

IMPROVING STATE MANDATED TEST SCORES BY IMPLEMENTING A
RESPONSE TO INTERVENTION PLAN

by

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ABSTRACT

The Response to Intervention (RTI) framework is a tiered method that focuses on prevention and intervention to close academic gaps in students in grades kindergarten through 12th grade. This study focused on how a small school in McMinnville, TN used a color-coded tracking system to analyze RTI data and help close the students' gaps so that they perform on grade-level. This resulted in the school going from a Tennessee Value Added Assessment System (TVAAS) overall growth score of 1 for the 2016-2017 school year to an overall growth score of a 5 for the 2017-2018 school year. TVAAS scores are determined by assessing students' progress from year to year as well as their end of year scores on state testing (Tennessee Department of Education, N.D. e). I focused on how well the students did on their end of the year test, TNReady. I compared the number of students in the Below/Approaching level and On-track/Mastered level for the 2016-2017 school year, which was before the tracking system intervention and the 2017-2018 school year, which was after the intervention. I also looked at teacher opinions on why they believe the school was able to make huge gains in their TVAAS scores. I asked questions that related to how the teachers and administration analyzed data before and after the implementation of the color-coded tracking system.

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CHAPTER I: INTRODUCTION

Every year Tennessee releases new TVAAS scores (Tennessee Value Added Assessment Scores) based on the previous school year achievement scores and growth (Tennessee Department of Education [TNDOE], N.D.e). TVAAS scores are composed of a school's growth from one year to the next as well as students' achievement scores. TVAAS compares student's scores on previous state testing (e.g., TNReady) to his/her current performance on state achievement testing (TNDOE, N.D.e). This means that districts, teachers, and individual students can achieve high TVAAS scores even if the students do not perform in the proficient or above range on the end of the year achievement testing. Use of TVAAS scores provides a way of assessing teachers that focuses on their ability to help students grow from one year to the next instead of focusing just on the end of year state achievement scores (e.g., TNReady). This means that students can show growth, but they might not meet proficiency on state testing (Tennessee Department of Education [TNDOE], N.D.e). Many different TVAAS scores are provided. My student focuses on school-wide overall scores. In 2018, Tennessee released new TVAAS scores for all districts in Tennessee. Results at one particular school peaked my interest. Irving College Elementary School, a small school in McMinnville, TN, improved their overall score from a 1 for the 2016-2017 school year to a 5 for the 2017-2018 school year (Curtis, C. Personal Communication. October 26, 2018). TVAAS compares growth scores within participants. In other words, it compares individual students' performance against themselves year to year on the achievement testing. For my thesis, I chose to look at the achievement scores between participants and

determine if there is a link between TVAAS overall scores and end of year achievement scores.

It is critically important for every child to achieve as much as possible in school and remain on grade level. Students who fail to keep up with achievement expectations are experiencing achievement gaps. If an achievement gap is found, closing the achievement gap as early as possible is critical to ensure success in later grades (TNDOE, 2016; Vaugh, Wanzek, Woodruff, & Linan-Thompson, 2007). Students who are initially behind in reading in the earlier grades, will continue to fall further and further behind their peers as they progress through school (Haines, Husk, Baca, Wilcox, & Morrison, 2018). According to the Tennessee Department of Education, almost half of the students in Tennessee are not performing on grade level in math and reading by the end of the third grade. This decreases those students' chances of reaching proficiency in later grades (TNDOE, 2016).

Many states have turned to a general education initiative know as Response to Intervention (RTI) to help close achievement gaps as early as possible (Cater-Smith, 2019). For example, Tennessee mandates that all public schools use RTI as a way to track the success of all students as well as to identify students with learning disabilities (TNDOE, 2016). There are at least two important aspects of implementing RTI. These are using effective instruction and creating a culture of high expectations for all students. Effective instruction means that students receive high quality, data-driven, differentiated instruction in their regular education classrooms. It is only by focusing instruction on student needs, that schools can close learning gaps (TNDOE, 2016).

Following the RTI model intends to help achieve the goal of all students graduating with the education that they need to be successful in their future paths (Lichtenstein, 2014; TNDOE, 2017a).

When in office in 2017, Governor Bill Haslam had high expectation for the future of Tennessee's educational system and set state-wide goals. These goals included having 55% of Tennessee's adults earning a college degree or certificate by the year 2025. The governor wanted students to leave school with the necessary skills to be successful in later life whether that be in college or in a career. His driving theme was that all members of our society should be capable of achieving tasks that are crucial to our society. For high school graduates, this may include a variety of things such as continuing to educate themselves, becoming part of the workforce, or choosing a healthy lifestyle for themselves (TNDOE, 2017a). One initiative to help students perform in schools is implementation of a Response to Intervention program.

History of Response to Intervention (RTI)

Response to Intervention (RTI) began gaining support in the early 2000's, but the idea has been around for decades (Bear & Minke, 2006; Vaughn & Fuchs, 2003). Before RTI became popular for the identification of learning disabilities, IQ-achievement discrepancy was widely used; however, there were numerous problems with how to measure and interpret the findings. Research coming from the National Research Council provided three criteria to establish whether or not special education practices and assessment of disabilities were valid. These included assessing the strengths of the general education program, measuring the sufficiency of the special education program,

and creating an accurate system for determining eligibility for special education (Vaughn & Fuchs, 2003).

Lichtenstein (2014) discussed how Fuchs and Fuchs (1998) recommended a three-phase system based on the Heller, Holtzman, and Messick (1982) framework. The first phase focuses on the growth of all students in the general education classroom. This phase is used to identify if there are any significant problems with the core classroom instruction. If the class as a whole is not performing as well as other same grade classes, then something in the instruction needs to change. After it is determined that the general education classroom is performing as it should be, phase two begins. Phase 2 is used to identify students who are not making progress with effective general education instruction. Phase 3 occurs when teachers use academic accommodations to adapt the general education classroom to meet the needs of struggling students. If the adaptation(s) have been shown to be ineffective in helping individual student(s) respond to the general education instruction, special education should be considered (Vaughn & Fuchs, 2003).

RTI Practices in General

RTI is a multilevel system that places the focus on prevention instead of special education (Carter-Smith, 2019). It starts with high-quality instruction across the general education classes. All students should receive this instruction. Students' progress toward reaching their standards is tracked using curriculum-based measures (CBM; Gresham, 2002). The students who are not meeting the grade-level standards are provided with additional supports to help them make progress toward and achieve all of

the grade-level standards. If after the student has received high-quality core instruction and additional supports and he/she is still not making progress, then the student should be referred for an evaluation to decide if a learning disability is present (Lichtenstein 2014).

Lichtenstein (2014) state that there are three recommendations that are keys to RTI: (a) emphasizing results, (b) embracing prevention, and (c) considering general education as the place where special education students receive most of their education. This approach recommends focusing on the results or progress and not so much on the process to get there. By embracing a model of prevention, the school system can potentially provide support to students who are just beginning to struggle instead of waiting until the students are failing and in need of special educational services. Lastly, the RTI approach places a focus on the general education classroom, and what and how the curriculum is being taught in the classroom to support both the general education children as well as the children with disabilities (Vaughn, Wanzek, Woodruff, & Linan-Thompson, 2007). With the revision of the Individuals with Disabilities Educational Act (IDEA) 2004, the RTI approach was written into law as an option for identifying Specific learning Disability (SLD). TN adopted it across the state as the only option for identifying a specific learning disability (TNDOE, 2017a).

Consistent with the federal definition, a specific learning disability is defined by Tennessee as “a disorder in which one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do

mathematical calculations and that adversely affects a child's educational performance" (TNDOE, N.D.c, 1). The evaluation process consists of analyzing data to ensure that the student received appropriate instruction in the general education classroom (Tier 1) by a qualified and appropriately trained educator, evaluating the data collected documenting the student's progress in intervention, observing in the general education classroom (Tier 1) as well as during the student's intervention program, administering an individual achievement test in the area of suspected disability, and calculating the student's rate of improvement (ROI) and monitoring a student's learning gap (called GAP analysis) to determine if the student's rate of progress is significantly less than his/her peers and thus unlikely to close in a reasonable amount of time (TNDOE, N.D.c).

Steps of the Response to Intervention Program in Tennessee

As with RTI general education initiatives around the country, the first step of RTI in Grades K-8 is to administer a universal screener to all students (TNDOE, 2017a). The universal screener should be nationally normed and focus on assessing skills. The second step is to analyze the results of the universal screener as well as other classroom-based assessments (e.g., teacher observation, grades). The results from the universal screener and classroom-based assessments should be used in the third step to identify the students who are at risk for being behind. The identified students will be administered survey level assessments to identify specific skills that they need intervention for. Survey level assessments are quick probes that help identify the skill(s) that a student has mastered and which skills(s) he/she needs to receive intervention for. The last step is to collect the data and use that data to make decisions on how to best

help the student. If the students are not at risk, they receive Tier I instruction, also known as core instruction. If the students are identified as being at risk, they are placed in Tier II or Tier III instruction as well as Tier I instruction (Lichtenstein, 2014; TNDOE, 2017a).

Tiers of the Response to Intervention Program in Tennessee

Lichtenstein (2014) and the Tennessee Department of Education (TNDOE, 2017) state that RTI is composed of three tiers. The majority of students (around 80%) will be served in Tier 1 (core instruction) alone and make adequate progress (Vaughn, Wanzek, Woodruff, & Linan-Thomas, 2007). As described by Martines, Nellis, and Prendergast (2006), Tier 1 should be comprised of high quality, differentiated instruction in English Language Arts (ELA), Math, and Writing that allows all students to have a well-rounded learning experience. Ongoing assessments and data collection take place in Tier I. These assessments are from different methods including formal formative assessments (e.g., teacher-made tests), informal formative assessments (e.g., written assignments, homework), summative assessments (e.g., state-level assessments), universal screeners, survey level assessment, progress monitoring, diagnostic assessment, teacher observations, and student records review (Martines, Nellis, & Prendergast, 2006).

In Tennessee, students are given a universal screener to assess whether they are performing on grade-level expectations. If the student's performance shows significant discrepancies from grade-level expectations, they are then given a curriculum-based assessment (CBA) to validate that the student is not performing on grade-level expectations (TNDOE, 2017a). If the curriculum-based assessment indicates that the

students are not performing on grade-level, they begin receiving Tier II instruction as well as Tier I instruction. According to the RTI model mandated for use in Tennessee on average, 80-85% percent of students' academic needs ought to be met with Tier I interventions.

The programs used in Tier II should be research-based with documented evidence that they improve students' academic weaknesses. The areas of deficit include: basic reading skill(s), reading fluency, reading comprehension, mathematics calculation, mathematics problem solving, and written expression. It is strongly recommended that students needing assistance receive at least 30 min daily in their area of deficit. If the student has a deficit in both math and reading, then the student can receive intervention in their weakest area for 3 days and 2 days in the other area. For example, if the student has a weakness in both reading and math, and his/her reading skills are weaker than their math skills, interventions in reading will be emphasized, but interventions in math will not be ignored.

Another aspect of Tier II intervention is staff to student ratio. Smaller groups are shown to make greater improvements (TNDOE, 2017a). Smaller groups are required for Tier II compared to Tier I. The Tennessee Department of Education has recommended specific staff to student ratios for Tier II instruction. Grades K-5 should have a 1:5 ratio of staff to students, Grades 6-8 should have a 1:6 ratio, and Grades 9-12 should have a 1:12 ratio (TNDOE, 2017a). It is also stated that for high school students (grades 9-12), smaller groups are recommended when more individualized interventions are being used (TNDOE, 2017a).

In addition to published recommended ratios for staff members to students, the Tennessee Department of Education characterizes the instructor's role in the Response to Intervention Manual (TNDOE, 2017a). The RTI instructor is responsible for setting goals for each of the students in Tier II. The student's performance in a tier is closely evaluated. This process is referred to as progress monitoring. It is conducted regularly either weekly or biweekly depending on the skill being assessed with minitests described as probes. These are measures that are sensitive to change. They help ensure that the intervention is effective and student(s) are making adequate progress toward their goals (TNDOE, 2017a). Probes are conducted individually but takes only a few minutes so that they are as time efficient as possible (Hosp, Hosp, & Howell, 2016).

Another important part of the RTI process is measuring student learning rates. For struggling students to catch up with typically developing peers, they must demonstrate an accelerated learning rate. Students' rates of improvement (ROI) are used to determine if the students are making adequate progress (TNDOE, 2017a).

In Tennessee if the ROI of a student in Tier II intervention is greater than the ROI of typical peers and sustained over four assessment periods, then it is considered that the student has successfully closed the gap and may return to Tier I (TNDOE, 2017a). If the rate of improvement (ROI) of the student in Tier II intervention ROI is less than the ROI of typical peers for 4 consistent data points or the student is not showing growth, the intervention may need to be changed. If 8-10 data points every other week or 10-15 data points every week show that the student is still not making adequate progress, then the student should be moved to even more intense interventions. These Tier III

interventions are more intense and more specialized and are delivered to even smaller groups of students (TNDOE, 2017a).

When a student isn't making adequate progress towards the set goals in Tier II as determined by progress monitoring and rate of improvement data, the student begins receiving Tier III interventions as well as Tier I instruction. Only 3-5% of students are typically expected to be served in Tier III. According to the Tennessee Department of Education, students may also be placed directly in this tier if they are 1.5 to 2 years behind grade-level or the universal screener scores showed that they are below the 10th percentile. The students in Tier III should receive intervention for 40-60 min depending on what grade they are in and what area their deficit is in. The instructor to student ratio for Tier III is 1:3 for Grades K-5, 1:6 for Grades 6-8, and 1:12 for Grades 9-12 (TNDOE, 2017a).

In Tennessee goals in Tier III are also set for each individual student. Progress monitoring is the same in Tier III as in Tier II. Rate of improvement (ROI) is also calculated to aid general education instructional teams in making decisions about changing the intervention. In order for the students to be moved out of Tier III and back to Tier II or (out of Tier II and back to Tier I), their ROI must be greater than the ROI of their typical peers or they must show consistency with meeting their goal of performing above the 25th percentile. If the students are not making progress, changes to the intervention may need to be made. There should be at least 4 data points before any changes are made to the intervention. There should be 8-10 data points for every other week or 10-15 data points for weekly data collection before any decisions are made

about the effectiveness of Tier III interventions. If the students are still not showing improvement with Tier III intervention, a referral for special education for a Specific Learning Disability (SLD) may occur (TNDOE, 2017a).

Assessing the Effectiveness of RTI

Researchers have demonstrated that RTI is effective in improving student's reading and math abilities and closing the achievement gap. For example, Vaughn, Thompson, and Hickman (2003) used response to instruction and assessment strategies to identify and help improve 45 second graders who were behind in one or more of the following four areas of reading or spelling. The reading areas were phonemic awareness, phonics, fluency, comprehension, and spelling. The students received additional instruction for 35 minutes of reading every day with the time spent in all of the previously mentioned academic areas for three 10-week periods. Students were exited back to the general education classroom from the intervention once each reached a certain score. Exit criteria were set for each area. These criteria were not disclosed by the authors. The interventions were modified during the last 10-week period to be more individualized to the students who had not exited from the extra interventions. These authors reported very large effect sizes for all of the groups of children (Early Exit: 2.74, Mid Exit: 3.23, Late exit: 6.06, No exit: 2.66). Ten students were able to exit the program after 10 weeks. Fourteen students exited the program after 20 weeks. Ten students exited the program after 30 weeks. There were 11 students who did not make enough progress to exit the program, which was fewer than 25% of the participants. Of the 24 students who met the exit criteria by Week 10 or Week 20, 23 of them continued to

maintain their reading fluency in the general education classroom without supplemental interventions. However only 16 students continued to make gains, which was defined as improving by one word correct per minute per week on reading fluency probes. This study showed that the extra instruction via RTI can help students close the gap and keep the gap closed. Although these authors were pleased that students were moved back to the general education classroom from the intervention program once they reached the exit score, the authors were disappointed that not all initially-successful students were able to continue to make gains once they were back in the general education classroom. The RTI program was described as being similar to the national model with similar goals and methods (Vaugh, Thompson, & Hickman, 2003).

O'Connor, Harty, and Fulmer (2005) looked at how tiered interventions are being used to decrease referrals to special education because students' academic gaps were being closed with Tier II and Tier III interventions. Students were then placed in Tier II supports if they meet the following criteria: (a) student was performing behind his/her grade-level peers by the second half of kindergarten on phoneme awareness and letter knowledge, (b) student had made limited but unspecified progress with the instruction since the first measurements were given. These students were tracked until the end of their third-grade year with some of them making progress and others needing more help in Tier III. This school was placing an average of 15% of students in special education before the tiered interventions were implemented. At the end of the 4-year intervention, the rate of special education placements decreased to 8%. The authors

concluded that extra instruction can help keep students stay on track so they do not fall so far behind and potentially need special education.

Ardoin, Witt, Connell, and Koenig (2005) researched how 2 fourth-grade classes used a tiered method to identify students who were behind in math and help them progress toward the grade-level standards. In Phase I, students were tested, and it revealed a class-wide Tier 1 problem. After fixing the unspecified class-wide problem, the researchers were able to identify 4 students who were behind in math and placed them in extra interventions. One other student was included in the interventions per the teacher's request. The interventions consisted of peer tutoring and Cover-Copy-Compare instruction. The Cover-Copy-Compare (CCC) method to learning math involves the students reviewing math facts and solutions that are presented on the right side of the page. Once the student has finished reviewing the problems, he/she covers the answers up. The student then copies the facts and solution on the left side. Once the student has finished solving the problems, he/she uncovers the original facts and solutions on the right side of the paper, and comparing the two sides (Stocker & Kubina, 2017). All but one student showed improvement with the extra interventions.

Group standardized testing has also been used to measure the effectiveness of RTI programs. For example, Jeffers (2013) looked at how a school in Missouri implemented an RTI program to the fifth-grade classes from 2011-2013 and evaluated whether or not student achievement on the Missouri Assessment Program (MAP) improved compared to the scores in 2010 before RTI was implemented. The Missouri researcher used a predesign postdesign to analyze the percentage of students scoring in

the Proficient/Advanced and Basic/Below Basic on Communication Arts and Mathematics for each year that RTI was implemented. The percentage of students who scored Proficient/Advanced on the Math portion of MAP in 2010 before RTI was implemented was 55.6%. During the first year of RTI implementation, 2011, 62.9% of students scored Proficient/Advanced on the Math portion. In 2012, 60.2% of students scored Proficient/Advanced on the Math portion. In the last year, 2013, 51.2% of students scored Proficient/Advanced on the Math portion. According to the study, *t* test with an alpha level of .25, a *t* test value of 0.353412, and a p-value of 0.757556 indicated that there was not a significant difference in scores on the Math portion of the MAP for students who received RTI and those who didn't. When Communication Arts was the dependent variable, 58.7% of students scored Proficient/Advanced on MAP in 2010 before the implementation of RTI. In 2011, it increased to 64.5%. In 2012, the percentage decreased to 57.7% and continued to decrease to 53.6% in 2013. A *t* test with an alpha level of .25, a *t*-test value of 0.0157303, and a p-value of 0.988878 also indicated that whether or not a student received RTI did not affect the student's scores on the MAP Communication Arts section. Although Jeffers concluded that the results were not encouraging, there is a wealth of anecdotal evidence presented in textbooks and journals that support that RTI is effective in closing achievement gaps and helping students perform on grade level (e.g. Lichtenstein, 2014; Vaughn, Thompson, & Hickman, 2003)

Importance of Group Achievement Testing to Measure Educational Outcomes

Starting in the 1960s, the federal and state governments have required states to hold school districts accountable for their students' progress. The aims of these achievement tests are to show that the curriculum was being accurately taught in schools and that students were mastering critical educational skills (Gershon, 2015). Tennessee was no exception. Tennessee began using the Tennessee Comprehensive Assessment Program (TCAP) in 1988 (TNDOE, N.D.b). Since 2017 the group assessment system in Tennessee has been referred to as TNReady (TNDOE, 2019). In order to obtain state funding every public school in Tennessee must follow detailed, strict assessment guidelines to ensure that all students complete the TNReady exams. Schools are required to use a variety of state-approved tests to assess all students so that state educators can measure and document growth scores as well as grade-level standard scores. Results of these tests are reported online on the Tennessee State Report Card and are used to determine state-wide educational progress and to identify 5-star schools as well as hapless schools that are failing their students (TNDOE, N.D.d). State-approved academic tests are used in determining TVAAS (Tennessee Value Added Assessment Score) scores as well. Although group tests are not often used in documenting RTI outcomes, I did find one such study previously mentioned, Jeffers (2013).

Description of TNREADY Interpretation Process

TNReady is a yearly assessment taken by students in Grades 3-8 in: English Language Arts (ELA), Mathematics, Science, and Social Studies. The content on the test

is aligned with the Tennessee Academic Standards that are taught in the classrooms (TNDOE, N.D.a). The students' scores fall into one of four performance levels: Below, Approaching, On Track, and Mastered. Table 1 contains the Tennessee Department of Education definitions of each performance level (TNDOE, 2019).

Table 1

Tennessee Department of Education definition of TNReady Performance Levels

Level	Category	Description
Level 4	Mastered	Performance at this level demonstrates that the student has an extensive understanding and expert ability to apply the (English Language Arts, Math, Science, Social Studies) knowledge and skills as defined by the Tennessee academic standards.
Level 3	On Track	Performance at this level demonstrates that the student has a comprehensive understanding and thorough ability to apply the (English Language Arts, Math, Science, Social Studies) knowledge and skills as defined by the Tennessee academic standards.
Level 2	Approaching	Performance at this level demonstrates that the student is approaching understanding and has partial ability to apply the (English Language Arts, Math, Science, Social Studies) knowledge and skills as defined by the Tennessee academic standards.
Level 1	Below	Performance at this level demonstrates that the student has a minimal understanding and nominal ability to apply the (English Language Arts, Math, Science, Social Studies) knowledge and skills as defined by the Tennessee academic standards.

Previously, students in Grades 3-8 have not done well on the TNReady scores with most students falling in the Approaching performance level. Table 2 shows the percentage of students in grades 3rd-8th scoring in each of the performance levels for both ELA and math in 2017 (TNDOE, 2017b).

Table 2

Percentage of Students in Grades 3-8 in Each Performance Level

Performance Level	ELA	Math
Mastered	5.7%	8.9%
On track	28.1%	29.1%
Approaching	44.7%	36.1%
Below	21.5%	25.9%

The 2016-2017 Science portion of the exam was not based on the new TNReady standards and the Social Studies exam was only being tested, so results are not being discussed.

Teacher's Perceptions of the RTI Process

Teachers are an important component in the Response to Intervention Process. They are responsible for many aspects in the RTI framework including things such as delivering instruction, progress monitoring, and analyzing data (Castro-Villarreal, Rodriguez, & Moore, 2014). Greenfield, Rinaldi, Proctor, and Cardarelli (2010)

interviewed eight staff members at an elementary school about their perceptions of RTI after the first year of implementation. The interview protocol consisted of questions regarding the following: (a) implementation of RTI; (b) the change within the school; perceptions about how the community accepted RTI; (c) their perceptions about data collection and whether or not they used it to change their teaching practices; (d) their beliefs about the tiers; (e) their perceptions about how culture and linguistic diversities affected special education referrals; (f) how they think RTI impacted the referral process; and their overall opinion and possible causes of the progress that was made (Greenfield, Rinaldi, Proctor, & Cardarelli, 2010). The researchers grouped the staff responses into five themes: (a) assessment and progress monitoring; (b) the link between intervention and instruction; (c) impact on teacher practice; (d) culture of reform; and (e) special education referral process for English Language Learners (ELL) students. If the theme was evident in the responses of seven or eight of the participants, it is was considered a general outcome. If the theme was evident in the responses of four to six of the participants, it was considered a typical outcome.

According to Greenfield, Rinaldi, Proctor, & Cardarelli (2010), the most prominent result of Theme 1, assessment and progress monitoring, was that teachers were in fact collecting progress monitoring data to help identify students who needed extra support. Theme 2, the link between intervention and instruction, showed that teachers used RTI to help individualize their instruction as well as monitor the effectiveness. Theme 3, the impact on teacher practice, showed that RTI was affecting the instructional practices of teachers according to teachers' opinions. It also revealed

that the teachers believed that professional development and progress monitoring were a necessary part of implementation. Theme 4, culture of reform, revealed that the culture of the school was mixed during the first year of implementation, but overall it was optimistic according to teachers' opinions. Theme 5, the ELL referral process, revealed that half of the participants thought that the RTI process had an effect on the rate of special education referrals for ELL students. The authors concluded that the teachers' perceptions of RTI had a lot of variability. They also concluded that overall teachers showed willingness to participate in changing the school climate. A weakness of the study was that no actual referral data were collected to test the effectiveness of Theme 5 (Greenfield, Rinaldi, Proctor, & Cardarelli, 2010).

In Tennessee, teachers are a large part of the RTI process, but their input has not always been documented. I could not locate research conducted on what teachers in Tennessee think about RTI.

Current Study

The current study evaluated the effectiveness of one school's effort to measure the effectiveness of a Response to Intervention (RTI) program. The intention of the program described here was to improve educational outcomes as measured by state-mandated group tests. As described in detail in the Method section, school staff members planned to advertise individual student scores (e.g., progress monitoring data from RTI) to heighten awareness of progress within the school. This heightened awareness means that teachers and administrators were consistently analyzing the RTI data to clearly see when a student was not making progress within RTI program. This

allows them to make changes to the intervention to increase students' progress. RTI has been shown to reduce the achievement gap in some schools, but I have only located a single study, Jeffers (2013), that addresses the effectiveness of RTI by using state testing results. Thus, I am hopeful that nearly a decade later, I can show that RTI can be addressed and found to be effective at increasing achievement results using state test scores as the dependent variables.

Hypotheses

1. After implementation of posting Response to Intervention (RTI) scores, the percentage of students in Grades 3-8 scoring in the Mastered and On Track performance level on the English Language Arts (ELA) portion of TNReady will increase significantly compared to their scores from the year prior to the implementation of the posting program.
2. After implementation of posting RTI scores, the percentage of students in Grades 3-8 scoring in the Mastered and On Track performance level on the Mathematics portion of TNReady will increase significantly.
3. Teachers will believe that the new way of data collection and analyzing had a positive impact on closing the achievement gap and students' performance on TNReady.

CHAPTER II: METHOD

Participants

The archived data anonymously analyzed for this study was from students in Grades 3-8 who attended Irving College Elementary School during the 2016-2017 and 2017-2018 school years. Irving College is located in McMinnville, TN and serves approximately 240 students. At the time of the study the racial makeup of the student body at Irving College was 85% Euro-American; 15% of the student population was African-American, Hispanic-American, and Native-American. Socioeconomic data for the school showed that about 44% of the children qualified for the free or reduced lunch program. Additional demographic data were that 4% of the students were classified as English Language Learners, about 9% of the students had Individualized Education Programs through the Special Education Department, and about 3% of the children were designated as homeless (TNDOE, N.D.d).

Materials

The Tennessee Value-Added Assessment System (TVAAS) is used to assess how a student grows from school year to school year on the TNReady English Language Arts, Math, Science, and Social Studies tests (TNDOE, 2019). The child does not have to be proficient to receive a high TVAAS score, they only need to have made progress from the previous school year (TNDOE, N. D. e). The score is determined by comparing the student's scores to those of a peer who has scored similarly in the past on state testing like TNReady. There are 5 levels of growth with 5 being the highest. The district,

individual schools, and individual teachers all receive TVAAS scores for each student, each class, each school, and the district as a whole (TNDOE, N.D.f).

Procedures

Intervention Procedures Involving Monitoring Student Progress at Irving College Elementary School.

The proposed study took place at Irving College Elementary School in McMinnville, TN. Prior to the start of the study, Irving College Elementary School received an overall TVASS score of 1 on student growth for the 2016-2017 school year (C. Curtis, personal communication, October 26, 2018). The Tennessee State Department of Education defines this index as simply whether or not the students made growth from the previous academic year (TNDOE, N.D.e). The faculty members and administrators decided to focus on improving the score (D. Perry, personal communication, October 26, 2018.) All of the levels of performance (Mastered, On Track, Approaching, and Below Expectations) were assigned a color to represent each level. For example, green was used for Mastered, blue was for On Track, yellow was for Approaching, and red was used for Below Expectations. All of the students' names were placed around one of the administrator's offices in the administration suite but not in a school corridor. Students did not have access to this room to keep scores confidential. Every time the students were progress monitored, their progress was noted, a color was assigned, and an appropriate color was placed beside their names. Thus, if Betty B. was performing on grade-level, she would have a green dot placed next to her name indicated that she had mastered the skill. This allows the administrators and teachers to

easily see if children's scores were improving. This coloring system allowed the teachers and administrators to make changes to the intervention if needed. For example, if a student went from blue (On Track) to red (Below Expectations), the administrators could work to analyze the reason for this drop. If the student was attending school regularly, he/she was apparently fully engaged in the classwork, and the intervention was being implemented with fidelity, but the score was dropping, the intervention team could conclude that the intervention needed to be changed (D. Perry, personal communication, October 26, 2018.)

Description of Participants

Permission was obtained from the Warren County School District research committee chair and the principal of Irving College Elementary School. Individual parental consent was not required because all data were anonymous. All children's names were deidentified because the focus was on grade-level performance and not individual performance. Participation in this study by the Warren County School District and Irving College was voluntary and the school administrators knew that they had the right to withdrawal their participation at any time. This information was included in the IRB consent form in Appendix A.

In addition to the student data, I also collected data on staff members' perspectives of what caused the difference in the TVAAS growth scores from 2016-2017 to 2017-2018. Written consent was obtained from all participants and participation was voluntary per consent form in Appendix A. I went to the school on a professional development day to invite staff members to participate. In November 2019, I went to

Irving College Elementary School and passed out paper interviews for participants to complete during the schoolwide in-service. As can be seen from the document in Appendix B, the interview consisted of questions regarding the cause of the increased TVAAS growth score, the protocol for analyzing RTI data, their role in the data analysis, and any other factors that participants thought were relevant. There were four participants total that were 3rd-8th grade teachers in the 2016-2017 and 2017-2018 school year. There was one teacher who could not participate because of absence.

Data Collection Procedures

The researcher is a school psychologist graduate student who has had coursework pertaining to RTI and how to analyze RTI data. After receiving permission from the district and school, I collected the TNReady English Language Arts and Math scores for Grades 3-8 at Irving College Elementary School for the 2016-2017 (before new monitoring strategy) and 2017-2018 (after new monitoring strategy) school years. I analyzed how each grade level and the school as a whole scored in each of the two subject areas before and after the monitoring strategy.

CHAPTER III: RESULTS

TNReady Comparisons

The Social Science Statistics program was used to perform chi-square tests of independence to examine the relation between intervention/ no intervention and the level of performance on TNReady for each Grades 3-8 as well as all grades combined for English Language Arts and Math. The relation between these variables for fourth grade math scores was significant, $\chi^2(2, N = 66) = 6.602, p = 0.010$. The intervention did have an effect on how students performed on fourth grade TNReady Math scores at the $p < .05$ level. All other grade-levels English Language Arts and Math chi-square tests of independence resulted in the relation between intervention/no intervention and the level of performance on TNReady was insignificant. The intervention did not have an effect on all other grade levels English Language Arts or Math performance on TNReady.

Questionnaire Results

There were five teachers eligible to participate in the debriefing regarding the response to intervention (RTI) program. Four teachers willingly responded to the questionnaire. The only teacher who did not participate was absent that day. The participants decided to work on the questionnaire together, so answers are very similar. Here is a compilation of the response to the questionnaire items.

1. What do you think caused TVAAS scores to increase from an overall growth score of 1 for the 2016-2017 school year to an overall growth score of 5 for the 2017-2018 school year?

Teachers reported that they analyzed specific standards that aligned with TCAP items. They then used this information to create practice questions that mimicked the questions that students would see on TCAP/TNReady.

2. What was the school's protocol for analyzing RTI data in the 2016-2017 school year?

The teachers analyzed the scores by looking at benchmarks. They also focused on teacher-initiated referrals to tiered services.

3. In the 2017-2018 school year, what was the teacher's role in analyzing RTI data? Were teachers required to look at the wall with student's RTI data on it?

During Professional Learning Communities (PLCs) the grade level teachers would come together after benchmarking and look at the data that had been placed on the board. They began following students and questioning what was happening to students and why they were performing the way that they did. They also had vertical PLC meetings, which is where different grades work together (e.g., third and fourth would work together and fifth and six would work together informing each other of topics where students needed additional instruction).

4. Where there any other factors that you believe could have impacted the students' performance?

Teachers reported that they started using Powerschool to help develop better practice questions that would require more higher order thinking for the students to answer successfully.

CHAPTER IV: DISCUSSION

There is little existing research that looks at how response to intervention (RTI) affects state mandated tests. The results from this study were similar to that in Jeffers (2013) who concluded that whether or not students received Response to Intervention did not affect how they would perform on MAP (Missouri Assessment Program). Overall the present study revealed insignificant results for the effect that intervention had on TNReady scores. Only fourth grade Math yielded significant findings. A possible explanation as to why the results were insignificant is that TVAAS looks at two different things: Student's achievement (e.g., TNReady) as well as student's growth (e.g., the progress made from one year to the next; TNDOE, N.D.e). This means that a student could show growth from one year to the next, but still score low on an achievement test. An additional explanation as to why the results were insignificant is because TVAAS scores focus on achievement scores that individuals receive from year to year, and this study focused on achievement scores from different individuals (e.g., fourth grade math in 2017 compared to fourth grade math in 2018).

Despite the insignificant finding of this study and Jeffer's (2013) study, showing that RTI did not have an effect on academic testing, there have been many studies that show that RTI has a significant effect on improving student's academic performance. Even though students may not be showing a significant amount of improvement on end of year academic tests due to RTI, research does show that RTI can help improve academic gaps. Vaughn, S. and Fuchs, Lynn (2003) used an RTI approach to help second-grade students' close their reading gaps. Ardoin, Witt, Connell, and Koenig, (2005) used

a tiered approach to help fourth-grade students who were behind on math standards. All but one of the participants showed improvement after receiving the intervention. O'Connor, Harty, and Fulmer (2005) used a tiered-approach to help decrease special education referrals. The O'Connor and colleagues study began with a group of kindergarten students and followed then through the third grade. At the beginning of the study there was a 15% referral rate for special education, and by the end of the study, the special education referral rate had decreased to 8% because students' educational weaknesses were being addressed with tiered intervention services.

There were two notable weaknesses for the current study. The first is that the study focused only on one small school, so the sample size was small. A second weakness is that the questionnaire that the teachers were asked to complete stating their opinions about the changes from the 2016-2017 school year to the 2017-2018 school year was completed as a group. The original intention was to have all participants complete the questionnaire with individual opinions. The participants chose to each complete a questionnaire, but they discussed to questions and answers as a group, so there was limited variety in responses.

Beginning with the 2018-2019 school year, Irving College made changes in the way that they track their students' progress. The school began using an excel file to track students' data. This Excel file listed all of the students' names and their performance in RTI. The school continues through Spring 2020 to use a color-coded system to track how well the students are performing on their benchmarks. The excel file can be shared with teachers. Teachers also have the ability to add additional

information in the excel file such as the students' grades for different classes however scores are no longer posted in an office frequented by teachers.

Summary

In sum, my research investigated the dramatic increase in TVAAS growth scores from one year to the next. I analyzed how Irving College used a new way of color-coded tracking to analyze how students' progress monitoring in their RTI program. My project looked the gains students made on academic achievement through TNReady scores. Unfortunately, I did not find that RTI had a significant effect on TNReady scores. However, several other studies have shown that RTI does have a positive effect on academic achievement. RTI can be used to close academic gaps in students who are not performing on grade level. My study did reveal that the teachers at Irving College Elementary School started to analyze RTI data more after the color-coding way of tracking student's performance was established. They would use the data collected during benchmarking and analyze why students were performing the way that they did. They would also use this information to help guide their PLC meetings. Thus, I ended the study optimistic that by working together with visual aids, teachers can improve TVAAS scores.

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APPENDICES

Appendix A

IRB Consent Form

From: irb_submissions <IRB.Submissions@mtsu.edu>
Sent: Wednesday, November 6, 2019 10:32 AM
To: James Rust <James.Rust@mtsu.edu>
Cc: Madison P Curtis <mpc2s@mtmail.mtsu.edu>
Subject: RE: IRB re-submission from Madison Curtis 20-2028 Approval

Madison,

Thanks for your patience.

I am pleased to inform you that your expedited application has been reviewed and we did not find any further issues. Your protocol is now approved and I have attached the expedited approval notice and the approved informed consent template. Please screen the documents for correctness and get back to me immediately should there be any errors or omissions

Sincerely,

Moses M. Prabu, Ph.D.
Compliance Officer
Middle Tennessee State University (PO BOX 124)
Tel: +1 615 494 8918
Email: Moses.Prabu@mtsu.edu

IRB

INSTITUTIONAL REVIEW BOARD
Office of Research Compliance,
010A Sam Ingram Building,
2269 Middle Tennessee Blvd
Murfreesboro, TN 37129



IRBF016 – Participant Informed Consent
A. INFORMATION AND DISCLOSURE SECTION
(Participant Copy)

Primary Investigator(s)	Madison Curtis	Student <input checked="" type="checkbox"/>
Contact information	(931) 952-8153 or mpc2s@mtmail.mtsu.edu	
Department Institution	Psychology	
Faculty Advisor	Dr. James Rust	Department Psychology
Study Title	Improving State Mandated Test Scores by Implementing a Response to Intervention Plan	
IRB ID	20-2028	Expiration: 11/30/2020 Approval: 11/06/2019

The following information is provided to inform you about the research project and your participation in it. Please read this disclosure carefully and feel free to ask any questions you may have about this study and the information given below. You must be given an opportunity to ask questions, and your questions must be answered. Also, you must receive a signed copy of this disclosure.

Your participation in this research study is voluntary. You are also free to withdraw from this study at any time. In the event new information becomes available that may affect the risks or benefits associated with this research study or your willingness to participate in it, you will be notified so that you can make an informed decision whether or not to continue your participation in this study.

For additional information about giving consent or your rights in this study, please feel free to contact the Middle Tennessee State University (MTSU) Office of Compliance (Tel 615-494-8918 or send your emails to irb_information@mtsu.edu). Please visit www.mtsu.edu/irb for general information on MTSU's research participant protection policies.

Please read this section and sign Section B if you wish to enroll in this study. The researcher will provide you with a copy of this disclosure form for you to keep for your future reference.

- 1. Purpose of the study:** You are being asked to participate in this research study because the purpose of this study is to determine if visually analyzing student's performance on RTI will help close the achievement gap and improve state mandated testing.

2. Classification of procedures to be followed and approximate duration of the study:

- 2.1 *Educational Tests* – Study involves either standard or novel education practices which consists educational testing and such studies expose the participants to lower than minimal risk
- 2.2 *Behavioral Evaluation* – Although the study may or may not involve educational tests, the specific aim is to understand behavioral characteristics.

The following classifications indicate that the participant will be asked to perform or part-take in physical activities or procedures. Examples of such studies simple physical exercises, medical or clinical intervention, pharmaceutical testing and etc. Due to the nature of these studies, you may be exposed risky situations that may exceed normal day-to-day scenarios.

- 2.3 *Psychological intervention or procedures* 2.4 *Physical Evaluation or Procedures*
- 2.5 *Medical Evaluation or Clinical Research* 2.6 *OTHER*

Educational intervention or Procedures- My goal is to use four TVAS questions to learn what school staff members believe lead to the change in Irving College's TVAAS growth scores from 2016-2017 to 2017-2018 school years.

- 3. What are procedures we intend on doing in this study?**
I will analyze the percentage of student's in each of TNReady's descriptor categories (Below Expectations, Approaching Expectations, On-Track, and Mastered) in English Language Arts and Mathematics for 3rd -8th grade in the 2016-2017 and 2017-2018 school years. I will also be analyzing responses to the interview questions about the procedures used to improve TVAAS scores during those years.
- 4. What will you be asked to do in this study?**
You will be asked to answer a few short questions about procedures that school staff used which resulted in an increase in TVAAS scores for the 2016-2017 and 2017-2018 school years.
- 5. What are we planning to do with the data collected using your participation?**
I plan to use the anonymous data collected from you to complete my Master's thesis at MTSU. I am also required to present my findings at a professional conference. The names of the study participants will not be disclosed.
- 6. What are your expected costs to you, your effort and your time commitment?**
It is expected to take no more than 15 minutes of your time to complete the consent form and interview questions.
- 7. What are the potential discomforts, inconveniences, and/or possible risks that can be reasonably expected as a result of participation in this study?**
There are no expected discomforts, inconveniences, and/or possible risks that can be reasonably expected as a results of participation in this study.
- 8. How will you be compensated for your participation?**
There is no compensation for participation.
- 9. What are the anticipated benefits from this study?**
A possible benefit would be to help other schools increase their students' achievement levels and improve state testing scores.
- 10. Will you be compensated for any study-related injuries?**
We do not foresee any study-related injuries occurring. There will be no compensation for any study-related injuries.
- 11. Circumstances under which the researcher may withdraw you from this study:**
The researcher may withdraw you from this research if you did not teach in both the 2016-2017 and 2017-2018 school years at Irving College Elementary.
- 12. What happens if you choose to withdraw your participation?**
If you choose to withdraw your participation, your interview will be disposed of and not included in the research.
- 13. Can you stop the participation any time after initially agreeing to give consent/assent?**
You may stop your participation any time after initially agreeing to give consent.
- 14. Contact Information.** If you should have any questions about this research study or possibly injury, please feel free to contact Madison Curtis by telephone (931) 952-8153 or by email mpc2s@mtmail.mtsu.edu OR my faculty advisor, Dr. James Rust, at (615) 898-2319 or james.rust@mtsu.edu. For additional information about giving consent of your rights as a participant in this study, to discuss problems, concerns and questions, or to offer input, please feel free to contact the MTSU IRB by email: compliance@mtsu.edu or by telephone (615) 494 8918.

15. Confidentiality. All efforts, within reason, will be made to keep the personal information in your child's research record private but total privacy cannot be promised. Your information may be shared with MTSU or the government, such as the Middle Tennessee State University Institutional Review Board, Federal Government Office for Human Research Protections, if you or someone else is in danger or if we are required to do so by law.

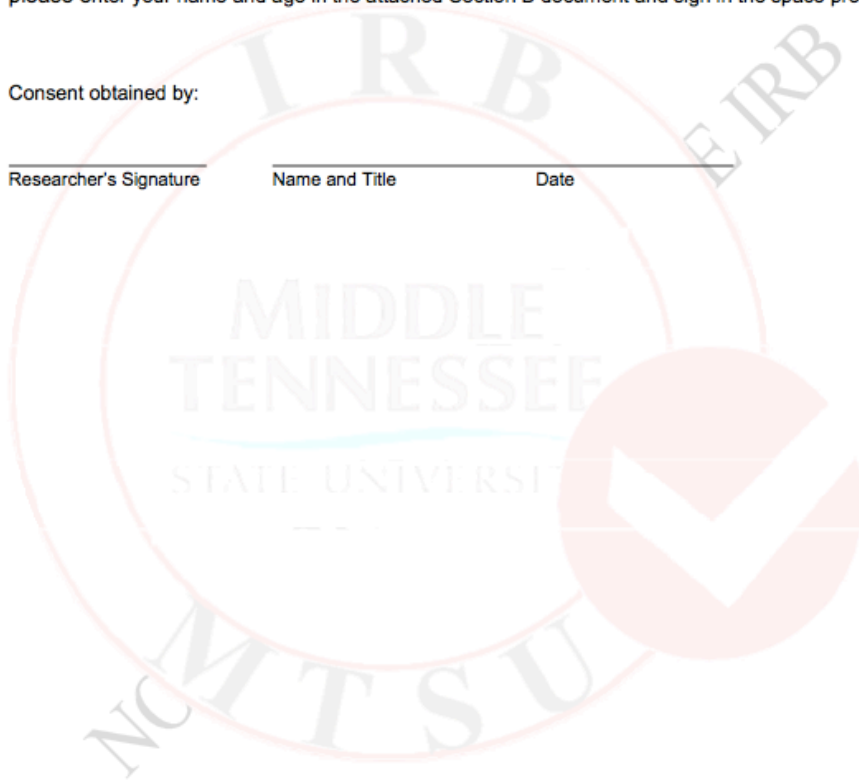
You do not have to do anything if you decide not to participate. If you wish to enroll, then please enter your name and age in the attached Section B document and sign in the space provided.

Consent obtained by:

Researcher's Signature

Name and Title

Date



IRB**INSTITUTIONAL REVIEW BOARD**

Office of Research Compliance,
010A Sam Ingram Building,
2269 Middle Tennessee Blvd
Murfreesboro, TN 37129



**B. Signature Section
(Researchers' Copy)**

Primary Investigator(s) Madison Curtis Student
 Contact information (931) 952-8153 or mpc2s@mtmail.mtsu.edu
 Department Institution Psychology
 Faculty Advisor Dr. James Rust Department Psychology
 Study Title Improving State Mandated Test Scores by Implementing a Response to Intervention Plan
 IRB ID 20-2028 Expiration: 11/30/2020 Approval: 11/06/2019

PARTICIPANT SECTION

(To be filled by the participant and return to the researcher)

Participant Name or ID	(print)	Age:
------------------------	---------	------

- No Yes I have read this informed consent document pertaining to the above identified research
 No Yes The research procedures to be conducted have been explained to me verbally
 No Yes I understand each part of the interventions and all my questions have been answered
 No Yes I am aware of the potential risks of the study

By signing below, I affirm that I freely and voluntarily choose to participate in this study. I understand I can withdraw from this study at any time without facing any consequences.

Date Signature of the Participant

RESEARCHER SECTION

(To be filled by the researchers)

Informed Consent obtained by:

Date Signature Print Name & Title

Faculty Verification if the PI is a student:

Date Faculty Signature Print Name & Title

Appendix C

Warren County Permission to Conduct Research



APPROVAL OF RESEARCH

The proposed research entitled: Improving State Mandated Test Scores by Implementing a Response to Intervention Plan

To be performed by (Name of Researcher): Madison Curtis

*This proposal has been received by the Research Review Committee of Warren County Schools and:

---This proposal has been APPROVED / ~~DISAPPROVED~~ (circle one) as meeting required criteria

---This form should be forwarded to the PRINCIPAL(S) / ~~DIRECTOR OF SCHOOLS~~ (circle one)

Research Committee Chair Signature: Candice Williams Date: 9/3/19

- > If specific school(s) or department(s) involvement in research is necessary, the approval of administrators (principals/department heads) is required. After having obtained the approval of the Research Review

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Committee (see above), the researcher must next obtain the approval of any administrator whose school will be directly involved. Please note, however, that preliminary approval by the Research Committee does not guarantee school administrative approval.

Principal:

I AGREE/DISAGREE (circle) that our school will participate in this research study. I also understand that of given my approval, this research will be conducted in accordance with Warren County School System's policies. (If multiple schools and additional signatures are needed, see next page.)

Principal's Signature: Rachael Graver Date: 9/4/19

Department Chair's Signature: _____ Date: _____
(if needed)

➤ After obtaining required signatures, please return this form to the Research Committee Chair

Director of Schools:

I support the decision of the the Principal(s) of the participating

Research Review Committee and school(s).

Director of Schools



Signature: [Signature] Date: 7-5-19