THE EFFECTIVENESS OF SCHOOL WIDE RESPONSE TO INTERVENTION (RTI) IN RURAL PUBLIC SCHOOLS

Sarah E. Sanford

The Effectiveness of School Wide Response to Intervention (RTI) in Rural Public Schools

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Sarah E. Sanford

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To the College of Graduate Studies:

We are submitting a field study written by Sarah Sanford entitled "The Effectiveness of School Wide Response to Intervention (RTI) in Rural Public Schools." We have examined the final copy of this thesis proposal for form and content. We recommend that it be accepted in partial fulfillment of the requirements for the degree of Educational Specialist.

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DEDICATION

To my husband and children who have tirelessly put up with my piles of research stacked around the house, my endless mutterings about RTI, and my long hours in front of the computer while typing up this field study. And to my brother, Stephen, for taking time out of his intensely busy schedule to run a ridiculous number of stats for me – you just let me know when you're ready for me to proofread your dissertation!

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ABSTRACT

The purpose of this study was to examine the effectiveness of school wide RTI programs in rural public schools. The study examines two rural Tennessee schools with similar demographics and student body size. Both schools used Aimsweb and STAR Reading and Math for baselines and progress monitoring. TCAP scores were also examined to determine gains between the two schools. Significant results were found in favor of the school using school wide RTI.

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CHAPTER I

INTRODUCTION

Since the introduction of Response to Intervention (RTI) as a part of an effort to increase learning gains in at risk children in the reauthorization of IDEA in 2004, there has been a wealth of research done on RTI as a method of decreasing special education referrals. In the majority of these research studies, RTI is done on a student-by-student basis in an attempt to target the lower functioning children in a school and bring them up to grade level. In their 2005 blueprint article, Fuchs and Fuchs define RTI as a four-step process – step one is screening for children who are at risk for school failure. Steps two-a and two-b are implementing classroom instruction and monitoring responsiveness to that instruction. Step three-a is implementing a supplementary, diagnostic instructional trial. Three-b is monitoring the responsiveness to the supplementary, diagnostic instructional trial. Step four is designation of LD and special education placement.

Statement of the Problem

An exhaustive search by the author on the use of RTI on a school wide basis revealed that there is relatively little research available on the use and effectiveness of school wide RTI. School systems are under increasing pressure to bring up student scores, make Adequate Yearly Progress and prove that their methods work. RTI, while recommended by the government as a method of helping children who are behind, has not been implemented on a school-wide basis in many schools.

Purpose of the Study

The purpose of this study was to examine the effectiveness of RTI on a school wide basis to determine if implementation of RTI with all students instead of a targeted

few brings up scores for the entire student population. The school studied was a rural school in Cheatham County that implemented a school wide RTI program beginning in 2009 as part of the school improvement plan. All students were given reading and math benchmark tests in the fall, winter, and spring and had progress monitoring periodically throughout the year once every nine weeks. Every student in every grade was placed in an RTI group based on skill level. Interventions were planned around the group level's abilities. The control school was another school in the county with similar demographics and student body size that did RTI on a student-by-student basis but not on a school-wide basis. The study examined and compared progress rates of general education and special education children on benchmarks and progress monitoring as well as TCAP scores of the third and fourth graders.

Significance of the Study

School administrators and teachers need to know what brings about improvement, especially with increased pressure to bring up test scores. With the recommendation of the use of RTI in IDEA 2004, school systems are under increased pressure to implement it. RTI is being used in many schools on a student-by-student basis. Additional research on the effectiveness of RTI aids school administrators in their decisions to implement RTI on a school wide basis or not.

Limitations of the Study

As with any study there are potential limitations that can affect results. The study and control school were rural schools and are therefore smaller than urban schools. Both schools had approximately 400 students. At the time of the study, School A had been using RTI for two years. Data at School A was collected for every benchmark and

progress monitoring period using Aimsweb measures the first year and a combination of Aimsweb and STAR Reading and Math the second year. There was less data from the control school as they only benchmarked all students and then progress monitored those who are targeted for RTI. There were very few minority students at either school with an estimate of ten or less African American and Hispanic students per school. The number of students with IEPs was comparable between schools as was the socio-economic status of the students and the rural area in which they lived. Factors that could affect the students included school administration, teacher effectiveness, student home life, and student health and attitude.

Research Questions

1. Is there a significant difference in benchmarking scores of Aimsweb and STAR Reading between the students of School A (with school wide RTI) and School B (without school wide RTI)?
2. Is there a significant difference in the gains made between schools in Aimsweb and STAR Reading benchmarking scores?
3. Is there a significant difference in the TCAP reading and math scores of third and fourth graders between School A and School B?
4. Is there a significant difference between the TCAP reading and math scores, STAR reading and math scores, made by the general education students and students with IEPs at School A and School B?

Definitions of Terms

1. Response to Intervention (RTI): … integrates assessment and intervention within a multi-level prevention system to maximize student achievement and to reduce behavioral problems. With RTI, schools use data to identify students at risk for poor learning outcomes, monitor student progress, provide evidence-based interventions and adjust the intensity and nature of those interventions depending on a student's responsiveness, and identify students with learning disabilities or other disabilities (National Center on Response to Intervention, 2010, Essential components of RTI – A closer look at response of intervention, p. 2).
2. Universal screening: … brief assessments that are valid, reliable, and demonstrate diagnostic accuracy for predicting which students will develop learning or behavioral problems. They are conducted with all students to identify those who are at risk of academic failure and, therefore, need more intensive intervention to supplement primary prevention (i.e., the core curriculum) (National Center on Response to Intervention, 2010, Essential components of RTI – A closer look at response of intervention, p. 8).
3. Student progress monitoring: … repeated measurement of performance to inform the instruction of individual students in general and special education in grades K-8. These tools must be reliable and valid for representing students' development and have demonstrated utility for helping teachers plan more effective instruction (National Center on Response to Intervention, 2010, Essential components of RTI – A closer look at response of intervention, pp. 9).

CHAPTER II

REVIEW OF LITERATURE

Introduction

The implementation of No Child Left Behind (NCLB) in 2001 and the reauthorization of Individuals with Disabilities Education Improvement Act of 2004 (IDEA) began a new era in teaching, remediation and identification for special education. NCLB detailed Adequate Year Progress (AYP) goals that schools are required to meet if they are to avoid governmental intervention and possible takeover. IDEA provided the recommendation of the Response to Intervention (RTI) model which is meant to aid in closing the achievement gap between groups of children – for example, those who had early intervention versus those who did not and children from a lower socioeconomic status versus those from a more affluent background (Alonzo, Tindal & Robinson, 2008). Over the ensuing years, school systems all over the country have implemented RTI on varying levels. Some systems have implemented RTI on a student-by-student basis. Others have made RTI school-wide and/or system-wide in an effort to improve all student achievement.

History of RTI

In 2001, President Bush created The President's Commission on Excellence in Special Education (PCESE) for the purpose of determining how best to revitalize and improve special education. The commission complied a report and submitted it in 2002. The report addressed nine problems identified by the commission through their discussions and over the course of 13 public meetings conducted through the United States in which the commissioners listened to the concerns of teachers, administrators,

and parents. Three major recommendations to remedy these problems were presented (President's Commission on Excellence in Special Education, 2002).

First, the commission found that IDEA provided "basic legal safeguards and access" for children with disabilities, but that process and bureaucracy was often placed before student achievement and results. Regulations were complex, the paperwork was excessive and it was a complicated process to qualify a child for special education (President's Commission on Excellence in Special Education, 2002).

Second, the special education model then in effect used a "wait to fail" model - which is, rather than using prevention and early intervention, students were not helped until they were already failing (President's Commission on Excellence in Special Education, 2002). The further behind a child gets, the more intensive interventions are needed to remediate and bring the child back on level with his or her peers – early intervention prevents failure as well as future difficulties.

Third, special education children were general education children first. The two systems – general education and special education – are not separate, even though they have always operated as separate entities. Special education provides additional services to general education, not separate services from general education. "General education and special education share responsibilities for children with disabilities. They are not separate on any level – cost, instruction or even identification" (President's Commission on Excellence in Special Education, p. 7).

Fourth, parents often felt the system failed them and their children – especially when struggling with a system that seemed to offer them no options. Parents wanted to

help their children succeed, but with the "wait to fail" model, they were put off until the child had failed, then were presented with options such as special education testing.

Fifth, threat of litigation developed a culture of compliance, which pulled the focus away from doing what schools were created to do – educate every child (President's Commission on Excellence in Special Education, 2002).

Sixth, many of the methods used to identify children for special education were not valid, which led to thousands of children being misidentified every year and many more not being identified at all.

Seventh, children identified as having a disability require highly qualified teachers.

Eighth, the special education field was in need of long-term coordination to support students, parents and educators and it needed to use evidence-based practices.

Ninth, and finally, the focus of the school system was too much on bureaucracy and compliance and not enough on actually educating the children it was created to serve (President's Commission on Excellence in Special Education, 2002).

The commissioners proposed three major recommendations to reform the problems identified. The first recommendation was to "Focus on results – not on process. IDEA must return to its educational mission: serving the needs of every child … the system must be judged by the opportunities it provides and the outcomes achieved by each child" (President's Commission on Excellence in Special Education, p. 8).

The second recommendation was to "embrace a model of prevention and not a model of failure" (President's Commission on Excellence in Special Education, p. 9).

Third, children with special needs must be considered as general education children first. Instructional methods used in the classrooms must be effective, early intervention must take place and children with special needs must have access to the school's full gamut of resources instead of being relegated to a separate program all together (President's Commission on Excellence in Special Education, 2002).

The reauthorization of IDEA in 2004 drew upon these recommendations and modifications were made to incorporate them as well as change the outlook on specific learning disabilities (also recommended in the President's Commission on Excellence in Special Education, 2002) and include RTI as a method of early intervention. The 2006 NASDSE and CASE White Paper on RTI detailed growing interest in the use of RTI due to three major changes in IDEA 2004:

(1) "… when determining whether a child has a specific learning disability as defined in section 602, a local education agency shall not be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability …" [P.L. 108-446, §614(b)(6)(A)];

(2) "In determining whether a child has a specific learning disability, a local education agency may use a process that determines if the child responds to scientific, research-based intervention as a part of the evaluation procedures …" [P.L. 108-446, §614(b)(6)(B)]; and

(3) a local education agency may use up to 15% of its federal funding "… to develop and implement coordinated, early intervening services … for students in kindergarten through grade 12 (with a particular emphasis on students in kindergarten through grade 3) who have not been identified as needing special

education or related services but who need additional academic and behavioral support to succeed in a general education environment" [P.L. 108-446, §613(f)(1)] (p. 1).

The purpose of the NASDSE and CASE white paper was to try to impress the importance of the use of RTI by general educators upon the education community. RTI plays a large part in identifying struggling students and finding the intervention that works best for them. It also helps teachers and administrators decide which children should be referred for special education. A child who was struggling and falling behind, but makes gains in an RTI program most likely does not need a special education referral. A student who is not making gains despite intensive interventions should be referred for special education evaluation (2006).

What is RTI

Fuchs, Mock, Morgan, and Young (2003) described RTI as the front-running alternative to the IQ/achievement discrepancy model that has been the standard for identifying students as Learning Disabled. Instead of looking at a set of numbers given on a one-time battery of standardized tests that may or may not reflect the curriculum being taught, RTI uses dynamic assessment, problem solving, and interventions to assess whether or not there is a learning disability (Fuchs et al, 2007). Fuchs et al (2003) gave the following broad description of RTI:

1. Students are provided with "generally effective" instruction by their classroom teacher;
2. Their progress is monitored.

3. Those who do not respond get something else, or something more, from their teacher or someone else;
4. Again, their progress is monitored; and
5. Those who still do not respond either qualify for special education or for special education evaluation. (p. 159)

There is no standard for RTI implementation therefore it is employed in many different ways across the country. Fuchs et al (2003) discuss positive aspects of RTI including the simple fact that it provides help quickly to a greater number of struggling students. Bursuck and Blanks (2010) stated: RTI "has the potential to narrow the achievement gap and reduce the number of referrals to special education by catching children before they fail," which reduces referrals and potential misdiagnoses and therefore allows special educators to focus on those students whose needs truly cannot be met in the general education setting. This intensive help also assists in ruling out students who truly have a disability from those who are lacking in instruction that meets their needs. RTI is for any student who is in danger of falling behind his or her peers and helps identify those who are struggling, but who may catch up and become proficient with the right interventions provided in a timely manner (Moore & Whitfield, 2009).

In 2010, the National Center for on Response to Intervention published the brief, *Essential Components of RTI – A Closer Look at Response to Intervention*. The definition of RTI offered in this brief reflected current research and evidence-based practice. The definition states:

> Response to intervention integrates assessment and intervention within a multi-level prevention system to maximize student achievement and to reduce

> behavioral problems. With RTI, schools use data to identify students at risk for poor learning outcomes, monitor student progress, provide evidence-based interventions and adjust the intensity and nature of those interventions depending on a student's responsiveness, and identify students with learning disabilities or other disabilities (p. 2).

A 2005 report prepared by the National Joint Committee on Learning Disabilities define the core concepts of an RTI approach as being, "... the systematic (1) application of scientific, research-based interventions in general education; (2) measurement of a student's response to these interventions; and (3) use of the RTI data to inform instruction" (p. 2). RTI is not an instructional practice. It is a preventative method designed to help teachers make the best decisions on how to teach their children and to respond quickly to learning difficulties and thereby minimize the effects of learning difficulties (National Center on Response to Intervention, 2010).

RTI is based on a set of core principles beginning with the effective teaching of all children and early intervention. RTI uses a multi-tier model of service delivery and a problem-solving method to make decisions within that multi-tier model. Interventions used must be research-based and scientifically validated as much as possible. Student progress must be monitored and data gathered in order to make instruction decisions. All children should be screened in order to identify the ones who are not progressing as expected. Diagnostics are needed to determine what children can and cannot do in behavioral and academic domains. Progress monitoring is necessary to prove whether the interventions are having the needed effects or not (NASDSE and CASE White Paper on RTI, 2006).

As defined by the NASDSE and CASE white paper, the three key components of RTI are:

- High-quality instruction/intervention, which is defined as instruction or intervention matched to student need that has been demonstrated through scientific research and practice to produce high learning rates for most students. Individual response is assessed in RTI and modifications to instruction/intervention or goals are made depending on results with individual students.
- Learning rate and level of performance are the primary sources of information used in ongoing decision-making. … Decisions about the use of more or less intense interventions are made using information on learning rate and level.
- Important educational decisions about intensity and likely duration of interventions are based on individual student response to instruction across multiple tiers of intervention. Decisions about the necessity of more intense interventions, including eligibility for special education, exit from special education or other services, are informed by data on learning rate and level (p. 3).

Interventions in RTI are tiered according to intensity. The greater a student's need the higher tier or intervention he or she is given. The National Center on Response to Intervention says these tiers represent a continuum of supports and that many schools use multiple interventions within a single level of prevention (2010). Tier I should be appropriate for 80% - 85 % of the student population, Tier II is used for approximately 15%, and Tier III serves the smallest percentage at approximately 5% of students (NASDSE and CASE White paper, 2006).

Tier I involves high quality instruction for all students in general education. Behavioral supports are also provided. Universal screenings are conducted in the areas of literacy, academics and behavior. Teachers implement various research-based teaching methods. Curriculum based assessment and progress monitoring are ongoing and are used to guide differentiated instruction (National Joint Committee on Learning Disabilities, 2005).

Tier 2 increases intervention for students who are lagging behind their peers in progress and performance. They receive more specialized intervention within the general education setting. Curriculum-based measures identify students who continue to need more help and in which areas. School personnel collaborate to problem solve and differentiate instruction for those needed more intensive help. The progress of identified students is monitored to ensure the modifications are effective and assessments are conducted to establish the reliability of the instruction and interventions being used. Parents are informed of the interventions and are included in planning and monitoring progress. General education teachers receive support and help as needed from other educators in order to effectively serve identified children (National Joint Committee on Learning Disabilities, 2005).

Tier 3 involves an evaluation by a multidisciplinary team to determine if a child has a learning disability, if special education and related services are required. Parents are informed of their rights and procedural safeguards as required by IDEA 2004. Consent for an evaluation is obtained. The evaluation uses assessments such as standardized tests, norm-referenced measures, observations by parents, teachers, and students, as well as the

data collected in Tier 1 and Tier 2 (National Joint Committee on Learning Disabilities, 2005).

Assessment is a key component of RTI. Screenings are short assessments that identify students who may be in need of interventions. Progress monitoring, testing that is done frequently throughout the year, determines if these interventions are effective. The data gathered in progress monitoring aids in planning the interventions to be used for a particular child, whether a child needs to be moved into a different intervention, if the child is progressing at the rate his or her peers are, and if he or she may have a learning disability. The data from all students can also be complied to track progress toward school achievement goals and to examine the appropriateness of the core curriculum being used (National Center on Response to Intervention, 2010).

Johnston (2006) discusses the instructional frame of RTI, "The law describes RTI in two ways: as a strategy for identifying students with learning disabilities (LD) … and as a strategy for reducing the number of students who end up with disabilities" (p. 602). If RTI is looked at as a way to identify students with LD, he calls RTI a measurement problem that emphasizes standardization. If RTI is examined as a strategy to prevent LD, it then becomes an instructional problem, which emphasizes effective teaching and responsive use of assessment data to improve teaching and teacher expertise.

Problems with RTI

There have been challenges along the way to implementing RTI in schools across the country. Kozleski and Huber (2010) list some common barriers that stand in the way of widespread RTI use as: confusion about how RTI is implemented and it's purpose, lack of training on the part of school staff so they do not know their role in the RTI

process and they are not prepared to effectively teach in an RTI setting, a lack of understanding about how ELL students fit in the RTI model, and a dearth of knowledge of what is really evidence for evidence based practices.

Harlacher, Walker and Sanford (2010) stated that teachers must be given instruction on how to intensify and differentiate their teaching. Educators must understand how to accurately assess students and identify those who are struggling. They cited the 2006 National Council on Teacher quality, which stated that, "most general education teacher preparation programs surveyed across the United States failed to provide training in research-based reading instruction in the five critical elements of reading" (p. 32). If educators do not have sufficient knowledge of evidence-based practices and researched-based interventions, they will be unable to locate appropriate interventions to use in their schools. Reeves, Bishop, and Filce (2010) reported that there are now "...several commercially available resources ... designed to help teachers choose appropriate interventions that meet specific literacy needs" (p. 33). They further state that these seem to be "one-size-fits-all" products that try to offer "one-stop" solutions to schools struggling to develop an RTI system. Teachers need to use a variety of programs and interventions in order to differentiate instruction based on student needs.

Hoover and Love (2011) call RTI a constantly evolving process. There were not set rules given by the government, merely guidelines for what RTI needed to incorporate. State departments of education and school districts provide general parameters and the individual schools are allowed to develop an RTI program that meets their dynamic needs. As the school develops its RTI program things are constantly changing as they are found to work or not work – the types of assessments used, the interventions

implemented; how many levels of intervention there are in each tier, and so forth. A critical component of a successful RTI implementation is obtaining the full support and willingness to cooperate of the teachers. Hoover and Love (2011) recommend schools have a school team leader who has been trained in RTI facilities and can maintain school staff support in several ways including maintaining critical principal and school district support throughout the process; identifying issues of direct relevance and responding to school-based issues instead of generic RTI concerns and issues; the school team selecting solutions for RTI problems based on the school's needs; and, discussing specific school-based RTI issues with an outside support person.

Hoover and Love (2011) examined a case study involving three schools in the Western United States, three master educators assisted in solving problems that arose when trying to implement RTI. These problems were: transitioning to the three-tiered RTI model, supplemental instruction and progress monitoring, collaborating to integrate Tier 1 and Tier 2 instruction, determining the most appropriate tier of instruction, determining special education eligibility, and distinguishing learning differences from disabilities in diverse learners. Through the process of aiding these schools in working through their problems the master educators outlined the above key RTI challenges that are found in all different school settings and provided the following guidance to educators who are attempting to implement a school-wide RTI process:

- Operating from a clear understanding of the RTI framework to be implemented in the school is important, especially as related to transitioning from the previous prereferral model to the contemporary RTI model.

- Whereas school- and district-wide RTI professional development provides a general knowledge base of understanding, ongoing supports assist school teams to more directly address RTI issues specific to their schools.
- An understanding of the interactions between Tier 1 and Tier 2 instruction is essential for effective collaboration between general education classroom teachers (i.e., Tier 1 instruction) and those providing Tier 2 supplemental supports.
- School teams responsible for making RTI instructional and eligibility decisions that establish and adhere to clear decision rules where cut scores, rate of progress, and gap analysis results are taken into consideration are best positioned to make informed data-based decisions.

- A process for providing periodic and ongoing support to team leaders in their task of leading RTI implementation in their schools may be of significant benefit, as this model empowers a school staff to quickly and directly deal with their own site-based RTI issues in a timely and efficient manner (p. 47).

Harkening back to the recommendation in the President's Commission that called for education to be driven by results, not by process, RTI has also found pitfalls in the realm of paperwork. Some schools have made RTI a burden of papers to be filled out – a form to refer a child for Tier 2, a form to track their interventions, a form for scores, etc. Buffum, Mattos, and Weber said teachers told them they often decide not to refer a child for intervention "because it's not worth the paperwork" or that they hate RTI because they have to spend more time filling out papers than they get to spend actually working with students. They wondered if these reasons might be playing a part in why some districts are reluctant to implement an RTI program.

In 2009 Mellard, McKnight, and Woods published a study for The Division for Learning Disabilities of the Council for Exceptional Children on the screening and progress-monitoring practices in schools. They were charged by the U.S. Department of Education to identify, describe, and evaluate the implementation of RTI in elementary schools across the country. The National Research Center on Learning Disabilities (NRCLD) worked with six federally funded Regional Resource Centers to ask more than 60 schools that were potentially using RTI to participate. Only 41 met their criteria. In order to qualify as a school using an RTI program they had to first indicate that they had,

> (a) at least two tiers of intervention; (b) a reliable, valid system for monitoring learner progress; (c) leadership and professional development supporting RTI; (d) scientifically based reading practices in general education; (e) scientifically based reading practices with appropriate intensity beyond the first tier; (f) an objective cut point or procedure for demarcating responsiveness; and (g) LD identification procedures that followed regulatory requirements (p. 188).

Secondly, the schools had to prove that their RTI implementation contained adequate essentials of an RTI working model. Their criteria in this second selection level contained five broad categories that contained 27 elements. The categories were: "(a) general education practices, (b) student assessment practices, (c) intervention model practices, (d) disability determination practices, and (e) student outcome data" (p.188). Their third qualification was the school administrator's willingness to provide information for the study.

The schools that met all the criteria were mostly affluent schools. Only three percent of the 41 schools served children of low socio-economic status. The authors noted that it is most likely easier for affluent schools with few ELLs or students with SLD to implement RTI. These schools were willing and able to devote time and resources to advancement and school-wide change. The authors further stated that they believed that schools of both high and low socioeconomic status could learn from the implementation methods of these 41 schools as they develop their own RTI plans (Mellard et al., 2009).

Mellard et al. (2009) were surprised by the assessment methods of the schools. They expected school-wide screenings would be conducted one to three times a year. They found instead that the schools used various assessment instruments with greater frequency than anticipated. These data gave teachers a frequent update on how their students were learning and achieving. Teachers reported they preferred this databased decision making to the former non-data-based method of determining instructional needs.

Grigorenko (2009) identified a host of limitations with RTI and current research on RTI:

- a lack of clarity in translating information obtained in the context of RTI into regulations for identifying children with special education needs;
- the primary focus of RTI on elementary grades
- the primary focus of RTI on reading, with some limited information available for math and very little information for other academic skills and domains;
- the primary focus on SLDs and limited attention to other special needs;

- a lack of consideration of level of ability (i.e., lack of provision for children with high levels of ability who, although achieving at the average level of ability, underachieve for their level of potential);
- a lack of differentiation between limited English proficiency and low SES as sources of underachievement
- the need to combine RTI-based information with other sources of information (e.g., on general ability and cognitive functioning and behavior;
- a lack of working models incorporating RTI consistently with existing practices within the LEA or private educational settings; and
- a lack of professionals and/or professional training enabling the implementation of RTI.

RTI and Reading

RTI has been primarily used for reading interventions. Torgeson (2002) names reading difficulties as the primary reason for most special education referrals. A student who struggles in reading will likely struggle in every subject, as independent reading is increasingly required for taking in information and following directions (Dunn, 2010). A child who struggles with reading will not be able to fully understand the directions or the word problems on his or her math paper. He or she will not comprehend the words in the science book or the history lesson that must be read for homework with the promise of a pop quiz over the material in the morning. In their article about the use of RTI and differentiated instruction to teach reading, Walker-Dalhouse et al state, "The long-term goal is teachers assuming responsibility for adjusting instruction according to students'

specific needs rather than following a predetermined skill sequence that may not match students' development" (p. 85).

A 2010 study by Denton et al. on the effectiveness of a supplemental early reading intervention with first graders provided favorable results. Their study included students of various socioeconomic status, different settings, varying levels of teacher experience and training. Using the early intervention, 91% of their at-risk readers could read and spell adequately at the end of first grade.

Gettinger and Stoiber (2007) studied the effectiveness of the EMERGE (Exemplary Model of Early Reading Growth and Excellence) program as an effective intervention for early literacy development in low-income children. The children in the study group outperformed the control group in all areas on the post-test. This study, while providing validity for a useful tool, was not based on a school-wide RTI program.

Schoolwide RTI

A thorough and exhaustive search through the existing literature on RTI revealed a startling lack of research on RTI used on a school wide or system-wide basis. The majority of the research found by the researcher revolves around the use of RTI as an alternative or supplement for the IQ/achievement discrepancy model for identifying children for special education and there is some generalized research that discusses the process of RTI – much of which is discussed above. The lack of research on the subject of school wide RTI may be simply because RTI is not often used on a school wide basis. Using RTI as a preventative and early intervention system is costly in both time and resources according to Fuchs, Fuchs, and Compton (2012). Systems must invest in assessments and interventions that were not used in previous decades. Staff must be

adequate to conduct benchmarking and progress monitoring as well as to teach the interventions. Rural schools, in particular, may lack resources needed to hire additional staff, pay for training and needed assessment and intervention materials, and may need to use fewer tiers or make do with what supplemental instruction materials they have on hand (Stecker, Fuchs, & Fuchs, 2008). Fletcher and Vaughan (2009) call scaling issues in the schools significant and discuss difficulties involved with funding coming from many different sources such as Title I and IDEA that have specific criteria about what the funds may be used for which make it difficult to merge the funds for a school wide intervention model.

Mahdavi and Beebe-Frankenberger (2009) conducted a study involving two rural schools in Montana who implemented school wide RTI. Their study focused mainly on the social validity of the implementation, the effectiveness of collaboration, and the acceptability of RTI. They found that the longer RTI was in use, the more effective it became, the more comfortable the staff and the community became with it and the more the children improved. There was some resistance from the teachers at first, but the longer they were involved in the process and the more improvement they saw in their students, the more they enjoyed and accepted the process.

In a 2009 study by Deno et al a school wide progress monitoring system was developed in St. Paul, MN. All students were progress monitored using oral reading CBMs and a MAZE CBM. Their scores were compiled and the students were ranked according to their ability and placed in reading groups accordingly. Goals were outlined for each at-risk student and they were progress monitored every two weeks. This method

of benchmarking, teaching according to skills and needs, and progress monitoring ended in greatly improved scores for all students, even those with special needs.

Fuchs and Deshler (2007) outlined conditions that effective RTI implementation is dependent on. These conditions are:

1. Significant and sustained investments in professional development programs to provide teachers with the array of skills required to effectively implement RTI as well as to deal with ongoing staff turnover.
2. Engaged administrators who set expectations for adoption and implementation of RTI, provide the necessary resources, and support the use of procedures that ensure fidelity of implementation.
3. District level support to hire teachers who embrace RTI principles and possess the pre-requisite skills to implement it effectively in their classes.
4. A willingness of teaching and ancillary staff to have their roles redefined in ways to support effective implementation (Reid, 1987, as cited in Fuchs & Deshler, 2007).
5. The degree to which staff is given sufficient time to 'make sense of' and accommodate RTI into their instructional framework, and have their questions and concerns addressed (Spillane, Reiser, & Reimer, 2002 as cited in Fuchs & Deshler, 2007).
6. Whether decisions regarding the adoption of RTI have been influenced by the thoughts and beliefs of practitioners at the grassroots level versus decisions made exclusively by those on high (Knight, 2004 as cited in Fuchs & Deshler, 2007).

Shapiro and Clemens (2009) further outlined a conceptual model for evaluating RTI systems. This model can be used to evaluate school-wide RTI programs or programs that target students in danger of failing. Their model outline consists of five evaluation indices: 1) monitoring risk levels across benchmark periods, 2) rate of improvement across benchmark measures, movement between tiers, movement within tiers, and accuracy of referrals to special education. They pose that using the data from these indices can enable administrators to determine the impact they are making, if any areas in their program need to be changed, where they are doing well, and where they have room to grow.

Need for More Research

There is a great deal of research on the use of RTI as a method of identification for learning disabilities. This research is not reviewed here for this study focuses on the use of school wide RTI. Many articles discuss how RTI should be implemented, the tier systems and the assessments needed as well as the problems that can occur during implementation. Still others discuss different reading strategies and programs that can be used in an RTI framework. One of the major purposes of RTI is to prevent learning difficulties. It seems more research is needed to determine if RTI achieves that goal when it is implemented on a school wide level.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to examine the effectiveness of school wide RTI by comparing two schools in a rural Tennessee county – one of which used school wide RTI and the other, which did not. Test scores, reading levels and gains for two consecutive years were compared to determine if the use of school-wide RTI in School A improved scores overall in relation to School B.

Research Design

The study was a quantitative study of the 2009-2010 and 2010-2011 school years. The study design was primarily a regression discontinuity design. Analysis of variance (ANOVA) and independent samples t-tests were conducted to determine if students from a variety of backgrounds (e.g., socio-economic status and students with IEPs) were differentially impacted by the RTI groups.

Independent variables were the interventions provided at Elementary School A. Interventions for reading include: the regular reading curriculum, Wilson Reading, Failure Free Reading, SRA Reading Mastery, Fast Forward (computer program), Sing, Read, Learn, and leveled readers.

Dependent variables were TCAP scores for 3rd and 4th graders and curriculum-based measurements for all grades. Curriculum based measurements included: Children's Progress for K and 1st grades, Discovery Education for 2nd – 4th grades and STAR Reading and Math for grades K-4, as well as Aimsweb testing for the special education children. Aimsweb was used county wide in 2009-2010 for benchmarking and progress

monitoring, but was discontinued at the end of the year for all except students with IEPs. The special education department continued the use of all Aimsweb measures. Both schools did continue to use the Reading CBM measure for benchmarking.

Population

The population consisted of the K-4 student bodies of School A and School B. Both schools were of similar size and location. Both were Title 1 schools and the students were of similar socioeconomic backgrounds. The student population of each school averaged 400 students with similar ratios of minorities and special education students. School A met the criteria outlined by the National Research Center on Learning Disabilities to be considered a school that uses RTI.

Instrumentation

Instruments the schools used to collect data included Aimsweb, STAR Reading and Math, Children's Progress, Discovery Ed, and TCAP. Aimsweb used benchmarking tests and shorter progress monitoring measures that were timed and administered by a teacher. Results were recorded on paper, then transferred to a spreadsheet. STAR Reading and Math, Children's Progress, and Discovery Ed were both computer programs that recorded data as the children were tested. Reports were generated from the programs' databases. TCAP was administered at the end of the school year to third through eighth grades. Student score reports were sent to the schools from the state department of education. The purpose of all of these measures was to determine the level of a child's achievement and if they were progressing as they should through the curriculum.

Data Collection

The district transferred data spreadsheets for 2009-2010 and 2010-2011 school years on grades K-4 to the researcher in December 2011. These spreadsheets contained Aimsweb benchmarking and progress monitoring scores, STAR Reading and Math grade-level scores, and TCAP scores. For the purpose of the study, scores from grades 1-3 were utilized for the 2009-2010 school year and for those same students in 2010-2011 for grades 2-4.

Null Hypotheses

Null hypotheses investigated in this study were:

Hypothesis one (Ho1): There will be no statistically significant difference between the benchmarking scores of Aimsweb and STAR Reading and Math between the students at School A and School B.

Hypothesis two (Ho2): There will be no statistically significant difference in the gains made between schools in Aimsweb and STAR Reading benchmarking scores.

Hypothesis three (Ho3): There will be no statistically significant difference in the reading and math TCAP scores of third and fourth graders between School A and School B.

Hypothesis four (Ho4): There will be no statistically significant difference between the math and reading TCAP scores, STAR reading and math scores, made by general education students and special education students at School A and School B.

Analysis of the Data

The study design was primarily a regression discontinuity design and analysis of variance (ANOVA) to determine if students from a variety of backgrounds (e.g., socio-economic status and having an educational disability) were differentially impacted by the RTI groups.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

Data were collected on students from School A and School B for two consecutive school years, 2009-2010 and 2010-2011. Students who moved into or out of the schools during these years were removed from the data pool, which left a total of 320 students as subjects – 176 at School A and 144 at School B. Aimsweb, STAR Reading and Math, and TCAP Reading and Math scores were compiled and statistically analyzed for this study to determine the effectiveness of school wide RTI. School A used RTI on a school wide basis – every student was tested using Aimsweb and STAR student, then they were divided by ability level and a specific time was set aside during the school day for extra instruction for those needing help or enrichment for those who are above grade level. Students were periodically reassessed and their RTI group changed as needed. School B only used RTI with students who were targeted as having the potential to fail.

Table 1 contains demographic data for the study. It is broken down by school, male, female, and children with IEPs. It is of interest to note that School A has nearly twice the number of students identified as Special Education as School B. Faculty at School B report this as being partly due to a breakdown in the Cheatham Academic Response to Empower Students (CARES – formerly called Support Team) process that has been resolved in the current year. The number of students with disabilities include students who have IEPs for speech impairments and language impairments, as well as those who receive resource services for reading and math.

Table 1

Demographic Data for School Wide RTI Study

	School A	School B	Total
Number	176	144	320
Males	98	79	177
Females	78	65	84
Students with IEPs	31	17	48

Data analysis is presented in this chapter by hypothesis. Data were analyzed by a regression discontinuity design and analysis of variance (ANOVA), with statistical significance being at the 0.05 level.

Research question one

The first question researched in this study was: Is there a significant difference in gains on benchmarking scores of Aimsweb and STAR Reading between the students of School A (with school wide RTI) and School B (without school wide RTI?)

Null hypothesis one (Ho1)

Null hypothesis one to correlate to research question one is: There will be no statistically significant difference between the benchmarking scores of Aimsweb and STAR Reading between the students at School A and School B.

Tables 2-13 contain descriptives and ANOVAs with data relevant to null hypothesis one. In these tables, School A had students taught with the use of school wide RTI, School B did not use school wide RTI.

Research question two

The second question researched in this study was: Is there a significant difference in the gains made between Schools in Aimsweb and STAR Reading benchmarking scores?

Null hypothesis two (Ho2)

Null hypothesis two to correlate to research question two is: There will be no statistically significant difference in the gains made between schools in Aimsweb and STAR Reading benchmarking scores.

Tables 2-13 contain descriptives and ANOVAs with data relevant to null hypothesis two. In these tables, School A had students taught with the use of school wide RTI, School B did not use school wide RTI.

Table 2 consists of a breakdown of the 2009-2010 Aimsweb benchmark scores for the first graders in both schools in 2009-2010. During this school year, all schools in the county used Aimsweb to benchmark all students. School A also used it to progress-monitor all students and plan the school wide RTI groups accordingly. The other schools in the county, including School B, only progress monitored and used RTI with those who were identified as having the potential to fail. Aimsweb measures used with first grade during the 2009-2010 school year included Letter Naming Fluency (LNF), Letter Sound Fluency (LSF), Missing Number (MN), Nonsense Word (NWS), Phoneme Sound Fluency (PSF), and Math Quantity Discrimination (MQD). School A had higher means on all measures. Statistical significance was determined using an ANOVA, which is found in Table 3.

Table 2

Descriptives: First Grade, 2009-2010, Aimsweb Benchmark Scores

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
LNF	School A	56	45.5357	15.72487	2.10132	41.3246	49.7469	16	82
	School B	42	36.9762	15.90289	2.45387	32.0205	41.9319	7	75
	Total	98	41.8673	16.28587	1.64512	38.6022	45.1325	7	82
LSF	School A	56	30.8929	11.23093	1.5008	27.8852	33.9005	0	55
	School B	42	24.3095	12.21452	1.88474	20.5032	28.1158	0	52
	Total	98	28.0714	12.05422	1.21766	25.6547	30.4881	0	55
MN	School A	56	12.8036	5.59682	0.74791	11.3047	14.3024	1	30
	School B	42	8.1905	4.81987	0.74372	6.6885	9.6925	0	15
	Total	98	10.8265	5.73113	0.57893	9.6775	11.9756	0	30
NWS	School A	56	37.6786	14.23582	1.90234	33.8662	41.4909	12	73
	School B	42	26.7857	11.2695	1.73892	23.2739	30.2975	0	49
	Total	98	33.0102	14.06941	1.42123	30.1895	35.8309	0	73
PSF	School A	56	59.6964	13.28693	1.77554	56.1382	63.2547	19	91
	School B	42	30.8095	15.0353	2.32	26.1242	35.4949	0	68
	Total	98	47.3163	20.05282	2.02564	43.296	51.3367	0	91
MQD	School A	56	20.9821	8.16754	1.09143	18.7949	23.1694	3	38
	School B	42	20.8333	6.0724	0.93699	18.941	22.7256	0	34
	Total	98	20.9184	7.30862	0.73828	19.4531	22.3837	0	38

In Table 3 the ANOVA for first grade Aimsweb benchmarking scores in 2009-2010 is found. Hypothesis 1 was rejected for Letter Naming Fluency (LNF) with a p-value of 0.009 and for Letter Sound Fluency (LSF) with a p-value of 0.007 – both of which show statistical significance in favor of School A. Hypothesis 1 was rejected for Missing Number (MN), Nonsense Word (NWS), and Phoneme Segmentation Fluency (PSF) with p-values of 0.000, which showed high statistical significance. Hypothesis 1 failed to be rejected for Math Quantity Discrimination (MQD) with a p-value of 0.921, which showed no statistical significance.

Table 3

ANOVA: First Grade, 2009-2010, Aimsweb Benchmark Scores

		Sum of Squares	df	Mean Square	F	Sig.
LNF	Between Groups	1758.371	1	1758.371	7.043	0.009
	Within Groups	23968.905	96	249.676		
	Total	25727.276	97			
LSF	Between Groups	1040.167	1	1040.167	7.649	0.007
	Within Groups	13054.333	96	135.983		
	Total	14094.5	97			
MN	Between Groups	510.736	1	510.736	18.327	0.000
	Within Groups	2675.315	96	27.868		
	Total	3186.051	97			
NWS	Between Groups	2847.704	1	2847.704	16.717	0.000
	Within Groups	16353.286	96	170.347		
	Total	19200.99	97			
PSF	Between Groups	20026.878	1	20026.878	101.304	0.000
	Within Groups	18978.315	96	197.691		
	Total	39005.194	97			
MQD	Between Groups	0.531	1	0.531	0.01	0.921
	Within Groups	5180.815	96	53.967		
	Total	5181.347	97			

Table 4 shows the descriptives of the 2010-2011 second grade benchmarking scores. In the 2010-2011 school year the county began using the STAR reading program, which is a computer-based test geared to measure reading levels of students. The only Aimsweb measure used in 2010-2011 was the Reading Curriculum Based Measure (RCBM), which was also used on all students for benchmarking purposes. In the fall and spring RCBM and STAR benchmarking, School A, which used school wide RTI, had higher means. In the difference between fall and spring RCBM, which measured gains, School B (no school wide RTI) had a higher mean, and in the difference between fall and

spring STAR reading scores, School A had a higher mean. The statistical significance of these numbers is seen in Table 5.

Table 4

Descriptives: Second Grade, 2010-2011, Aimsweb & STAR Reading Benchmark Scores

School		Fall RCBM	Spring RCBM	Difference Fall & Spring RCBM	Fall Star Reading	Spring Star Reading	Difference Fall & Spring Star Reading
School A	Mean	53.6964	100.0536	46.3571	2.025	3.0536	1.0286
	N	56	56	56	56	56	56
	Std. Deviation	33.02116	35.59592	15.98685	0.96167	1.23361	0.70213
	Skewness	0.151	-0.18	1.07	0.822	0.318	1.01
	Kurtosis	-1.283	-0.81	3.237	2.368	-0.696	1.921
School B	Mean	34.9167	88.9444	54.0278	1.4806	2.1333	0.6528
	N	36	36	36	36	36	36
	Std. Deviation	25.1968	37.41271	24.03745	0.53121	0.54458	0.35009
	Skewness	1.101	-0.755	-0.458	0.156	-0.957	0.06
	Kurtosis	1.288	-0.073	-0.114	-0.065	1.773	-0.417
Total	Mean	46.3478	95.7065	49.3587	1.812	2.6935	0.8815
	N	92	92	92	92	92	92
	Std. Deviation	31.43472	36.52232	19.77043	0.85957	1.11255	0.61572
	Skewness	0.506	-0.422	0.262	1.088	0.781	1.318
	Kurtosis	-0.885	-0.322	0.622	3.222	0.284	3.278

In Table 5 the ANOVA for second grade Aimsweb and STAR Reading benchmarking scores in 2010-2011 is shown. Hypothesis 1 was rejected for fall RCBM with a p-value of 0.005, for fall STAR Reading with a p-value of 0.000 – both of which were statistically significant in favor of School A, which was on its second year of school-wide RTI in 2010-2011. Hypothesis 2 was rejected for the difference in fall and spring STAR Reading (gains) with a p-value of 0.004, which is statistically significant in favor of School A. Hypothesis 1 failed to be rejected for spring Reading CBM with a p-value of 0.156, which showed no statistical significance. Hypothesis 1 was rejected for

spring STAR Reading with a p-value of 0.000, which showed high statistical significance in favor of School A. Hypothesis 2 failed to be rejected for the difference between fall and spring Reading CBM with a p-value of 0.069, which showed no statistical significance.

Table 5

ANOVA: Second Grade, 2010-2011, Aimsweb & STAR Reading Benchmark Scores

			Sum of Squares	df	Mean Square	F	Sig.
Fall RCBM * School	Between Groups	(Combined)	7728.28	1	7728.28	8.462	0.005
	Within Groups		82192.589	90	913.251		
	Total		89920.87	91			
Spring RCBM * School	Between Groups	(Combined)	2704.348	1	2704.348	2.051	0.156
	Within Groups		118678.728	90	1318.653		
	Total		121383.076	91			
Difference Fall & Spring RCBM * School	Between Groups	(Combined)	1289.334	1	1289.334	3.385	0.069
	Within Groups		34279.829	90	380.887		
	Total		35569.163	91			
Fall Star Reading * School	Between Groups	(Combined)	6.495	1	6.495	9.624	0.003
	Within Groups		60.741	90	0.675		
	Total		67.237	91			
Spring Star Reading * School	Between Groups	(Combined)	18.557	1	18.557	17.752	0.000
	Within Groups		94.079	90	1.045		
	Total		112.636	91			
Difference Fall & Spring Star Reading * School	Between Groups	(Combined)	3.095	1	3.095	8.869	0.004
	Within Groups		31.404	90	0.349		
	Total		34.499	91			

Table 6 contains the descriptives of 2009-2010 Aimsweb benchmark scores for second graders. Aimsweb measures used with second graders included Reading MAZE and Math CBM. School A, which used school wide RTI, had higher means for the fall

MAZE and fall Math CBM. School B, which did not use school wide RTI, had higher means for spring MAZE and spring Math CBM as well as the difference between fall and winter benchmarks for both the MAZE and Math CBM. Statistical significance of these measures is analyzed in the ANOVA found in Table 7.

Table 6

Descriptives: Second Grade, 2009-2010, Aims web Benchmark Scores

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Fall Reading MAZE	School A	51	6.6471	5.22618	0.73181	5.1772	8.1169	0	18
	School B	48	6.2708	4.00924	0.57868	5.1067	7.435	1	20
	Total	99	6.4646	4.65616	0.46796	5.536	7.3933	0	20
Winter Reading MAZE	School A	51	10.2353	6.80761	0.95326	8.3206	12.15	0	27
	School B	48	12.0208	7.96666	1.14989	9.7076	14.3341	0	30
	Total	99	11.101	7.40862	0.74459	9.6234	12.5786	0	30
Difference Fall & Winter MAZE	School A	51	3.5882	4.59206	0.64302	2.2967	4.8798	-8	14
	School B	48	5.75	6.01947	0.86884	4.0021	7.4979	-5	21
	Total	99	4.6364	5.41437	0.54416	3.5565	5.7162	-8	21
Fall MCBM	School A	51	9.3725	4.81232	0.67386	8.0191	10.726	2	34
	School B	48	7.8125	3.27243	0.47233	6.8623	8.7627	2	17
	Total	99	8.6162	4.19112	0.42122	7.7803	9.4521	2	34
Winter MCBM	School A	51	15.1176	8.13301	1.13885	12.8302	17.4051	3	41
	School B	48	20.5208	11.99998	1.73205	17.0364	24.0053	5	59
	Total	99	17.7374	10.49644	1.05493	15.6439	19.8309	3	59
Difference Fall & Winter MCBM	School A	51	5.7451	5.83384	0.8169	4.1043	7.3859	-8	21
	School B	48	12.7083	11.32115	1.63407	9.421	15.9957	-2	43
	Total	99	9.1212	9.54289	0.9591	7.2179	11.0245	-8	43

Table 8 contains the ANOVA to test for statistical significance of the second grade 2009-2010 Aimsweb benchmarking scores. Hypothesis 1 was rejected for winter Math CBM with a p-value of 0.01, which is statistically significant in favor of School B. Hypothesis 1 failed to be rejected for Fall Reading MAZE with a p-value of 0.69, for winter Reading MAZE with a p-value of 0.233, and fall Math CBM with a p-value of

0.064 – all of which show no statistical significance. Hypothesis 2 was rejected for the difference between fall and winter Reading MAZE with a p-value of 0.047, which was statistically significant in favor of School B. Hypothesis 2 was rejected for the difference in fall and winter Math CBM with a p-value of 0.000 which showed high statistical significance in favor of School B.

Table 7

ANOVA: Second Grade, 2009-2010, Aimsweb Benchmark Scores

		Sum of Squares	df	Mean Square	F	Sig.
Fall Reading MAZE	Between Groups	3.5	1	3.5	0.16	0.69
	Within Groups	2121.126	97	21.867		
	Total	2124.626	98			
Winter Reading MAZE	Between Groups	78.834	1	78.834	1.443	0.233
	Within Groups	5300.156	97	54.641		
	Total	5378.99	98			
Difference Fall & Winter MAZE	Between Groups	115.556	1	115.556	4.065	0.047
	Within Groups	2757.353	97	28.426		
	Total	2872.909	98			
Fall MCBM	Between Groups	60.18	1	60.18	3.514	0.064
	Within Groups	1661.234	97	17.126		
	Total	1721.414	98			
Winter MCBM	Between Groups	721.898	1	721.898	6.95	0.01
	Within Groups	10075.273	97	103.869		
	Total	10797.172	98			
Difference Fall & Winter MCBM	Between Groups	1198.943	1	1198.943	15.054	0.000
	Within Groups	7725.603	97	79.645		
	Total	8924.545	98			

Table 8 contains the descriptives for 2009-2010 third grade Aimsweb benchmark scores. Measures used with third graders were Reading MAZE and Math CBM. School A, which employed school wide RTI, had higher means on fall and winter MAZE, fall and winter Math CBM, and higher means on the difference between the fall and winter benchmarks for both measures than did School B, which did not use school wide RTI. Statistical significance of these measures is discussed in Table 9.

Table 8

Descriptives: Third Grade, 2009-2010, Aimsweb Benchmark Scores

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
						Lower Bound	Upper Bound		
Fall Reading MAZE	School A	52	12.5385	5.63414	0.78132	10.9699	14.107	1	28
	School B	53	8.0189	2.97742	0.40898	7.1982	8.8395	2	16
	Total	105	10.2571	5.01542	0.48945	9.2865	11.2277	1	28
Winter Reading MAZE	School A	52	16.4038	6.9459	0.96322	14.4701	18.3376	1	36
	School B	53	11.4717	4.72556	0.64911	10.1692	12.7742	1	23
	Total	105	13.9143	6.40029	0.6246	12.6757	15.1529	1	36
Difference Fall & Winter MAZE	School A	52	3.8654	3.24206	0.44959	2.9628	4.768	-2	9
	School B	53	3.4528	3.95924	0.54384	2.3615	4.5441	-7	11
	Total	105	3.6571	3.61042	0.35234	2.9584	4.3558	-7	11
Fall MCBM	School A	52	16.3654	5.82095	0.80722	14.7448	17.9859	4	35
	School B	53	11.7736	5.15767	0.70846	10.352	13.1952	1	23
	Total	105	14.0476	5.93617	0.57931	12.8988	15.1964	1	35
Winter MCBM	School A	52	24.0385	8.41092	1.16638	21.6968	26.3801	8	48
	School B	53	16.6415	7.16051	0.98357	14.6678	18.6152	3	36
	Total	105	20.3048	8.61028	0.84028	18.6385	21.9711	3	48
Difference Fall & Winter MCBM	School A	52	7.6731	6.00562	0.83283	6.0011	9.3451	-8	19
	School B	53	4.8679	5.56098	0.76386	3.3351	6.4007	-7	23
	Total	105	6.2571	5.92749	0.57846	5.11	7.4043	-8	23

Table 9 outlines the ANOVA for third grade 2009-2010 Aimsweb benchmarking scores. Hypothesis 1 was rejected for fall and winter Reading MAZE and for fall and winter Math CBM with p-values of 0.000, which were highly statistically significant in

favor of School A. Hypothesis 2 failed to be rejected for the difference in fall and winter Reading MAZE (gains) with a p-value of 0.561, which showed no statistical significance. Hypothesis 2 was rejected for the difference in fall and winter Math CBM (gains) with a p-value of 0.015, which was statistically significant in favor of School A.

Table 9

ANOVA: Third Grade, 2009-2010, Aimsweb Benchmark Scores

		Sum of Squares	df	Mean Square	F	Sig.
Fall Reading MAZE	Between Groups	536.153	1	536.153	26.551	0.000
	Within Groups	2079.904	103	20.193		
	Total	2616.057	104			
Winter Reading MAZE	Between Groups	638.502	1	638.502	18.159	0.000
	Within Groups	3621.727	103	35.162		
	Total	4260.229	104			
Difference Fall & Winter MAZE	Between Groups	4.467	1	4.467	0.341	0.561
	Within Groups	1351.19	103	13.118		
	Total	1355.657	104			
Fall MCBM	Between Groups	553.421	1	553.421	18.321	0.000
	Within Groups	3111.341	103	30.207		
	Total	3664.762	104			
Winter MCBM	Between Groups	1436.136	1	1436.136	23.577	0.000
	Within Groups	6274.112	103	60.914		
	Total	7710.248	104			
Difference Fall & Winter MCBM	Between Groups	206.539	1	206.539	6.171	0.015
	Within Groups	3447.518	103	33.471		
	Total	3654.057	104			

Table 10 contains the descriptives for grades 2-4 for 2010-2011 Aimsweb Reading Curriculum Based Measure benchmark scores. School A, which used school wide RTI, had higher means in all grades for fall and spring RCBMs. The only measure in this table of descriptives in which School B had a slightly higher mean was for the gains made by third grade, which is shown in the difference between fall and spring scores. These values are analyzed by ANOVA in Table 11.

Table 10

Descriptives: Second through Fourth Grades, 2010-2011 Aimsweb Benchmark Scores

Grade			N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
			Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
2	Fall RCBM	School A	56	53.6964	33.02116	4.41264	44.8533	62.5396	5.00	120.00
		School B	36	34.9167	25.19680	4.19947	26.3913	43.4420	.00	111.00
		Total	92	46.3478	31.43472	3.27730	39.8379	52.8578	.00	120.00
	Spring RCBM	School A	56	100.0536	35.59592	4.75671	90.5209	109.5862	24.00	167.00
		School B	36	88.9444	37.41271	6.23545	76.2858	101.6031	4.00	149.00
		Total	92	95.7065	36.52232	3.80772	88.1430	103.2701	4.00	167.00
	Difference Fall & Spring RCBM	School A	56	46.3571	15.98685	2.13633	42.0758	50.6384	19.00	110.00
		School B	36	54.0278	24.03745	4.00624	45.8947	62.1609	3.00	104.00
		Total	92	49.3587	19.77043	2.06121	45.2644	53.4530	3.00	110.00
3	Fall RCBM	School A	64	69.5938	40.50386	5.06298	59.4762	79.7113	4.00	193.00
		School B	47	59.7234	31.39281	4.57911	50.5061	68.9407	10.00	144.00
		Total	111	65.4144	37.09067	3.52049	58.4376	72.3912	4.00	193.00
	Spring RCBM	School A	64	109.8125	41.99844	5.24981	99.3216	120.3034	25.00	234.00
		School B	47	100.6170	33.62165	4.90422	90.7453	110.4887	36.00	169.00
		Total	111	105.9189	38.77842	3.68069	98.6247	113.2132	25.00	234.00
	Difference Fall & Spring RCBM	School A	64	40.2188	14.34879	1.79360	36.6345	43.8030	-2.00	76.00
		School B	47	40.8936	16.36570	2.38718	36.0885	45.6988	6.00	75.00
		Total	111	40.5045	15.16687	1.43958	37.6516	43.3574	-2.00	76.00
4	Fall RCBM	School A	55	104.3455	36.69000	4.94728	94.4268	114.2642	11.00	200.00
		School B	52	73.4231	35.34111	4.90093	63.5840	83.2621	1.00	147.00
		Total	107	89.3178	39.08737	3.77872	81.8261	96.8094	1.00	200.00
	Spring RCBM	School A	55	133.4364	42.78446	5.76906	121.8701	145.0026	21.00	256.00
		School B	52	100.6154	38.37082	5.32108	89.9329	111.2979	6.00	180.00
		Total	107	117.4860	43.73254	4.22778	109.1040	125.8680	6.00	256.00
	Difference Fall & Spring RCBM	School A	55	29.0909	15.01884	2.02514	25.0307	33.1511	-3.00	79.00
		School B	52	27.1923	10.54410	1.46220	24.2568	30.1278	5.00	49.00
		Total	107	28.1682	13.01196	1.25791	25.6743	30.6622	-3.00	79.00

The statistical analysis by ANOVA for second grade 2010-2011 Aimsweb benchmarking scores is seen in Table 11. Hypothesis 1 was rejected for fall Reading

CBM with a p-value of 0.005, which was statistically significant in favor of School A. Hypothesis 1failed to be rejected for spring Reading CBM with a p-value of 0.156, which was not statistically significant. Hypothesis 2 failed to be rejected for the difference in fall and spring Reading CBM with a p-value of 0.069, which showed no statistical significance.

For third grade 2010-2011 Aimsweb benchmarking scores, again analyzed in the ANOVA in Table 11, Hypothesis 1 failed to be rejected for fall and spring Reading CBM with p-values of 0.167 and 0.219 respectively, which showed no statistical significance. Hypothesis 2 failed to be rejected for the difference in fall and spring Reading CBM with a p-value of 0.818, which showed no statistical significance.

For fourth grade 2010-2011 Aimsweb benchmarking scores, also analyzed in the ANOVA in Table 11, Hypothesis 1 was rejected for fall and spring Reading CBM, both with p-values of 0.000 which show high statistical significance in favor of School A. Hypothesis 2 failed to be rejected for the difference in fall and spring Reading CBM with a p-value of 0.453, which showed no statistical significance.

Table 11

ANOVA: Second through Fourth Grades, 2010-2011 Aimsweb Benchmark Scores

Grade			Sum of Squares	Df	Mean Square	F	Sig.
2	Fall RCBM	Between Groups	7728.280	1	7728.280	8.462	0.005
		Within Groups	82192.589	90	913.251		
		Total	89920.870	91			
	Spring RCMB	Between Groups	2704.348	1	2704.348	2.051	0.156
		Within Groups	118678.728	90	1318.653		
		Total	121383.076	91			
	Difference Fall & Spring RCMB	Between Groups	1289.334	1	1289.334	3.385	0.069
		Within Groups	34279.829	90	380.887		
		Total	35569.163	91			
3	Fall RCBM	Between Groups	2640.095	1	2640.095	1.935	0.167
		Within Groups	148688.842	109	1364.118		
		Total	151328.937	110			
	Spring RCMB	Between Groups	2291.414	1	2291.414	1.531	0.219
		Within Groups	163122.856	109	1496.540		
		Total	165414.270	110			
	Difference Fall & Spring RCMB	Between Groups	12.342	1	12.342	.053	0.818
		Within Groups	25291.406	109	232.031		
		Total	25303.748	110			
4	Fall RCBM	Between Groups	25558.068	1	25558.068	19.676	0.000
		Within Groups	136391.129	105	1298.963		
		Total	161949.196	106			
	Spring RCMB	Between Groups	28792.894	1	28792.894	17.381	0.000
		Within Groups	173935.835	105	1656.532		
		Total	202728.729	106			
	Difference Fall & Spring RCMB	Between Groups	96.350	1	96.350	.567	0.453
		Within Groups	17850.622	105	170.006		
		Total	17946.972	106			

The school system began using STAR Reading in 2010-2011 to measure reading level. The descriptives for second through fourth grades for the 2010-2011 school year

are found in Table 12. School A had higher means for all grades in all benchmarking periods and for the differences (gains) between the two benchmarking periods.

Table 12

Descriptives: Second through Fourth Grades, 2010-2011 STAR Benchmark Scores

Grade			N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
			Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
2	Fall Star Reading	School A	56	2.0250	.96167	.12851	1.7675	2.2825	.50	5.70
		School B	36	1.4806	.53121	.08853	1.3008	1.6603	.40	2.60
		Total	92	1.8120	.85957	.08962	1.6339	1.9900	.40	5.70
	Spring Star	School A	56	3.0536	1.23361	.16485	2.7232	3.3839	.90	5.70
		School B	36	2.1333	.54458	.09076	1.9491	2.3176	.40	3.10
		Total	92	2.6935	1.11255	.11599	2.4631	2.9239	.40	5.70
	Difference Fall & Spring Star	School A	56	1.0286	.70213	.09383	.8405	1.2166	-.30	3.60
		School B	36	.6528	.35009	.05835	.5343	.7712	-.10	1.40
		Total	92	.8815	.61572	.06419	.7540	1.0090	-.30	3.60
3	Fall Star Reading	School A	64	2.8984	1.42311	.17789	2.5430	3.2539	.60	9.30
		School B	47	2.2383	.61875	.09025	2.0566	2.4200	.80	3.20
		Total	111	2.6189	1.19472	.11340	2.3942	2.8436	.60	9.30
	Spring Star	School A	64	4.0750	1.76500	.22063	3.6341	4.5159	.90	11.60
		School B	47	2.6511	.66557	.09708	2.4556	2.8465	1.00	4.20
		Total	111	3.4721	1.57129	.14914	3.1765	3.7676	.90	11.60
	Difference Fall & Spring Star	School A	64	1.1766	.89969	.11246	.9518	1.4013	-.50	3.90
		School B	47	.4128	.34428	.05022	.3117	.5139	-.60	1.30
		Total	111	.8532	.81048	.07693	.7007	1.0056	-.60	3.90
4	Fall Star Reading	School A	55	4.0545	1.34424	.18126	3.6911	4.4179	.90	7.70
		School B	52	2.5212	.77138	.10697	2.3064	2.7359	.80	3.80
		Total	107	3.3093	1.34154	.12969	3.0522	3.5665	.80	7.70
	Spring Star	School A	55	4.8273	1.71847	.23172	4.3627	5.2918	.90	8.00
		School B	52	2.7788	.74448	.10324	2.5716	2.9861	.60	4.40
		Total	107	3.8318	1.68201	.16261	3.5094	4.1542	.60	8.00
	Difference Fall & Spring Star	School A	55	.7727	1.17086	.15788	.4562	1.0893	-1.80	3.50
		School B	52	.2577	.46414	.06437	.1285	.3869	-1.00	1.80
		Total	107	.5224	.93216	.09012	.3438	.7011	-1.80	3.50

Table 13 is the ANOVA analysis of the descriptives for the 2010-2011 STAR Reading benchmark scores. For second grade 2010-2011 STAR Reading benchmarking scores Hypothesis 1 was rejected for fall and spring STAR Reading with respective p-values of 0.003 and 0.000, indicating high statistical significance in favor of School A, which used school wide RTI. Hypothesis 2 was rejected for the difference in fall and spring STAR Reading scores with a p-value of 0.004, which was also highly statistically significant in favor of School A.

For third grade 2010-2011 STAR Reading benchmarking scores Hypothesis 1 was rejected for fall and spring STAR Reading with p-values of 0.004 and 0.000, which are highly statistically significant in favor of School A. Hypothesis 2 was rejected for the difference between Fall and Spring STAR Reading scores with a p-value of 0.000 indicating high statistical significance in favor of School A.

For fourth grade 2010-2011 STAR Reading benchmarking scores Hypothesis 1 was rejected for fall and spring Reading with p-values of 0.000 and 0.000 which were highly statistically significant in favor of School A. Hypothesis 2 was rejected for the difference in fall and spring STAR Reading scores with a p-value of 0.004, which was highly statistically significant in favor of School A, which employed school wide RTI.

Table 13

ANOVA: Second through Fourth Grades, 2010-2011 STAR Benchmark Scores

Grade			Sum of Squares	df	Mean Square	F	Sig.
2	Fall Star Reading	Between Groups	6.495	1	6.495	9.624	0.003
		Within Groups	60.741	90	.675		
		Total	67.237	91			
	Spring Star Reading	Between Groups	18.557	1	18.557	17.752	0.000
		Within Groups	94.079	90	1.045		
		Total	112.636	91			
	Difference Fall & Spring Star Reading	Between Groups	3.095	1	3.095	8.869	0.004
		Within Groups	31.404	90	.349		
		Total	34.499	91			
3	Fall Star Reading	Between Groups	11.809	1	11.809	8.865	0.004
		Within Groups	145.201	109	1.332		
		Total	157.010	110			
	Spring Star Reading	Between Groups	54.946	1	54.946	27.646	0.000
		Within Groups	216.637	109	1.987		
		Total	271.583	110			
	Difference Fall & Spring Star Reading	Between Groups	15.809	1	15.809	30.528	0.000
		Within Groups	56.447	109	.518		
		Total	72.256	110			
4	Fall Star Reading	Between Groups	62.848	1	62.848	51.586	0.000
		Within Groups	127.923	105	1.218		
		Total	190.771	106			
	Spring Star Reading	Between Groups	112.156	1	112.156	62.729	0.000
		Within Groups	187.736	105	1.788		
		Total	299.892	106			
	Difference Fall & Spring Star Reading	Between Groups	7.090	1	7.090	8.757	0.004
		Within Groups	85.016	105	.810		
		Total	92.106	106			

Research question three

The third question researched in this study was: Is there a significant difference in the TCAP reading and math scores of third and fourth graders between School A and School B?

Null hypothesis three (Ho3)

Null hypothesis three to correlate with research question three is: There will be no statistically significant difference in the TCAP reading and math scores of third and fourth graders between School A and School B. Tables 14-17 below contain descriptives and ANOVAs with data relevant to null hypothesis three. In these tables, School A had students taught with the use of school wide RTI, School B did not use school wide RTI.

Table 14 shows the descriptives of the 2009-2010 TCAP Reading and Math scores. School A had a slightly higher mean for reading and school B had a higher mean for math. ANOVA analysis of this data is found in Table 15.

Table 14

Descriptives: Third Grade, 2009-2010, TCAP Reading and Math Scores

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
TCAP Reading	School A	46	727.2391	127.50027	18.79889	689.3762	765.102	37	807
	School B	51	726.6471	41.53496	5.81606	714.9652	738.329	610	797
	Total	97	726.9278	92.2971	9.37135	708.3259	745.5298	37	807
TCAP Math	School A	46	724.3913	129.70453	19.12389	685.8738	762.9088	11	844
	School B	51	740.7059	34.90747	4.88802	730.888	750.5238	665	844
	Total	97	732.9691	92.66938	9.40915	714.2921	751.6461	11	844

Table 15 contains the ANOVA analysis of the TCAP data for third graders in 2009-2010. Hypothesis 3 failed to be rejected for 2009-2010 third grade TCAP Reading

and Math scores with p-values of 0.0975 and 0.0389 respectively, which showed no statistical significance.

Table 15

ANOVA: Third Grade, 2009-2010, TCAP Reading and Math Scores

		Sum of Squares	df	Mean Square	F	Sig.
TCAP Reading	Between Groups	8.478	1	8.478	0.001	0.975
	Within Groups	817792.017	95	8608.337		
	Total	817800.495	96			
TCAP Math	Between Groups	6437.362	1	6437.362	0.748	0.389
	Within Groups	817973.545	95	8610.248		
	Total	824410.907	96			

Table 16 outlines the descriptives of the fourth grade 2010-2011 TCAP scores. School A, which had been using school wide RTI for two years at this point, had higher means on both reading and math. The statistical significance of these scores is analyzed in the ANOVA found in Table 17.

Table 16

Descriptives: Fourth Grade, 2010-2011, TCAP Reading and Math Scores

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
TCAP Reading	School A	55	745.7091	70.38115	9.49019	726.6824	764.7358	287	814
	School B	51	694.7451	145.06024	20.3125	653.9462	735.5439	238	801
	Total	106	721.1887	114.98837	11.16866	699.0433	743.3341	238	814
TCAP Math	School A	55	744.4909	71.5192	9.64365	725.1566	763.8253	294	835
	School B	51	695.8627	144.858	20.28418	655.1208	736.6047	241	806
	Total	106	721.0943	114.97317	11.16718	698.9519	743.2368	241	835

The statistical significance of the fourth grade 2010-2011 TCAP scores is analyzed by ANOVA in Table 17. Hypothesis 3 was rejected for 2010-2011 TCAP

Reading and Math scores. Reading had a p-value of 0.022, which showed statistical significance in favor of School A. Math had a p-value of 0.029, which also shows statistical significance in favor of School A.

Table 17

ANOVA: Fourth Grade 2010-2011, TCAP Reading and Math Scores

		Sum of Squares	df	Mean Square	F	Sig.
TCAP Reading	Between Groups	68731.195	1	68731.195	5.417	0.022
	Within Groups	1319613.032	104	12688.587		
	Total	1388344.226	105			
TCAP Math	Between Groups	62575.272	1	62575.272	4.91	0.029
	Within Groups	1325401.785	104	12744.248		
	Total	1387977.057	105			

Research question four

The fourth research question investigated in this study was: Is there a significant difference between the math and reading TCAP scores, STAR reading and math scores, made by the general education students and students with IEPs at School A and School B?

Null hypothesis four (Ho4)

Null hypothesis four to correlate to research question four is: There will be no statistically significant difference between the math and reading TCAP scores, STAR reading and math scores made by general education students and students with IEPs at School A and School B. Tables 18-27 contain descriptives and ANOVAs with data relevant to null hypothesis four. In these tables, School A had students taught with the use of school wide RTI, School B did not use school wide RTI.

Table 18 contains the descriptive information for only the general education students who were in first grade in 2009-2010. Special education student data is broken out in Table 20. School A, which used RTI school-wide, had higher means on all Aimsweb measures. Statistical significance of these values is found in the ANOVA in Table 19.

Table 18

Descriptives: First Grade, 2009-2010, Grade General Education Only, Aimsweb Benchmark Scores

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
LNF	School A	48	45.1458	15.84767	2.28741	40.5442	49.7475	16	82
	School B	37	36.4054	16.43245	2.70148	30.9266	41.8843	7	75
	Total	85	41.3412	16.5907	1.79951	37.7626	44.9197	7	82
LSF	School A	48	31	11.05884	1.59621	27.7888	34.2112	0	55
	School B	37	24.8919	12.78841	2.1024	20.628	29.1558	0	52
	Total	85	28.3412	12.15726	1.31864	25.7189	30.9634	0	55
MN	School A	48	13.7292	5.19713	0.75014	12.2201	15.2383	4	30
	School B	37	8.3514	4.67984	0.76936	6.791	9.9117	0	15
	Total	85	11.3882	5.62963	0.61062	10.174	12.6025	0	30
NWS	School A	48	39.1667	13.87533	2.00273	35.1377	43.1956	12	73
	School B	37	28.2432	9.9538	1.63639	24.9245	31.562	8	49
	Total	85	34.4118	13.41134	1.45466	31.519	37.3045	8	73
PSF	School A	48	60.5	12.97297	1.87249	56.733	64.267	19	91
	School B	37	32.6216	14.2777	2.34724	27.8612	37.382	9	68
	Total	85	48.3647	19.36113	2.10001	44.1886	52.5408	9	91
MQD	School A	48	22.5625	7.14562	1.03138	20.4876	24.6374	3	38
	School B	37	21.3514	6.14282	1.00987	19.3032	23.3995	0	34
	Total	85	22.0353	6.71609	0.72846	20.5867	23.4839	0	38

Table 19 is the ANOVA for the 2009-2010 first grade general education students. Hypothesis 4 was rejected for Letter Naming Fluency with a p-value of 0.015 and Letter Sound Fluency with a p-value of 0.021, which is statistically significant for better performance on these two measures than that of the students with IEPs. Hypothesis 4 was

rejected for Missing Number and Nonsense Word, which had p-values of 0.000 indicating statistical significance in favor of the general education students. Hypothesis 4 was also accepted for Math Quantity Discrimination, which had a p-value of 0.413 for the general education students, which showed no statistical significance.

Table 19

ANOVA: First Grade, 2009-2010, Grade General Education Only, Aimsweb Benchmarking Scores

		Sum of Squares	df	Mean Square	F	Sig.
LNF	Between Groups	1596.208	1	1596.208	6.155	0.015
	Within Groups	21524.898	83	259.336		
	Total	23121.106	84			
LSF	Between Groups	779.538	1	779.538	5.561	0.021
	Within Groups	11635.568	83	140.188		
	Total	12415.106	84			
MN	Between Groups	604.277	1	604.277	24.372	0.000
	Within Groups	2057.912	83	24.794		
	Total	2662.188	84			
NWS	Between Groups	2493.111	1	2493.111	16.403	0.000
	Within Groups	12615.477	83	151.994		
	Total	15108.588	84			
PSF	Between Groups	16238.991	1	16238.991	88.39	0.000
	Within Groups	15248.703	83	183.719		
	Total	31487.694	84			
MQD	Between Groups	30.649	1	30.649	0.677	0.413
	Within Groups	3758.245	83	45.28		
	Total	3788.894	84			

In Table 20 are the Aimsweb descriptives for students with IEPs who were in first grade in 2009-2010. School A students with IEPs, who had RTI in addition to any help provided with their IEP, had higher means on all measures except Math Quantity Discrimination. The statistical significance of these data are analyzed in ANOVA Table 21.

Table 20

Descriptives: First Grade, 2009-2010; Students With IEPs Only, Aimsweb Benchmark Scores

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
LNF	School A	8	47.875	15.78822	5.58198	34.6757	61.0743	31	74
	School B	5	41.2	11.69188	5.22877	26.6826	55.7174	28	55
	Total	13	45.3077	14.22665	3.94576	36.7106	53.9048	28	74
LSF	School A	8	30.25	13.01373	4.60105	19.3703	41.1297	16	51
	School B	5	20	5.56776	2.48998	13.0867	26.9133	15	28
	Total	13	26.3077	11.66465	3.23519	19.2588	33.3566	15	51
MN	School A	8	7.25	4.86239	1.71912	3.1849	11.3151	1	16
	School B	5	7	6.245	2.79285	-0.7542	14.7542	0	15
	Total	13	7.1538	5.17761	1.43601	4.025	10.2826	0	16
NWS	School A	8	28.75	13.90529	4.91626	17.1249	40.3751	12	58
	School B	5	16	15.65248	7	-3.4351	35.4351	0	41
	Total	13	23.8462	15.36688	4.26201	14.56	33.1323	0	58
PSF	School A	8	54.875	15.03745	5.31654	42.3034	67.4466	33	77
	School B	5	17.4	15.07647	6.7424	-1.3199	36.1199	0	38
	Total	13	40.4615	23.82791	6.60867	26.0625	54.8606	0	77
MQD	School A	8	11.5	7.83764	2.77102	4.9476	18.0524	3	25
	School B	5	17	4.1833	1.87083	11.8057	22.1943	12	23
	Total	13	13.6154	7.03015	1.94981	9.3671	17.8637	3	25

In Table 21, the first grade 2009-2010 special education only Aimsweb benchmarking scores are analyzed by ANOVA. Hypothesis 4 was rejected for Phoneme Sound Fluency with a p-value of 0.001 for the students with IEPs, which was highly statistically significant for better performance on this measure than that of the general education students. Hypothesis 4 failed to be rejected for Missing Number and Nonsense Word, which had p-values of 0.937 and 0.153 for the students with IEPs, showing no statistical significance. Hypothesis 4 was also failed to be rejected for Math Quantity Discrimination, which had a p-value of 0.18 for students with IEPs, showing no statistical significance.

Table 21

ANOVA: First Grade 2009-2010; Students With IEPs Only, Aimsweb Benchmarking Scores

		Sum of Squares	df	Mean Square	F	Sig.
LNF	Between Groups	137.094	1	137.094	0.658	0.434
	Within Groups	2291.675	11	208.334		
	Total	2428.769	12			
LSF	Between Groups	323.269	1	323.269	2.716	0.128
	Within Groups	1309.5	11	119.045		
	Total	1632.769	12			
MN	Between Groups	0.192	1	0.192	0.007	0.937
	Within Groups	321.5	11	29.227		
	Total	321.692	12			
NWS	Between Groups	500.192	1	500.192	2.358	0.153
	Within Groups	2333.5	11	212.136		
	Total	2833.692	12			
PSF	Between Groups	4321.156	1	4321.156	19.074	0.001
	Within Groups	2492.075	11	226.552		
	Total	6813.231	12			
MQD	Between Groups	93.077	1	93.077	2.048	0.18
	Within Groups	500	11	45.455		
	Total	593.077	12			

Table 22 contains the descriptive data for second graders in 2010-2011. Data for students with IEPs and general education students are in the same table. General education students had a higher mean on all measures than did the students with IEPs. Statistical significance of these data are analyzed by ANOVA in Table 23.

Table 22

Descriptives: Second Grade, 2010-2011; Both Schools General Education and Students With IEPs, Aimsweb and STAR Reading Benchmark Scores

Classification		Fall RCBM	Spring RCMB	Difference Fall & Spring RCMB	Fall Star Reading	Spring Star Reading	Difference Fall & Spring Star Reading
No IEP	Mean	50.225	101.9625	51.7375	1.9138	2.8525	0.9388
	N	80	80	80	80	80	80
	Std. Deviation	31.04997	32.67308	18.37358	0.8531	1.08651	0.63235
	Skewness	0.42	-0.326	0.521	1.123	0.801	1.215
	Kurtosis	-1.011	-0.491	0.894	3.506	0.081	2.931
IEP	Mean	20.5	54	33.5	1.1333	1.6333	0.5
	N	12	12	12	12	12	12
	Std. Deviation	20.30898	34.43571	22.21588	0.55487	0.59289	0.28604
	Skewness	1.287	-0.138	0.457	0.51	-0.807	-0.14
	Kurtosis	1.348	-1.442	-0.358	-0.69	0.088	-0.178
Total	Mean	46.3478	95.7065	49.3587	1.812	2.6935	0.8815
	N	92	92	92	92	92	92
	Std. Deviation	31.43472	36.52232	19.77043	0.85957	1.11255	0.61572
	Skewness	0.506	-0.422	0.262	1.088	0.781	1.318
	Kurtosis	-0.885	-0.322	0.622	3.222	0.284	3.278

Table 23 breaks down the ANOVA for the descriptives found in Table 22. Hypothesis 4 was rejected for Fall Reading CBM with a p-value of 0.002, which is statistically significant in favor of general education students. It was rejected for spring Reading CBM with a p-value of 0.000, which is highly significant in favor of general education students. Hypothesis 4 was rejected for the difference in fall and spring Reading CBM (gains) with a statistically significant p-value of 0.002 in favor of general education students. It was rejected for Fall STAR Reading with a statistically significant p-value of 0.003 and for the difference between Fall and Spring STAR Reading scores with a p-value of 0.02, both of which are statistically significant in favor of the general education students. Hypothesis 4 was also rejected for spring STAR Reading, which had

a p-value of 0.000, which shows high statistical significance in favor of general education students.

Table 23

ANOVA: Second Grade, 2010-2011; Both Schools, General Education and Students With IEPs, Aimsweb and STAR Reading Benchmark Scores

			Sum of Squares	df	Mean Square	F	Sig.
Fall RCBM * Classification	Between Groups	(Combined)	9219.92	1	9219.92	10.282	0.002
	Within Groups		80700.95	90	896.677		
	Total		89920.87	91			
Spring RCBM * Classification	Between Groups	(Combined)	24004.189	1	24004.189	22.185	0.000
	Within Groups		97378.888	90	1081.988		
	Total		121383.076	91			
Difference Fall & Spring RCBM * Classification	Between Groups	(Combined)	3470.676	1	3470.676	9.731	0.002
	Within Groups		32098.488	90	356.65		
	Total		35569.163	91			
Fall Star Reading * Classification	Between Groups	(Combined)	6.355	1	6.355	9.395	0.003
	Within Groups		60.882	90	0.676		
	Total		67.237	91			
Spring Star Reading * Classification	Between Groups	(Combined)	15.51	1	15.51	14.372	0.000
	Within Groups		97.126	90	1.079		
	Total		112.636	91			
Difference Fall & Spring Star Reading * Classification	Between Groups	(Combined)	2.009	1	2.009	5.564	0.02
	Within Groups		32.49	90	0.361		
	Total		34.499	91			

Table 24 contains the descriptive data for second graders in 2009-2010. School A, which used school-wide RTI, had higher means on all measures for general education students except for the difference between fall and winter MAZE and the difference between fall and winter MCBM.

Table 24

Descriptives: Second Grade, 2009-2010; Both Schools, General Education and Students With IEPs Aimsweb Benchmark Scores

Classification			N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
							Lower Bound	Upper Bound		
No IEP	Fall Reading MAZE	School A	40	7.625	5.35263	0.84633	5.9131	9.3369	0	18
		School B	45	6.4	4.08656	0.60919	5.1723	7.6277	1	20
		Total	85	6.9765	4.73582	0.51367	5.955	7.998	0	20
	Winter Reading MAZE	School A	40	12.25	6.11325	0.96659	10.2949	14.2051	3	27
		School B	45	12.2444	8.04577	1.19939	9.8272	14.6617	0	30
		Total	85	12.2471	7.15959	0.77657	10.7028	13.7913	0	30
	Difference Fall & Winter MAZE	School A	40	4.625	4.13669	0.65407	3.302	5.948	-7	14
		School B	45	5.8444	6.11241	0.91119	4.0081	7.6808	-5	21
		Total	85	5.2706	5.28112	0.57282	4.1315	6.4097	-7	21
	Fall MCBM	School A	40	9.825	5.18324	0.81954	8.1673	11.4827	2	34
		School B	45	7.7333	3.22208	0.48032	6.7653	8.7014	2	17
		Total	85	8.7176	4.36057	0.47297	7.7771	9.6582	2	34
	Winter MCBM	School A	40	16.525	8.27721	1.30874	13.8778	19.1722	8	41
		School B	45	20.8444	12.30291	1.83401	17.1482	24.5406	5	59
		Total	85	18.8118	10.76092	1.16719	16.4907	21.1328	5	59
	Difference Fall & Winter MCBM	School A	40	6.7	5.64869	0.89314	4.8935	8.5065	-3	21
		School B	45	13.1111	11.58216	1.72657	9.6314	16.5908	-2	43
		Total	85	10.0941	9.76951	1.05965	7.9869	12.2014	-3	43
IEP	Fall Reading MAZE	School A	11	3.0909	2.66288	0.80289	1.302	4.8799	0	8
		School B	3	4.3333	2.08167	1.20185	-0.8378	9.5045	2	6
		Total	14	3.3571	2.53004	0.67618	1.8963	4.8179	0	8
	Winter Reading MAZE	School A	11	2.9091	3.2697	0.98585	0.7125	5.1057	0	10
		School B	3	8.6667	7.02377	4.05518	-8.7813	26.1147	2	16
		Total	14	4.1429	4.67164	1.24855	1.4455	6.8402	0	16
	Difference Fall & Winter MAZE	School A	11	-0.1818	4.3317	1.30606	-3.0919	2.7283	-8	7
		School B	3	4.3333	5.1316	2.96273	-8.4143	17.0809	0	10
		Total	14	0.7857	4.7097	1.25872	-1.9336	3.505	-8	10
	Fall MCBM	School A	11	7.7273	2.68667	0.81006	5.9223	9.5322	4	11
		School B	3	9	4.58258	2.64575	-2.3837	20.3837	4	13
		Total	14	8	3.01279	0.8052	6.2605	9.7395	4	13
	Winter MCBM	School A	11	10	5.17687	1.56089	6.5221	13.4779	3	19
		School B	3	15.6667	4.04145	2.33333	5.6271	25.7062	12	20
		Total	14	11.2143	5.38057	1.43802	8.1076	14.3209	3	20
	Difference Fall & Winter MCBM	School A	11	2.2727	5.36826	1.61859	-1.3337	5.8792	-8	8
		School B	3	6.6667	1.52753	0.88192	2.8721	10.4612	5	8
		Total	14	3.2143	5.10171	1.36349	0.2686	6.1599	-8	8

Table 25

ANOVA: Second Grade, 2009-2010; Both Schools General Education and Students With IEPs, Aimsweb Benchmarking Scores

Classification			Sum of Squares	df	Mean Square	F	Sig.
No IEP	Fall Reading MAZE	Between Groups	31.778	1	31.778	1.424	0.236
		Within Groups	1852.175	83	22.315		
		Total	1883.953	84			
	Winter Reading MAZE	Between Groups	0.001	1	0.001	0	0.997
		Within Groups	4305.811	83	51.877		
		Total	4305.812	84			
	Difference Fall & Winter MAZE	Between Groups	31.49	1	31.49	1.131	0.291
		Within Groups	2311.286	83	27.847		
		Total	2342.776	84			
	Fall MCBM	Between Groups	92.649	1	92.649	5.111	0.026
		Within Groups	1504.575	83	18.127		
		Total	1597.224	84			
	Winter MCBM	Between Groups	395.102	1	395.102	3.514	0.064
		Within Groups	9331.886	83	112.432		
		Total	9726.988	84			
	Difference Fall & Winter MCBM	Between Groups	870.403	1	870.403	10.108	0.002
		Within Groups	7146.844	83	86.107		
		Total	8017.247	84			
IEP	Fall Reading MAZE	Between Groups	3.639	1	3.639	0.549	0.473
		Within Groups	79.576	12	6.631		
		Total	83.214	13			
	Winter Reading MAZE	Between Groups	78.139	1	78.139	4.561	0.054
		Within Groups	205.576	12	17.131		
		Total	283.714	13			
	Difference Fall & Winter MAZE	Between Groups	48.054	1	48.054	2.4	0.147
		Within Groups	240.303	12	20.025		
		Total	288.357	13			
	Fall MCBM	Between Groups	3.818	1	3.818	0.401	0.538
		Within Groups	114.182	12	9.515		
		Total	118	13			
	Winter MCBM	Between Groups	75.69	1	75.69	3.021	0.108
		Within Groups	300.667	12	25.056		
		Total	376.357	13			
	Difference Fall & Winter MCBM	Between Groups	45.509	1	45.509	1.865	0.197
		Within Groups	292.848	12	24.404		
		Total	338.357	13			

Table 26

Descriptives: Third Grade, 2009-2010; Both Schools, Students With IEPs and General Education, Aimsweb Benchmark Scores

Classification			N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
							Lower Bound	Upper Bound		
No IEP	Fall Reading MAZE	School A	45	12.5111	5.88767	0.87768	10.7423	14.28	1	28
		School B	46	8.1087	3.11433	0.45918	7.1839	9.0335	2	16
		Total	91	10.2857	5.16674	0.54162	9.2097	11.3617	1	28
	Winter Reading MAZE	School A	45	16.4222	7.14298	1.06481	14.2762	18.5682	1	36
		School B	46	11.2826	4.75003	0.70035	9.872	12.6932	1	23
		Total	91	13.8242	6.54997	0.68662	12.4601	15.1883	1	36
	Difference Fall & Winter MAZE	School A	45	3.9111	3.218	0.47971	2.9443	4.8779	-2	9
		School B	46	3.1739	3.89475	0.57425	2.0173	4.3305	-7	11
		Total	91	3.5385	3.57556	0.37482	2.7938	4.2831	-7	11
	Fall MCBM	School A	45	16.8	6.04002	0.90039	14.9854	18.6146	4	35
		School B	46	11.9565	5.31646	0.78387	10.3777	13.5353	1	23
		Total	91	14.3516	6.15607	0.64533	13.0696	15.6337	1	35
	Winter MCBM	School A	45	24.2222	8.63368	1.28703	21.6284	26.8161	8	48
		School B	46	16.4783	6.60215	0.97343	14.5177	18.4389	3	31
		Total	91	20.3077	8.56698	0.89806	18.5235	22.0919	3	48
	Difference Fall & Winter MCBM	School A	45	7.4222	6.15146	0.917	5.5741	9.2703	-8	19
		School B	46	4.5217	4.97433	0.73342	3.0445	5.9989	-7	18
		Total	91	5.956	5.74439	0.60218	4.7597	7.1524	-8	19
IEP	Fall Reading MAZE	School A	7	12.7143	3.94606	1.49147	9.0648	16.3638	6	17
		School B	7	7.4286	1.90238	0.71903	5.6692	9.188	4	10
		Total	14	10.0714	4.04711	1.08164	7.7347	12.4082	4	17
	Winter Reading MAZE	School A	7	16.2857	5.99206	2.26479	10.744	21.8274	6	25
		School B	7	12.7143	4.71573	1.78238	8.353	17.0756	6	20
		Total	14	14.5	5.50175	1.4704	11.3234	17.6766	6	25
	Difference Fall & Winter MAZE	School A	7	3.5714	3.64496	1.37766	0.2004	6.9425	0	9
		School B	7	5.2857	4.19183	1.58436	1.4089	9.1625	-1	11
		Total	14	4.4286	3.87724	1.03624	2.1899	6.6672	-1	11
	Fall MCBM	School A	7	13.5714	3.15474	1.19238	10.6538	16.4891	9	19
		School B	7	10.5714	4.07665	1.54083	6.8012	14.3417	5	17
		Total	14	12.0714	3.83234	1.02424	9.8587	14.2842	5	19
	Winter MCBM	School A	7	22.8571	7.26702	2.74667	16.1363	29.578	12	32
		School B	7	17.7143	10.76591	4.06913	7.7575	27.6711	7	36
		Total	14	20.2857	9.21895	2.46387	14.9629	25.6086	7	36
	Difference Fall & Winter MCBM	School A	7	9.2857	5.05682	1.9113	4.6089	13.9625	2	15
		School B	7	7.1429	8.6877	3.28364	-0.8919	15.1776	-2	23
		Total	14	8.2143	6.91908	1.8492	4.2193	12.2092	-2	23

Students with IEPs in School B had higher means on all measures in Table 24. Statistical significance is analyzed by ANOVA in Table 25.

The ANOVA analysis for 2009-2010 second grade is found in Table 25. Hypothesis 4 was rejected only for Fall Math CBM and the difference between fall and winter Math CBM, which had p-values of 0.026 and 0.002 for the general education students, therefore failing to reject Hypothesis 4. Fall Reading MAZE was 0.236 for general education and 0.473 for students with IEPs, winter Reading MAZE was 0.997 for general education and 0.054 for students with IEPs, the difference between fall and winter Reading MAZE was 0.291 for general education and 0.147 for students with IEPs, and winter Math CBM was 0.064 for general education and 0.108 for students with IEPs - none of which shows statistical significance.

Table 26 contains the descriptive data for third graders in 2009-2010. School A, which used school wide RTI, had higher means on all measures for general education students. Students with IEPs in School B had higher means on all measures in Table 26 except for the difference between fall and winter MAZE scores. Statistical significance for these data are analyzed by ANOVA in Table 27.

The ANOVA for 2009-2010 third grade is in Table 27. Hypothesis 4 was rejected for fall Reading MAZE in which the p-value for students with IEPs was statistically significant at 0.008, and for the difference between fall and winter Math CBM, which had a statistically significant p-value of 0.015 for general education.

Table 27

ANOVA: Third Grade, 2009-2010; Both Schools, Students With IEPs and General Education, Aimsweb Benchmark Scores

Classification			Sum of Squares	df	Mean Square	F	Sig.
No IEP	Fall Reading MAZE	Between Groups	440.87	1	440.87	20.002	0.000
		Within Groups	1961.701	89	22.042		
		Total	2402.571	90			
	Winter Reading MAZE	Between Groups	600.883	1	600.883	16.403	0.000
		Within Groups	3260.304	89	36.633		
		Total	3861.187	90			
	Difference Fall & Winter MAZE	Between Groups	12.362	1	12.362	0.967	0.328
		Within Groups	1138.253	89	12.789		
		Total	1150.615	90			
	Fall MCBM	Between Groups	533.634	1	533.634	16.507	0.000
		Within Groups	2877.113	89	32.327		
		Total	3410.747	90			
	Winter MCBM	Between Groups	1364.129	1	1364.129	23.164	0.000
		Within Groups	5241.256	89	58.891		
		Total	6605.385	90			
	Difference Fall & Winter MCBM	Between Groups	191.368	1	191.368	6.13	0.015
		Within Groups	2778.456	89	31.219		
		Total	2969.824	90			
IEP	Fall Reading MAZE	Between Groups	97.786	1	97.786	10.191	0.008
		Within Groups	115.143	12	9.595		
		Total	212.929	13			
	Winter Reading MAZE	Between Groups	44.643	1	44.643	1.536	0.239
		Within Groups	348.857	12	29.071		
		Total	393.5	13			
	Difference Fall & Winter MAZE	Between Groups	10.286	1	10.286	0.667	0.43
		Within Groups	185.143	12	15.429		
		Total	195.429	13			
	Fall MCBM	Between Groups	31.5	1	31.5	2.371	0.15
		Within Groups	159.429	12	13.286		
		Total	190.929	13			
	Winter MCBM	Between Groups	92.571	1	92.571	1.097	0.315
		Within Groups	1012.286	12	84.357		
		Total	1104.857	13			
	Difference Fall & Winter MCBM	Between Groups	16.071	1	16.071	0.318	0.583
		Within Groups	606.286	12	50.524		
		Total	622.357	13			

Winter Reading MAZE had a p-value of 0.000 for general education, which showed high statistical significance, and 0.239 for students with IEPs, which is not statistically significant, causing failure to reject the null hypothesis for special students with IEPs and rejection of the null hypothesis for general education. Fall and winter Math CBM had p-values of 0.000, which showed statistical significance for general education children, and 0.15 and 0.315 for students with IEPs, which showed no statistical significance. The difference in fall and winter Math CBM was 0.43 for general education children and 0.583 for students with IEPs, which showed no statistical significance. Null hypothesis 4 failed to be rejected for these comparisons with no statistical significance.

Summary

In summary, school wide RTI made a difference in children's progress as evidenced by the increase in statistical significance of School A over School B in 2010-2011, which was the second year school wide RTI had been used at School A. There were statistically significant differences in the 2009-2010 school year, but these were more dramatically evidenced in the 2010-2011 school year.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

School wide RTI made a difference in children's progress, as was evidenced by the increase in statistical significance of School A over School B in 2010-2011, which was the second year school-wide RTI had been used at School A. There were statistically significant differences in the 2009-2010 school year, but these were more dramatically evidenced in the 2010-2011 school year after the program had been well established and the children at School A had a year of additional help behind them.

Findings

1. School wide RTI was effective in the rural school setting. Grouping the children by ability for additional help and restructuring the groups as needed based on progress and student needs aids those who were in danger of failing, helped to catch up those who are falling behind, and provided enrichment for the children who were at or above grade level.
2. While there was little statistical significance in the difference between the students with IEPs and general education students' scores, this could be attributed to the fact that all students were getting the same amount of extra assistance, which served to level the playing field somewhat between the two.
3. The most striking differences were seen in the STAR Reading scores and the gains made from fall to spring benchmarks. STAR Reading measures grade level reading ability. The majority of School A's RTI time was spent on

reading. This improvement in STAR Reading scores can be linked to daily reading interventions that all students at School A receive.

Recommendations

Based on this study the following recommendations are merited:

1. School wide RTI should be considered for use in all schools in the system in which the study took place. The schools in the county are all of similar demographics and, if implemented properly, the RTI process used at School A should work similarly well in the other schools in the county.
2. Prior to system wide implementation, training should be held for all administrators, teachers, and assistants to give them a thorough understanding of what RTI is, the process involved, and how it will benefit their school as a whole and to equip them with the tools they need to be effective in a school wide RTI setting.
3. This study focused on rural elementary schools with a minimal minority population. More research should be done in urban settings with culturally and ethnically diverse student populations as well as in middle and secondary schools.
4. Guidelines should be set for implementing school wide RTI. As of now, each school decides how they will use RTI and how it will be implemented – whether on a school wide or student-by-student basis. Consistency and use of programs that have been proven to be effective will increase the success of RTI programs in other schools across the country.

Conclusion

The purpose of this study was to examine the effectiveness of RTI on a school wide basis to determine if implementation of RTI with all students instead of a targeted few brings up scores for the entire student population. The school studied was a rural one that implemented a school wide RTI program beginning in 2009 as part of the school improvement plan. All students were given benchmark tests and had progress monitoring periodically throughout the year. Every student in every grade was placed in an RTI group based on skill level. Interventions were planned around the group level's abilities.

The control school was another school in the county with similar demographics and student body size that did RTI on a student-by-student basis but not on a school wide basis. The study examined and compared progress rates of students in general education and children with disabilities on benchmarks and progress monitoring as well as TCAP scores of the third and fourth graders.

This research is important because school administrators and teachers need to know what brings about improvement, especially with increased pressure to bring up test scores. With the recommendation of the use of RTI in IDEA 2004, school systems are under increased pressure to implement it. RTI is being used in many schools on a student-by-student basis, but there has not been widespread literature on school wide RTI. Additional research on the effectiveness of RTI aids school administrators in their decisions to implement RTI on a school wide basis or not. This study showed that school wide RTI is indeed effective and is of benefit to all the students in the school and not just select few.

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APPENDICES

APPENDIX A

Letter of Approval to do Research From

Cheatham County Board of Education

CHEATHAM COUNTY
Board of Education
102 Elizabeth Street
Ashland City, Tennessee 37015

Director of Schools
Timothy K. Webb, Ed.D.
Phone: (615) 792-5664
Fax: (615) 792-2551

April 15, 2011

Sarah Sanford
3079 Mosley Ferry Road
Ashland City, TN. 37015

Dear Ms. Sanford,

Congratulations! I am pleased that you are pursuing your studies at Austin Peay State University. As part of your research process, you have my permission to explore the effectiveness of the RTI programs at West Cheatham Elementary and East Cheatham Elementary.

I understand you will compare benchmark and progress monitoring scores, student gains, and achievement. I look forward to seeing the final report. Remember, children and learning are our lifelong priorities.

Yours in education,

Timothy K. Webb

Timothy K. Webb, Ed.D.
Director of Schools

TKW:cfc

C: Dianne Williams
Dr. Sherry Gibbs

APPENDIX B

Letter of Approval for Field Study From

Austin Peay State University

Institutional Review Board

June 15, 2011

Sarah Sanford
3079 Mosley Ferry Rd.
Ashland City, TN 37015

RE: Your application regarding study number 11-039 Rural school wide RTI: Effectiveness for general and special education children.

Dear Ms. Sanford

Thank you for your application for the study above. The Austin Peay IRB has reviewed your application and has approved your study without modification. Congratulations!

You are granted permission to conduct your study as described in your application effective immediately. The study is subject to continuing review on or before June 15, 2012, unless closed before that date. Enclosed please find the forms to report when your study has been completed and the form to request an annual review of a continuing study. Please submit the appropriate form prior to June 15, 2012.

Please note that any changes to the study as approved must be promptly reported and approved. Some changes may be approved by expedited review; others require full board review. If you have any questions or require further information, contact me at (221-7231; fax 221-6267; email grahc@apsu.edu).

Again, thank you for your cooperation with the APSU IRB and the human research review process. Best wishes for a successful study!

Sincerely,

Charles R. Grah
Chair, Austin Peay Institutional Review Board

Cc: Dr, Larry Lowrance