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PRESERVICE TEACHERS' PERCEPTIONS AND KNOWLEDGE OF RESPONSE TO INTERVENTION/MULTITIERED SYSTEMS OF SUPPORT

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PRESERVICE TEACHERS' PERCEPTIONS AND KNOWLEDGE OF RESPONSE TO INTERVENTION/MULTITIERED SYSTEMS OF SUPPORT

Abstract

There has been considerable research that establishes the need to improve teachers' knowledge of and ability to effectively implement response to intervention (RtI)/multi-tiered systems of support (MTSS), and there is a scarcity of research examining interventions addressing these concerns. In a mixed methods study, we examined the perceptions and knowledge of the RtI/MTSS frameworks of undergraduate preservice teaching candidates enrolled in a dual certification program at a small, private Catholic university in Kentucky, before and after participating in a semester-long, experiential learning project. The project involved monitoring both the reading and mathematics progress of struggling elementary or middle school-aged students using validated Curriculum Based Measures. Preservice teachers worked in concert with the cooperating classroom teacher and their professor to score, graph, and interpret CBM results and make recommendations for high-quality, research-based intervention. Results from participants indicate their concern that not all teachers will enter the profession with knowledge of RtI/MTSS. Further, the experiential learning project intervention enhanced preservice teachers' perceptions and knowledge of RtI/MTSS frameworks.

Keywords

Teacher education, RTI/MTSS

The Response to Intervention (RtI) paradigm arose in response to findings that the traditional IQ-Achievement discrepancy model used to identify specific learning disabilities was fundamentally flawed (e.g., Ysseldyke et al., 1982). It was found that the IQ-Achievement discrepancy model either denied services to some struggling students or delayed provision of services until students were far enough behind to evidence a significant discrepancy between their potential cognitive ability and their perceived academic performance (Bradley et al., 2007; Gersten & Dimino, 2006). The reauthorization of the Individuals with Disabilities Education Improvement Act (2004) allowed schools to intervene and provide preventive services to more students earlier in their school careers through implementation of RtI. The preventive framework is a multitiered system of supports (MTSS) that “involves universal screening, evidence-based instructional programming and curricula, routine progress monitoring of all students, increasingly intensive supplemental support and intervention for struggling students, and effective teaming practices” (Jimerson et al., 2016, p. 1). It is important to describe RtI as part of MTSS, as MTSS provides the underlining structure of the three-tiered framework for supporting students in academic, behavior, and social-emotional outcomes (Eagle et al., 2015).

Considerable research has addressed the complications inherent in implementing RtI/MTSS effectively (see Fuchs & Fuchs, 2017). Of particular concern is the need for explicit training of teachers in effectively implementing RtI/MTSS. Findings from survey research in recent years on the knowledge and perceptions of pre-service teachers provide evidence that preservice teachers do not feel confident in their ability to implement RtI effectively (Barrio & Combes, 2015; Beckman, 2019; Vollmer et al., 2019). Only a few exploratory studies were found that investigated the impact of field-based interventions on pre-service teachers' knowledge and ability to effectively implement RtI practices: Hawkins et al. (2008) and Hurlbut and Tunks (2016).

Hawkins et al. (2008), gathered teacher and student level data resulting from a grant-funded collaboration between the special education and school psychology departments at a university and two field-placement supervisors from a kindergarten classroom with a high percentage of struggling readers. Two graduate student trainees assisted in creating and implementing interventions and monitoring student progress within the three tiers of the RtI paradigm under the supervision of faculty members and supervisors from the kindergarten classroom. Researchers reported successful trainee outcomes as well as successful student level outcomes for the kindergarten participants. Specifically, both trainees earned rubric scores of competent or highly competent from both faculty supervisors on two outcome measures: a professional practice portfolio and a teacher work sample (e.g., lesson plan and analysis of student learning). Regarding student outcomes, at baseline, 52% of the 22 kindergarteners were performing below mid-year benchmark

measures. After the five-week intervention, all 22 students had met or exceeded their goal on the Phoneme Segmentation Fluency assessment of the DIBELS for at least 2 consecutive data points and 77.27% of the class met the Nonsense Word Fluency assessment goal at least twice. Despite the success of the research by Hawkins et al., in subsequent years no replications or extensions of their work were located.

Hurlbut and Tunks (2016) conducted a qualitative study to investigate knowledge and perceptions of RtI and ability to transfer said knowledge to classroom application for pre-service elementary education teachers enrolled in a course on methods of teaching mathematics to elementary school aged students. Participants ranged in their specializations: one was pursuing a degree focused on bilingual education, six were studying special education, and 15 were pursuing a degree teaching English as a second language. Outcomes of the study included interviewing and analysis of teacher work samples. Similar to Hawkins et al. (2008), Hurlbut and Tunks' (2016) study involved preservice teachers working under the supervision of a mentor teacher in a field placement to develop and implement interventions for struggling students as well as monitoring the progress of those students. In contrast to Hawkins et al., the reported outcomes for Hurlbut and Tunks were in the form of student perceptions and did not include analysis of the progress made by the students in the field placement. Despite participation in a field-based project that mimicked the RtI process over the course of 4-6 weeks, 68% of participants' responses to questions about "confidence in implementing RtI with a struggling student were negative or demonstrated a lack of perceived confidence" (p. 38). Interestingly, the five positive comments regarding confidence in implementing RtI all came from students pursuing a special education degree.

Given the confusion regarding the roles and responsibilities of special education and general education teachers in the RtI/MTSS process (Barrio et al., 2015), it is critical that researchers consider the training provided regarding collaboration between general and special educators. One aspect of this collaboration can be found in the under-researched area of teacher education programs that provide dual certification in both general and special education.

Effective implementation of RtI/MTSS is contingent upon preservice teachers' preparation in areas of assessment and progress monitoring, intervention, and decision making (Hurlbut & Tunks, 2016). Furthermore, the goal of Tier 1 is to provide instructional practices that are beneficial for all students. Tier 2 employs small grouping practices to focus on remediation and/or enrichment opportunities. When intensive support is needed, Tier 3 offers individualized student plans developed in collaboration with educators and caregivers (Hollingsworth, 2019). In offering support across the three tiers, general education and special education teachers can play various roles. For example, a core assumption is that general education teachers will use evidence-based practices in the classroom setting in

Tier 1 (Hurlbut & Tunks, 2016). Moreover, general education teachers should have expertise in remedial strategies and curriculum-based measurement (CBM) in Tier 2 (Brownell et al., 2010). Special education teachers, on the other hand, should be able to support students in all tiers (Harvey et al., 2015), including having advanced knowledge and skills specific to Tier 3.

Current Study

There has been considerable research that establishes the need to improve teachers' knowledge of and ability to effectively implement RtI/MTSS, and there is a scarcity of research examining interventions addressing these concerns. As such, research examining the training of pre-service teachers on the processes of RtI/MTSS is sorely needed.

In the present study, we examined the perceptions and knowledge of the RtI/MTSS frameworks of undergraduate preservice teaching candidates enrolled in a dual certification program at a small, private Catholic university in Kentucky. The study was intended to answer the following research questions:

RQ1: What are preservice teachers' perceptions and knowledge of RtI/MTSS frameworks?

RQ2: To what extent does participating in an experiential learning project intervention enhance preservice teachers' perceptions and knowledge of RtI/MTSS frameworks?

Most graduates from this institution teach in general education settings; therefore, a broader goal of this research was not only to inform classroom instruction on the topic at the collegiate level but to better equip general education teachers with the knowledge of RtI/MTSS and become more familiar with how to implement RtI/MTSS systems in their future classrooms through the experiential learning project.

Method

Research Design

We employed a case study approach while using mixed methods for data collection in this study. We used a case study approach because we wanted an in-depth exploration of a bounded system (i.e., a specific class for preservice teaching candidates; Creswell & Guetterman, 2019). To answer research question two, a closed-ended pre- and post-assessment was administered to establish baseline knowledge of RtI/MTSS and later examine growth. To answer research question

one and further contextualize research question two, participants responded to open-ended reflection questions at the end of the semester, before completing the post-assessment.

Participants and Setting

A total of 23 preservice teaching candidates participated in this study. All preservice teaching candidates were undergraduate students within a school of education accredited by the Council for the Accreditation of Educator Preparation (CAEP). The participants were enrolled in a special education course that explored assessment and measurement. Additionally, participants were enrolled in a field practicum that took place in general education classrooms that corresponded with their individual programs in a large, urban school district in Kentucky. These were both criteria for participation in this study; students not enrolled in this course were excluded from the study. Table 1 describes the characteristics of the participants and their programs.

Table 1
Characteristics of participants and their programs.

	<i>n</i>	%
Sex		
Male	0	0
Female	23	100
Race		
American Indiana or Alaska Native	0	0
Asian	0	0
Black or African American	1	4.35
Native Hawaiian or Other Pacific Islander	0	0
White	22	95.65
Ethnicity		
Hispanic or Latino	0	0
Not Hispanic or Latino	23	100
Type of Program		
Elementary Education & L/BD	21	91.30
Middle Education & L/BD	2	8.70
Middle Education Concentration		
English Language Arts	0	0
Mathematics	2	8.70
Science	0	0
Social Studies	0	0

Measures

Two measures were used to collect data for this study. The first measure was a pre- and post-assessment that measured participants knowledge of RtI/MTSS frameworks. This assessment consisted of 15 multiple-choice questions and one open-ended question in which the participants were asked to describe their knowledge and perceptions of RtI/MTSS systems. Figure 1 displays the pre- and post-assessment used in this study. Written reflections from a class project entitled “Curriculum-Based Measurements (CBM)” comprised the second measure. Responses to four researcher-created reflection questions that students answered after implementing curriculum-based measures in their field placement classroom were analyzed. The reflection questions for the CBM project were:

Q1: What is the role of general education teachers in the process of RtI/MTSS?
What is the role of special education teachers in the process of RtI/MTSS?

Q2: How does RtI/MTSS benefit all students?

Q3: What potential barriers do you see in fully implementing RtI/MTSS school-wide?

Q4: What concerns do you have regarding your own abilities to implement RtI/MTSS processes?

Figure 1

Curriculum-Based Measurements Project: Pre- and Post-Assessment

1. What does RtI/MTSS stand for?
 - a. Response to Intervention/Multi-Tiered Systems of Support
 - b. Responsiveness to Instruction/Meaningful Systems of Support
 - c. Responding to Individuals/Managing the Student Success
 - d. Reacting to Incidents/Momentary Time Sampling System
2. Who should be the targeted student population served by RtI/MTSS?
 - a. General education students
 - b. Special education students
 - c. Title I students
 - d. All students
3. Which of the following is the purpose of RtI/MTSS?
 - a. Reducing the incidence of “instructional casualties” by ensuring that students are provided high quality instruction with fidelity.
 - b. Providing interventions to students as soon as a need arises.
 - c. Providing data for decision-making regarding eligibility for special education

- d. All of the above are purposes of RtI/MTSS
- 4. How many tiers are within RtI/MTSS?
 - a. 1
 - b. 2
 - c. 3
 - d. 4
- 5. In which tier does universal screening occur?
 - a. Tier 1
 - b. Tier 2
 - c. Tier 3
 - d. None of the tiers
- 6. How often should universal screening occur?
 - a. Once a year
 - b. Two times a year
 - c. Three times a year
 - d. Six times a year
- 7. Which tier provides the most intense intervention and/or support?
 - a. Tier 1
 - b. Tier 2
 - c. Tier 3
 - d. Tier 2 and 3
- 8. Who can provide interventions within each tier of RtI/MTSS?
 - a. General education teachers
 - b. Special education teachers
 - c. School psychologists, school counselors, school social workers
 - d. All of the above
- 9. Who should be part of the team who collects and analyzes RtI/MTSS data?
 - a. Teachers (Gen Ed/SPED)
 - b. Teachers (Gen Ed/SPED), school psychologists
 - c. Administrators, school psychologists, school counselors
 - d. Teachers (Gen Ed/SPED), administrators, school psychologists, and other relevant educators
- 10. How often should progress monitoring occur?
 - a. Daily
 - b. Weekly
 - c. Monthly
 - d. Depends on the tier and intervention
- 11. The RtI/MTSS framework can be utilized to measure and track students' _____ goals.
 - a. Academic
 - b. Behavior

- c. Social-emotional
 - d. All of the above
12. Approximately what percent of the student population should be in Tier 1?
- a. 25-30%
 - b. 40-50%
 - c. 60-70%
 - d. 75-90%
13. Approximately what percent of the student population should be in Tier 2?
- a. 1-5%
 - b. 5-10%
 - c. 10-25%
 - d. 30-35%
14. Approximately what percent of the student population should be in Tier 3?
- a. Under 50%
 - b. Under 30%
 - c. Under 20%
 - d. Under 10%
15. What should the school do if too many students are in Tier 2 and Tier 3?
- a. Implement individualized plans for all students
 - b. Improve upon Tier 1 core curriculum and supports
 - c. Gain more parental involvement for students in Tier 2 and Tier 3
 - d. Conduct progress monitoring more frequently
16. Describe your knowledge or perceptions of RtI/MTSS systems.

Procedures and Data Analysis

Procedures

This study received approval from our Institutional Review Board. As noted previously, the study was conducted during a semester long course. The students in the class were first given the consent and the researcher explained that participation in this research study was completely voluntary; in no way would their grade be impacted in the class if they did not participate. The following week, the pre-assessment was given during the second class session of the semester. After the participants took the pre-assessment, the instructor introduced the CBM project. At this point, the procedures for the project were explained to students.

Curriculum Based Measurements

The purpose of the project was to help participants begin to make successful data-based decisions. To accomplish this, participants needed practice accurately and

effectively implementing different types of multi-component processes. For this project specifically, participants practiced administering, scoring, and graphing assessment data. They were then asked to administer both reading and mathematics CBMs in their field placements. The participants obtained and employed accounts for the website *EasyCBM Lite* (n.d.) to complete this project. The website was chosen because it was designed by researchers at the University of Oregon and peer-reviewed (*EasyCBM Lite*, n.d.).

Participants were tasked with visiting their field practicum classroom the day after the project was introduced to choose a student to work with on the project. Participants were instructed to identify a student who was performing below-grade level academically but not currently eligible for special education. To help aid in the decision-making, participants were asked to get guidance from their cooperating teacher. The participants entered information about their chosen student on the *EasyCBM Lite* (n.d.) website including the students first and last name, grade, gender, race, ethnicity, special education status, and English Language Learner (ELL) status. Next, participants chose reading and mathematics CBM probes from the website with the guidance of their cooperating teachers to help inform their decision-making on which probe would work best for their individual students chosen for this project. The *EasyCBM Lite* (n.d.) website generates probes for reading and mathematics based on grade level.

After the participants chose a student for the project and selected appropriate reading and mathematics CBM probes, they familiarized themselves with the *EasyCBM Lite* (n.d.) website. During the next week in class, the participants practiced administering and scoring the chosen CBMs (both reading and mathematics) with a peer in class. While doing this they needed the student copy and the assessor copy, both of which were materials that could be downloaded from the website. During this process, they were able to familiarize themselves with the directions on the assessor copies. They were given the choice of administering using technology (e.g., tablets or laptops) or pencil/paper. Then, after they had sufficient time to practice and felt comfortable with both administering and scoring, they were released to implement in their field practicum classrooms.

The participants were required to administer and score one reading and one mathematics CBM probe each week for a duration of five weeks with their chosen student in their field placement. After a seven-week timespan (additional time was given to account for student absences), participants brought their data into the class. During class, participants wrote individual goals and suggested research-based interventions that were based on the data collected from the field.

In addition to data collection, participants were tasked with writing a paper. In the paper, they were asked to provide information about the student including their pseudonym, grade, age, and gender. They explained why the student was below grade-level and elaborated on what academic struggles the student had faced.

They were then asked to explain their rationale for their chosen CBM probes. They summarized how they administered the probes and described the student's behavior during the administration of the probes. A scoring table was provided for the participants to input the score and the dates the probes were given. The participants then wrote the one-year goals that they created for the student in class and described recommendations for implementing high quality, evidence-supported interventions for the student. Lastly, participants were asked to reflect on the project by answering the four reflection questions listed in the Measures section.

Data Analysis

For data analysis, all student names were removed, and all data analyses were conducted by two of the three authors. Disagreements and discrepancies were discussed until consensus was reached. For the multiple-choice component of the pre- and post- assessment, we calculated descriptive (e.g., change scores) and inferential statistics (i.e., paired *t*-test) to assess growth in knowledge of RtI/MTSS. In addition, we examined error patterns by item. Data were also collected from the participants' open-ended reflections in their project "Curriculum-Based Measurements." During this data analysis process, we looked for themes surrounding preservice teachers' perceptions of RtI/MTSS systems using basic content analysis (Krippendorff, 2018). To organize this analysis process, we followed several steps as outlined in Creswell and Guetterman (2019). First, we (i.e., the three authors of the study) read each open-ended response to gain familiarity. Second, we divided the text into segments that related to the research questions. Next, we labeled segments with codes and collapsed them into themes. We employed in-vivo coding by using participants' own words to improve trustworthiness of open-ended findings (Saldaña, 2016). We also individually analyzed participant open-ended responses, shared our findings with each other, and then came to a consensus on our final themes.

Results

Multiple Choice Pre-/Post-Assessment Data

A majority of participants (70%) showed increased scores on the multiple-choice items at post-assessment ranging from a one- to a five-point increase ($M = 2.5$ points; $SD = 1.4$) as compared to their score at pre-assessment. Four participants' post-assessment scores were the same as their pre-assessment scores, and three participants' post-assessment scores were 1 or 2 points lower than their pre-assessment scores. A paired samples *t* test indicated a statistically significant

increase in mean scores from pre-assessment ($M = 11.3$, $SD = 1.5$) to post-assessment ($M = 12.7$, $SD = 1.3$), $t = 3.45$, $p = .002$.

Analysis of error patterns by item revealed that at pre-assessment, all participants underestimated the recommended number of times universal screening should occur per year. The text for the class stated that universal screening should ideally occur three times per year (NCLD, n.d.). At pre-assessment, 19 participants said it should occur once a year, and the remaining four said twice a year. At post-assessment, only two participants changed their answer from what they chose at pre-assessment to the correct answer of three times a year. One other item showed a persistently high error percentage with little growth from pre- to post-assessment: “how often should progress monitoring occur?” At pre-assessment, 11 participants (48%) correctly identified that recommended frequency of progress monitoring depends on the tier and the intervention, and at post-assessment that number only increased to 14 participants (61%). Participant responses to question 12 on the pre- and post-assessment (“Approximately what percent of the student population should be in Tier 1?”), showed the greatest growth. At pre-assessment only eight participants (35%) selected the preferred answer of 75-90% while the rest of the students selected a lower percent. At post-assessment, 20 participants (87%) chose the correct answer.

Open-Ended Data

Roles

The participants were asked to describe the roles of both the general education and special education teachers. Participant responses demonstrated an understanding that the roles of general education and special education teachers are vast and can be complex within the RtI/MTSS framework. Several responsibilities were indicated by participants such as implementing interventions, tracking intervention data, providing high-quality instruction, and observing students.

General Education Teachers. One of the primary responsibilities described for general education teachers from over half of the participants included monitoring student progress. As one participant noted, “They are responsible for assessing the individual needs of their students, identifying goals that need to be met, monitoring progress, and using progress data to inform instruction.” While over half of the participants included monitoring progress as a responsibility, there was a variety of responses about which tier in the RtI/MTSS framework that general education teachers should be monitoring progress within. As such, one participant noted, “The role of the general education teacher in the RtI/MTSS process is to assess individual student needs, create target goals, and monitor each student’s progress within the first tier,” whereas another participant focused on how general

education teachers provide “high-quality instruction for all students through implementing research-based strategies and differentiated instruction.” Importantly, participants noted that the general education teacher can provide Tier 1 and Tier 2 interventions in the general education classroom.

Special Education Teachers. Collaboration and support were included in many responses for an additional responsibility for special education teachers. One participant stated, “The RtI approach in schools requires collaboration between teachers in order for it to be effective. Special education teachers assist general education teachers in coming up with ways to assist students and provide intensive interventions if needed” while another responded, “The role of the special education teacher in the process of RtI/MTSS is to collaborate with the general education teacher.” Participants’ focus on collaboration for special education teachers and not for general education teachers highlights their beliefs that possibly only special education teachers need to develop these relationship-building skills.

Moreover, participants highlighted the role of planning and intervention that special education teachers follow. For example, participants described how students may receive support from special education teachers without receiving official special education services through an Individualized Education Plan (IEP). Therefore, special education teachers may be responsible for planning and implementing some interventions, specifically for students in Tier 2 or 3. As one participant noted, “similar to the general education teacher, special education teachers must use research and evidence-based practices in their interventions to support these students. They may also do progress monitoring and collect data on the students if interventions should be changed or should they be referred to special education.” Overall, participants emphasized how the main goal for the special education teacher is to collaborate with other teachers and professionals, recommend and implement interventions, and monitor students’ progress.

Benefits

Most of the participants agreed on the benefits that are provided to students in the RtI/MTSS system. One of the most salient benefits of RtI/MTSS surrounded the immediacy of support that students are given in response to any academic or behavioral concerns. Participants noted that RtI/MTSS [RtI] “...is in place to provide immediate intervention to struggling students at the first indication of failure to learn” while another noted that RtI/MTSS is beneficial because it provides “interventions and extra support at the moment the student starts struggling.” Others agreed on the benefit of RtI/MTSS was providing students with high-quality instruction. One participant stated, “RtI/MTSS benefit all students by providing them with high-quality instruction and intervention suited to students’ needs in the general education classroom” and another participant stated, “RtI/MTSS gives

high-quality instruction to every student no matter their level of instruction.” Lastly, another benefit noted was the different levels of support provided to students according to Tiers, as one participant mentioned, “Tier one allows for the benefit for all students and increase in intensity as you move to tier 2 and 3.” Participants were able to articulate that these frameworks do support all students regardless of the level of intervention required.

Barriers

The two most salient themes that emerged from participant responses were barriers related to a lack of resources and a lack of training. Over half the participants mentioned that resources, in the form of funding, staffing, or time, were likely to present as challenges for schools and districts that are implementing an RtI/MTSS framework. As one participant noted, “If a school district does not have the funding to implement RtI/MTSS, they will not be able to provide their students with the necessary tools and interventions they may need in the classroom,” while another responded how “teachers are already overwhelmed and trying to squeeze in time for individual monitoring might be too much.” Some participants still conflated RtI/MTSS as only a special education initiative, with one participant stating a barrier could be “funding to pay a special education teacher to help with the tier 2 and tier 3 students,” and another describing how schools would need “multiple special education teachers because one special education teacher could not keep track with the whole school.” Despite this limited view of RtI/MTSS from some participants, others better articulated how RtI/MTSS could present a barrier for general education teachers in terms of a lack of training, as “general education teachers may not feel prepared or educated on what RtI really is” because “not every college [teacher preparation program] provides information on special education and RtI.” Finally, one participant described how “weak and inadequate professional development for teachers and administrators [can cause] limited knowledge and lack of understanding of importance in the process.”

Concerns

The most prominent concerns that participants described in implementing RtI/MTSS were ensuring that all students received the support needed as well as issues with data collection. As one participant succinctly stated, “I struggle in being able to serve all the students in my classroom, to differentiate the content and give every student the modifications needed.” Another participant provided nuance to this concern, particularly as a new teacher: “as a new teacher it is going to [be] really stressful, and I don’t want to slack on meeting the needs of all my students... I know that it [will] be very overwhelming for a while when I am trying to plan out

lessons that meet all the needs of the students with interventions, accommodations, and modification.” The second major concern centered on data collection. Some participants were broad in this concern, expressing worry about “processes [of] collecting data for progress monitoring, keeping track of which students are on what tier, and figuring out what works best for my students.” Others were more specific in their concern about the assessment component of data collection: “one concern I have...is not knowing what kind of assessment I need to give first in order to collect data on a student,” another expressed concern about “giving the wrong assessment to the student.”

Discussion

In describing preservice teachers' perceptions and knowledge of RtI/MTSS frameworks (RQ1), our participants shared their concern that not all teachers will enter the profession with knowledge of RtI/MTSS. This aligns with Vollmer et al.'s (2019) finding that 25% of respondents from programs that did not offer RtI training to their general education preservice teachers because some teacher educators believed it was only a special education initiative. Participants believed that these frameworks are beneficial to student outcomes, as they provide access to high-quality instruction to all students (Brownell et al., 2010; Hurlbut & Tunks, 2016), as well as access to immediate intervention and support as needed. In addition to these benefits, participants noted perceived barriers, including a lack of staffing to support students in all tiers, as well as a concern that they will not have the resources or time needed to support students across the three tiers. For example, some expressed concern that they will not have the skills necessary for data collection and analysis, which echoes findings from previous research (Barrio & Combes, 2015; Beckman, 2019; Hurlbut & Tunks, 2016; Vollmer et al., 2019). Moreover, while many of our participants understood that they will be responsible for the implementation of screening, assessment, and interventions as general education teachers (Hurlbut & Tunks, 2016), some participants still siloed RtI/MTSS as only a special education teacher role. For example, participants were able to describe how special education teachers have the unique role of supporting students in Tier 2 and 3 through intervention and progress monitoring (Brownell et al., 2010), but they did not articulate the role of general education teachers in these tiers.

Participants also described the importance of collaboration, particularly for special education teachers, noting that special education teachers will need to work with general education teachers and other staff to support students. Despite expressing understanding of the importance of collaboration, participants stated a belief that special education teachers should be seen as the experts on RtI/MTSS and serve to support general education in RtI/MTSS processes. There was little

discussion of how general education teachers need to collaborate to support students, and participants did not describe how general education teachers indeed support the work of special education teachers in Tier 2 or 3. These findings reinforce Barrio et al.'s (2015) discussion about how the roles and responsibilities of special education and general education teachers in RtI/MTSS are unclear. It will be essential that preservice teachers understand that RtI/MTSS requires that the general education teacher understand best instructional practices to support all learning needs (Hurlbut & Tunks, 2016) as part of the tiered approach for supports, modifications, and accommodations.

The experiential learning project intervention enhanced preservice teachers' perceptions and knowledge of RtI/MTSS frameworks (RQ2). Results from both the pre- and post-assessment indicated that 70% of participants demonstrated growth in knowledge. These results as well as the written reflections from the CBM project demonstrate that together, participants' understanding that RtI/MTSS frameworks are critical facets to understand is shared mutually by both general and special education teachers. Responses to the pre- and post-assessment question, "Approximately what percent of the student population should be in Tier 1?", showed the greatest growth, indicating that participants understood that general education teachers need to employ RtI/MTSS to meet the many students who we expect to thrive in Tier 1. It is also important to note that while 70% of participants demonstrated growth on the pre- and post-assessment, 30% of participants did not. The lack of growth in knowledge informs us that there is room for additional instruction and clarification of roles in RtI/MTSS. Key areas of growth include the implementation of universal screeners as well as progress monitoring. For example, participants indicated a variety of responses surrounding how often universal screeners should be given ranging from one to three times a year. The guidance that was presented in class was to administer a universal screener three times a year as best practice (NCLD, n.d.); however, it is clear that there is a not a specific, set number of times this should be given, only recommendations. Additionally, over half of the participants did not recall that the recommended frequency of progress monitoring depends on the tier and the intervention. This reinforces the need for teacher educators to ensure they review evidence-based interventions and their recommended frequency with students.

Implications for Practice

This study contributes to the field's understanding of preservice teachers' perspectives and needs regarding RtI/MTSS, particularly in programs where candidates are dual certified in general and special education. Direct instruction on RtI/MTSS and hands-on application of concepts are valuable experiences for preservice teachers. Data collected in this study demonstrated increased knowledge

and skills in RtI/MTSS, particularly in how these frameworks should be applied school-wide for all students, not only those who may potentially be assessed for eligibility for special education. Teacher preparation programs would benefit from providing RtI/MTSS instruction either in separate courses or embedded strategically throughout existing course requirements. Curriculum mapping is one method to recognize areas of deficiencies and opportunities within program coursework to improve RtI/MTSS instruction. It is imperative that preservice teacher candidates be given multiple opportunities to apply RtI/MTSS knowledge in a hands-on approach. As indicated by this research study, without a hands-on, experiential learning opportunity, preservice teaching candidates are not able to crystallize the knowledge gained from solely reading a textbook about RtI/MTSS.

Limitations and Suggestions for Future Research

The generalizability of this study is limited as the specific sample does not represent the broader preservice teacher population in the United States. All participants were enrolled in one course, taught by one professor, within a private Catholic university in Kentucky. Further, participants were all enrolled in a dual certification (general and special education) program. Additionally, the content taught in class regarding RtI/MTSS was limited to two textbooks (i.e., Pierangelo & Giuliani, 2017; Salvia et al., 2013) with few additional resources (e.g., Brown et al., 2009; NCLD, n.d.). An additional limitation of this research is that the pre-service teacher outcome measures were created by the researchers and were not piloted and validated before use. Future research should involve investigating and improving the psychometrics of the outcome measures.

For this study, we did not follow the model of Hawkins et al. (2008) who gathered and analyzed the CBM data from students in the field placement classrooms, which added an additional level of verification of effectiveness of implementation of RtI/MTSS by the pre-service teachers. Future research should include such student-level data analysis. Further, we could extend our findings with longitudinal data by following up with participants when they are in their student teaching placement as well as after they have become licensed teachers. In addition, replicating this study in other teacher preparation programs serving diverse student populations would help improve our understanding of the effectiveness of the RtI/MTSS assignment in increasing students' knowledge and skills for implementation.

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