen et al. (2015) emphasized the importance of interactions between effective interventions, enabling implementation, and the context in which interventions are implemented. Participants provided information regarding their knowledge and understanding of the process. Secondly, participants' descriptions of MTSS implementation were used to identify their perspectives of and ability to use student data to adjust instructional

intensity. Finally, I identified environmental components that impact sustainable MTSS implementation.

Although stages of implementation appear to be linear in nature, organizations may exhibit characteristics of multiple stages simultaneously. Further, individuals and organizations may move between stages multiple times. Within this study, analysis of participant responses provided a basis for identifying the research site's stage of implementation. Implementation stages include the current state of implementation, but core implementation components drive the success or failure of implementation.

Core implementation components, implementation drivers, are divided into competency drivers, organization drivers, and leadership drivers (Fixsen et al., 2009). Each set of implementation drivers integrates with others to form a supportive system for sustainable innovation. Competency drivers involve preparation of staff members whereas organization drivers involve systems, administration, and data support (Fixsen et al., 2009). Finally, leadership drivers involve technical and adaptive leadership skills that are required to facilitate successful and sustainable change (Fixsen et al., 2009). By comparing participants' responses to implementation drivers, I addressed drivers that are currently used for MTSS as a component of eligibility determination in the category of SLD. Because I sought to explore implementation methods that participants used during MTSS in a public Montessori charter school, implementation science was an appropriate conceptual framework. Examination through this lens facilitated analysis of interactions between interventions and implementation, as well as contexts that were specific to a public Montessori charter school.

Nature of the Study

I used a basic qualitative design to explore administrators' and teachers' perceptions of data collection and analysis within MTSS in a public Montessori charter school. Specifically, I identified implementation methods participants used, as well as their perceptions of the impact of Montessori culture as the context for implementation. Case studies are appropriate for the exploration of a single location at a specific time and specific to a bounded system (Baxter & Jack, 2008; Creswell, 2012). At first consideration, this topic of study appears to fit the definition as it focuses on collecting data from a single school in the early stages of MTSS implementation. However, this is not a bounded system as the phenomenon is not finite (Merriam & Tisdell, 2016). Further, a basic qualitative study is appropriate when analyzing data in an unbounded system (Merriam & Tisdell, 2016). Because the purpose of this study was to examine administrators' and teachers' perceptions of the data collection and analysis components of MTSS implementation, the basic qualitative study design was the most appropriate methodology.

The setting for this study was a public Montessori charter school in NC. I invited three public Montessori charter schools in eastern NC to participate. Directors of two schools agreed to forward information about the study to their teaching and administrative staff members. However, all interviewees worked at a single research site. During the 2022-2023 school year, the total student population of the research site was approximately 750 students from 3-year-old preschool through grade 8. The executive director noted 65 of 102 staff members were instructors, including teachers, MTSS

interventionists, and special education staff. The remaining staff consisted of administrators and support staff. Each grade level director at the research site managed a team of 20 staff and approximately 200 students in eight learning environments. MTSS implementation began during the 2017-2018 school year to prepare for changes in eligibility criteria for SLD. Rumrill et al. (2011) stated purposive sampling is used when participants have similar characteristics that represent the topic of interest. The topic of interest for this study was MTSS in public Montessori charter schools. Participants included the executive director and grade level directors, as well as teachers and interventionists. This allowed for a potential pool of 65-76 participants that represented a variety of perspectives regarding MTSS implementation at the research site. From this pool, I interviewed 12 participants who included administrators, teachers, and interventionists.

I conducted semi-structured interviews with participants. To aid in accurate transcription of interviews, I recorded interviews using Otter AI transcription software. As recommended by Korstjens and Moser (2018) and Kyngas et al. (2020)., I took notes during and immediately following each interview to aid in transcription, as well as reflect on any biases or preconceived expectations. Following verbatim transcription of interviews using Otter AI, I uploaded transcribed interviews into QDA Miner Lite to be coded using in-vivo coding during the open coding phase of analysis. Following open coding, I used axial coding to group codes and thematic analysis to identify themes that emerged from data. Following thematic analysis, participants reviewed themes via member checking.

Definitions

Administrator: Executive and grade level directors.

Children's House: Multi-age class at the research site comprised of children in the early childhood developmental range. In schools with traditional pedagogy, these students are in 3-year-old preschool, 4-year-old preschool, and kindergarten.

Data-Based Problem-Solving: Cyclical and multi-step process involving problem identification, problem analysis, instruction, and evaluation of change (NC-DPI, 2015a). Data-based problem-solving is synonymous with data-based decision-making.

Multi-Age Classes: Classes implementing Montessori pedagogy that are made up of students at similar developmental levels (American Montessori Society, n.d.). In the research site, each developmental level is made up of students who would be in one of three grade levels in schools utilizing traditional pedagogy. For this study, the term *Multi-Age Classes* is used to describe each of the developmental levels at the research site.

Multi-Tiered System of Support (MTSS): Framework that involves using data-based problem-solving to support students with academic and behavioral needs (Arden & Pentimonti, 2017; NC-DPI, 2016b).

Public Charter School: Schools that are part of the public school system and free for all students. Unlike traditional public schools, students attending public charter schools are selected for entry using a lottery system. The lottery system provides for equal opportunities in terms of selection of potential students (NC-DPI, n.d.d).

Assumptions

During interviews, I assumed participants provided honest answers to interview questions. Although it was not possible to directly measure accuracy of participant responses, confidential treatment of the site location, participants' identities, and responses increased the likelihood their responses reflected their honest perspectives.

Scope and Delimitations

I focused on administrators' and teachers' perceptions of data collection and analysis in terms of MTSS implementation at a public Montessori charter school in eastern NC. No teachers or administrators from the high school level were included. Administrators, general education teachers, and special education teachers were invited to participate in the study as they were responsible for MTSS implementation and special education eligibility consideration at the research site. Specials teachers, teacher assistants, and other administrative staff were not invited as they did not participate in special education eligibility consideration.

Limitations

Although three possible research sites were invited to participate in the study, only two sites responded to the invitation. Further, all individuals who agreed to participate were employed by one research site. Because all 12 participants were from a single school, interview data may lack breadth of perspectives that might be obtained if participants represented multiple similar schools. Characteristics of the research site may prevent application of study results to other locations, including private Montessori schools, Montessori high schools, and public charter schools with different pedagogies.

Detailed descriptions of school context and data contributed to potential transferability of results to other similar settings.

Significance

This study contributed to the field of special education by exploring administrators' and teachers' perceptions of data collection and analysis within MTSS as a component of special education eligibility in category of SLD. Specifically, I used coding and thematic analysis to identify participants' understanding of and ability to effectively collect and analyze data within MTSS. Further, I described the impact of Montessori pedagogy as the context for implementation. Additionally, research suggested strategies that administrators and teachers could use to increase sustainable use of MTSS. Data provided information that is beneficial to stakeholders in similar public Montessori schools implementing MTSS. Because little research exists that describes data collection and analysis during MTSS within Montessori environments, this study contributed to early research upon which new studies can be developed.

Summary

In NC, recent changes in eligibility determination in the category of SLD require that districts implement MTSS as one component of the assessment process. Sustainable use of MTSS is dependent on intentional consideration of effective interventions, enabling implementation, and the context within which MTSS is implemented. The central purpose of this basic qualitative study was to identify administrators' and teachers' perceptions of the data collection and analysis components of MTSS. I used thematic analysis of participants' responses to semi-structured interview questions to

identify data collection and analysis methods administrators and teachers use during

MTSS, as well as the impact of a public Montessori charter school on sustainable

implementation.

Chapter 2: Literature Review

The IDEA (2004) provided states with options for eligibility determination in the category of SLD. In response to this legislation, the NC-DPI shifted criteria for eligibility determination for SLD from a discrepancy model to a model that involved examining students' failure to respond to increasing levels of evidence-based instruction (NC-DPI, 2016d). Specifically, this educational policy required special education eligibility teams analyze changes in student performance data gathered during MTSS beginning during the 2020-2021 school year. To sustain the data-driven problem-solving component of MTSS, teachers and administrative staff need to develop a culture of data use that goes beyond simple data summary (Demchak & Sutter, 2019; Gummer, 2021). Educational personnel must develop the capacity to use data for setting student-specific instructional goals, evaluating student performance, and making changes in instructional intensity and frequency (Arden & Pentimonti, 2017; Bundock et al., 2018; Fuchs et al., 2017; Hebbecker et al., 2022; Jimerson & Wayman, 2015; Nelson et al., 2015). However, there is a gap between the research literature in data use and the practices used by teachers in the field (Gesel et al., 2021). Although little research describes data use in Montessori schools, the research site serves as an exemplar of the gap between the literature supporting the collection and analysis of data as a component of MTSS and practices used in schools. Specifically, a problem exists as the administrators and teachers in an eastern NC public Montessori charter schools have not developed the capacity to collect and analyze student progress data during MTSS. The purpose of this basic qualitative

study was to identify administrators' and teachers' perspectives of the data collection and analysis components of MTSS in the research site.

In this chapter, I describe search techniques to locate recent literature regarding implementation science, special education eligibility, MTSS, and data-based problem-solving. I provide an in-depth discussion of implementation science components and their relationship to the current study. Next, I present a review of literature regarding three models that are currently used to determine eligibility for special education in the category of SLD. Because eligibility teams in public NC schools consider student-specific progress data as part of MTSS, I describe MTSS and its use in terms of guiding tiered intervention in traditional and Montessori schools. Finally, I review literature focused on data-based problem-solving as a component of MTSS.

Literature Search Strategy

The initial literature search involved using the following databases via the Walden University Library: Academic Search Complete, Educational Source, ERIC, PsycArticles, SocINDEX, EBSCOHost, and SAGE Journals. Sources were peer-reviewed and published between 2019 and 2024. I used the following search terms: *multi-tiered systems of support*, *MTSS*, *response to intervention*, *RTI*, *tiered instruction*, *data use capacity*, *data-based problem-solving*, *learning disabilities*, *SLD*, *Montessori*, *special education*, *special needs*, *disabilities*, *eligibility*, and *implementation science*. Terms were searched individually and in combination to maximize results. I also reviewed all abstracts for the *Journal of Montessori Research*. Additionally, I searched Google Scholar for articles that cited authors of seminal works to locate recently published

articles based on these original works. Finally, I searched Google Scholar to locate peer-reviewed research. Because I located a limited number of peer-reviewed articles specific to MTSS and Montessori, I broadened parameters to include non-peer-reviewed articles. This resulted in two additional articles regarding implementation of MTSS within Montessori schools.

Conceptual Framework

Ghate (2016) defined implementation as "the process of putting an idea (e.g., a policy, a service, a plan for a specific improvement or innovation) into practical use" (p. 815). Cook and Odom (2013) described implementation science as a "field of scientific inquiry in which issues related to implementation are investigated" (p. 139). More specifically, Eccles and Mittman (2006) defined implementation science as "the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice" (p. 1). Based on a review of 200 articles, Fixsen et al. (2005) identified a set of core implementation components, as well as organizational and external influences on systematic changes and improved outcomes.

Fixsen et al. (2009) reported common characteristics of implementation science could be divided into four implementation stages and three core components they identified as drivers, each of which is critical to teams bridging the gap between research and practice. Subsequently, Fixsen et al. (2013) presented a formula that described interactions between effective interventions and effective implementation as multiplicative; if either the intervention or implementation was ineffective, outcomes would not improve. Fixsen et al. (2015), Duda et al. (2014), and Duda and Wilson (2015)

combined an additional factor, enabling contexts, to the previous implementation

formula. They reiterated the importance of intentionally considering multiplicative

interactions of active implementation frameworks embedded in the implementation

formula: selection of effective interventions, effective implementation methods, and

enabling contexts that are required to sustain policy implementation from development

through practice.

Throughout system change, purposeful consideration of the components of each

factor in the formula increases the possibility of achieving improved outcomes (Duda et

al., 2014; Jackson et al., 2018). Further, purposeful examination of individual

components, as well as their interactions, allows institutions to evaluate and improve

effectiveness of system changes within the context of the change. During this study,

analysis of interview data via an implementation science conceptual lens allowed

examination of interactions between implementation science components and MTSS as a

critical element of special education eligibility in the category of SLD in a public

Montessori charter school.

Effective Intervention

Before interventions can be classified as effective, they must be matched with

identified needs and philosophies of institutions. Further, effective interventions not only

result in improved outcomes, but also are doable within institutional settings (Jackson et

al., 2018). To achieve this, components of interventions must be operationally defined to

increase implementers' ability to maintain fidelity. When considering data from MTSS as

a component of the SLD eligibility process, the implementation team must determine

teachers' ability to collect and analyze data, as well as their ability to use data to change tiered instruction (Beck & Nunnaley, 2021). Without developing the knowledge and abilities to use progress monitoring data to adjust interventions, eligibility teams may base lack of student growth on factors that are not related to tiered instruction. In this study, I used themes to identify administrators' and teachers' descriptions of the data collection and analysis components of MTSS and how they match MTSS with needs and philosophy of the research site.

Effective Implementation

According to Duda et al. (2014), Duda and Wilson (2015), Fixsen et al. (2015), Jackson et al., 2018, and Louison and Fleming (2016-17), effective implementation requires examination of who makes up the implementation teams, at what point and how often during the stages of implementation outcomes are examined, and how implementation drivers and cycles impact the effectiveness of implementation.

Implementation Team

Implementation teams consist of small groups of staff members knowledgeable of active implementation science frameworks. They are responsible for selecting staff members and conducting professional development (Jackson et al., 2018). Teams may be comprised of administrative leaders, school psychologists, and lead teachers whose roles have been repurposed (Castillo et al., 2022; Eagle et al., 2015; National Association of School Psychologists, 2016). During MTSS implementation, new roles can range from creation and provision of initial professional development through continued coaching to ensure fidelity. Specific to the use of MTSS as a component of SLD eligibility,

implementation teams must facilitate skill development in using data to make student-specific decisions regarding instructional intensity (Eagle et al., 2015; Gerzon, 2015; Hebbecker et al., 2022). The data from this study described how teams developed staff roles required for MTSS. Additionally, data related to topics and types of professional development described how implementation team members currently identify staff needs and work to increase their skills in data collection and analysis for MTSS within the research site.

Implementation Drivers

According to Fixsen et al., (2015), Jackson et al. (2018), and the National Implementation Research Network (NIRN, n.d.), the implementation science conceptual framework is comprised of three implementation drivers that are integrated and compensatory in nature. Institutions implementing new policies and procedures may not exhibit equal use of competency, organizational, and leadership drivers (Jackson, 2018; NIRN, n.d.). Thus, one or more drivers may serve to compensate for the deficits in other driver(s). Ultimately, implementation is most successful when leaders purposefully consider the components of each driver throughout the process.

Implementation teams function within competency drivers. Competency drivers focus on the selection, training, and coaching of individuals responsible for implementing the intervention (NIRN, n.d.). Additionally, implementation teams utilize professional development and coaching strategies to increase skills identified through performance assessments. Analysis of interview data in this study described how implementation team members in the research site are selected, trained, and coached to implement MTSS.

Implementation drivers that promote implementation at an organizational level include decision support data systems, facilitative administration, and systems intervention (NIRN, n.d.). It is critical that administrative personnel establish data-based decision-making systems while creating positive environments and removing barriers to implementation, fidelity, and sustainability. By proactively removing barriers and obtaining funding, facilitative administration makes internal policy decisions and procedural changes that result in a culture of data use and implementation fidelity (Abrams et al., 2021; Jackson, 2018; Jimerson et al., 2021; NIRN, n.d.). At the organizational level, data systems provide information implementation teams require to measure fidelity and outcomes, as well as to facilitate long- and short-term planning (NIRN, n.d.). Analysis of data collected in this study identified policy and procedural changes used to proactively establish and sustain positive environments while removing the barriers to MTSS implementation within the research site.

Based on complexity theory, NIRN (n.d.) described the final set of implementation drivers, leadership drivers, as two seemingly conflicting leadership styles. Specifically, leaders who employ technical leadership agree upon the set of tasks that must be done, as well as how to accomplish them. Conversely, leaders who apply adaptive leadership techniques exhibit less agreement regarding what needs to be done and less certainty about how to accomplish it. Although apparently incongruous, both leadership drivers are displayed by varying degrees throughout the stages and cycles of implementation depending on the needs of the organization (NIRN, n.d.). When used in tandem, leadership drivers support organizations as they move among the stages of

implementation. Analysis of interview data collected in this study identified the current leadership drivers used to support MTSS implementation in the research site.

Implementation Stages

Although linear in appearance, Jackson et al. (2018) described implementation stages as more fluid with institutions moving among stages as they are impacted by internal and external changes. The stages identified within the implementation science framework included: exploration, installation, initial implementation, and full implementation (Fixsen et al. 2015; Jackson, 2018; NIRN, n.d.). As the name suggests, organizations explore the match between the potential intervention and the specifics of the target organization during the exploration phase (Bertram et al., 2015). Fixsen et al. (2015) stated this as the time to examine economic, training, and personnel resources required for the intervention. During the installation stage, the organization ensures that resources are aligned with competency and organizational drivers (Bertram et al., 2015). The initial implementation stage begins as soon as the first group of implementors is trained in the intervention procedure with full implementation occurring when the intervention becomes a systemized part of the institutional culture (Jackson et al., 2018). Because organizations may exhibit characteristics of several different stages simultaneously, implementation teams utilize improvement cycles to establish sustainability across components of intervention.

Improvement Cycles

Based on implementation drivers and applied by implementation teams, improvement cycles are weaved within the implementation stages. Duda et al. (2014) and

Jackson et al. (2018) described improvement cycles as components critical to improving and sustaining implementation. Beginning during the exploration stage, implementation teams plan, implement, analyze, and revise plans cyclically, adjusting implementation based on the experiences of personnel. Improvement cycles are begun with small implementation groups and repeated with new groups of implementors until improved outcomes are achieved and systemized during full implementation (Jackson et al., 2018). Analysis of interview data collected during this study identified how school staff use data to drive improvement cycles during MTSS in the research site.

Enabling Contexts

Regardless of the effectiveness of the identified intervention and the implementation processes, the environment or context surrounding implementation can support or impede positive outcomes. Gerzon (2015) and Marsh and Farrell (2014) identified components of enabling contexts specific to developing a culture of data use in educational settings. Although Gerzon (2015) based her analysis on existing literature and Marsh and Farrell (2014) based their findings on data collected during a year-long comparative case study, both studies supported teachers' need for changes in the institutional culture to support effective implementation. Themes identified in the data analysis phase of this study described the impact of the public Montessori charter school culture and pedagogy on implementation of MTSS as a component of special education eligibility.

Literature Review Related to Key Concepts

Special Education Eligibility

Current federal legislation and state guidelines allow school-based teams to use a variety of models for eligibility determination in the category of SLD (IDEA, 2004; NC-DPI, 2016a). After the passage of IDEA 2004, some states continued to use the discrepancy model to determine eligibility for special education in the category of SLD. State departments of education utilizing a discrepancy model to determine eligibility for special education in the category of SLD base decisions on an identified discrepancy between a student's ability and achievement (Christo & Ponzuric, 2017). Whereas other models for eligibility consideration include establishing a pattern of strengths and weaknesses, examining changes in student performance following tiered intervention, or a combination of response to tiered intervention and formal assessments (Christo & Ponzuric, 2017; Grapin, 2018; Ihori & Olvera, 2015; Watson et al., 2016).

Each of these models examine students' skills and/or performance. Yet, they vary based on what is examined. One alternative model for determining eligibility in the category of SLD is based on establishing a pattern of strengths and weaknesses in a student's achievement and cognitive processing. According to supporters of this model, students with SLD exhibit uneven patterns of strengths and weaknesses that represent inclusionary criteria (Christo & Ponzuric, 2017; Gartland & Strosnider, 2018). However, identified patterns of strengths and weaknesses are dependent on the instruments used, as well as the method used to determine the pattern of strengths and weaknesses (Fletcher & Miciak, 2019; McGill et al., 2016; Miciak et al., 2018). Further, Maki and Adams (2019)

and Beaujean et al. (2018) reported a lack of evidence to support the validity of the most commonly used method for identifying a pattern of strengths and weaknesses in the United States.

NC-DPI (2016c) required that problem-solving teams evaluate student response to tiered intervention as one component of SLD eligibility consideration. Although Kavale (2005) discouraged the shift away from the discrepancy model or a model focused on examining patterns of strengths and weaknesses, Christo and Ponzuric (2017) and Lindstrom (2019) supported eligibility decisions based on student response to tiered intervention in combination with formal assessments. Additionally, Lindstrom (2019) stated that analysis of MTSS data provided documentation that identified academic deficits were not due to a lack of instruction. Although Armendariz & Jung (2016) reported that special education teachers supported the use of a discrepancy model for establishing eligibility, other researchers indicated that school psychologists, special education teachers, and general education teachers supported the use of tiered intervention for identification of students with SLD (Armendariz & Jung, 2016; Maki & Adams, 2019; O'Donnell & Miller, 2011).

MTSS is based on students' response to intervention through multi-tiered service delivery (Cakiroglu, 2015). Use of MTSS increased due to changes in dyslexia policy and federal special education law (Gearin et al., 2018; IDEA, 2004). Dunn (2018) and Bose et al. (2019) stated that it is an effective practice for identifying students who require specially designed instruction due to SLD. However, states' regulations for implementation and progress monitoring vary (Maki et al., 2015; Sanetti & Luh, 2019).

MTSS

State departments of education that chose to examine students' response to

evidence-based intervention required a structured data-based system. Initially, school

districts used Response to Intervention (RtI) to provide tiered reading interventions and

Positive Behavioral Interventions and Supports (PBIS) to address the need for tiered

behavioral interventions (Sailor et al., 2018). In an article comparing RtI and PBIS, Sugai

and Horner (2009) became some of the first researchers to use "multi-tiered system" to

describe school-wide interventions focused on all students. Since that time, school

districts have used MTSS frameworks to support the academic and behavioral needs of

all students through a series of data-based decisions (Donohue et al., 2015; Harn et al.,

2015; Sailor et al., 2018; Sugai et al., 2016). However, the specific components of MTSS

vary from district to district.

In an examination of MTSS variations across models, Cakiroglu (2015) identified

five common components: universal screening, high-quality general education

instruction, evidence-based tiered instruction, progress monitoring, and implementation

fidelity. However, Balu et al. (2015) reported only four components were required for full

MTSS implementation: at least three instructional tiers, universal screening, use of data

to determine placement, and progress monitoring of student performance. Although the

NC-DPI integrated these components into the MTSS model outlined in the North

Carolina School Improvement Planning Implementation Guide (NC-DPI, 2016c),

additional critical components in the document included leadership, building capacity and

infrastructure for implementation, communication and collaboration, data-based problem-solving, multiple tiers of instruction and intervention, and data evaluation.

Tiered intervention within MTSS begins with high quality Tier 1 instruction in the general education classroom. According to the NC-DPI (n.d.b), at least 80% of all students are successful at this level of instruction. Students who do not adequately respond to this level of instruction require evidence-based instruction at more intense levels. In an MTSS framework that utilizes three tiers, approximately 20% of students require Tier 2 instruction and 5% require Tier 3 instruction (NC-DPI, n.d.b). Each tier of instruction layers on the lower tiers ensuring that students receive all appropriate levels of instruction.

Traditional school districts use MTSS to facilitate continuous school improvement because it provides structure for making data-based decisions that guide instruction for all students. Specific to academic skills, researchers exploring the use of tiered instruction in literacy and math noted positive student results in traditional educational settings (Filderman & Toste, 2022; McAlenney & Coyne, 2015; Powel et al., 2021; Witzel & Clarke, 2015). However, not all researchers report progress using tiered literacy instruction. For example, Carta et al. (2015) and McAlenney and Coyne (2015) noted that tiered instruction in preschool and kindergarten decreased the need for higher levels of tiered instruction in later grades. On the contrary, Balu et al. (2015) reported that students' scores following tiered literacy instruction did not demonstrate significant improvement. Similar to Balu et al. (2015), Barrett & Newman (2018) reported that improvements in students' performance following tiered instruction varied across

schools. Regarding tiered math instruction, researchers reported increased math performance and higher scores on high-stakes assessments after MTSS implementation (Keuning et al., 2019; Powell et al., 2021; Weisenburgh-Snyder et al., 2015; Witzel & Clarke, 2015). The use of MTSS within education settings allows teams make decisions regarding the intensity and frequency of intervention students require to make progress.

Although extensive research explores MTSS in traditional schools, a paucity of articles existed regarding MTSS implementation in Montessori schools. In an early non-peer reviewed article, Cossentino (2010) suggested the use of a three-tiered system of early intervention to address the needs of students attending Montessori schools. Similar to MTSS procedures, Cossentino (2010) proposed use of the Child-Centered Community of Practice to provide a system for teachers to collaboratively discuss student data, instructional strategies, and progress monitoring. Subsequently, Jones and Cossentino (2017) recommended the use of a Child Study Protocol to guide discussion and to develop action plans that consist of interventions and student specific goals. Excerpts from the action plan presented in their case study suggested that the team used interventions that centered on changes in the environment, as opposed to the changes in instructional method, frequency, and intensity that are typical of MTSS (Jones & Cossentino, 2017). Similarly, Weaver (2018) supported the use of the Child Study Protocol to collaboratively address the needs of students in a Montessori setting. Although these authors did not specifically reference the use of MTSS, the use of a Child Study Protocol and development of an action plan is similar to some of the components of MTSS as it is implemented in traditional schools.

Data-Based Problem-Solving and Decision-Making

Researchers use different terms when discussing the use of data when monitoring

student progress and making decisions regarding the need for increasing or decreasing

tiered intervention. Although NC-DPI (2015a) and Nelson et al. (2015) use the term data-

based problem-solving to describe identification, analysis, intervention, and progress

monitoring of student performance during multi-tiered instruction, other researchers use

the term data-based decision-making (Arden et al., 2017; Fan et al., 2016; Hintze et al.,

2018; Nelson et al., 2015). For the purposes of this study, data-based problem-solving

and data-based decision-making are synonymous. Because data-based problem-solving is

a key component of MTSS, it is critical to use a consistent operational definition. The

NC-DPI (2015a) defined data-based problem-solving as:

> "a multi-step process that includes examining performance related to
>
> goals/expectations (problem identification), understanding variables causing
>
> problems (problem analysis), selecting/designing and implementing strategies to
>
> lessen barriers and achieve goals (instruction/intervention delivery), and
>
> monitoring effectiveness (monitoring/evaluation). (p. 15)

The examination of data-based decision-making as a process emphasizes the importance

of moving from identifying and understanding the possible causes for a lack of student

progress to the analysis of progress monitoring data to inform instruction.

Although data-based problem-solving as defined by NC-DPI (2015a) is a critical

component of MTSS, school-based teams may struggle to analyze student performance

data to inform instruction (Arden et al., 2017; Armendariz & Jung, 2016, Fan et al.,

2016). Teams who do not use data to identify instructional targets and adjust tiered

intervention cannot support sustainable implementation of MTSS (Bertram et al., 2015).

Further, students may not receive the appropriate level of instructional and intervention

intensity (Bundock et al., 2018; Gersten et al., 2017). Therefore, there is a need to

establish and monitor the systems through which intervention and data-based problem-

solving practices are implemented (Christ & Desjardins, 2018; Hintze et al., 2018;

Nelson et al., 2015; Van Norman & Parker, 2018). However, several factors impact the

use of data-based problem-solving as a component of MTSS. These factors include

teachers' knowledge and understanding of MTSS, data systems, staff consistency,

availability of adequate budget and resources, leadership styles, and the school

environment.

Teachers' and school counselors' knowledge of MTSS and data-based problem

solving may impact their ability to effectively implement MTSS. For example, Cavendish

et al. (2016), Patrikakou et al. (2016), and Sun et al. (2016) stated that teachers and

school counselors supported the use of MTSS but lacked the knowledge required for

effective implementation. Further, Swain and Hagaman (2020) and Wachen et al. (2018)

reported that teachers used data to identify students performing below grade level and to

monitor progress but did not demonstrate the understanding of or the ability to use data to

adjust intervention strategies. On the contrary, Mundschenk & Fuchs (2016) reported that

more than 75% of participants in professional learning committees focused on data-based

problem-solving found them very helpful in developing their understanding. Research

focused on increasing this skill demonstrated the importance of using multiple training

strategies. For example, Marsh et al. (2015) demonstrated teams using a combination of coaching and professional learning communities demonstrated increased ability to use data to adjust their intervention. Whereas Datnow et al. (2021) reported teachers increased use of data following instructional coaching. On the contrary, Begeny et al. (2023) and Farrell and Marsh (2016) reported that coaching alone did not alter teachers' data use.

Clearly defined policies and data systems also impact the use of data-based problem-solving as a component of MTSS. Many state departments of education do not collect the data required to evaluate the effectiveness of response to intervention nor do they report a policy driven number of days students must receive tiered instruction prior to establishing eligibility in the category of SLD (Hudson & McKenzie, 2016a; Hudson & McKenzie, 2016b). Further, some school districts do not define or implement all components of MTSS with fidelity (Stahl, 2016; Swindlehurst et al., 2015). School psychologists reported similar policy inconsistencies using MTSS data at the school and district levels (Cottrell & Barrett, 2016). Without consistent policies and subsequent data analysis, general education students receiving intensive levels of intervention may be denied the specialized instruction and legal protections provided to students eligible for special education services (Hudson & McKenzie, 2016b; Zirkel, 2017). To address the need for consistent policies and data analysis, NC-DPI (2016a) described universal screening areas and best practices for progress-monitoring, including decision points and timelines for evaluating student progress in tiered instruction.

Research indicates several methods of data-based decision-making. For example, Buzhardt et al. (2020) described the benefits of using a computer app to successfully guide language instruction in infants and toddlers. Abbott et al. (2017) described a strategy for monitoring both intervention and decision-making fidelity through a cyclical process beginning with collection of student data and progressing through provision of feedback data to teachers providing tiered interventions. Further, Schildkamp and Poortman (2015) reported that teams who used cyclical feedback engaged in deeper levels of discussion and demonstrated an increased ability to identify and implement data-based actions. Weisenburgh-Snyder et al. (2015) reported that graphing, analyzing, and presenting data via celeration charts increased the use of common language, as well as the use of data to inform math instruction. Similarly, McAlleney and Coyne (2015) used progress monitoring data to identify students who could be successfully transitioned from Tier 2 to Tier 1 reading intervention. Additionally, Hammerschmidt-Snidarich et al. (2019) indicated that efficacy and efficiency of reading interventions could be increased using individual goal setting during a repeated reading intervention. However, some studies demonstrated that even with well-defined policies and data collection and analysis systems, teachers entered data but did not use it to change their instructional practices (Chen, 2019; Supovitz & Sirinides, 2018; Wachen et al., 2018). Further, repeated assessments take extended time, result in a focus on skill deficits as opposed to student progress, and do not result in increased students' skills for low performing readers (Lasater et al., 2021; Peters et al., 2021).

Other factors that impact effective MTSS implementation include staff consistency, available resources, and leadership support. In recent research, teachers reported uncertainty regarding their roles within MTSS, as well as the lack of time and the fiscal resources to implement evidence-based practices and data-based problem-solving (Meyer & Behar-Horenstein, 2015; Schildkamp Smit, Blossing, 2019; Swain & Hagaman, 2020). Additionally, they reported a lack of support from leadership within the school building (Meyer & Behar-Horenstein, 2015). On the contrary, Schildkamp, Poortman, et al. (2019) stated that leadership provided supportive leadership to data teams. Although teachers reported personnel turnover as a factor that hindered effective MTSS implementation, this factor may be overcome when members of the team share similar educational philosophies, knowledge, skills, and commitment (Charlton et al., 2018; Cramer et al., 2023; Schildkamp, Smit, & Blossing, 2019; Schildkamp, Poortman, et al., 2019).

van Geel et al. (2017) and Choi et al. (2019) identified the need for strong instructional leadership for effective MTSS implementation. Similarly, Schildkamp, Smit, and Blossing. (2019) indicated that school leaders who provided encouragement and distributed leadership across personnel enabled school-based teams to more effectively implement MTSS. State leaders also reported district staff turnover, lack of funding, funding restrictions, and lack of support for leaders at the state level as factors that hindered MTSS implementation at the state level (Charlton et al., 2020).

The final factor impacting data-based problem-solving within MTSS centers on educational context. Schildkamp, Smit, and Blossing (2019) identified three components

of context that enabled or hindered data-based problem-solving: pressure and support, coaching, and collaboration between schools. Further, state educational leaders identified three educational factors that hindered MTSS implementation at the state and district level in traditional school systems: competing priorities, philosophies, and practices (Charlton et al., 2020). However, no peer-reviewed research has explored the impact of educational context on data-based problem-solving within a public Montessori charter school.

Summary and Conclusions

Currently, the NC-DPI requires school-based teams examine progress monitoring data across increasing levels of tiered instruction within MTSS before determining eligibility for special education in the category of SLD. Literature identified the importance of data collection and analysis in traditional schools. However, there is a gap between practices described in the research literature and the current practices in the research site, a public Montessori charter school in NC. In Chapter 2, I presented a review of literature germane to MTSS as a component of special education eligibility in the category of SLD. I outlined processes for searching literature and presented an in-depth description of implementation science as the conceptual framework for analyzing MTSS implementation. Further, I reviewed and summarized current research involving special education eligibility, MTSS, and data-based problem-solving. In Chapter 3, I describe research methods used to collect and analyze data to examine administrators' and teachers' perceptions of the data collection and analysis components of MTSS in a NC public Montessori charter school.

Chapter 3: Research Method

The purpose of this basic qualitative study is to identify administrators' and teachers' perceptions of the data collection and analysis components of MTSS as a component of special education eligibility in a public Montessori charter school in NC. In this chapter, I describe the research design and provide the rationale for its use. Further, I explain my role as the researcher. I also describe selection of participants, instrumentation, and plan for data analysis. Next, I describe measures to ensure trustworthiness, including credibility, transferability, dependability, and confirmability. Finally, I explain procedures for upholding ethical standards.

Research Design and Rationale

I used a basic qualitative design to explore administrators' and teachers' perceptions of MTSS in a public Montessori charter school. Specifically, I identified implementation methods administrators and teachers use during MTSS. Research questions were:

RQ1: What implementation methods do administrators and teachers use during data collection and analysis within MTSS as a component of SLD eligibility in a public Montessori charter school?

RQ2: What components of the Montessori pedagogy do administrators and teachers identify as impacting their ability to implement MTSS?

Merriam and Tisdell (2016) identified six research designs common to qualitative research. I ruled out research designs which did not lead to answers to the research question. For example, phenomenology did not fit the needs of this study because it

involves particular experiences and this study involved examining participants'

perceptions of MTSS. Ethnography was not appropriate since my primary focus was use

of implementation methods, not overall culture of the school. Another qualitative design

is grounded theory. Because this study will not lead to the development of a theory,

grounded theory is not an appropriate design. Finally, narrative inquiry is not appropriate

as participants were not asked to tell their stories regarding MTSS implementation at the

research site.

Case studies involve deeply exploring a specific topic within an authentic context

(Baskarada, 2014; Yin, 1981). Although case studies are appropriate for the exploration

of a single location at a specific time, they are specific to a bounded system (Baxter &

Jack, 2008; Creswell, 2012). Merriam and Tisdell (2016) stated data collection in a case

study often spans a longer time interval to fully explore finite systems. However, the

current project focus is not a bounded system as there are other public Montessori charter

schools that are implementing MTSS. Merriam and Tisdell (2016) suggested a basic

qualitative study is more appropriate when analyzing data from an unbounded system.

Because the purpose of this study is to examine staff members' perceptions of the data

collection and analysis components of MTSS within the research site, a basic qualitative

design is a more appropriate methodology.

Role of the Researcher

Throughout the development of this study, I was employed in a separate school

system from the research site. Although I had a casual relationship with the director of

one of the potential research sites, neither they nor any staff members in that site

volunteered to participate. I met each participant when they responded to emailed invitations that were forwarded to them by their grade level directors. No power relationships existed between me and participants as I was not employed in the same school district as the research site. My role as researcher did not negatively impact the ethical nature of this study.

Methodology

Participant Selection

The population for this study includes administrators and teachers employed by public Montessori charter schools implementing MTSS. Participants consisted of administrative staff and teachers at a public Montessori charter school in NC. Three potential research sites received email invitations to participate in the study. Administrators from two of the three sites agreed to participate as research sites. All administrators and teachers from the two research sites were invited via email to participate in the study. Possible participants included: executive directors, heads of school, multi-age level directors, curriculum coordinators, interventionists, special education directors, MTSS coordinators, and teachers. This allowed for a potential pool of approximately 90 participants that represented a variety of perspectives regarding MTSS in research sites. Six administrators and six teachers and intervention staff members from one site agreed to participate in the study. No administrators or teachers from the other site responded to email invitations.

Instrumentation

Instrumentation for basic qualitative studies involves primarily data from interviews (Merriam & Tisdell, 2016). Collection of data via interviews is used to gather information and perspectives that are not easily observable (Kaariainen et al, 2020). Research questions focused on administrators' and teachers' perceptions of data collection and analysis during MTSS, which is not observable without direct input from participants. Therefore, interviews served as the only source of data.

Merriam and Tisdell (2016) and Olsen (2012) described a semi-structured interview as one in which the structure is between a structured interview with close-ended questions and an unstructured interview guided by the participant freely talking about a topic. During this study, I conducted semi-structured interviews comprised of predetermined questions asked in the same sequence. I developed the interview questions using MTSS and implementation science research literature. I asked additional questions as needed to clarify participants' responses.

Each interview followed a structured interview protocol (see Table 1). Prior to beginning interviews, I reviewed the purpose of the study and explained procedures to participants, including recording of interviews. I reminded participants that all responses were confidential, and they were free to withdraw from the study at any time. I asked each participant a set of interview questions based on research questions. Additionally, I asked participants follow-up questions if needed to clarify their responses to initial questions. I audio-recorded interviews virtually using Google Meet and Microsoft Teams. Further, I took notes during and immediately following each interview to aid in

transcription, as well as reflect on any biases or preconceived expectations that were identified. I transcribed recorded interviews using Otter AI transcription software. Five years after completion of the study, I will destroy all audio recordings, handwritten notes, and transcriptions.

Table 1

Interview Protocol

Step	Procedure
1	Introduce researcher
2	Explain the study purpose
3	Explain the study procedures, including recording
4	Discuss confidentiality
5	Discuss ability to withdraw from the study and to stop the interview
6	Answer participant's questions
7	Present interview and follow-up questions
8	Explain that emergent themes will be sent to them for validation
9	Thank participant for time and participation

Note. Adapted from *Response to Intervention Program Implementation in a Suburban Elementary School Setting* by D. M. Kovach, 2018. Retrieved from https://scholarworks.waldenu.edu/dissertations

Procedures for Recruitment, Participation, and Data Collection

All administrators and teachers employed at the research sites were invited to participate in the study. I emailed flyers to the head of school and executive director of

each research site. The flyers contained a description of the study, expectations for

participants, confidentiality of data, voluntary nature of their participation, a description

of the thank you gift, and my contact information. I requested the head of school and

executive director forward information to administrators and teachers at their respective

sites. I requested potential participants email me directly if they were interested in

participating in the study. I emailed a copy of the informed consent form to each potential

participant who expressed interest. I requested participants respond by emailing "Yes, I

consent to participate" if they were willing to participate. When I received participants'

responses, I sent follow-up emails to schedule interviews.

All data were collected from administrators and teachers via semi-structured

interviews. I completed all interviews remotely using Google Meet and Microsoft Teams

cloud-based video conference platforms. I emailed a $20.00 gift card and thank you note

participants who completed the study. I emailed a thank you note to the participant who

was unable to complete the interview before the end of the study. Following completion

of the study, I sent emails to participants with a summary of findings.

Data Analysis Plan

During this study, I used in-vivo coding during open coding of transcribed

interview data (Baskarada, 2014; Feng & Behar-Horenstein, 2019; Kozleski, 2017).

Elliott (2018) emphasized the importance of maintaining an overview of the project while

diving into the data and codes during open coding. Similarly, Maher et al. (2018)

recommended a combination of software and hand coding to fully analyze qualitative

data. Therefore, I re-read and analyzed participants' responses during open coding with

QDA Miner Lite to ensure less obvious codes were not overlooked. I grouped identified codes into similar categories using axial coding. Following axial coding, I used thematic analysis to group similar categories into operationally defined themes identified from the data (Neuendorf, 2019).

Trustworthiness

Credibility

Credibility as a component of trustworthiness centers on the research consumers' ability to depend on the results of the study being truthful (Kyngas et al., 2020). I used member checking to establish credibility. As described by Merriam and Tisdell (2016), I asked participants to provide brief feedback regarding themes identified in the final analysis. I emailed identified themes to participants following thematic analysis. Interviewees had 2 weeks to check the themes and to respond via email with responses regarding the accuracy of the identified themes. Themes that emerged from the data were determined to be credible if participants confirmed the accuracy of them or did not respond to the email during member checking.

Transferability

Transferability refers to the ability to apply the research findings from one setting to another (Merriam & Tisdell, 2016). To increase the likelihood that results can be applied to other settings, Daniel (2019) stated that researchers should include descriptions of study sites and participants. Additionally, Linneberg and Korsgaard (2019) emphasized the importance of detailed descriptions of study findings. For this study, I described the research problem and the research sites in Chapter 1. I also provided

detailed descriptions of the methodology in this chapter. Following collection and analysis of data, I provided thick descriptions of the findings. These descriptions increased the likelihood that the themes identified in the study may be applied to other public Montessori charter schools implementing MTSS.

Dependability

Dependability refers to the processes used to ensure that the data collected are stable (Kemparaj & Chavan, 2013). Further, dependability provides information that facilitates another researcher or consumer of the research in their effort to follow the decision trail left by the original researcher (Daniel, 2019). Two methods of increasing dependability of the results include reflexive journaling and creating an audit trail. Nowell et al. (2017) suggested using a reflexive journal to capture daily decisions regarding the research, as well as to document personal reflections. I kept a reflexive journal throughout data collection to document procedural decisions, as well as to document personal reflections throughout the study. Forero et al. (2018) suggested researchers document data collection and analysis procedure through an audit trail to decrease bias and increase dependability. The audit trail consisted of detailed documentation of data collection and analysis, as well as daily decisions captured in the reflexive journal.

Confirmability

Similar to dependability, confirmability of data refers to the objectivity of the data (Kemparaj & Chavan, 2013). To establish objectivity, qualitative researchers must reflect on their biases, preconceptions, and influences (Korstjens & Moser, 2018). Forero et al

(2018) and Xerri (2018) suggested that researchers keep a journal to document their reflections and self-evaluation throughout the collection and analysis of data. Therefore, I used a reflexive journal to document issues that arose during the study, including any that arose from researcher bias and preconceptions.

Ethical Procedures

Roulston and Choi (2018) expressed the importance of maintaining ethics during research. One component of ensuring ethical treatment of study participants required that I complete a research ethics course. To fulfill this requirement, I completed the Doctoral Student Researchers Basic Course (Collaborative Institutional Training Initiative, 2021) on June 5, 2021. Pietila et al. (2020) described the importance of studies undergoing an independent, transparent review. Therefore, the study was submitted to the institutional review board for approval prior to data collection (Walden IRB approval no. 04-14-22-0534545). An additional ethical consideration centers on the participants' autonomy within the study (Pietila et al., 2020). Specifically, this refers to their freedom to participate or to remove themselves from the study. To maintain participant autonomy, each participant was told that they were free to stop the interview or to leave the study at any time. This information was provided in writing as a component of the informed consent and reviewed verbally prior to beginning the interview session.

Another factor that impacts ethical treatment of participants centers on minimizing potential harm as a result of participating in the study (Pietila et al., 2020). Audio-recording of interviews may create potential for harm for participants due to concerns regarding confidentiality and anonymity. I identified all participants with

pseudonyms to maintain anonymity. I stored raw interview data, transcribed interview responses, and reflexive notes on a password protected laptop computer to ensure that confidentiality and anonymity of participants. The computer remained in my personal possession or in my personal residence protected by a home security system. Five years following the study, all digital files will be erased from the computer. Finally, permission to conduct the study was obtained from the director of each research site. By completing each of these activities, minimal ethical concerns impacted this study.

Summary

This chapter includes a description of the basic qualitative study to identify implementation methods that administrators and teachers use during the data collection and analysis components of MTSS in a public Montessori charter school in NC. In this chapter, I described the research design and rationale, including research questions. I also reviewed my role as the researcher, participant selection, instrumentation, and procedures for recruitment, participation, and data collection. Finally, I describe the plan for data analysis, as well as maintaining trustworthiness and ensuring ethical procedures. Chapter 4 contains results of data analysis.

Chapter 4: Results

NC public schools began using progress monitoring data as part of MTSS during the 2020-2021 school year (NC-DPI, 2016c). This requirement applied to both traditional and charter schools that may employ a variety of instructional pedagogies. Montessori is a type of child-focused pedagogy that is used in public charter schools across the state. According to the NCMPS (2021), there are 20 public Montessori schools in NC. The purpose of this basic qualitative research study was to identify administrators' and teachers' perspectives of the data collection and analysis components of MTSS in a public Montessori charter school. The research questions were:

RQ1: What implementation methods do administrators and teachers use during data collection and analysis within MTSS as a component of SLD eligibility in a public Montessori charter school?

RQ2: What components of the Montessori pedagogy do administrators and teachers identify as impacting their ability to implement MTSS?

This chapter includes details about the study, including descriptions of the setting, participants, and data collection procedures. Also included in this chapter are details regarding themes and subcategories that were identified during data analysis.

Setting

Three potential research sites received email invitations to participate in the study. Administrators from two of the three sites agreed to participate as research sites. However, all respondents who agreed to participate in interviews were from one site. The 12 interviews were conducted via digital format due to scheduling complications. One

subject agreed to participate in the study but withdrew before the interview could be completed. During the interview process, one participant indicated that the administrative team was scheduled to meet with a member of the NC-DPI to review and revise sections of the MTSS handbook in the first week of interviews. Although one participant shared that the meeting did not take place as originally scheduled, no other participants mentioned meetings during the interview period to revise the MTSS handbook.

All participants worked at the research site during interviews. They reported working at the research site for a range of 1 to 15 years. Six participants self-identified as administrative staff and six self-identified as lead teachers or intervention staff. Eight of 12 participants described a background in Montessori pedagogy, two indicated a background in both Montessori and traditional pedagogy, and two disclosed a background in traditional pedagogy with 1 year or less in a Montessori school. Because grade levels at the site are multi-age, participants indicated multi-age levels where they worked. Five participants indicated responsibility for students at more than one multi-age level. Seven participants described working with a single multi-age level, with four of the seven working with 3-, 4-, and 5-year-olds. Because it might lead to breaches of confidentiality, details regarding remaining levels participants worked with are not included in descriptions of participants. Participants' gender is not included for the same reason.

Data Collection

Twelve subjects participated in this study. Each interviewee participated in an individually conducted 30-to-45-minute interview via a digital platform following the

interview protocol that was outlined in Chapter 3 (see Table 1). The initial two interviews were conducted using Google Meet. Due to a change in participants' ability to access Google Meet, the remaining 10 interviews were conducted using Microsoft Teams. Each participant self-selected an environment within the research site that limited interruptions during interviews. I conducted the first four interviews from my home and the final eight interviews from my workspace. In both locations, I was the only person present in the room. Neither interview questions nor participants' responses could be overheard by others.

I recorded and transcribed each interview using Otter AI transcription software. Otter AI provides a password-protected digital platform where recordings and transcriptions are stored. Following the initial transcription, I relistened to each recording and checked transcriptions for accuracy. Following accuracy checks, I uploaded transcriptions into QDA Miner Lite for analysis.

Variations in the data collection plan that was presented in Chapter 3 centered on scheduling interviews and offering participants the opportunity to complete interviews in in-person settings. Although the original plan indicated that I would schedule interviews via SignUpGenius, some participants responded with preferred times when giving consent to participate in the study. Therefore, I scheduled each interview by asking participants for their preferred days and times for interviews. One participant requested to complete the interview at the research site. However, I was unable to travel after scheduling the interview. Each participant agreed to complete the interview online.

During data collection, unusual circumstances resulted from technology issues. After completing two interviews via Google Meet, changes in technology required I conduct interviews using Microsoft Teams. Audio difficulties during three Microsoft Teams interviews resulted in using Otter AI recordings and transcriptions of audio via cell phones and land lines. I captured audio for the remaining seven interviews using Otter AI during Microsoft Teams meetings. I saved all recordings and transcriptions in Otter AI.

Data Analysis

I used Otter AI to record and transcribe each interview. Upon completion of each interview, I relistened to recordings and confirmed they matched transcripts. As NVivo did not function on my personal computer, I uploaded each transcript to QDA Miner Lite for coding and analysis. Initial coding consisted of open coding with codes that were defined and placed into a code book. I reread each interview to verify initially identified codes.

Once I identified and verified open codes, I used axial coding to group them. During this part of analysis, I identified 40 axial codes that were then grouped into nine categories. Following axial coding, I reread initially coded data to ensure all codes were accurately grouped. Finally, I used thematic coding to group nine categories into four overarching themes: MTSS implementation components, importance of data as part of MTSS, impact of pedagogy, and impact of other school factors (see Table 2).

Table 2

Axial Codes, Categories, and Themes

Theme 1	Staff Recognize MTSS Implementation Components		
Category	*Policies and Procedures Guiding MTSS*	*Implementation of MTSS*	*Systemic improvement of MTSS*
Axial Codes	MTSS manual / handbook	Procedural activities	Revision cycles
	Overall MTSS process	Team members	Outside collaborators
		Intervention	Sustainability
		Training	Time as a resource
		Time for implementation	Overall perspectives
Theme 2	**Staff Recognize the Importance of Data as Part of MTSS**		
Category	*Data Collection*	*Data Analysis*	
Axial Codes	Lessons	Goal identification	
	Observations	Shifting between tiers	
	Anecdotal notes	Analysis of data trends	
	Work samples		
	Use of accommodations		
	Dependency on goals		
	Assessments		
	Students' background information		
	Developmental states		
	Specific to academic/behavioral strategies		
	Collection of multiple data points		
Theme 3	**Staff Recognize the Impact of Pedagogy**		
Category	*Montessori Pedagogy*	*Traditional Pedagogy*	
Axial Codes	Daily observations	State standards	
	Montessori materials	Non-Montessori materials	
	Montessori best practice		
	Relationships		
	Learning environment		
	Record keeping		
	Multi-age classrooms		
	Location of intervention		
	Montessori certification		
Theme 4	**Staff Recognize the Impact of Other School Factors**		
Category	*Charter School*	*School Culture*	
Axial Codes	Link between PK and K	Size	
		Resources	

Results

RQ1

Analysis of participant's responses revealed two major themes related to this question: Staff Recognize MTSS Implementation Components and Staff Recognize the Importance of Data as Part of MTSS. All participants made comments that were coded into both themes (see Table 3). The remaining information in this section will present details regarding each theme.

Table 3

Number of Participants Referencing Themes 1-2

Theme	Administrators	Teachers	Total
1 Staff Recognize MTSS Implementation Components	6	6	12
2 Staff Recognize the Importance of Data as Part of MTSS	6	6	12

Theme 1: Staff in the research site recognize MTSS implementation components.

Participants' comments in this theme coded into three categories: policies and procedures guiding MTSS, implementation of MTSS, and systemic improvement of MTSS. Five administrators and four teachers mentioned the components guiding MTSS implementation in the research site. Analysis of interview data indicated two codes under the first category: Policies and Procedures Guiding MTSS. These codes included the MTSS manual/handbook and the overall MTSS process. Although three of six administrators reported using an MTSS manual or handbook (see Table 4), only two participants described more than its existence. Specifically, P6 described the handbook as "multi-faceted" with "some really helpful components that address the blending of MTSS

and Montessori," whereas, P3 stated that "It shouldn't be called a handbook because

that's not what it is. It's more of a guide." Further, it is important to note that no teachers

mentioned the manual or handbook in their responses to the interview questions.

Five administrators (Participants 1, 3, 5, 6, and 9) and four teachers (Participants

4, 10, 11, and 12) referred to the overall MTSS process (see Table 4). Participants 1, 4, 5,

6, 10, and 12 described MTSS as a process or plan with specific steps. Further, P1 linked

the handbook to the procedure when they stated, "We have some really nice flowcharts

that we created that are embedded in the handbook that are meant to sort of simplify the

process for teachers and administrators." However, not all participants indicated a clear,

straightforward process when implementing MTSS. Specifically, P3 expressed that,

"Right now, we do the work, but people still don't know. They really don't know what

the real, full process is."

Table 4

*Number of Participants Referencing Axial Codes for Policies and Procedures Guiding
MTSS*

Axial Codes	Administrators	Teachers	Total
Manual/Handbook	3	0	3
Overall MTSS process	5	4	9

Because of the structure of the interview questions, all 12 participants described

the second category in this theme: implementation of MTSS in the research site. Analysis

of participants' responses revealed five axial codes: procedural activities, team members,

intervention, training, and time for implementation (see Table 2). A range of two to six

administrators and five to six teachers made comments that in the identified codes (see

Table 5).

Table 5

Number of Participants Referencing Axial Codes for Implementation of MTSS

Axial Codes	Administrators	Teachers	Total
Procedural Activities	6	6	12
Team members	5	5	10
Intervention	5	6	11
Training	6	6	12
Time for Implementation	2	6	8

Analysis of participants' responses to questions about MTSS implementation revealed that 12 of 12 participants made comments regarding procedural activities (see Table 5). However, a range of 6 to 10 participants made comments that fell into four open codes: Administrative Observation, Teacher/Administrator Collaboration, Noticing a Student Form, and Meetings (see Table 6). Two administrators (Participants 6 and 1) and one teacher (P10) made comments fell into each of these codes. Whereas the remaining nine participants' comments coded into a range of one to three different codes.

Table 6

Number of Participants Referencing Open Codes for Procedural Activities

Open Codes	Administrators	Teachers	Total
Administrative observation	4	3	7
Teacher/administrator collaboration	4	6	10
Noticing a student form	3	3	6
Meetings	4	4	8

Four administrators (Participants 1, 3, 5, and 6) and three teachers (Participants 10, 11, and 12) described asking an administrator to observe students who are not making progress in tier one behavioral or academic instruction (see Table 6). For example, P12 reported "I have my notes, my own observations before I would go to my director to have her come in and observe." Similarly, administrators described targeted observations of

students based on teacher concerns. P5 stated that the observation also provides the opportunity to identify gaps in implementation in the "tier one curriculum." Similarly, P1 expressed the need to identify "if it's just a material that wasn't working and they catch on with something else before we actually bring it to the MTSS table."

Additionally, four administrators (Participants 1, 5, 6, and 9) and all six teachers (Participants 2, 4, 8, 10, 11, and 12) described the importance of collaboration between the lead teacher and the administrator following the observation (see Table 6). P2 described the collaboration as "a coaching format." Similarly, P5 stated that "most of the groundwork is done between director and teacher." Participants' comments identified a variety of collaborative topics including giving feedback on the observation, identifying student needs, identifying accommodations, developing a plan, discussing intervention ideas, analyzing progress monitoring data, and identifying different ways to implement the core Montessori curriculum. P1 summed up collaboration by stating "It's me empowering them to be able to be good practitioners. And that's what we do here."

Although an equal number of administrators (Participants 1, 6, and 9) and teachers (Participants 2, 8, and 10) described the importance of completing the Noticing a Student Form, only six participants mentioned the form when describing selection of students for increased tiers of intervention (see Table 6). Both administrators and teachers mentioned the form as the first step in identifying students moving from Tier 1 or core instruction to Tier 2 intervention. For example, P2 stated "We have a form called "Noticing a Student" where you start noticing that there's a concern." Further, one administrator (P6) and two teachers (Participants 2 and 10) indicated that the form serves

to notify administrators of a teacher's concerns regarding student performance. Another teacher, P8, expanded on the use of the form when they said, "We're not just looking at the weakness of a child. We want to know the strengths of the child." Also, they indicated that the form may be used as a form of collaboration regarding student concerns. Specifically, P8 stated that the administrator "may give me some guidance after I filled it out as to – Can you explain this more or I need more data."

When describing identification of students for increased levels of tiered intervention, four administrators (Participants 1, 3, 6, and 13) and four teachers (Participants 2, 4, 10, and 11) described meetings as procedural activities (see Table 6). Participants described four kinds of meetings. One teacher, P10, described monthly meetings and "frequently coming together to share" with the director. Similarly, P6 described meeting "with every teacher every other week, for one-on-one meeting". However, neither of these participants described how these meetings fit into MTSS implementation. On the contrary, P1 stated that "with the Noticing a Student (form), we set up a meeting right away with the teacher and myself" and "we get in touch with the Director of Student Affairs and that director will set up a meeting so that we can begin the process." Also, P2, P3, and P4 described weekly core team meetings. Finally, P3 and P10 described meetings between teachers and parents to discuss student performance.

Five administrators (Participants 1, 3, 5, 6, and 13) and five teachers (Participants 4, 8, 10, 11, and 12) identified members of teams involved in implementation of MTSS (see Table 5). Participants 3, 4, 5, 8, and 13 described the MTSS core team, consisting of the director of student affairs, other directors, academic and behavioral specialists, and

the counselor. However, when asked how teachers and interventionists are selected to

implement MTSS, P13 responded by saying that "Everyone does MTSS. If you're a gen

ed teacher, if you're an assistant, if you work with children, you're doing MTSS."

Similarly, P10 stated that "all staff are kind of included in the process." P11 supported

this perspective by defining tier one as instruction provided to all students. Specifically,

they said, "The whole class would be considered tier one." However, P6 explained that

the directors and MTSS core team become involved when students require Tier 2 and

Tier 3 intervention. Finally, one teacher (P11) stressed the importance of parents as

MTSS team members. Specifically, they stated "I feel like everyone needs to be on the

same page in order to help these children out. And if it's just us and not the parents then

we're doing him or her a disservice."

Analysis of coded data revealed that eleven of 12 participants made comments

related to student specific intervention. A range of five to six participants mentioned three

different open codes: specific intervention strategies, implementation fidelity, and length

of time or frequency (see Table 7). Although no participant made comments specific to

all three open codes, four administrators and four teachers comments reflected two each.

One administrator and two teachers made comments identified as belonging to one open

code each.

Table 7

Number of Participants Referencing Open Codes for Intervention

Open Codes	Administrators	Teachers	Total
Specific intervention strategies	2	4	6
Implementation fidelity	3	2	5
Length of time or frequency	4	2	6

Although not specifically asked to describe intervention strategies, two teachers (Participants 2 and 8) described specific intervention strategies used during tiered intervention, including Orton Gillingham for reading (https://www.ortonacademy.org), Hill Center for reading and math (https://www.hillcenter.org), and Lindamood Bell for comprehension and auditory processing (https://lindamoodbell.com). Further, P8 reported the use of "evidence-based, research-based interventions." Two administrators (Participants 9 and 13) and three teachers (Participants 2, 10, and 12) shared classroom interventions used to increase students' academic and behavioral skills.

Three administrators (Participants 1, 5, and 6) and two teachers (Participants 4 and 8) identified implementation fidelity as another factor impacting the effectiveness of MTSS (see Table 7). P6 expressed difficulty with implementation fidelity

because of variability in teacher practices. For example, I have a teacher who kind of just like naturally embeds a lot of Tier 2 supports in what they do as students need it organically… And then I've got a teacher who is going to fill out six of them (Noticing a Student Form) within the first 3 weeks of school.

Participants 1 and 5 described maintaining fidelity by providing the intervention at the specified frequency. Whereas Participants 4 and 8 indicated the importance of collecting data with fidelity. P8 also indicated the importance of analyzing the data. "And if I have a child who sits for an assessment in 2 years. I had a folder on them. I never noticed them and now they're two grades behind. That's where I failed that child." Without a process for implementing interventions with fidelity accompanied by procedures for collecting

and analyzing data, teams using MTSS will not have the data needed to determine if a student's lack of progress is due to a lack of instruction or disability.

Four administrators (Participants 1, 6, 9, and 13) and two teachers (Participants 11 and 12) mentioned implementing interventions for a specific length of time or frequency (see Table 7). Five of the participants (1, 6, 9, 12, and 13) described providing interventions for 4 to 6 weeks before meeting to review the data. Only one participant described the frequency of interventions as a factor related to specific tiered intervention levels. Specifically, P13 said that "Tier 2 is like twice a week, three times a week for 20 minutes. Tier 3 is like every day for 20 minutes."

When asked about training for data collection and analysis during MTSS, participants' responses fell into three open codes: training currently provided in the research site, training needed to improve MTSS implementation, and time for professional development. Although 9 to 11 participants described current training and training needs, only one participant described the relationship between time and professional development (see Table 8).

Table 8

Number of Participants Referencing Open Codes for Training

Open Codes	Administrators	Teachers	Total
Training currently provided	5	6	11
Identified training needs	6	3	9
Time for professional development	1	0	1

Five administrators (Participants 1, 5, 6, 9, and 13) and six teachers (Participants 2, 4, 8, 10, 11, and 12) identified four types of training staff currently occurring in the research site (see Table 8). Three participants (10, 11, and 12) referred to MTSS training

that occurs at the beginning of the school year. P12 indicated that "It could be new information for new teachers, but always a review for teachers that have been here just so that we understand the process." Four participants (4, 9, 10, and 11) described training provided by administrators. Specifically, P4 indicated that "directors train them individually." Similarly, P11 mentioned "mentoring by our director," and P10 stated that "My director sends out a weekly message and sometimes she'll touch on the MTSS process." Two administrators (Participants 5 and 6) expressed the importance of less formal professional development in the research site. Specifically, P5 stated "There has been no formal training as far as to be a member of the core MTSS team or training on how to analyze the data. It's all on our own, figuring it out." Whereas P6 indicated the need for "teachers to really lean on each other so that I can get those two teachers in conversations. They can compare notes." Finally, one teacher (P2) described "a consultant that the school hired to come in last year to do some training on MTSS."

Although 11 of the 12 participants described current training, all six administrators (Participants 1, 3, 5, 6, 9, and 13) and three teachers (Participants 2, 4, and 8) identified areas of need for future training (see Table 8). These data fell into two major areas of need: implementation of the process and data. Both administrators and teachers indicated the need for training in both areas.

Four administrators (Participants 1, 6, 9, and 13) and one teacher (P8) reported a need for additional training in MTSS. Specifically, two administrators (Participants 1 and 9) and one teacher (P8) expressed a need for more training in the MTSS process. For example, P1 stated that "I just have a few that I need to go back and make sure that they

understand what the process is about and what they're looking at." Additionally, P8

identified the need for "more guidance around how to fill out the (Noticing a Student)

form, not so much what to put on the form." Two participants (6 and 8) expressed the

need for training in current intervention practices, including both intervention strategies

and the length of time needed for implementation. Finally, P13 expanded on this need by

stating that teachers need a "structured and formal way (to talk) about their MTSS

caseloads."

Two administrators (Participants 1 and 6) identified additional training needs

related to the implementation of classroom interventions. P1 identified the need to help

teachers learn to modify classroom lessons to meet the needs of individual students.

Specifically, they said "You need to do the child the honor by allowing that lesson but

modifying it to meet that child's needs. So, there's more and more education towards

how do we meet the child's needs. How do we know when to modify that material?"

Further, P9 described conversations with teachers that suggested the need for training

focused on matching data to the identified problem. In addition to training in these areas,

participants reported the need for training specific to data-based decision making within

MTSS.

Three administrators (Participants 3, 6, and 9) and three teachers (Participants 2,

4, and 8) identified the need for more training related to making decisions related to

moving students from one intervention tier to another. For example, P4 stated "Tier 1 is

everything. Maybe some more training on what a Tier 2 looks like, moving into Tier 3."

P3 expanded this thought by asking "What are your decisions, how do you decide when

that student no longer needs to be in Tier 2 and needs to move to Tier 3? Will no longer need to be a Tier 2, you know, doing fabulous and is no longer in need of MTSS interventions? So, it's a lot of little pieces that the glue we need to insert to really make it more cohesive." Finally, another administrator (P9) summed up the continued need for training in the MTSS process when they said, "I still feel teachers with the MTSS process are all over the place. And so, that is why there is so much work between the director and the teacher, to help guide them."

The final five open codes within this theme centered on time for implementation. Both administrators and teachers expressed the importance of two codes: time to implement intervention strategies and time to collect data, whereas only teachers mentioned the final three codes: time to analyze data, the impact of student and staff absences, and overall time management (see Table 9). Two administrators and all teachers made comments coded into time. No participants made comments coded into all five open codes. One participant's comments referred to four codes, three participants' comments referred to three codes, one participant's comments referred to two codes, and four participants' comments referred to one code.

Table 9

Number of Participants Referencing Open Codes for Time for Implementation

Open Codes	Administrators	Teachers	Total
Time to implement the strategy	1	3	4
Time to collect data	1	3	4
Time to analyze data	0	1	1
Student absences	0	3	3
Time management	0	3	3

Specifically, one administrator (P6) and three teachers (Participants 4, 11, and 12) indicated the impact of time on the ability to implement tiered intervention strategies (see Table 9). P11 summarized this when they said, "I might have all these plans to do, but I may not be able to do all of that, you know, get to every single child." Further, one administrator (P6) and four teachers (Participants 2, 8, 10, and 12) expressed the impact of time on data collection. P10 summed up the perspectives in this area when they said, "It's having the time during the day to sit down and collect the data." Further, P12 linked the time for implementation with the time needed to collect data when they said, "If you don't get that one-on-one time, that negatively affects you getting the observations and the data that you need on that day." One teacher (P10) also expressed the need for time to analyze data when they said, "Also, having the time after the children leave to be able to analyze because I might collect it, but it might be a mess of notes."

In addition to the impact of time on implementation of intervention strategies, data collection, and data analysis, three teachers (Participants 8, 10, and 11) mentioned the impact of student and staff absences (see Table 9). P11 explained that overall student absences could have a positive impact by reducing the total number of students in a classroom for the day. On the contrary, they went on to explain the negative impact when they said, "How can we help them if they're not in school?"

Finally, three teachers (Participants 10, 11, and 12) made comments that reflected a general reference to time management as the main thing that impacts their ability to implement MTSS (see Table 9). P10 described the biggest impact as

just any change in routine, whether it's a normal routine for us, but there's a

holiday and so the child might be more amped up, or we came back from a break

and they might, you know, different things that affect their behavior, whether it's

on either end or change in routine.

Overall, eight of 12 participants (two administrators and six teachers) described time as

having an impact on their ability to successfully implement MTSS.

Although not specifically asked about systemic improvement of MTSS, this

category emerged from participants' responses across multiple questions. A range of

three to nine participants' comments reflected the following axial codes: revision cycles,

consultation with outside collaborators, sustainability, time as a resource, and overall

perspective of MTSS implementation at the research site (see Table 10). Each axial code

contained comments by both administrators and teachers. Further, participants made

comments coded into a range of one to three codes in this category.

Table 10

Number of Participants Referencing Axial Codes for Systemic Improvement of MTSS

Axial Codes	Administrators	Teachers	Total
Cycle/revisions	6	2	8
Outside collaborators	3	2	5
Sustainability	2	1	3
Time as a resource	3	2	5
Overall perspective	4	5	9

When asked to describe implementation of MTSS within the research site, all six

administrators and two teachers described revisions to the MTSS process (see Table 10).

For example, P13 mentioned revising MTSS by "creating that structure with

intentionality and care." Additionally, P6 stated that "our MTSS handbook has now been

completely rewritten essentially from the ground up with some key parts, leftover from 5 years ago. So, in some ways, it feels like we're sort of starting from scratch again." Although P6 indicated that "we really dug in and spent some time on the work to get this handbook ready," other participants indicated that more revision may be indicated. Specifically, P4 stated, "with MTSS, I just think it still needs to be not as broad" and P3 reported, "I think it's just still for me not clear as to the benchmarks of data collection and then when everything is done." P5 summarized the cyclical nature of MTSS revisions by stating, "It's always a work in progress."

Three administrators and two teachers identified outside collaborators as key to the revisions of MTSS at the research site (see Table 10). P1 reported consultation with "an outside Montessorian." Whereas, Participants 4, 3, and 1 mentioned working with a consultant from DPI. Finally, P2 described "a consultant that came in, that the school hired, last year to do some training on MTSS, the process, as well as help produce a better document of how it would be done here." Finally, P6 reported the research site hiring "an inclusion consultant as we move towards using more of an inclusion model for our EC (exceptional children) practices." Use of multiple consultants may have resulted in slowing of the handbook revision process because not all of the revisions are approved by DPI. Specifically, P1 stated "Through the process with this other person last year, we came up with some really definitive, beautiful charts that the teachers could follow. But when DPI came in, they asked us to hold off on everything."

Two administrators and one teacher described the third axial code, sustainability (see Table 10). P5 stated that it is crucial to have "a strong core team leader who knows

and understands MTSS deeply and really knows how to guide the team." Further, P2

expressed the opinion that the research site has a director who is supportive of

accreditation as a means of "going forward so that it will always be there." P9 summed

up the concept of sustainability when they said,

> It takes time, but the more experience and years that we all work together, come
>
> together, the more cohesive it is. And I feel it only gets better and better because
>
> the more you do things, you think about things like how can we make this better?
>
> How can we make sure our teachers are understanding this process? How can we
>
> make it more streamlined, the whole process?

Three administrators and two teachers mentioned the importance of time as a

resource required to sustain MTSS implementation (see Table 10). P8 took ownership of

the need to improve by learning to "best use my time." Whereas other participants

identified time as a resource in short supply. Specifically, P12 stated, "We always feel

like we don't have time." P6 elaborated this opinion by saying, "The time thing is just

like the eternal battle with teachers and just not having the time."

Participants' overall perspective regarding MTSS in the research site emerged as

the final axial code in this category. Nine participants' comments referenced their overall

perspective (see Table 10). One administrator and four teachers expressed comments that

reflected a positive perspective. For example, P8 indicated that implementation of MTSS

supports student progress. They stated, "MTSS is really a way that I've been able to find

another way to support children who may be meeting grade level expectations." Other

participants reported a general appreciation for MTSS. On the contrary, one administrator

expressed a less positive view of the current implementation of MTSS in the research site. Specifically, P3 stated, "MTSS is, from my perspective, still not as tight as I would want it to be." Comments by one other administrator and two other teachers reflected less specific and more neutral perspectives regarding MTSS. For example, P13 stated, "It's hard because MTSS is this middle ground."

Theme 2: Staff in the research site recognize the importance of data as part of MTSS.

Participants' responses regarding the second theme reflected an understanding of the importance of data within MTSS. Specifically, their comments fell into two categories: data collection and data analysis. Data collection emerged as a category encompassing the following axial codes: lessons, observation, anecdotal notes, work samples, accommodations, assessments, background information, use of multiple data points, use of dependency on goal, reference to academic and behavioral strategies, and students' developmental stages (see Table 11). Responses to interview questions regarding this theme reflected the comments of all participants. A range of zero to four administrators and two to five teachers made comments coded into the identified axial codes. No participants' comments reflected each code. However, individual participants' comments represented one to eight different codes.

Table 11

Number of Participants Referencing Axial Codes for Data Collection

Axial Codes	Administrators	Teachers	Total
Lessons	2	2	4
Observation	2	4	6
Anecdotal notes	1	5	6
Work samples	2	2	4
Use of accommodations	0	2	2
Dependency on goal	1	2	3
Assessments	3	2	5
Background information	2	2	4
Developmental stages	1	2	3
Academic/behavioral strategy	2	2	4
Use of multiple data points	4	5	9

Two administrators (Participants 1 and 5) and two teachers (Participants 8 and 12) identified lessons as a data collection method (see Table 11). Teachers noted the importance of tracking the specifics of the lesson presentation. For example, P12 described "keeping track of how many times we're doing lessons per day." Similarly, P8 explained the use of a folder system used to document lessons, including the materials used, the number of students in the group, and the frequency with which the lesson is taught. Administrators identified the need to examine the content of the lessons and the results. Specifically, P5 mentioned "looking through what the lessons are." P1 expanded this thought by adding the need to look at the "lessons that they're just not picking up on."

Two administrators (Participants 1 and 9) and four teachers (Participants 8, 10, 11, and 12) made comments that reflected observation as another type of data collection (see Table 11). Specifically, P10 reported that data collection occurs "mostly through

different structured or unstructured observations." Similarly, P11 stated, "That's how I gather any kind of information is observing." P9 indicated that selecting students for increased levels of tiered intervention is based "a lot through working with the students and observation." Participants also described observations completed by staff members other than the lead teacher including a behavioral teacher, another educator, administrator, or specialist.

One administrator (P5) and five teachers (Participants 4, 8, 10, 11, and 12) described the use of anecdotal notes as the third type of data collection (see Table 11). The administrator and one teacher (P4) described the use of anecdotal observation notes for behavioral concerns. On the contrary, the remaining teachers recounted the use of anecdotal notes to document details of student performance. For example, P11 reported taking "notes on a daily basis in reading, writing, and math." They went on to say that they record "a lot of detail of how we did the lesson very specifically. And then what kinds of things were struggles to him, as well as what kind of accommodations I've made." Similarly, P8 related collecting "the data primarily in a more anecdotal format." P4 used vaguer terminology but described the same practice by saying "I noticed something about a specific child and then go write something down."

Two administrators (Participants 1 and 9) and two teachers (Participants 2 and 8) identified the use of work samples as the fourth form of data collection (see Table 11). Unlike the previous descriptions of documenting lessons, observations, and anecdotal notes, references to work samples were less specific. For example, P1 and 8 mentioned work samples to gather data without specifically describing the types of data collected

from this source. P9 gave slightly more detail by describing work samples as "classwork." Finally, P2 described "looking at the child's work" in conjunction with observations.

Two teachers (Participants 8 and 11) described the use of accommodations during data collection (see Table 11). Although not a type of data collection, both participants identified the importance of documenting accommodations made during lessons. P11 noted the practice of documenting accommodations. Whereas P8 described the reason for documenting accommodations when they said, "They (the MTSS core team) want to know what accommodations we may have made that maybe weren't necessarily like as in Tier one."

One administrator (P9) and two teachers (Participants 2 and 8) described data collection as being dependent on the intervention goal (see Table 11). P9 described a typical conversation with teachers explaining the relationship between data collection and intervention goals.

> What you're saying is, you're concerned that she has a problem with xxx, but based on the data that we have right now, we see no sign of this. So, what we have to do is come up with some strategies and put them into place and weekly assess to see what kind of data we are getting. So, let's look at these areas that we can measure and see what type of progress or not progress the student is making.

P8 described observing students during intervention tasks that address the area of need. Finally, P2 summed up the type of data collection used by saying that "it just depends on what their intervention is."

Three administrators (Participants 1, 3, and 9) and two teachers (Participants 2 and 8) identified formative and benchmark assessments during data collection (see Table 11). All five participants (1, 2, 3, 8, and 9) mentioned the use of iReady scores in the research site to assess third through eighth grade students' reading and math during the fall, winter, and spring. Participants 1, 2, and 3 also mentioned the use of Easy CBM to collect academic data for students in kindergarten through grade two. Finally, P2 listed other formative assessments used to collect data including assessments specific to intervention programs, running records, and reading inventories.

Two administrators (Participants 6 and 9) and two teachers (Participants 2 and 8) stated the need to consider background information as part of data collection (see Table 11). P8 expressed the need to "look at their background". Similarly, Participants 6, and 9 stated the importance of looking at students' history. Specifically, P6 described looking at background information as "one important part of the process." They went on to state that "any students that receive Tier 2 or Tier 3 supports; I get documentation if/when they rise up." P2 also emphasized the importance of looking at progress and performance in problem areas for "every single year they've been in school."

One administrator (P1) and two teachers (Participants 11 and 12) described the importance of collecting information regarding students' developmental stages when making decisions regarding the need for completing the Noticing a Student Form (see Table 11). P1, an administrator, stated that "it takes skill and knowing your students. It takes skill and understanding differences." Teachers described the importance of developmental stages in more detail. For example, P11 stated that it's "knowing with

their age what they should be able to developmentally do." Similarly, P12 described the importance of knowing "their maturity and their growth, and their ability to learn, to take responsibility for their work."

Two administrators (Participants 9 and 13) and two teachers (Participants 2 and 10) identified specific academic or behavioral data collection strategies used at the research site (see Table 11). P2 summarized data collection methods by stating "I don't think there's just one way to collect data. It just depends on what you're collecting data on and what that child needs." They went on to describe specific data collection methods such as timed math tests and fluency checks. Similarly, P9 described the use of Mad Minute math as a data collection method. Regarding data collection for behavioral strategies, Participants 10 and 13 described using tally marks or moving paper clips from one pocket to another to collect data regarding on-task behavior. Although they described specific strategies for increasing independent on-task behavior, P12 did not describe specific data collection strategies that matched the intervention.

Nine of 12 participants (four administrators and five teachers) described the use of multiple data points as the final area of data collection (see Table 11). One administrator (P13) vaguely mentioned the use of multiple data points when they said, "you're doing it – a layered x level of extra and you're documenting what the extra is, and whether the kid's responding or not." Three of the teachers (Participants 4, 11, and 12) gave more detail regarding collection of multiple data points. Specifically, P12 stated, "if I'm writing a note about him every day, I'll have a record of what I've been doing weekly with this child." Additionally, P4 indicated that "It's up to the teachers to track that data.

And go ahead and monitor and manage all those data points." One teacher (P10)

mentioned the need to "have different data points" when describing teachers and

administrators collaborating to complete observations and the Noticing a Student Form.

Two administrators (Participants 1 and 9) and one teacher (P2) described additional types

of data points collected including observations, work samples, and benchmark

assessments. Finally, one administrator (P3) described storage of data when they said,

"All the data is compiled and a lot of times it's an electronic folder and it's stored there

until the time to share."

The second category of this theme, data analysis, contained participants'

comments that indicated their recognition of the importance of the following axial codes:

identifying goals, shifting intervention tiers, and examining data trends. Responses to

interview questions regarding this theme reflected the comments of all participants (see

Table 12). A range of zero to six administrators' and three to six teachers' comments

were coded into the three identified axial codes. One administrator's comments reflected

all three axial codes in this category. Three administrators' and four teachers' comments

coded into each of two codes. Three administrators' and one teacher's comments

reflected one code each.

Table 12

Number of Participants Referencing Axial Codes for Data Analysis

Axial Codes	Administrators	Teachers	Total
Identifying goals	0	3	3
Shifting between intervention tiers	6	6	12
Data trends	3	3	6

Three teachers (Participants 2, 4, and 8) described analyzing data to identify intervention goals each from a different perspective (see Table 12). P2 mentioned the need to complete additional assessments to "really pinpoint specifically what their needs are." Whereas P8 described the importance of analyzing data to differentiate between patterns of skill deficit and a single missing skill. Specifically, they stated that when a student is missing a single skill, "That's just something I need to do. I need to give them a lesson. That's my work." Finally, P4 stated that collecting and analyzing progress monitoring data is negatively impacted by a lack of specific goal development.

Although they did not identify a particular procedure, all participants expressed the need to analyze data to shift between intervention tiers (see Table 12). When asked how they analyze data, P3 stated "We don't know. We just do. I think it's more of a like, well we've done this 4 weeks and can't really see. You know, so maybe we should try something else." Conversely, 10 participants identified the need to examine students' performance during intervention and make decisions based on progress or lack thereof. Additionally, P6 described meeting as a team to "analyze that data together."

Three administrators (Participants 3, 5, and 9) and three teachers (Participants 2, 11, and 12) mentioned examination of data trends when analyzing data to shift between intervention tiers (see Table 12). Further, P3 summarized the use of "charts and graphs to really show the progress or lack hereof." Similarly, P2 described the use of graphing the percentage of math problems correctly answered and stated, "I can track the data that way." Although both of these participants specifically referred to the use of charts and

graphs, other participants gave fewer specific narratives of looking at student data over time.

RQ2

Analysis of participants' responses to interview questions identified two themes: Pedagogy and Other School Factors (see Table 2). Eleven of 12 participants made comments that were coded into Theme 3: Pedagogy. Two axial codes made up this category: Montessori pedagogy and traditional pedagogy. Three participants' comments reflected both Montessori and traditional pedagogy. Whereas eleven participants' comments reflected only Montessori pedagogy. Five participants made comments coded into theme 4: Other School Factors (see Table 13). Only P9 did not make any comments that related to pedagogy or other school factors.

Table 13

Number of Participants Referencing Themes 3 – 4

Theme	Administrators	Teachers	Total
3 Pedagogy	5	6	11
4 Other School Factors	3	2	5

Theme 3: Staff in the research site recognize the impact of pedagogy on MTSS implementation in the research site.

Comments made by five administrators and six teachers enumerated components of Montessori pedagogy when describing MTSS in the research site (see Table 14). Analysis of interview data indicated ten axial codes under this category: daily observations, reference to specific materials, use of Montessori best practice, relationships, learning environment, record keeping, multiple opportunities for learning,

multiple grade levels, location of intervention, and Montessori certification. A range of 2

to 10 participants made comments that fell into the identified axial codes. One

administrator's comments coded into seven different codes. Whereas other

administrators' and teachers' comments coded into a range of one to four codes.

Table 14

Number of Participants Referencing Axial Codes for Montessori Pedagogy

Axial Codes	Administrators	Teachers	Total
Daily observations	1	2	3
Reference to specific materials	2	1	3
Use of Montessori best practice	4	6	10
Relationships	0	2	2
Learning environment	2	3	5
Record keeping	1	2	3
Multiple opportunities	1	1	2
Multiple grade levels	2	2	4
Location of intervention	2	1	3
Montessori certification	3	0	3

Three participants (one administrator and two teachers) mentioned daily

observations as a component of Montessori pedagogy that impacts implementation of

MTSS (see Table 14). Two teachers (Participants 2 and 12) identified observations as a

key component of data collection in the Montessori classroom. For example, P12 stated

"We're observing all of our students, anyways. Observation is our way of life and data."

Although teachers recognized the importance of observing, one administrator (P1) noted

"my staff continues to build their observational skills."

Three participants (two administrators and one teacher) described specific

Montessorian materials when describing MTSS implementation (see Table 14). For

example, one administrator (P1) suggested that teachers support children's learning

"through the sandpaper letters, through the moveable alphabet, through fetching games."

The other administrator (P5) emphasized the flexibility of using hands-on materials.

Specifically, they stated that "There's always these modifications because they're hands-on materials and it's not worksheets and everybody kind of doing along." Finally, P2 (a teacher) specifically explained using moveable alphabet and sandpaper letters but indicated "you may need to look at some other alternatives" if the student does not make progress.

Four administrators (Participants 1, 5, 6, and 13) and six teachers (Participants 2, 4, 8, 10, 11, and 12) described the relationship between Montessori best practice and the three tiers of MTSS (see Table 14). Three participants (1, 2, and 5) mentioned Montessori core curriculum as MTSS Tier 1 instruction provided to all students. For example, one administrator (P1) stated "Tier 1 is best Montessori practices, which is rather lengthy." Similarly, a teacher (P2) reinforced this when describing the accreditation process. "Our Tier 1 core instruction is really getting heavily into really strengthening our Montessori roots." Finally, P5 described "all of the children being Tier 1 and making sure that we are within integrity of our Montessori curriculum." P6 summarized the difficulty of implementing MTSS within a Montessori school when they said, "It's a really valuable challenge to take on which is that like marrying of those two sorts of worlds."

One administrator (P13) described acceptance of diversity within Montessori best practice (see Table 14). They stated that "It's embedded in the Montessori model, in our curriculum, and how we approach lots of things with kids from a very young age and talking very transparently about the diversity of humankind." Similarly, three participants

(6, 10, and 11) stated that Tier 2 interventions occur naturally within the classroom. Specifically, P6 described increased levels of tiered intervention by saying, "… Tier 2 or Tier 3 supports are embedded so much in the practices that you do for every child anyway that determining and deciphering who's receiving those specifically and who needs to be tracked and where we need data. That can be really tricky." Although most participants referred to overall benefits, one teacher (P4) indicated that use of the Montessori pedagogy may negatively affect the implementation of MTSS. Specifically, "The way Montessorians go about their whole curriculum is so different. I'm just not sure that we're tracking the needs."

The responses of two teachers (Participants 10 and 11) suggested the importance of relationships between students and staff (see Table 14). Although their comments were brief, P11 stated "you have to get to know them and, you know, you have to build trust." P10 elaborated on this when describing MTSS implementation by saying, "I feel like it's working well for a school and especially for the older grades where they really have the children for a longer time and get to know them more."

Five participants (two administrators and three teachers) identified the learning environment as another subcategory related to components of Montessori pedagogy impacting MTSS implementation (see Table 14). The three teachers (P2, 4, and 11) described the activity of students in the classroom. For example, P2 stated "it's not like everybody's doing the same thing at the same time in class." Similarly, P11 described activities in the classroom "(children) doing their own independent work, pulling certain children or small groups to do lessons, but it flows very nicely." Further, P4 reported that

"the kids have a lot of leeway." On the other hand, administrators (Participants 1 and 5) described the support provided by teachers. Specifically, P5 stated that accommodations and modifications are required "for every child to be successful in acclimating to a Montessori environment." Finally, P1 suggested "there's ways that you can do this within the classroom setting that you do not have to remove the student." Overall, P1 summarized the classroom when they said, "that's a big thing of the Montessori environment, that executive functioning is so crucial."

One administrator (P3) and two teachers (Participants 11 and 12) explained the record keeping component of Montessori pedagogy within MTSS implementation (see Table 14). Participants 11 and 12 described recordkeeping as a system for documenting lessons. For example, P12 stated,

> We record keep because we're looking at what lessons we're giving the children. So, we all have a system of let's say, in each interest area in our classroom, like if it's math or if it's language. We have sheets that we can document the lessons and we can check off what children have gotten those lessons.

On the contrary, P3 indicated the need to document student performance when they said, "Right. So, I think because we don't give grades, I think it's whatever their internal process progress monitoring is."

One administrator (P1) and one teacher (P12) noted the multiple opportunities for provision of lessons, practice of skills, and ways of learning within the Montessori pedagogy (see Table 14). P1 stated that Montessori provides "multiple opportunities to experience lessons in multiple ways so that the child can begin to put two and two

together." Similarly, P12 said, "We do have the freedom to vary and extend our lessons in any way that meets the child's needs."

Two administrators (Participants 5 and 13) and two teachers (Participants 4 and 10) explained the benefits of teaching multiple grade levels in the same classroom (see Table 14). Within this component of Montessori pedagogy, students are grouped into classrooms based on a 3-year cycle. Children's House is a multi-age classroom at the research site comprised of 3-year-old preschool, 4-year-old preschool, and kindergarten students. Students in grades 1-3 attend Lower Elementary, and students in grades 4-6 attend Upper Elementary. is. Middle School is the final level taught at the research site. P4 specified the benefit of this structure when they said, "it gives the kids more chances to learn and to work and see how other kids are working within their classroom." On the contrary, participants responsible for children in preschool and kindergarten reported the inability to maintain the typical Montessori 3-year cycle because the school is a public charter school. Specifically, P5 stated "We do not have the luxury of having our children for 3 years." Similarly, P10 explained that their students did not benefit from the 3-year cycle because "We only had them for one year because they got in the lottery for kindergarten then they're moving up."

Two administrators (Participants 1 and 13) and one teacher (P8) mentioned the location of intervention as a component that impacted MTSS (see Table 14). For example, P8 described a student who "was able to see a reading specialist here on campus who pulled her for small group." P13 gave more detail by recounting a process in which the interventionist "collects a kid and meets in the hallway. Tier 3 is like every day for 20

minutes usually outside the room." On the contrary, P1 reported providing interventions within the classroom. Specifically, they said, "We're about the least restrictive environment, and we're about including and bringing people into the classroom as much as we possibly can.

Three administrators (Participants 1, 6, and 13) emphasized the importance of Montessori certification as a subcategory of this theme (see Table 14). P1 mentioned a "Montessori based interventionist" and P6 stated that "every lead teacher at our school is Montessori trained." P13 indicated the need to "hire with an eye toward someone with a knowledge of the Montessori model and experience." However, no teachers identified Montessori certification as a component related to implementation of MTSS.

Within the category Traditional Pedagogy, three participants' comments reflected two different axial codes. One administrator (P13) and two teachers (Participants 2 and 8) mentioned state standards as a subcategory of traditional pedagogy impacting MTSS in the research site. Whereas only teachers commented on the second code: use of non-Montessori resources (see Table 15). For example, P2 stated "We are really focusing on Montessori as our core and the philosophy of Montessori also meshing that with the requirements from the state." Further, they identified this process "as kind of complicated." P2 and P8 described the importance of non-Montessori resources. Specifically, P8 said MTSS "allows us to look at what other resources could we use outside of our Montessori curriculum." Further, both participants identified specific resources used in the research site including Orton Gillingham (P8) and Lindamood Bell (P2).

Table 15

Number of Participants Referencing Axial Codes for Traditional Pedagogy

Axial Codes	Administrators	Teachers	Total
State standards	1	2	3
Non-Montessori resources	0	2	2

Theme 4: Staff members recognize other school factors that influence MTSS

implementation in the research site.

A total of three administrators and two teachers made comments that aligned with

the final theme: other school factors (see Table 16). One administrator and two teachers

mentioned the first category: charter school. On the contrary, three administrators and

one teacher made comments coded into the second category: school culture. Two

participants made comments coded into both categories: charter school and school

culture. Whereas the other three participants' comments reflected only one category each.

Table 16

Number of Participants Referencing Theme 4 – Other School Factors

Axial Codes	Administrators	Teachers	Total
Charter school	1	2	3
School culture	3	1	4

One administrator (P13) and two teachers (Participants 8 and 11) made comments

that indicated the impact of the charter school (see table 11). Specifically, P8 referenced

that "because we are a Montessori school first and charter school hand-in-hand is that we

do follow the child as our Montessori training has taught us." However, P13 stated that

the charter school creates the need for increased accommodations and modifications that

P11 equated as Tier 2 interventions. Specifically, P13 stated that "kinders are off the

lottery and not the same as the 4-year-olds the year before. So that does compromise the integrity of our Montessori model and being a 3-year cycle at the children's house level." P11 expanded this by linking the impact of the charter school to MTSS implementation. Specifically, they said, "Since it is charter for the kindergarteners, we only get them one year, which normally at a Montessori school, we would have them for 3 years. So, that can make things slightly difficult, dealing with MTSS."

Four participants (three administrators and one teacher) described other school factors as components impacting MTSS implementation (see Table 16). For example, P5 indicated that "It's the structure that the school has set up for them (teachers). It does require so much documentation." P6 stated that "It's often something that's a little bit more formalized in the MTSS process, and that we're a fairly large school. That presents a significant challenge." On the contrary, P13 reported one benefit of the size of the school when they said, "Our school is big enough that the MTSS numbers are high enough that they justify a staff." Finally, P11 stated "We have a lot of resources."

Evidence of Trustworthiness

Credibility

Credibility of research supports the end user's ability to depend on the truthfulness of the results (Kyngas et al., 2020). Merriam and Tisdell (2016) described member checking as a method used to gather feedback regarding the themes identified during data analysis. Member checking consisted of emailing themes and categories to each of the 12 participants and asking them to review and respond via email regarding the credibility of the identified themes within a two-week period. The text of the email stated

that the themes and categories would be determined to be credible if the participant did

not respond. Four teachers/interventionists and two administrators responded to the

email. Each participant's response supported the credibility of the identified themes.

Additionally, the response from one participant indicated the perceived importance of the

overall study. Specifically, P2 expressed appreciation for "taking the time to do this

important work."

Transferability

To increase the likelihood that research results can be transferred to other settings,

Merriam and Tisdell (2016) and Daniel (2019) emphasized the need for researchers to

include descriptions of study details, as well as the study sites and participants. The

purpose of this basic qualitative research study is described in Chapter 1, as well as at the

beginning of this chapter. The research site described is in Chapter 1. Because all

interviewees are from the third research site invited to participate in the study, the setting

section of this chapter includes descriptions of that site, as well as individuals who chose

to participate in the interviews. Detailed descriptions of the methodology used are

included in Chapter 3, as well as in the data collection and data analysis sections of this

chapter. Technology changes that occurred during data collection are described in that

section of this chapter.

Dependability

Nowell et al. (2017) suggested researchers use a reflexive journal to document

daily decisions regarding research, as well as to document personal reflections. I

maintained a password protected digital reflexive journal beginning with the initial

invitations emailed to participants and continuing throughout analysis of the interview data. Information documented in the journal included all contacts with participants, as well as data collection procedures. I also included changes made to the data collection procedures due to technological interruptions including changes in the platform used to conduct the interviews and the software system used to analyze data. In addition to the reflexive journal, I maintained a password protected audit trail to document decisions made during data collection, including changes made during analysis and personal reflections.

Confirmability

Korstjens and Moser (2018), Kyngas et al., (2020), and Xerri (2018) suggested the use of a reflexive journal to document researcher bias and preconceptions that arise over the course of the study. As outlined in Chapter 3, I used the reflexive journal to document reflections and self-evaluation. Because I am employed at a public school that implements MTSS within traditional pedagogy, I carefully reviewed my decisions during data collection and analysis for points of bias that may have arisen due to the differences in pedagogy. I documented daily notes during data collection and analysis to capture possible points of bias, as well as preconceptions.

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Summary

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Chapter 4 included information about the research setting and participants, data collection and data analysis procedures, results of the study, and evidence of trustworthiness. Analysis of interview data revealed four major themes. Two themes related to RQ1 and involved implementation methods administrators and teachers use

during data collection and analysis. These themes included staff recognition of MTSS

implementation components and staff recognition of the importance of data as part of

MTSS. The final two themes related to RQ2 and reflected components of pedagogy and

other school factors impacting MTSS at the research site. These themes were staff

recognition of the impact of pedagogy and staff recognition of the impact of other school

factors. Chapter 5 includes interpretations of findings, limitations of the study,

recommendations, and implications of the study.

Chapter 5: Discussion, Conclusions, and Recommendations

Policy changes and an addendum to the NC-DPI Policies Governing Services for

Children with Disabilities (NC-DPI, 2016d) implemented on July 1, 2020 resulted in

changes to criteria for eligibility determination in the category of SLD, which required

consideration of multiple data sources including data that were collected and analyzed

through MTSS. A problem exists as staff in NC public Montessori charter schools must

implement MTSS strategies that are designed for traditional schools as they collect and

analyze data. The purpose of this basic qualitative study was to identify administrators'

and teachers' perspectives of the data collection and analysis components of MTSS.

Analysis of data via individual interviews of administrators and teachers in a public

Montessori charter school revealed two themes related to MTSS implementation methods

and two themes related to the environment.

In Chapter 5, I interpret results regarding MTSS implementation. I address

limitations to trustworthiness that arose during research. Based on results of the study and

the literature review in Chapter 2, I focus on recommendations for further research.

Finally, I present implications of study findings, including implications for social change.

Interpretation of the Findings

Special education policy in NC requires collection and analysis of data using

MTSS. Teams using cyclical feedback demonstrated increased ability to identify and

implement data-based actions such as those that are required when making decisions

regarding changes involving instructional focus, intensity, and frequency (Abbott et al.,

2017; Schildkamp & Poortman, 2015). The following research questions were developed to identify and describe implementation of MTSS in a public Montessori charter school.

RQ1: What implementation methods do administrators and teachers use during data collection and analysis within MTSS as a component of SLD eligibility in a public Montessori charter school?

RQ2: What components of the Montessori pedagogy do administrators and teachers identify as impacting their ability to implement MTSS?

I used implementation science as the conceptual framework for this study. This involved emphasizing the importance of interactions between effective interventions, effective implementation, and implementation contexts (Fixsen et al., 2015). Specific to the current study, effective intervention and effective implementation referred to participants' knowledge and understanding of the implementation process, as well as their perspectives of and ability to use student data to adjust instructional intensity. During analysis of participants' responses to interview questions about MTSS implementation, I identified the following themes: MTSS implementation components, data as part of MTSS, the impact of pedagogy, and the impact of other school factors. In the remainder of this section will I address comparisons between participants' responses and literature on MTSS and implementation science.

Knowledge and Understanding of the Process

Theme 1: Staff in the research site recognize MTSS implementation components.

It is important to operationally define components of interventions to increase implementation fidelity (Fixsen et al., 2015; Jackson et al., 2018). Although no teachers

mentioned the existence of a MTSS manual or handbook, all six administrators at the

research site mentioned it. However, only two of six gave in-depth information about its

contents. Further, these two expressed opposing opinions about the usefulness of the

handbook, suggesting administrators may not have a firm knowledge of all MTSS

intervention components in the manual. Similar to Braun et al. (2020), opposing opinions

about the usefulness of the handbook may be due to multiple changes in the process since

implementation. Additionally, lack of information from teachers may indicate they do not

have a solid understanding of the MTSS process.

When describing MTSS within the research site, participants mentioned the

MTSS process as a process or plan that was made up of specific steps. However, only

half of participants presented a clear understanding of MTSS procedures. For example,

P3 stated, "Right now, we do the work, but people still don't know. They don't know

what the real, full process is." Lack of procedural understanding may negatively impact

the sustainability of MTSS within the research site.

When discussing MTSS, participants described procedural activities, team

members, specific intervention strategies, training, and time as factors impacting

implementation. Cossentino (2010) recommended procedural activities that included

collaborative conversations during which teachers discuss student data, instructional

strategies, and progress monitoring. Further, literature supported the use of a Child Study

Protocol to guide discussion of student progress and participants (Jones & Cossentino,

2017). Although 10 participants described the importance of collaboration between

administrators and teachers to discuss instruction and progress monitoring, they did not

describe use of a protocol to guide discussions. Further, six participants described early procedural activities such as observation of students and completion of the Noticing a Student Form. Although participants in the research site identified the importance of collaboration, they did not consistently identify early steps in the identification of students needing increased tiers of intervention.

Jackson et al. (2018) stated implementation teams are responsible for selecting staff members. Further, Eagle et al. (2015) reported these teams consist of staff members from various traditional roles, including administrative leaders, school psychologists, and lead teachers. Similarly, participants indicated MTSS implementation team members represented a variety of roles including administrators, teachers, counselors, and academic and behavioral specialists. P13 stated "everyone does MTSS." Similarly, P10 alluded to being selected to implement MTSS and said, "all staff are kind of included in the process." Although they reported all teachers participated in implementation, participants indicated teachers were not consistently included in the MTSS core team. Schildkamp, Smit, and Blossing (2019) stated leadership distributed across school personnel resulted in effective MTSS implementation. Although teachers are not consistently included in core MTSS meetings at the research site, administrative staff has begun to distribute leadership by including academic and behavioral intervention staff in these meetings.

Cakiroglu (2015), Jackson (2018), and NIRN (n.d.) emphasized the importance of maintaining fidelity when implementing interventions. Further, Mason and Smith (2020) identified the importance of considering intervention dosage. Although intervention is a

key component of MTSS, less than half of the participants described intervention strategies, fidelity, or frequency. Specifically, two participants mentioned the frequency of intervention, while two participants emphasized the importance of collecting data with fidelity. Additionally, one participant specifically identified variability in teacher practices as a factor that prevents implementation fidelity in the research site (P6).

To sustain MTSS implementation, leadership teams must create and provide professional development and continued coaching (Eagle et al., 2015; National Association of School Psychologist, 2016). Eleven of the administrators and teachers at the research site described the current professional development activities that ranged from review of the MTSS process at the beginning of the school year to demonstration of intervention strategies during meetings between interventionists and teachers. Although they identified current professional development activities, three-quarters of the participants identified additional training needs. Similar to early MTSS research (Meyer & Baher-Horenstein, 2015; Charlton et al., 2018) and research conducted more recently (Espin et al., 2021; Schildkamp, Smit, & Blossing, 2019; Swain & Hagaman, 2020), administrators and teachers identified the need for additional training in implementation of the MTSS process, including specific strategies, modification of classroom lessons to meet student needs, the length of time needed for implementation, and data collection and analysis.

In addition to professional development, participants indicated that time was a factor impacting sustainable implementation of MTSS in the research site. Similarly, Meyer and Behar-Horenstein (2015), Schildkamp, Smit, and Blossing, (2019), and Swain

and Hagaman (2020) identified the lack of time for implementation of evidence-based practices and data-based problem-solving as a factor that impacts effective MTSS implementation. Specifically, participants in the current study stated that they lack the time needed to implement strategies and to collect and analyze data. Teachers also identified time management and student absences as factors that negatively impacted their ability to implement MTSS.

Duda et al. (2014) and Jackson et al. (2018) described the importance of utilizing systemic review and adjustment to improve and sustain implementation of MTSS. Within the research site, participants mentioned systemic improvement of both the MTSS process and the overall nature of the Montessori pedagogy. Two-thirds of the participants described revisions to the MTSS handbook and process. Further, administrators and teachers described collaboration with individuals outside the site including a non-Montessori trained consultant from NC-DPI and a Montessori trained consultant. Regarding Montessori pedagogy, participants described the efforts of the director's current focus on attaining Montessori accreditation at the research site. Although continued revisions to the MTSS handbooks and administrative support in the research site provide evidence for the presence of activities directed toward sustainability of both the MTSS process and the overall Montessori pedagogy, the use of multiple consultants with differing pedagogical backgrounds may have resulted in slowing of the handbook revision process.

van Geel et al. (2017) and Schildkamp, Smit, and Blossing (2019) identified instructional leadership and distributed leadership as two components needed to sustain

MTSS implementation. Further, Meyer and Behar-Horenstein (2015) reported that a lack of district and school-based leadership negatively impacted successful implementation of tiered intervention. Participants in the current study described the importance of leadership as a component of sustainability. Although teachers did not describe the presence of instructional or distributed leadership, one administrator described the benefit of instructional leaders who support MTSS by identifying target goals and assisting in the implementation of tiered interventions. Further, one participant stated that sustainability in the research site is supported by a core MTSS team leader with a good understanding of the process. Although not identified by all participants, distributed instructional leadership may support MTSS sustainability in the research site.

According to NIRN (n.d.), sustainability also relies on identification and removal of barriers to implementation. Meyer and Behar-Horenstein (2015), Schildkamp, Smit, and Blossing (2019), and Swain and Hagaman (2020) reported that time is one such barrier. Similarly, study participants identified time as a resource impacting sustainability in the research site. Specifically, they stated that time impacts professional development activities, implementation of tiered interventions, data collection, and data analysis.

Ability to Use Data

Theme 2: Staff in the research recognize the importance of data as part of MTSS.

MTSS teams must collect and use data to identify and adjust instructional targets (Beck and Nunnaley, 2021; Bertram et al., 2015). Additionally, without examination of data, students may not receive the appropriate level of intervention intensity (Bundock et al., 2018; Gersten et al., 2017; Mason & Smith, 2020). Participants in this study described

the importance of data collection for all students across all three tiers of MTSS. Although their comments focused on 11 different aspects of data collection, participants' comments described a range of one to eight different aspects. Five of the aspects focused on data collection activities used for all students including documentation of lessons taught, observations, anecdotal notes, work samples, and assessments. Additionally, participants described the importance of collecting information regarding a student's background and comparing current performance with developmental stages. Participants also described the importance of collecting multiple data points on the use of accommodations, as well as collecting data specific to target goals. Further, some participants described specific strategies used to collect academic and behavioral data.

Although they described a variety of data collection aspects and emphasized the importance of examining multiple data points, participants' comments indicated a tendency to collect anecdotal information. Similar to the results of previous research (Ho, 2022; Vanommel, 2021), the lack of data from a variety of sources may prevent teams in the research site from effectively analyzing data to make data-based decisions regarding changes in instructional intensity.

Analysis of intervention data is a critical component of data-based problem-solving. Specifically, teams must closely examine progress monitoring data to determine the root cause for the lack of student achievement (NC-DPI, 2015a). However, Cavendish et al. (2016), Patrikakou et al. (2016), and Sun et al. (2016) reported that teachers lacked the knowledge required to effectively examine and evaluate data. Similarly, Swain and Hagaman (2020) and Wachen et al. (2018) reported that teachers demonstrated the skill

to identify and monitor student performance data but did not use the data to drive instructional changes. All participants in the current study identified the need to analyze data, and 10 of 12 participants reported making decisions based on progress or a lack thereof. P2 and P3 described the use of charts and graphs to evaluate student progress. P3 reported making decisions based on the length of time an intervention was used. P6 indicated that data analysis happened during team meetings. Although no participants described specific analysis procedures, administrators and teachers in the research site expressed an understanding of the need to analyze data when making decisions about the intensity of tiered intervention.

Implementation Context

Theme 3: Staff in the research site recognize the impact of pedagogy on MTSS implementation.

Duda et al. (2014), Gerzon (2015), and Marsh and Farrell (2014) described the importance of the context where implementation occurs. Three administrators mentioned "Montessori certification" but did not describe the impact on MTSS. Ten participants emphasized the importance of using Montessori best practices throughout all tiers of MTSS. Both administrators and teachers identified nine components of Montessori pedagogy that impact MTSS in the research site. However, no more than five participants mentioned the impact of each of the other components including daily observations, use of Montessori materials, learning environments, record keeping, multiple opportunities for learning, multi-age classrooms, and the location of intervention. When describing the environment, participants mentioned students selecting their independent work as well as

teachers pulling students individually and in small groups. Although they did not mention the impact of uninterrupted work periods, most participants indicated that other components of Montessori pedagogy are conducive to the use of accommodations, modifications, and tiered intervention within MTSS. Gerker (2023) stated that Montessori teachers in public schools expressed difficulty implementing policies designed for traditional schools in Montessori classrooms. Similarly, one participant in this study described the challenge of implementing strategies based on traditional pedagogy in the Montessori classroom. Although another participant stated that the pedagogical difference may prevent teachers and administrators from effectively tracking students' needs, Ho (2022) and Vanlommel et al. (2021) reported that teachers can successfully utilize qualitative data when making decisions about student progress. Qualitative and quantitative data provide the range of sources needed throughout the data-based decision-making process (Fjortoft & Lai, 2021; Mandinach & Schildkamp, 2021). Most participants in the research site appear to be aware of components of Montessori pedagogy that support MTSS. Whereas other participants recognize the difficulty blending traditional teacher directed instruction within a child-directed instructional classroom.

Although some participants stated that they use Montessori materials when providing tiered interventions, two participants reported that they use programs and assessments typically used in schools with a more traditional pedagogy. Similar to Weisenburgh-Snyder et al. (2015), participants reported the use of evidence-based interventions in math and reading as part of Tier 3 MTSS intervention. Specifically, they

mentioned the use of Hill Math, Orton Gillingham, and Lindamood Bell. In addition to using more traditional teacher-led interventions, one participant described the need to consider state MTSS requirements.

Theme 4: Staff in the research site recognize other school factors that influence MTSS implementation.

Study participants identified two additional school factors that impact MTSS implementation. One factor focused on the research site as a charter school. Attendance at a charter school in NC begins at the kindergarten level. However, the children's house multi-age classes are comprised of 3-, 4-, and 5-year-old students. Although the age range at this level is typical of Montessori pedagogy, 3- and 4-year-olds are not part of the charter school. On the contrary, only 5-year-olds attend as charter school students. One participant indicated that not having students for 3 years makes things "slightly difficult dealing with MTSS." Participants teaching and leading other multi-age levels did not identify impacts of the charter school on MTSS implementation. Therefore, the impact of charter school status on MTSS implementation may be restricted to students newly enrolled in the school.

Four participants also stated that the overall school culture is a component impacting MTSS implementation. Because of the size of the research site, two participants reported that the research site has ample resources, including MTSS interventionists. However, another participant indicated that the research site utilizes a structured MTSS process requiring large amounts of documentation. Although the site

size may provide the resources required to implement MTSS, the structure and documentation required by the current program may impact sustainability.

Limitations of the Study

The results of this study identified participants' perspectives of MTSS. However, limitations may impact transferring the results to other groups. Although the potential pool of 90 participants represented two research sites, the 12 participants worked at a single site which may limit transferability across other public Montessori charter schools. Further, the results may not be transferable across other educational settings, such as private Montessori schools, Montessori high schools, and public charter schools with different pedagogy.

Another possible limitation of the study centers on the age ranges participants served. Within the research site, each classroom level is designed to educate three age/grade levels of students. Specifically, Children's House serves 3-year-old preschool, 4-year-old preschool, and kindergarten students. Students in subsequent levels are grouped as follows: Lower Elementary serves first through third grade students, Upper Elementary serves fourth through sixth grade students, and Middle School serves seventh through ninth grade students. Because four participants were from a single level, the results of this study may not transfer across other multi-age levels. However, transferability may be possible as five participants stated they worked with students and staff across more than one multi-age level.

Recommendations

Although the current study adds to the research base of MTSS within public Montessori charter schools, transferability of the results is limited as the participants worked at a single site. Additional acquisition of teachers' and administrators' perspectives from a variety of sites would provide a database that could be used to validate or refute the results of this study. Further, research completed across settings could increase the number of participants in higher grade levels who may have more experience with data collection and analysis as part of the special education eligibility process. Specifically, future research should focus on the perspectives of teachers and administrators working with students who are in lower elementary, upper elementary, or middle school.

Data from this study included a brief examination of participants' pedagogical background. Eight participants reported working in schools with Montessori pedagogy for 1 year through more than 15 years. Additionally, two participants indicated that they had experience with both Montessori and traditional pedagogy and two participants reported only using traditional pedagogy prior to working in the research site. However, I could not separate and analyze data by pedagogical background without risking a breach in confidentiality. Purposeful sampling of a larger number of participants with Montessori and traditional pedagogical backgrounds could facilitate exploration of the impact of pedagogical experience on perceptions of data collection and analysis.

Finally, future researchers examining MTSS data collection and analysis within public Montessori charter schools should consider using case study methodology and

including data from interviews, documents and activities centered on data collection and analysis, such as the handbook and forms, professional development materials, and observation of MTSS data discussions. The data could allow researchers to compare teachers' and administrators' perspectives with policies and procedures taught and implemented within public Montessori charter schools.

Implications

The purpose of this basic qualitative study was to identify administrators' and teachers' perspectives of the data collection and data analysis components of MTSS in public Montessori charter schools. Analysis of interview responses served to answer the two research questions, as well as to identify aspects of implementation that impact data collection and analysis within a public Montessori charter school. These aspects may serve to describe the gap between research and practice when exploring data collection and analysis in MTSS.

One positive social change resulting from this study centers on organizational changes that may increase the fidelity of data collection and analysis in the research site. Although some participants stated they used the MTSS handbook throughout that process, other participants reported confusion once students are identified in need of tiered intervention. Jones and Cossentino (2017) suggested teams use the Child Study Protocol to develop action plans that document student specific goals, describe interventions, and guide data collection. This, or a similar, protocol could provide teachers and administrators in the research site with the structure needed to increase the fidelity of data collection and analysis. Nelson et al. (2015) recommended the use of a

self-monitoring checklist could increase implementation fidelity. Additionally, Saylor et al. (2018) described the use of supportive accountability within Montessori schools. The research site should consider using self-monitoring checklists, accountability teacher pairs, and action plans to increase implementation fidelity.

Another positive social change at the organizational level centers on the training needs identified by participants. Specifically, they reported the need for professional development directed toward data collection specifically designed to measure progress toward identified student goals. Additionally, they described the need for training and practice analyzing progress monitoring data. Marsh et al. (2015) described the use of multiple training sessions to increase teachers' ability to use data to adjust intervention strategies. Similarly, Webb and Michalopoulou (2021) identified the importance of providing training for teams who work together. Successful training may take the form of professional development or evidence-based coaching (Begeny et al., 2023; Gesel et al., 2021). Therefore, team training and practice in data analysis and data-based decision making may help close the gap between research and practice.

Conclusion

I completed this basic qualitative study to identify teachers' and administrators' perspectives regarding data collection and analysis during MTSS within public Montessori charter schools. Although these two components of data-based decision-making are critical when examining student progress monitoring data to determine eligibility for special education in NC, there is a gap between what is described in MTSS research and required by NC policy and what is identified in practice. When asked a

series of interview questions, participants in the research site described their perspectives

of MTSS implementation, including data collection and analysis. Qualitative analysis of

responses revealed four overarching themes. Staff in the research site recognize the

components of MTSS implementation, recognize the importance of data within MTSS,

recognize the impact of pedagogy on implementation, and recognize the impact of other

school factors on implementation. However, they expressed the need for further training,

specific to data analysis and decision-making.

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Appendix A: Interview Questions

Research Questions:

1. What implementation methods do administrators and teachers utilize during data collection and analysis within MTSS as a component of SLD eligibility in a public Montessori charter school?

    - How are staff selected and trained to collect and analyze data within MTSS?

    - How do you collect and analyze data for your students?

    - How do you select students for tiered intervention?

    - How do you adjust intervention tiers?

    - What impacts your ability to collect and analyze data?

2. What components of the Montessori pedagogy do administrators and teachers identify as impacting their ability to implement MTSS?

    - How are staff selected and trained to collect and analyze data within MTSS?

    - How do you collect and analyze data for your students?

    - How do you select students for tiered intervention?

    - How do you adjust intervention tiers?

    - What impacts your ability to collect and analyze data?