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EVALUATION OF MULTI-TIERED SYSTEMS OF SUPPORT CONTENT IN A REQUIRED COURSE FOR TEACHER CANDIDATES

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Introduction

Multi-tiered systems of support (MTSS) consist of a proactive intervention framework being implemented in schools across the nation to prevent students from falling behind, and to decrease the number of students referred for special education services (Elliot, 2008).

The MTSS model was developed to replace the IQ-achievement discrepancy model for identifying students with learning disabilities. The IQ-achievement discrepancy model assesses whether there is a significant difference between a student's scores on a test of general intelligence and scores obtained on an achievement test. If a student scored at least two standard deviations higher on the IQ test than on the achievement test, then the student was considered to have a disability. Because this method of identification often took several years to identify a disability, students were not receiving services when they needed them.   Hence, the IQ-achievement discrepancy method was a "wait to fail" model.   The MTSS model requires schools to examine contextual issues, such as the quality of instruction, and shifts the focus from identifying students with a deficit to identifying students who are at-risk (Ardoin, Witt, Connell, & Koenig, 2005).

Because MTSS is being widely implemented, pre-service teacher preparation programs should incorporate critical components of MTSS into coursework and clinical experiences in order to ensure that graduates enter the profession fully prepared. If future teachers do not understand how the system works, their students will not receive the types of interventions MTSS incorporates. In some pre-service teacher education programs, however, MTSS may not be prominently included because instructors fail to recognize its importance (Sawchuk, 2011).   It is also important to examine the

perceptions that pre-service teachers have on MTSS models so educators can use that information to help inform their instruction regarding MTSS.

This study was designed to answer two questions regarding MTSS implementation in the teacher education program at SIUC. First, how well is MTSS content implemented in pre-service teacher candidates' coursework as evidenced by teacher candidates' knowledge of the critical components? Second, how do pre-service teachers perceive their own understanding of the concepts of MTSS? If graduates do not fully understand the critical components of MTSS they will be ill prepared to join a collaborative team of teachers in a school implementing MTSS, and will be less likely to positively impact their own students' learning.

Overview

Background

Difficulties with the traditional IQ-Achievement Discrepancy Model, such as waiting for students to have a discrepancy of two standard deviations and not determining the specific learning disability of the students, were acknowledged during the course of the reauthorization of the Individuals with Disabilities Education Act (IDEA) in 1997 (Elliot, 2008). As a consequence, one form of MTSS, Response to Intervention (RtI) was included in the 2004 reauthorization of the Individuals with Disabilities Education Improvement Act (Fuchs & Fuchs, 2012) in order to provide an alternative to discrepancy-based identification of learning disabilities, and to differentiate instruction for children, particularly those who were responding less than optimally (Gillam & Justice, 2010). MTSS are also beneficial for gifted students and the twice-exceptional

students who require special considerations while being placed in gifted classes (Postma, Peters, Gilman, & Kearney, 2011). Twice-exceptional students are students who have been diagnosed with a learning disability but are also in gifted classes.

Models (Problem-Solving, Standard Treatment Protocol)

The MTSS framework has employed two different models, the standard-treatment model, and an individual problem-solving model for providing instruction (Stecker, Fuchs, & Fuchs, 2008). The standard-treatment model relies on a pre-determined set of methods for a single teacher to address learning deficits in students (Fuchs, Fuchs & Vaughn, 2014), while the problem-solving approach involves a treatment team that designs an individualized plan tailored to meet the learning needs of a given student (Fuchs, Fuchs & Vaughn, 2014). In general, the problem-solving model is preferred by teachers because it requires looking at each child individually and allows teachers to modify instruction immediately if the student does not respond to the intervention as expected. Researchers prefer the standard-treatment protocol model which uses the same intervention method implemented for a pre-determined time period because it increases the likelihood that an intervention will be implemented fully and with fidelity, and allows a comparison between interventions. The standard-treatment protocol is easier to teach pre-service teachers, but the problem-solving model gives teachers the flexibility to try different methods of intervention for each student based on their personal needs.

Key Components of MTSS

There are three key components of MTSS: a) three levels of intervention; b) differentiated instruction; and c) data-based decision making. The survey was designed to measure student knowledge and self-perceptions of those components and the roles each of them play in MTSS.

Levels of Intervention. MTSS organize interventions into three tiers. Tier I interventions are delivered in the general education classroom and are provided to all students working toward important academic and behavioral benchmarks. Tier II interventions are focused on specific skill development for students for whom Tier I interventions are not sufficient, are typically delivered in a smaller group setting, and can usually be delivered by general educators (Fuchs & Fuchs, 2012). Tier III is the most intensive and individualized help is provided to a student who is significantly below expectations for academic or behavioral progress (NASDE, 2006).

Tier I encompasses all students within a school and is usually effective for eighty to ninety percent of a school population (Elliot, 2008). Because the screening and instruction for this tier take place in a "regular" classroom (Fuchs & Fuchs 2008), it is imperative that general education teachers understand the important role effective instruction for all students plays in MTSS.

Students who do not respond to Tier I interventions receive Tier II interventions which normally take place in small group settings (Ardoin, Witt, Connell, & Koenig, 2005) and are generally necessary for ten to fifteen percent of school populations. A key feature of this tier is that the system of instruction is designed to provide rapid delivery of more intensive, research-based interventions to students who are not making adequate

progress with Tier I alone (Basham, Israel, Graden, Poth & Winston, 2010). A student's

progress is monitored more frequently than during Tier I interventions, usually occurring

every 2 weeks.

Tier III is usually required by five to ten percent of school populations, and provides

intensive individual intervention to students who have not responded to group

intervention in Tier II (Ardoin, Witt, Connell, & Koenig, 2005). Teachers spend more

time preparing the interventions and more school resources are utilized. Progress

monitoring occurs the most often during Tier III, usually weekly (Elliot, 2008). Tier III

is considered special education in some schools, but a student does not always require

special education services if they receive interventions in Tier III. An example of Tier III

interventions that are not special education would be when students work with a teacher

during their study hall every day for a subject that they need help in.

Differentiated Instruction. Differentiated instruction is used in a MTSS model to

address the needs of every student in the classroom during each level of intervention. It

is considered a key component in a MTSS model because every student does not learn at

the same pace or at the same level. Therefore, differentiated instruction is necessary so

that teachers can scaffold instruction when necessary and tailored to fit the needs of every

student in the classroom. It allows all students to access the same classroom curriculum

by providing entry points, learning tasks, and outcomes which are customized to the

students' learning needs (Watts-Taffe, Laster, Broach, Marinak, Connor & Walker-

Dalhouse, 2012) by modifying instruction so that it becomes appropriate for all students.

Differentiated instruction is an approach rather than a single strategy that incorporates a

variety of instructional strategies that are designed to meet the unique individual needs of all students in a classroom (Watts-Taffe, Laster, Broach, Marinak, Connor & Walker-Dalhouse, 2012).

One form of differentiated instruction is Universal Design for Learning (UDL), which was created with the same purpose that Universal Design has in architecture. Lessons designed with UDL principles make all materials accessible and relevant to all students by providing multiple means of representation, action and expression, as well as multiple means of engagement (Stockall, Dennis & Miller, 2012). This means that materials are presented in more than one way to students within a lesson, different forms of academic engagement are offered to the students, and students are given a variety of opportunities to demonstrate their ability using multiple assessment strategies. UDL allows students of all academic-levels to learn together in the same classroom by providing learning tasks and outcomes that are tailored to the needs of all students (Watts-Taffe, Laster, Broach, Marinak, Connor & Walker-Dalhouse, 2012). UDL represents the key components of differentiated instruction which are possessing an in-depth knowledge of students' capabilities, using evidence-based practices, and monitoring the effectiveness of the instruction so that lessons can be re-taught or modified when necessary so students can effectively learn the material (Watts-Taffe, Laster, Broach, Marinak, Connor & Walker-Dalhouse, 2012). In summary, differentiated instruction is tailoring instruction to meet the unique learning preferences and needs of all students within a classroom. Differentiated instruction is a critical component of MTSS because it is essential for all students to receive individualized interventions that best fit their academic needs.

Data-Based Decision Making. Data-based decision making is a key component in MTSS because it is used to determine the level of student performance for every subject. The data-based decision making process involves comparing student performance or progress to a desired level and making adjustments based on the comparison (Deno, 2000). The grade level standards, or benchmarks, are national goals for each student to try to reach. MTSS is designed to increase the likelihood that all students' achievement levels meet benchmark standards. Therefore, teams must record data on student achievement to discover whether or not students are performing at the level of the benchmark standards. The level and intensity of instruction are determined based on student performance so that students can meet the benchmarks for their grade level. Without data-based decision making, educators would not be able to determine the appropriate interventions each student needs and have evidence to support their decision.

Universal screenings are brief assessments that should use valid, reliable instruments in determining which students are at risk for developing learning problems (NCRE, 2010). Such instruments produce the type of data that the MTSS team school psychologists can use to determine whether a student's lack of skill is due to poor quality of instruction rather than a learning disability (Ardoin, Witt, Connell, & Koenig, 2005), and to identify which students need more intensive instruction (Basham, Israel, Graden, Poth & Winston, 2010). Universal screening results give a snapshot of a student's present level of performance, which can be used to help identify students with disabilities.

Progress monitoring is the repeated measurement of student performance at appropriate intervals so that teachers can use the data gathered to shape their instruction. To be effective, the tools used for progress monitoring must be psychometrically sound regarding internal consistency, inter-rater reliability, and construct/concurrent validity (Gillam & Justice, 2010).

Method

Subjects

The subjects for this research were pre-service teacher candidates enrolled in EDUC 308/SPED 408: Characteristics and methods for Teaching Exceptional Children during the spring 2012, fall 2012, spring 2013, and spring 2014 semesters. This course was chosen because the syllabus states that the key components of MTSS are addressed in the class, and the class is a requirement for all pre-service teachers. Teacher candidates typically complete this course during the semester prior to their student teaching. Sixty-six student surveys were used for this study.

Setting

The survey was given to students who were enrolled at a public university in the Midwestern United States. The students taking the survey were enrolled in a class titled EDUC 308/SPED 408 which met in a college classroom once a week for three hours. Between fifteen and twenty-five students were enrolled in each section of the class. The students were seated at desks while taking the survey. The survey was given at the beginning of the class period during one of the final weeks that the class met for each semester.

Instrument

A 20-item survey was designed to compare pre-service teacher candidates'

knowledge of MTSS with their level of confidence regarding implementation of key

elements of MTSS. The first ten questions of the survey targeted that confidence, asking

students about their familiarity of MTSS on a likert-type scale from one to five with one

meaning that students do not understand the concept and five meaning that students know

the concept well enough to teach it to others. Those were followed by multiple choice

and short answer questions about their knowledge of MTSS. The questions were derived

in part from an existing survey created by another university. Each perception question

on the survey had a knowledge-based question that tested the knowledge of that key

component.

Procedure

After permission from the Human Subjects Committee was secured for the

project, the survey was given to all teacher candidates in four, one- semester offerings of

EDUC 308/SPED 408.   The students were given the choice whether or not to take the

survey, and were assured their performance on the survey would not affect their grade in

the class. At the start of the class session teacher candidates were told that the purpose of

the survey was to gather information regarding teacher candidates' knowledge and

perception of MTSS. The survey was administered and took approximately 10 minutes to

complete. In order to protect anonymity all surveys were collected after 15 minutes and

kept in a locked drawer accessible only by the researcher. This procedure was repeated

for four semesters of the course.

Analysis

The knowledge question results were summarized by determining the percentage

of teacher that candidates answered each question correctly. A correct answer list was

used to determine whether or not student responses for the short answer questions were

correct. The perception question results were summarized by averaging each class's

perception on how well they understood each key component of MTSS by calculating a

mean value for each item across all respondents. The teacher candidates' responses were

analyzed to describe the relationship between their knowledge of MTSS principles and

their self-perceptions of their understanding of select survey questions. Data were

compared across the four semesters using the computer software program Prism. This

software program calculated the magnitude of any differences and graphed the

comparisons for each semester. The graphs show the percentage accuracy each

knowledge-based question was answered correctly and the mean confidence level the

respondents displayed while taking the survey. These two things are paired next to each

other for each semester and the results for each semester were compared for each key

component.

The results for the study are listed below.

1. A significant difference exists for Fall 2012 between student perception and knowledge regarding the Tiers (Figure 1).

2. As a majority, pre-service teacher candidates responded to the knowledge questions regarding the Tiers of MTSS with a passing grade of 70%. Seventy percent is considered passing because that is level students must perform at in order to pass classes in the Teacher Education Program.

3. A significant difference exists for Spring 2013 between student perception and knowledge regarding Differentiated Instruction (Figure 2).

4. Pre-service teacher candidates from all four semesters possess knowledge about Differentiated Instruction most consistently.

5. A significant difference exists for Fall 2012 between student perception and knowledge regarding Progress Monitoring (Figure 3).

6. The Progress Monitoring knowledge scores were three standard deviations lower for the fall semester compared to the spring semester knowledge scores.

7. A significant difference exists for Spring 2013 between student perception and knowledge regarding Universal Screening (Figure 4).

8. Knowledge scores for all four semesters of Universal Screening are below passing, meaning that below 70% of the students did not know the answer to the question. Since at least 30% of students for each semester did not answer the question regarding Universal Screening correctly, students need more intensive instruction regarding Universal Screening.

The purpose of the study listed two main questions. The first question was asking how well MTSS content is implemented in pre-service teacher candidates' coursework as evidenced by teacher candidates' knowledge of the critical components. The answer to this question is that MTSS content is definitely present in the required coursework for pre-service teacher candidates. However, pre-service teacher candidates did not consistently show, based on their answers for the knowledge portion of the survey, that they fully understand the key concepts of MTSS. The second question was how pre-service teachers perceive their own understanding of the concepts of MTSS. The answer found based on the pre-service teacher candidates' answers on the survey were that, on average, at least 70% of the candidates expressed that they possess an adequate understanding of MTSS in order to implement a MTSS model in a school setting. Below, the conclusions of these results are discussed.

Conclusions

As a whole, per-service teacher candidates possess higher perceptions of their level of understanding of key concepts of MTSS than their knowledge of those concepts. This means that the candidates are learning about the key components of MTSS and believe that they are retaining the knowledge even though the knowledge portion of the survey indicated that they are not retaining the knowledge as they believe they are. There is not overall significant different between student knowledge and perception because a there was no consistent significant difference between the knowledge and perception of pre-service teacher candidates for each key component of MTSS. However, the candidates do not demonstrate an acceptable level of knowledge on the key components of MTSS

based on their performance. Because of this, pre-service teacher candidates need to

receive a more intensive education on the key components of MTSS so there is more time

for the key components to be adequately learned and understood by pre-service teacher

candidates so they can successfully implement a MTSS model in a school setting.

There is a possibility that information regarding Progress Monitoring is harder to

retain over summer break because student performance on the progress monitoring

question was higher for the fall semesters. Therefore, professors need to make a point to

refresh pre-service teacher candidates on Progress Monitoring after returning from break.

The knowledge scores for Universal Screening are below passing for all four

semesters. Therefore, students needs more intensive instruction regarding Universal

Screening so Universal Screening needs to be addressed more in-depth in order for pre-

service teacher candidates to receive an adequate understanding of Universal Screening

before entering the field of education.

Because significant differences exist for each of the key components during different

semesters, it seems as if errors may exist in the survey given. Even though the survey is

valid, it does not seem reliable. This means that even though the survey tests teacher

candidates' knowledge on key components of MTSS, the questions may be worded

poorly because each semester of student performance did not reflect the same

understanding, which should be fairly uniform for all students taking the class since they

have all taken the same pre-requisites.

Overall, students need to receive more intensive instruction regarding the key

components of MTSS in order to adequately understand the purpose of each component

and implement a MTSS system while in a school setting. Conducting the survey to four
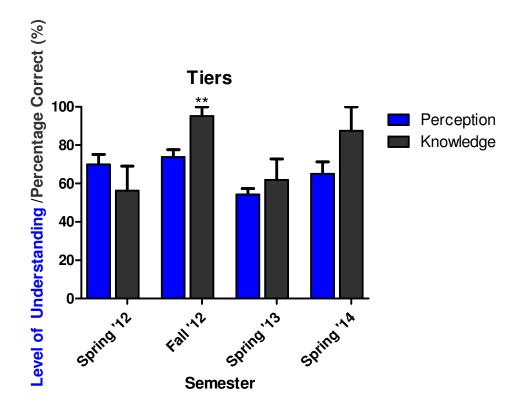
semesters of teacher candidates enrolled in EDUC 308/SPED 408 shed light on what

knowledge teacher candidates have regarding the key components of MTSS. The results

concluded that, in general, teacher candidates do not have a thorough understanding of

the key components of MTSS. Therefore, a reform in the teacher preparation program

needs to happen so that the components of MTSS can be more thoroughly taught

throughout the academic career of pre-service teacher candidates. The inclusion of

MTSS in teacher preparation provides an important addition to quality pre-service

teacher preparation programs because it helps enhance the knowledge of pre-service

teachers. This is important because MTSS models are present in public schools and also

because many of the key components of MTSS are also used by schools that do not use a

MTSS model. Also, pre-service teacher candidates will be able to implement their own

version of a MTSS model in their own classroom, which will help enhance the learning

of all students by providing them with academic instruction that is tailored for the success
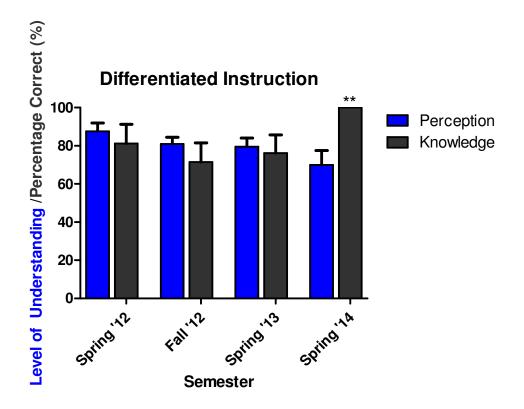
of each individual student.

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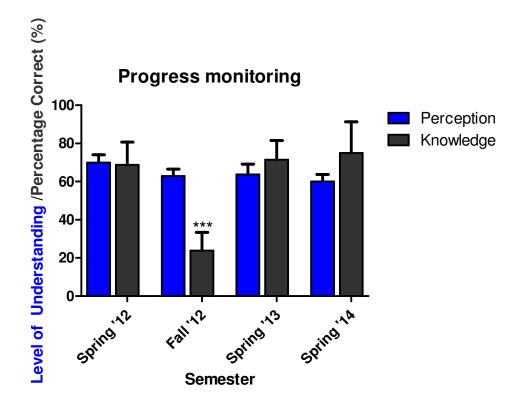
Figure 1. Tiers

Data are expressed as mean ± SEM and were analyzed by t test (n=8-21).
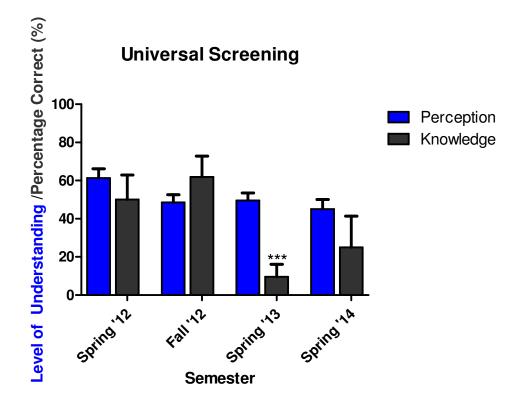
Figure 2. Differentiated Instruction

Data are expressed as mean ± SEM and were analyzed by t test (n=8-21).

Figure 3. Progress Monitoring

Data are expressed as mean ± SEM and were analyzed by t test (n=8-21).

Figure 4. Universal Screening

Universal Screening

Data are expressed as mean ± SEM and were analyzed by t test (n=8-21).

Multi-tiered Systems of Support (MTSS) Survey

What is your major? (Circle one)   Elementary Education   Secondary Education
Other_____
How many hours of coursework related to teaching have you completed? (Circle one)
0-12   13-24   25-36   37 or more
Circle the response that best indicates your understanding of the MTSS model.

I could teach others

Advanced understanding

Adequate understanding

Still learning the basics

Have   no understanding

		1	2	3	4	5
1.	How well do you understand the purpose of MTSS?	1	2	3	4	5
2.	How well do you understand the purpose of Tier I?	1	2	3	4	5
3.	How well do you understand the purpose of Tier II?	1	2	3	4	5
4.	How well do you understand the purpose of Tier III?	1	2	3	4	5
5.	How well do you understand universal screening?	1	2	3	4	5
6.	How well do you understand strategies for progress monitoring?	1	2	3	4	5
7.	How well do you understand early intervention?	1	2	3	4	5
8.	How well do you understand data-based decision making?	1	2	3	4	5
9.	How well do you understand the "Big Five" areas of reading?	1	2	3	4	5
10.	How well do you understand strategies for differentiating instruction in your classroom?	1	2	3	4	5

Please circle the correct answer.

11. Universal Screening Measures are all of the following <u>except:</u>

      a. administered to all students

      b. procedures to help educators plan instruction and diagnose learning problems

      c. an assessment given three times per year (i.e. fall, winter and spring)

      d. tools to help identify students who are not at the expected levels

12. Tier 3 intervention services are:

      a. for students eligible for special education services

      b. provided to very small groups of students with similar difficulties/needs

      c. specialized individualized systems for students with intensive needs

      d. the same is IEP goals

13. Progress monitoring is:

      a. not curriculum-imbedded assessment

      b. a classroom unit test

      c. not sensitive to small performance gains

      d. helpful for teachers but does not provide information on student performance

14. Differentiated instruction is responsive teaching based on:

      a. student readiness, interests and learning profile

      b. student demographics and questionnaires

      c. teacher thinking, interests and learning

      d. reading, math and group placement for ability grouping and tracking

15. Data-based decision making is:

a. planning for student success through the use of ongoing progress monitoring and analysis of data

b. incorporates different teaching strategies into each lesson

c. collecting and analyzing data to determine student progress toward specific skills

d. characterized by the administration of quick, repeatable testing of skills to all students

16. The following children are eligible to receive early intervention:

a. children who are gifted under the age of 6

b. children who are older than 6 and attending kindergarten

c. children who have a disability or at-risk of having a disability under the age of 6

d. both A and C are correct

17. Who receives Tier I support?

18. What is the purpose of multi-tiered systems of support?

19. How often are students tested who receive Tier II intervention?

20. What are the "Big Five" areas for research-based teaching and reading?

a. _____

b. _____

c. _____

d. _____

e. _____