Fall 2010

Response to Intervention and Implementing Early Math Intervention Programs

Megan Souther
Regis University

Regis University
College for Professional Studies Graduate Programs
Final Project/Thesis

Disclaimer

RESPONSE TO INTERVENTION

AND IMPLEMENTING EARLY MATH INTERVENTION PROGRAMS

by

Megan Souther

A Research Project Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Special Education

REGIS UNIVERSITY

August, 2010

ABSTRACT

Response to Intervention

and Implementing Early Math Intervention Programs

The Response to Intervention (RtI) model has transformed the methodology behind education and the way teachers instruct their students. This model focuses on giving students the instruction they need before the gap between them and their peer's increases. This model was created using a three tier system. All students within a school receive instruction at one of these tiers. Many intervention programs have been created to help teachers instruct students at each of these tiers and in each content area. Unfortunately for teachers it can be overwhelming to decide which of these programs are going to make the biggest difference for their students. This project focuses on three mathematical intervention programs and their success with students

TABLE OF CONTENTS

Chapter 1

INTRODUCTION

Many studies have been completed in the past few years that show that students who struggle in a specific subject are not making the necessary academic gains to bridge the gap between these students and their peers. Every year a student continues to lag behind academically the more this gap grows. "The solution is to intervene early so that students have both adequate initial skills, and the necessary pre-skills to make adequate progress. With comparable initial skills, students need only to make progress at the same, not a faster, rate as their peers" (Good, 1998, p.60).

Implementing early interventions has become a goal of many educators to coincide with the Response to Intervention (RtI) program that many school districts are following. "The general aim of RtI is to determine whether any student, regardless of type of disability needs more intensive instruction" (Gentry, 2010, p.3). RtI was created not to service the greatest at-risk students, but to serve all students who are struggling in a particular content area. Because of this, the RtI model is divided into three tiers. Tier I, also known as *universal interventions*, can be implemented to all students in a school. These interventions include academic interventions that benefit the students and can be implemented within the classroom by the teacher. Tier II, known as *selected interventions*, are provided to those students who are not making appropriate gains with the *universal intervention*. These interventions can be implemented either in the classroom or in a pull-out setting. Tier III, known as *targeted interventions*, are provided

to a small number of students who are not responsive to the previous interventions. These interventions are often implemented in a pull-out setting or in a special education classroom (Pavri, 2010).

Response to Intervention (RtI) has been instrumental in developing a new model to identify students as learning disabled instead of using the "wait to fail" model that was previously in place. "The 2004 reauthorization of the Individuals with Disabilities Education Act allows schools to use methods for examining if a student responds to a research-based intervention when determining eligibility for classification as learning disabled" (Gentry, 2010, p.8). The importance of this change comes from the No Child Left Behind Act of 2001 that put scientifically-based research at the forefront of creating classroom instruction that helped students achieve academically (LaRocco, 2009).

Statement of the Problem

It is the responsibility of educators to use appropriate interventions to help students make appropriate growth each year. The "Matthew Effect" refers to the biblical passage in which the rich get richer and the poor get poorer. "A Matthew Effect occurs when differences in initial skills lead to faster rates of acquisition of subsequent skills for those students with high skills and slower acquisition for students with lower initial skills" (Good, 1998, p.58). It is not fair for students who are struggling academically to continue to fall behind their peers each year, especially when all they might need is to be taught the information in a different way that makes sense to them.

Purpose of the Project

"Public policies that aim to improve the quality of education in our schools often bring change and the need to implement innovations not only at the organizational level

but also at the individual teacher level" (LaRocco, 2009, p.3). Teachers want nothing more than to support students in every way possible, and with this comes the need to modernize instruction. The one trouble, with all of the different interventions that have been created for the three different RtI tiers, is deciding which ones are going to meet the needs of each student at his/her intervention tier. The purpose of this project was to research three mathematical intervention programs and summarize their effectiveness using different instructional models.

Chapter Summary

It is this researcher's belief that struggling students need intervention programs that are going to meet their individual needs and enable them to make the growth that will make them more successful in school. The Response to Intervention (RtI) program was created to help teachers implement interventions to any student who is falling behind. Fortunately, there are many different intervention programs that have been developed for reading and math but it is difficult for teachers to know which ones are going to be successful with their students. Teachers do not have extra time in their schedules to try interventions that are not going to benefit students. Although this project does not focus on all interventions, it does give an extensive background on three mathematical interventions that are commonly used at the elementary level.

Chapter 2

REVIEW OF LITERATURE

Many studies have been completed in the past few years that show that students who struggle in a specific subject are not making the necessary academic gains to bridge the gap between these students and their peers. Every year a student continues to lag behind academically the more this gap grows. "The solution is to intervene early so that students have both adequate initial skills, and the necessary pre-skills to make adequate progress. With comparable initial skills, students need only to make progress at the same, not a faster, rate as their peers" (Good, 1998, p.60).

Implementing early interventions has become a goal of many educators to coincide with the Response to Intervention (RtI) program that many school districts are following. "The general aim of RtI is to determine whether any student, regardless of type of disability needs more intensive instruction" (Gentry, 2010, p.3). RtI was created not to service the greatest at-risk students, but to serve all students who are struggling in a particular content area. Because of this, the RtI model is divided into three tiers. Tier I, also known as *universal interventions*, can be implemented to all students in a school. These interventions include academic interventions that benefit all students and can be implemented within the classroom by the teacher. Tier II, known as *selected interventions*, are provided to those students who are not making appropriate gains with the *universal intervention*. These interventions can be implemented either in the classroom or in a pull-out setting. Tier III, known as *targeted interventions*, are provided

to a small number of students who are not responsive to the previous interventions. These interventions are often implemented in a pull-out setting or in a special education classroom (Pavri, 2010).

Response to Intervention (RtI) has been instrumental in developing a new model to identify students as learning disabled instead of using the "wait to fail" model that was previously in place. "The 2004 reauthorization of the Individuals with Disabilities Education Act allows schools to use methods for examining if a student responds to a research-based intervention when determining eligibility for classification as learning disabled" (Gentry, 2010, p.8). The importance of this change comes from the No Child Left Behind Act of 2001 that put scientifically-based research at the forefront of creating classroom instruction that helped students achieve academically (LaRocco, 2009).

History of Response to Intervention (RtI)

"At first glance, response-to-intervention (RtI) is a method to identify learning disabilities. But, RtI could play a much larger role. It has the ability to transform how we educate students – all students. With RtI, students may get the support they need as soon as they show signs that they are having difficulty learning, regardless of whether or not they have a disability" (Council for Exceptional Children, 2007). The importance of RtI is to help students before they fall so far behind their peers that it is almost impossible for them to catch up.

Response to Intervention was developed from Stanley Deno's cascade model which was created in 1970. The cascade model included five different environments for special education students to be educated. These environments included: home, special schools, self-contained classrooms, general education classrooms with pull-out support,

and general education classrooms with full inclusion. The idea behind integrating students into general education settings was to help meet the needs of students before referring them for special education evaluation. Unfortunately as time went on teachers were unprepared and could not support special education students within their classrooms (Buffum, 2009).

The Individuals with Disabilities Education Act (IDEA-97) was created to help bond special education and general education together. This act was reauthorized in 2004 and named the Individuals with Disabilities Education Improvement Act (IDEIA). The importance of this improvement was to find a better way to identify students as learning disabled instead of relying solely on IQ. It is now expected that states use other models including Response to Intervention to classify students as learning disabled (Wedl, 2005).

Response to Intervention is a research-based model that helps merge special education into the No Child Left Behind (NCLB) policies because it has clear standards, useful measurements, and sound instructional practices. Response to Intervention helps bring the focus of education back to instruction. "Sound evidence that research-based instructional interventions have been initiated and data verifying the impact of these interventions are key components to the RTI evaluation and decision-making model" (Wedl, 2005, p.2).

Educators felt the need for a more proactive approach to instruction. They were tired of the practice in place of waiting for a student to fail before providing services. Response to Intervention met the instructional needs for which educators were looking. The RtI model helps prevent students from having difficulties in certain subjects, identifies those at risk, and creates a better instructional match for students. Since this

program is multi-tiered it provides appropriate level instruction for all students (Gentry, 2010).

"Response to intervention is the practice of 1) providing high-quality instruction and interventions that match students' needs and 2) using students' learning rate over time and level of performance to make important educational decisions" (Buffum, 2009, p.14). Student performance data is collected frequently and is available to the different staff members who work with each student. This data provides information about the effectiveness of the instruction being taught and decisions can be made about modifying or changing the instruction. The most important fact about Response to Intervention is that students do not continue with a program that is not benefiting them. Educators find new interventions that are more supportive to the students needs.

The Response to Intervention model is being adapted by many school districts because it is not only geared to help students in special education programs, but its main goal is to support students before they fall behind their peers. The RtI model is used to identify which students need additional support and give them the instruction they need. This model also discourages all struggling students from being referred to special education programs. Teachers implement interventions and collect concrete data showing whether or not the interventions are a success. Those students who are falling behind their peers and are not making growth with the interventions can then be referred to a special education program. This forces all educators involved to be responsible for the instruction students are receiving.

Organization of RtI – A Three-tiered Model

"Response to intervention (RtI) is a new movement that shifts the responsibility for helping all students become more successful from the special education teachers and curriculum to the entire staff, including special and regular education teachers and curriculum" (Buffum, 2009, p.2). The reason that this is important is because more students will be successful when there are more people concerned with their education. The response to intervention model is divided into three tiers that are represented in the shape of a pyramid.

At the bottom of the pyramid is Tier I, which focuses on building the core curriculum and includes progress monitoring for all students. Tier II focuses on administering targeted interventions that are immediate and monitors students who have been struggling with the instruction in place. Tier III focuses on administering intensive interventions to help close the gap between the struggling students and their peers. As the intensity of the interventions increases the number of students who need additional support should decrease. Each tier is meant to focus on the different needs of all the students.

Tier I

Tier I has been called many things, but is most often referred to as the *universal* program. This tier focuses on "the teaching and school experiences that all kids receive every day" (Buffum, 2009, p.74). Before schools can implement Tier I interventions, teachers need to be teaching research-based programs and use class wide formative assessment data to identify areas where students are struggling. This assessment data will show teachers which students need specialized instruction to succeed in the classroom.

Tier I interventions not only focus on academic instruction, but also on the social behaviors that all students are expected to demonstrate. These interventions can include school-wide expectations, rules, procedures, discipline plans, and character building. Universal Interventions should be able to serve the majority of students in a school. "Simple measures may be used to determine which students are non-responsive to the universal interventions and who need additional support" (Pavri, 2009, p.3). These measures not only recognize which students need more instruction academically, but which students are withdrawn and depressed behaviorally and need other interventions in order to be successful.

Tier I should include differentiated instruction in small group settings. This small group instruction can include a thorough review of information, extended instruction to enhance a lesson, or a combination of remediation and enrichment (Buffum, 2009). These small group settings give teachers the opportunity to supplement the curriculum in place and it gives them the opportunity to individualize the instruction for students. An example of this small group instruction is guided reading. Teachers are able to teach all of the students in the classroom by differentiating these groups. This gives the teacher ownership of each of the students and firsthand knowledge of their reading strengths and weaknesses.

Challenges that teachers face in this tier are classroom management and students being able to work independently. These two problems are often correlated. A structured classroom management practice must be in place for small group differentiated instruction to be successful. Students should know what is expected of them and be able to follow the classroom expectations that are in place. For this to be accomplished the

teacher creates high quality activities that the students can accomplish independently while the teacher is working with other students in a small group. This allows the students to be engaged and gives the teacher the opportunity to direct his/her attention to the students in the small group (Buffum, 2009).

School success is based on students learning and because of this certain attributes should be addressed in order to inform quality teaching, focus staff development needs, and produce successful universal programs. These attributes include academic achievement, curriculum choices, frequent assessment and opportunities for improvement, writing, and external scoring. Academic achievement is important and all educators should work together to make this a priority. Teachers should spend a majority of their time on core subjects like math, reading, and writing to develop the student's mastery of these subjects. The importance of progress monitoring is that it gives students frequent opportunities to set goals and to continue improving their performance. Writing is a content area where students tend to struggle and view as a weak skill. It is important that students write regularly and are taught good writing skills, so that hopefully their enjoyment and their ability increase. It is important for teachers to share students' work with other teachers, so that they can receive feedback to improve their own teaching habits. "Quality teaching makes a difference; teaching of the highest quality is focused on key content and focused on depth over breadth" (Buffum, 2009, p.79).

To help schools improve the Tier I programs they have in place they should set high expectations for students and staff, focus their resources, efforts, and curriculum, and ensure that all students learn by diagnosing problems and prescribing supports one child at a time. Not only should students be held to high standards, but so should

teachers. Teachers should show that they believe all students can learn and be successful in school. Teachers should focus on improving student's abilities in certain core subjects, instead of briefly focusing on many subjects. Teachers can maximize instructional time if they make students highly engaged in the learning. Teachers also need to make sure that when evaluating the data collected concerning interventions, they know which students would be appropriate to recommend for Tier II interventions. Not all students are going to be successful with Tier I interventions and it is important for teachers to know which students are succeeding and which ones need more targeted interventions (Buffum, 2009).

Tier II

Tier II interventions are often referred to as *selected* interventions, because they focus on a specific area of need for a student. These students often need additional time and support from teachers. These interventions are considered supplemental because most students receive the support they need in Tier I. Tier II interventions focus on two different types of learners, those who failed to learn and those who failed to try (Buffum, 2009).

Intentional nonlearners are students who have chosen to put no effort into their learning. "The problem is not that the initial instruction was not appropriate or effective for this student; rather, he or she did not demonstrate the desire or effort necessary to master the new skills or material" (Buffum, 2009, p.89). These students are very difficult to motivate and they do not care about grades nor failing in school. It is difficult to make them do something that they have set their minds to not doing. Supplemental interventions have been put in place to help these students succeed including; mandatory

study hall, mandatory homework help, frequent progress reports, study-skills classes, goal-setting and career planning support, and targeted rewards. These supports help provide students with structured environments and the support they need to be successful. Intentional nonlearners are not given the opportunity to opt out of their education with these interventions (Buffum, 2009).

Failed learners are different from intentional nonlearners in that they want to do the work but they don't know how. These students are not receiving appropriate instruction for their learning abilities. For these students to be successful they need targeted differentiated instruction and additional time. Teachers need to understand that students learn in different ways. Some students are more visual than others and if teachers can incorporate different strategies into their teaching, more students will be successful. Similarly some students need to spend more time on new concepts before they completely understand them. Spiraling programs can often be difficult for some students. These programs briefly introduce concepts and then revisit them later in more detail. Some students need to spend more time on understanding new concepts before they are ready to move on. Also some failed learners do not have the prerequisite skills needed to be successful. These students need an intervention that targets their learning gap so they can be more successful with the current content they are learning (Buffum, 2009).

Students should be grouped not by the content area in which they struggle, but by how they struggle. Do they lack effort, do they have a gap in their learning, or are they visual learners? Each of these areas would require different interventions for students. If there are only broad interventions in place then neither the teacher nor the students will

be successful. "To be most successful, this process must also be frequent enough that students don't fall too far behind and flexible enough to adjust as student needs change" (Buffum, 2009, p.94).

Behavioral interventions can be easy to administer to small groups and are not very time consuming. These group interventions often include social skills training, group counseling, and mentoring programs. Interventions that are done in a more one on one setting include behavior contracts, self management strategies, and behavior reduction techniques. Daily behavior report cards can be used to progress monitor the effectiveness of the behavior interventions in place (Pavri, 2009).

"Tier II interventions are implemented to build a student's social-behavioral and/or academic-behavioral repertoire, so that students will become more responsive to universal interventions" (Pavri, 2009, p.4). The goal for Tier II is to give students the support they need to be successful in Tier I. If teachers notice by progress monitoring students that some students need more intensive interventions than they are receiving, they will be provided with Tier III interventions.

Tier III

Tier III interventions are known as *targeted* or *intensive* interventions. "*Intensive* refers to the amount of time per day, the number of days per week, the number of weeks of instruction, and the number of students receiving the intervention at a given time" (Buffum, 2009, p.100). Only a small percentage of students will receive instruction at this tier. These students showed low content area knowledge or lack of progress in the Tier I and II interventions and need more one on one or small group instruction. These interventions focus on the specific areas of deficiency that each student is struggling with.

Tier III interventions increase the frequency, duration, and progress monitoring of the instruction. "…frequent progress monitoring is especially important to establish that a students' lack of success was not caused by a lack of either effective instruction or systematic and intensive interventions, which would indicate the possible existence of a specific learning disability" (Buffum, 2009, p.102).

Students receiving Tier III interventions should also be receiving classroom instruction from the teacher. Interventions are meant to supplement the curriculum already in place, not replace this instruction. Interventions should only replace the core curriculum when the student is receiving accelerated instruction with the intention of returning the student to the classroom instruction.

Educators need assistance when deciding which research-based interventions would meet the needs of their students. The Florida Center for Reading Research (FCRR) has reviewed many interventions that will assist students in each of the five reading components. They have reviewed Corrective Reading, Failure Free Reading, Kaleidoscope, Language!, Success for All, Wilson Reading System, Voyager Passport, and more. They divide the programs by group size and length of daily lessons, so that teachers can decide which programs would fit into their daily schedules (Buffum, 2009).

School districts do not always have the resources needed for students with problem behaviors at the Tier III level. "The intensity and persistence of the problem behaviors in these students requires individualized and comprehensive interventions that are resource-intensive and often reach beyond the school system" (Pavri, 2009, p.4). Different agencies including mental health, juvenile justice, and social services get involved with these students. Teachers create functional behavioral assessments (FBA)

for their students to find the relationship between the student's behavior and variables in their environment. Positive behavior support interventions are used to decrease the problem behavior and replace this behavior with a positive one (Pavri, 2009). Students who are not making gains with Tier III interventions might be considered for special education evaluation. These students might be identified as learning disabled and need to receive additional accommodations.

Perceived Effectiveness of RtI for all Students

The reason that Response to Intervention is effective for all students is because the focus is on individualized instruction. To achieve this, teachers must work closely with parents and students to identify what the problem is that the student is having. The problem can exist with both the instruction and/or the learning environment. After the problem is identified this group must determine why the problem exists and what should be done to address the problem. This is when interventions are put in place to help the student become more successful. The student's progress is monitored and data is collected on the effectiveness of the intervention. The teacher meets with the parents and the student again to discuss the student's performance. The student can either continue with the intervention in place, the intervention can be modified, or a new intervention can be put into place (Wedl, 2005).

Response to Intervention is also an effective model because it focuses on implementing interventions early before students fall behind. "The solution is to intervene early so that students have both adequate initial skills, and the necessary pre-skills to make adequate progress" (Good, 1998, p.60). To accomplish this, students must be accurately identified as at risk. Students need to be frequently measured in the

different content areas to identify students who are struggling and who might qualify for additional interventions. The focus of the Response to Intervention model is on the individual student and their strengths and weaknesses which is why this model is effective with all students.

The Problems with Interventions

As previously stated, interventions are usually not meant to replace instruction but to supplement the instruction already in place. Some of the problems that educators have with interventions are finding ones that benefit all of the struggling students and finding the time in the day to teach these interventions in addition to the grade level curriculum.

It can be a difficult task for teachers to find interventions that benefit all students. At the Tier I level, teachers can differentiate instruction for their students in an easier way than at the other tiers. At the Tier II level, teachers need to find interventions and appropriate instructional settings that are going to benefit those students. Some students are going to need smaller group instruction from their teacher, while others might need to be pulled out of the classroom to work in a less distracting setting. At the Tier III level, students will most likely receive instruction in a pull out setting or self contained classroom. Even if the classroom teacher is not instructing the students at this time, it does not mean that they aren't involved with student instruction. The classroom teacher still teaches these students the curriculum and needs to know what they are learning in their interventions. All educators need to work together to make sure that students are succeeding.

Another problem with interventions is trying to find the time in the day to use them effectively. Research has found that interventions are most successful when used

with fidelity, meaning that teachers will find more success with these programs if they are used with a certain number of students for a certain amount of time a week. Teachers need to incorporate this amount of time into their day, so that students receive the regular curriculum in addition to the supplemented interventions. If a student is receiving more than one intervention it will add to the amount of instruction they receive daily. Sometimes teachers believe that if they aren't able to teach an intervention they can rely on someone else to teach that intervention. Unfortunately for students to receive the best instruction, they need to be taught by a teacher who has been trained in the intervention being implemented. These problems can be overcome by educators working together to find appropriate interventions for students and by using their time wisely to make sure that students receive the necessary allotted time for each intervention.

Interventions in the Area of Elementary Mathematics

As the Response to Intervention model has increased among school districts, more research-based interventions have been created to support teachers and students. Interventions have been created to support students at each of the tier levels and in different content areas. Mathematics interventions have been created to supplement the curriculum in place.

Students learn in different ways and because of this, intervention programs should include different teaching techniques. Mathematics interventions at each of the tiers use math manipulatives to help students visualize the information they are learning. Mathematics interventions can be used as a supplemental tool, in a small group setting, or independently on the computer. Interventions can be used in different instructional settings, which allows them to be more useful.

"Public policies that aim to improve the quality of education in our schools often bring change and the need to implement innovations not only at the organizational level but also at the individual teacher level" (LaRocco, 2009, p.3). Teachers want nothing more than to support students in every way possible, and with this comes the need to modernize instruction. The only trouble is that with all of the different interventions that have been created for the three different RtI tiers, is deciding which ones are going to meet the needs of each student at his/her intervention tier. The purpose of this project was to research three mathematical intervention programs and summarize their effectiveness using different instructional models.

Chapter Summary

The focus of this chapter is to give a review of Response to Intervention. It discusses the history of Response to Intervention (RtI) and how important the reauthorization of IDEA was to these new instructional practices. There was a brief description of how the RtI model is organized into three tiers. This chapter went into detail about each of these tiers and the importance of implementing interventions at an early age before students fall too far behind their peers. This chapter also focused on the effectiveness of RtI, the problems with the interventions, and finally, centered on math interventions.

Chapter three focuses on the methodology used for this research project and addresses the target audience that should benefit from this project. Chapter three also focuses on the organization of the project; the peer assessment plan; and gives teacher feedback on these interventions and their effectiveness with students.

Chapter 3

METHOD

The purpose of this project was to research three mathematical intervention programs and summarize their effectiveness using different instructional models. This project should give teachers insight into three commonly used mathematical intervention programs. The difficulties encountered by both general education teachers and special education teachers instructing struggling students is evident. In a two year period of time this researcher was amazed by how many students were considered learning disabled and were receiving special education services. At times the small group setting of the special education classroom felt more like a general education classroom with twenty students receiving instruction at a time. This problem stemmed from the "wait to fail" model that had been in place to identify students as learning disabled. Students were considered learning disabled if there was a severe discrepancy between their IQ and their classroom achievement (Gentry, 2010). Instead of using early intervention programs, students received assistance after they had fallen behind their peers. Unfortunately, they were often unable to gain the skills needed to be on grade level and thus received more instruction in the special education classroom. As the years progressed it was observed that fewer primary aged students were receiving special education services. More interventions were in place that either supported the students in the general education classroom or gave them the skills they needed to be on grade level with their peers. The

importance of early interventions is to support students before they fall too far behind their peers to catch up.

Target Audience

This project focuses on mathematical intervention programs that are used with elementary aged students. The Touch Math program is used mainly with primary aged elementary students, while the Do The Math and FASTT Math programs are used with intermediate aged students. Both special education and general education teachers should be interested in this study because it gives them a better understanding of three intervention programs that are being used in classrooms. They should be able to use the information provided to decide whether or not these programs are appropriate for their students and the instructional models they use.

Organization of the Project

This project gives teachers beneficial information on three intervention programs being used to help strengthen the math skills of students. The ideas in this project focus on identifying whether or not these interventions are useful to all students struggling in math and whether they can be taught using different instructional models including: in the classroom, in a pull-out setting, or in the special education classroom. The project includes the results found from the study performed when implementing these three interventions on both identified special education students and general education students identified as below grade level in math. The project also includes a discussion on how this topic impacted teachers and the instructional model used. The overview and the results of the studies using each of the models is presented in a PowerPoint format.

Peer Assessment Plan

This research study involved the cooperation of special education teachers, general education teachers, and math interventionists. The special education teachers and the math interventionists implemented the Do The Math program, while the general education and the special education teachers implemented the Touch Math and FASTT Math programs. All of these programs were used to supplement the Everyday Math curriculum used throughout the district. Each teacher was asked to provide feedback concerning the simplicity of the program, the amount of materials that accompany the program, student's interest, practicality of application, and student's math growth using the programs. The feedback was offered via a questionnaire designed specifically for this project.

Chapter Summary

Trying to find interventions that benefit students can be an overwhelming task for teachers. In addition to this challenge it can seem almost impossible to find time to incorporate these interventions into the content curriculum already in place. It would be beneficial to teachers to have a comparison of different programs being used to supplement the instruction of the curriculum in place. Teachers need to understand the pros and cons of different programs, so that they can make an educated decision about which programs are going to benefit students most. Chapter 4, provides research on different mathematical intervention programs and summarizes their effectiveness to increase math knowledge in students via a PowerPoint presentation.

Chapter 4

RESULTS

Many studies have been completed in the past few years that show that students who struggle in a specific subject are not making the necessary academic gains to bridge the gap between these students and their peers. Every year a student continues to lag behind academically the more this gap grows. "The solution is to intervene early so that students have both adequate initial skills, and the necessary pre-skills to make adequate progress. With comparable initial skills, students need only to make progress at the same, not a faster, rate as their peers" (Good, 1998).

Implementing early interventions has become a goal of many educators to coincide with the Response to Intervention (RTI) program that many school districts are following. "The general aim of RTI is to determine whether any student, regardless of type of disability needs more intensive instruction" (Gentry, 2010). RTI was created not to service the greatest at-risk students, but to serve all students who are struggling in a particular content area. Because of this, the RTI model is divided into three tiers. Tier I, also known as *universal interventions*, can be implemented to all students in a school. These interventions include academic interventions that benefit all students and can be implemented within the classroom by the teacher. Tier II, known as *selected interventions*, are provided to those students who are not making appropriate gains with the *universal intervention*. These interventions can be implemented either in the classroom or in a pull-out setting. Tier III, known as *targeted interventions*, are provided

to a small number of students who are not responsive to the previous interventions. These interventions are often implemented in a pull-out setting or in a special education classroom (Pavri, 2010).

Response to Intervention (RTI) has been instrumental in developing a new model to identify students as learning disabled instead of using the "wait to fail" model that was previously in place. "The 2004 reauthorization of the Individuals with Disabilities Education Act allows schools to use methods for examining if a student responds to a research-based intervention when determining eligibility for classification as learning disabled" (Gentry, 2010). The importance of this change comes from the No Child Left Behind Act of 2001 that put scientifically-based research at the forefront of creating classroom instruction that helped students achieve academically (LaRocco, 2009).

"I've always had students in my class who fall behind, who need more help, need more attention. This project has caused me to really figure out what to do to help them. I can't just say the same things again; these students need different approaches to help them learn" (Burns, 2008a). Most teachers feel this way at some point in their career, but they don't know what approaches to try that will be successful with their students. More and more intervention programs are being created to compliment the Response to Intervention model that has become adopted by districts.

"According to the 2003 National Assessment of Educational Progress (NAEP) result, 23 percent of fourth graders and 32 percent of eighth graders performed at Below Basic levels in mathematics" (Scholastic, 2005a). The gap is continuing to grow between those students who understand the information and those students who need more instruction. The reason that many of these students are struggling is because they do not

have a strong foundation in basic math facts. This causes students to have a difficult time learning more complex concepts. In order for teachers to bridge the academic gap among students they need to use an intervention program that focuses on building basic math facts.

"Students who are struggling with basic math skills is not a unique problem" (Green, 2009). This sentiment is felt by many teachers who are trying to decide how to help their students. Many districts using the Everyday Math curriculum are finding that the program is beneficial for those students who have a strength in math, but isn't sufficient for struggling students. Many districts are looking for programs to supplement the math instruction already in place.

Marilyn Burns, with the help of other educators, created the Do The Math intervention program. This program was formed to help elementary aged students struggling in mathematics. It focuses on creating a strong foundation in computation, number sense, and problem solving (Burns, 2008a).

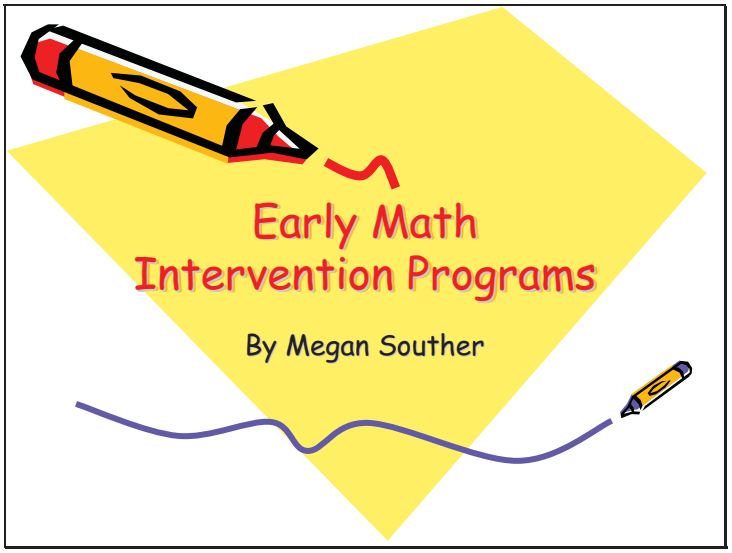
FASTT Math was created by Tom Snyder Productions to help students increase their math fluency in addition, subtraction, multiplication, and division. Once students are able to increase their basic facts recall then they will be able to use these skills with computation and problem solving. FASTT Math uses the Fluency and Automaticity through Systematic Teaching with Technology system to teach math-delayed and non math-delayed students (Scholastic, 2005a).

Janet Bullock was an elementary teacher who created the Touch Math program in 1975. Bullock was trying to find an intervention that would not only increase her student's math skills but also increase their confidence. Like most interventions this

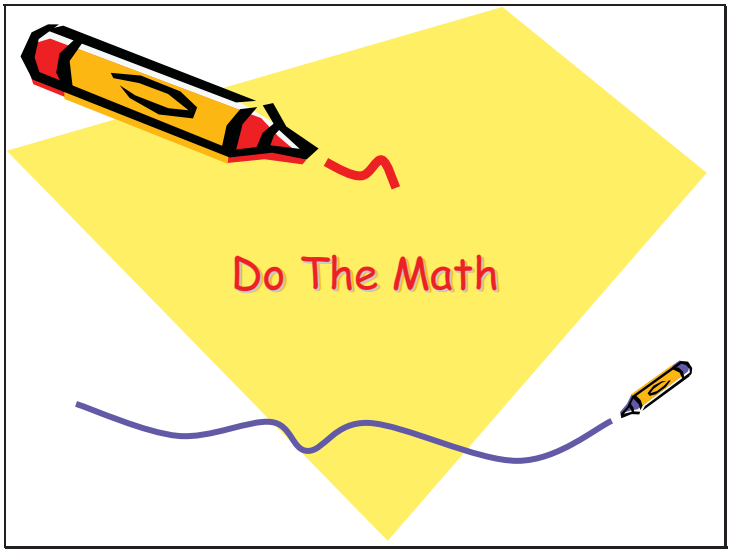
program is not meant to be taught alone, the point of this program is to help students better understand the math curriculum being taught to them (Green, 2009). "TouchMath is one such program that empowers children to master the basic facts and computation. After basic facts and computation are mastered, children using the TouchMath program can apply these skills to an endless variety of real-world problems" (Vinson, 2004).

The problem facing teachers is which program will be most successful with their students. Teachers do not have additional time in their day to try different intervention programs hoping that they will benefit their students. This project is to help teachers receive a better understanding of three common interventions that are presently being used in many elementary schools to support student progress in mathematics.

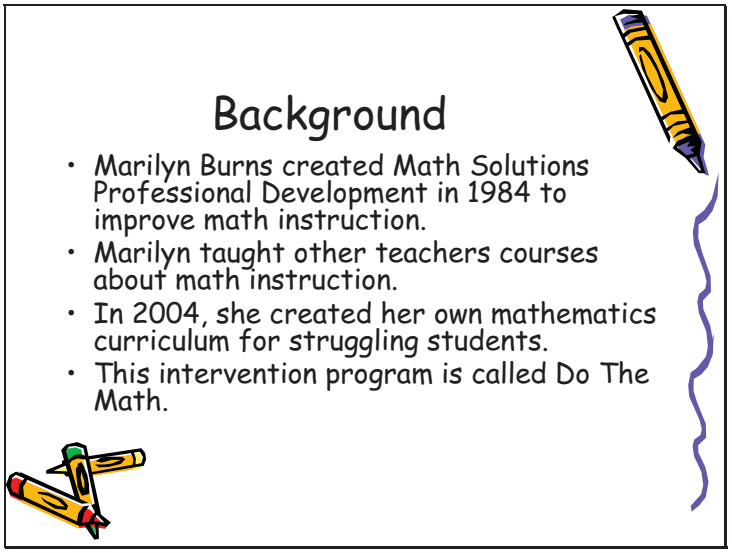
Slide 1



Slide 2

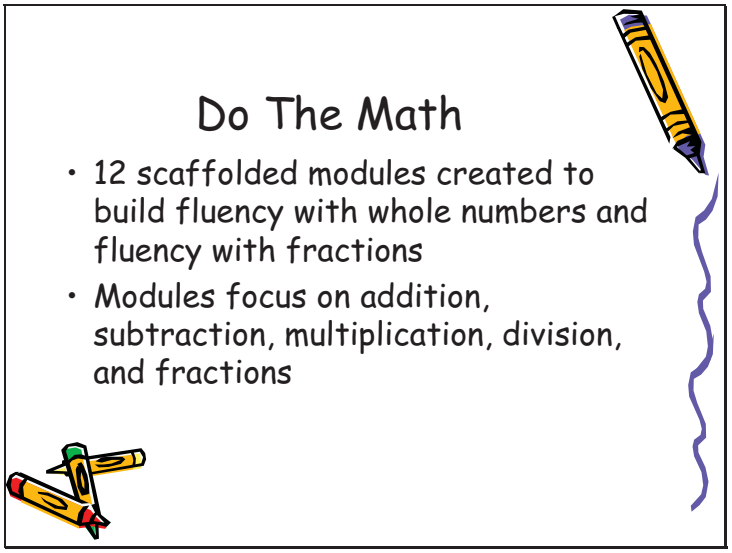


Slide 3



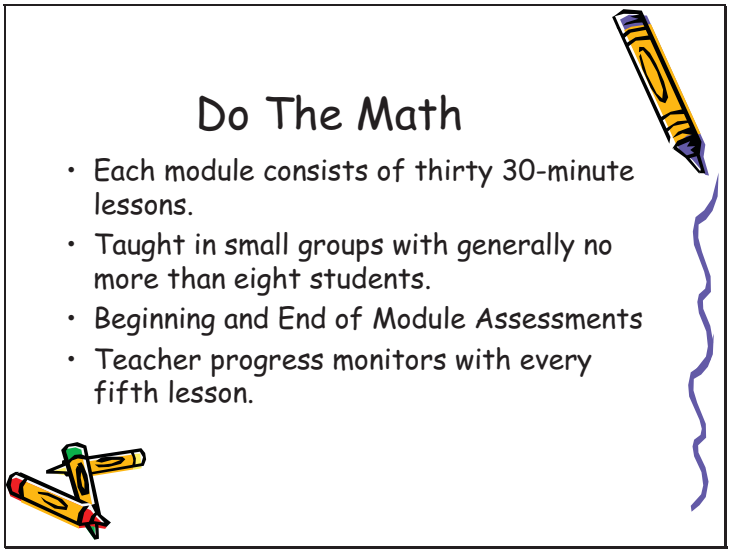
Students' struggling in school is not a new concept. Marilyn Burns created an organization in 1984 called Math Solutions Professional Development. The purpose of this organization was to help improve math instruction for students in kindergarten through eighth grade. Along with other educators, Marilyn decided to teach courses about math instruction to teachers around the world. She felt that teachers were not receiving the instruction they needed to be successful teachers of mathematics. In 2004 Marilyn decided that she wanted to create a mathematics curriculum that teachers could use with their struggling students. This program was meant to help students build up their basic math concepts in a way that they would understand. From her many years of working in classrooms and observing students she realized that many of them have similar misconceptions and she wanted her program to help deal with these problems. Marilyn and other teachers worked for two years to create this program. They combined their efforts with scholastic to publish the intervention program that is now called Do The Math. They piloted this program in six public schools and found that it was not only a success with the students but teachers as well (Burns, 2008a).

Slide 4



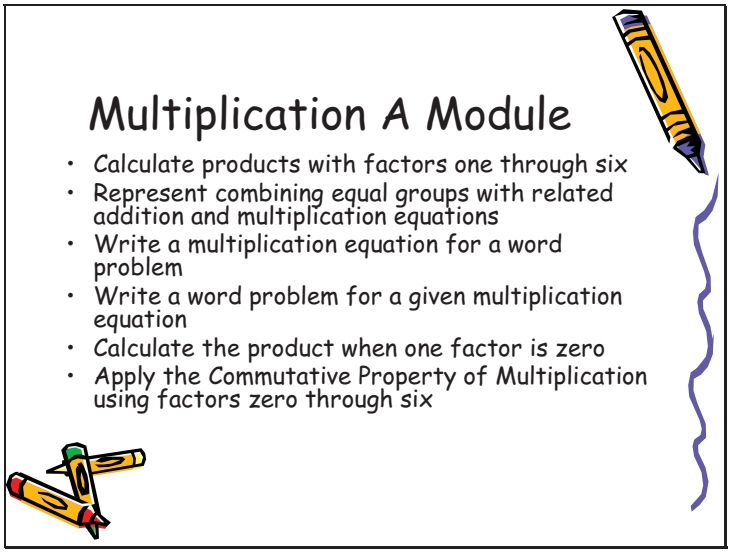
The Do The Math program consists of twelve scaffolded modules created to rebuild fluency with whole numbers and fluency with fractions. The addition and subtraction modules are divided into addition with sums up to 100, subtraction with numbers up to 100, and numbers greater than 100. The multiplication modules are divided into basic concepts, facts through 12 x 12, and factors greater than 12. The division modules are divided into basic concepts, facts through 100 / 10, and dividends to 1,000. The fractions modules are divided into basic concepts, equivalence and comparison, and addition and subtraction (Burns, 2008b).

Slide 5



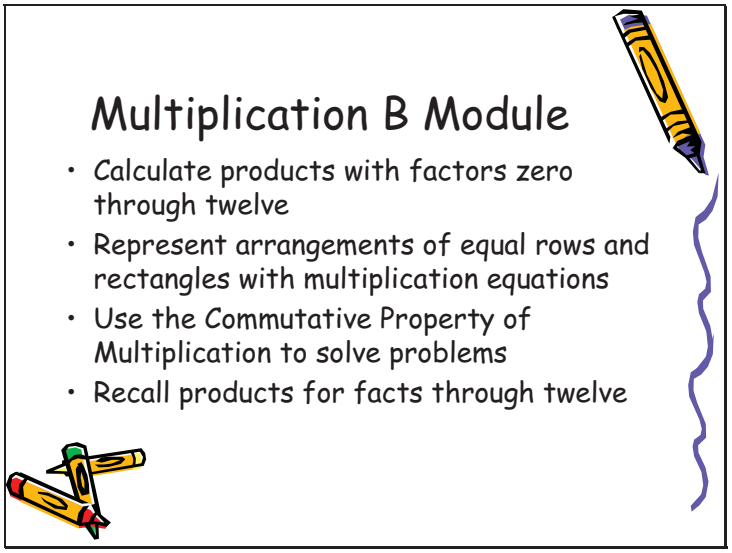
Each of the modules consists of thirty 30-minute lessons. The program is taught to small groups generally with no more than eight students in each group. Students are given a Beginning-of-Module Assessment to find out what their prior knowledge is and what methods they use to answer problems. Throughout the course of the lessons the teacher progress monitors the students at the end of every week or with every fifth lesson. This gives teachers the opportunity to decide whether the students are ready to continue on or if they need more instruction on a specific concept. If students are unable to understand the concepts by the tenth lesson, then the program is at a level that is too hard for the student and another intervention should be used. At the end of the thirty lessons the teacher administers an End-of Module Assessment. This assessment shows the teacher what mathematics concepts the student has now and if they have learned the material presented (Burns, 2008a).

Slide 6



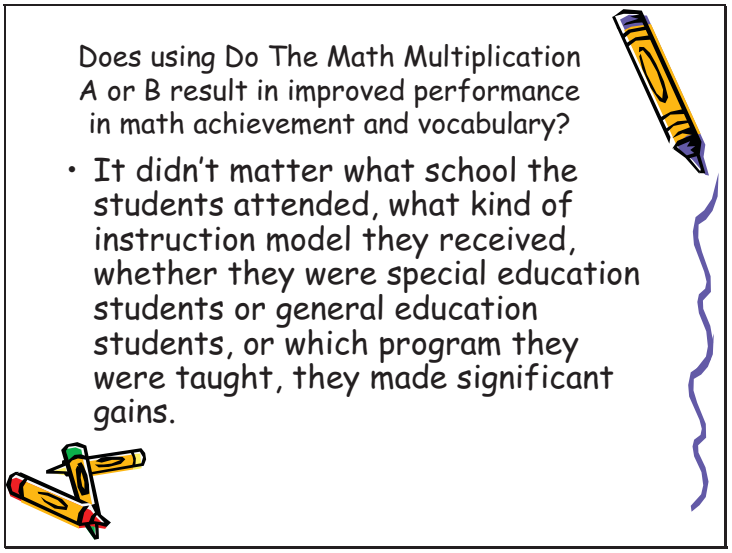
The students who were involved with the study were taught using the multiplication modules. The students who were selected for the intervention were those who needed additional instruction and support in math. The students being taught with the Multiplication A module were expected to calculate products with factors one through six, represent combining equal groups with related addition and multiplication equations, write a multiplication equation for a word problem, write a word problem for a given multiplication equation, calculate the product when one factor is zero, and apply the Commutative Property of Multiplication using factors zero through six (Scholastic, 2008).

Slide 7



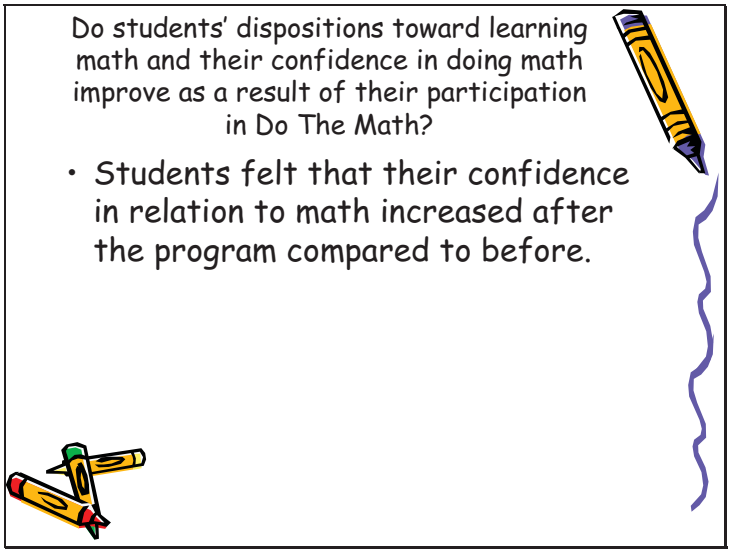
The students being taught with the Multiplication B module were expected to calculate products with factors zero through twelve, represent arrangements of equal rows and rectangles with multiplication equations, use the Commutative Property of Multiplication to solve problems, and recall products for facts through twelve (Scholastic, 2008).

Slide 8



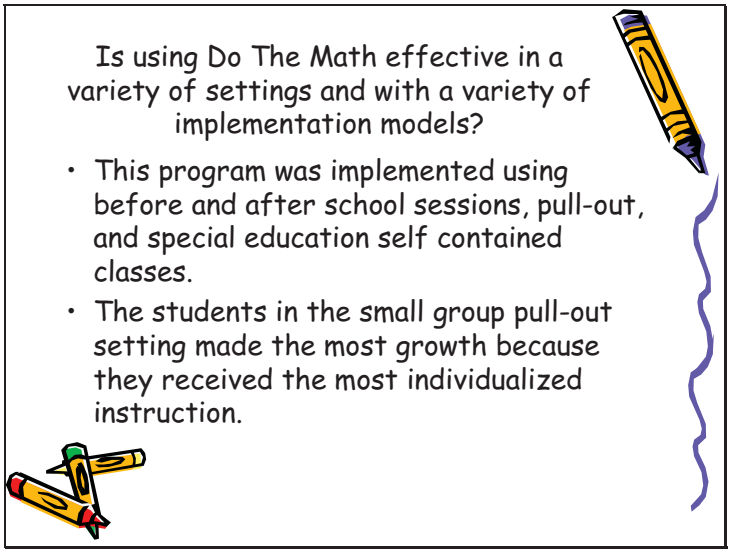
The researchers who conducted this study were looking to answer four main questions. The first question asked was, does using Do The Math Multiplication A or B result in improved performance in math achievement and vocabulary? The Scholastic Researchers (2008) found that it didn't matter what school the students attended, what kind of instruction model they received, whether they were special education students or general education students, or which program they were taught, they made significant gains ($t = 11.45$, $p < 0.001$). The researchers also found through their observations that the students not only understood the math vocabulary being taught to them, but they were also able to communicate these words in their everyday vocabulary. These vocabulary words included Commutative Property of Multiplication, equal, factor, multiplication, multiplication equation, multiply, product, times, square number, and zero property of multiplication.

Slide 9



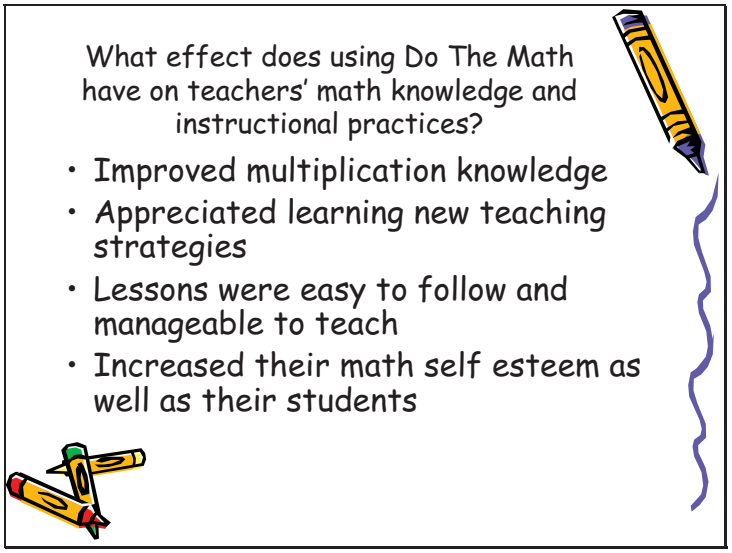
The second question asked was, do students' dispositions toward learning math and their confidence in doing math improve as a result of their participation in Do The Math? The Scholastic Researchers (2008) were able to use the student surveys they created as well as their informal conversations with the teachers and students to determine this. Unfortunately only twenty-five of the ninety-four students received the student survey before and after the program was taught. According to the survey, fifteen of the students felt that their confidence in relation to math was fairly good after the program compared to only nine students feeling this way before.

Slide 10



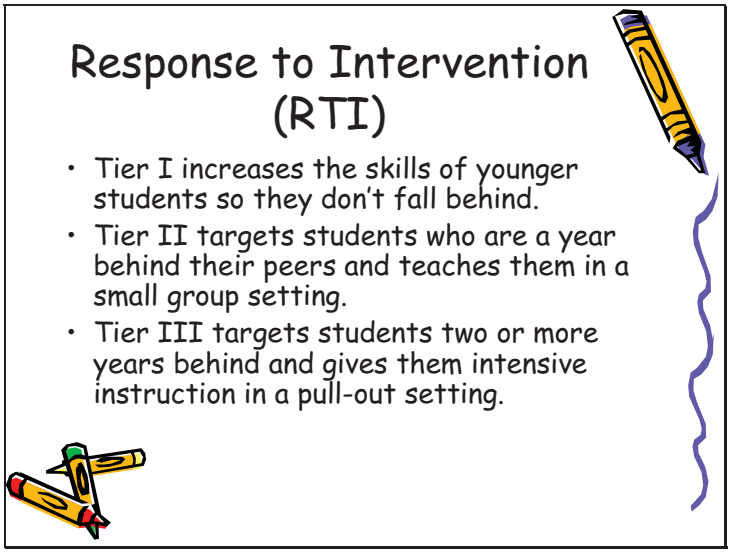
The third question was, is using Do The Math effective in a variety of settings and with a variety of implementation models? The Scholastic Researchers (2008) found that students could be successful in a variety of implementation models. The six schools implemented this program using before and after school sessions, pull-out, and special education self contained classes. The students who made the most growth were in a small group pull-out setting. These students received the most individualized instruction from the teacher. In New York City some schools implement an extended day program, which gave the teachers plenty of time to teach the thirty minute lesson and include setup and cleanup time. The special education self contained classes had the hardest time completing the lessons because their students needed more re-teaching then the general education students.

Slide 11



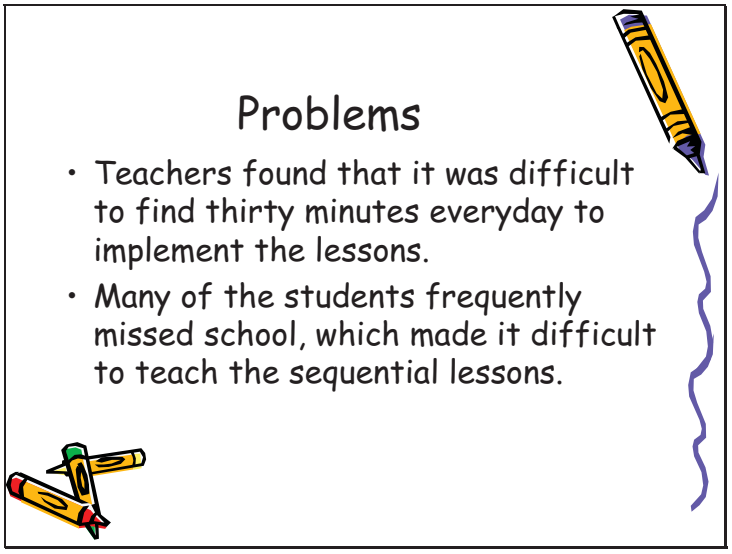
The fourth question asked was, what effect does using Do The Math have on teachers' math knowledge and instructional practices? The Scholastic Researchers (2008) found through their teacher interviews that most felt that they had improved their own knowledge of multiplication and that they appreciated learning new strategies to use with their struggling students. Many teachers feel the same way that Marilyn Burns felt in trying to find successful strategies to use with their students that are different then their normal instructional strategies. Some teachers also felt that math wasn't their strongest subject either and they thought the Do The Math program lifted their self esteem as well as their students. The teachers also felt that the lessons were easy to follow and manageable to teach. The teachers felt that the program was a success not only because their students made growth, but they did as well.

Slide 12



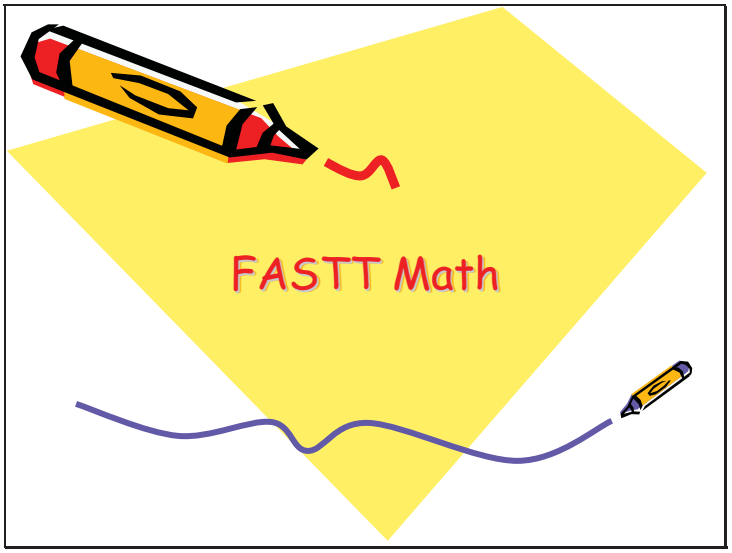
The Do The Math modules also align with the Response to Intervention (RTI) tiers. In Tier I, Do The Math focuses on teaching younger students the skills they need to have so that they aren't at risk of falling behind. In Tier II, Do The Math focuses on targeting students who are a year behind and teaching them in a small group setting. In Tier III, Do The Math focuses on targeting students who are two or more years behind in math and need intensive instruction in a pull-out setting (Burns, 2008a).

Slide 13

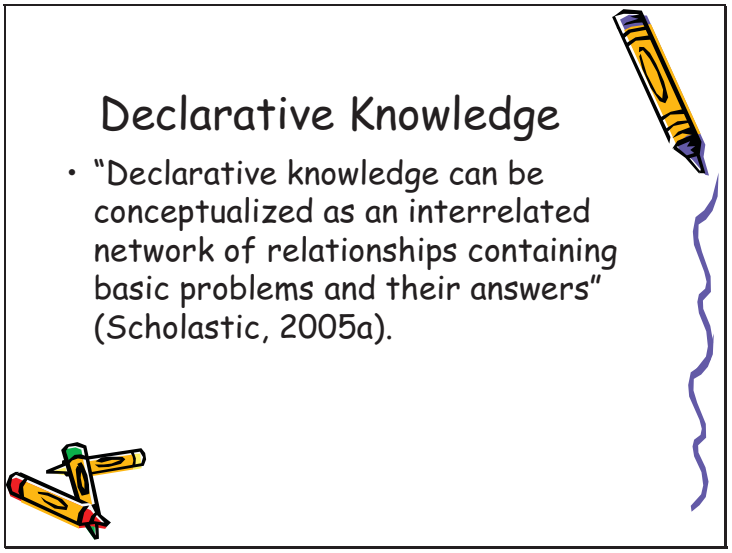


The two biggest problems that the Scholastic Researchers (2008) uncovered with the intervention were lack of time and high rates of absenteeism. The teachers found that it was difficult to find thirty minutes everyday to implement the lessons. Even the teachers with an extended day said that sometimes their schedules were changed and the program was cancelled. Teachers using the pull-out model said that they found resistance with certain teachers who did not want their students pulled out of the classroom. Also those students who are considered at risk academically are also the same students who seem to frequently miss school. With this program it is very important to teach the lessons sequentially because they build on each other, but if students are absent it is hard to catch them up and it is not fair to the students who are there to skip a day of teaching the program.

Slide 14

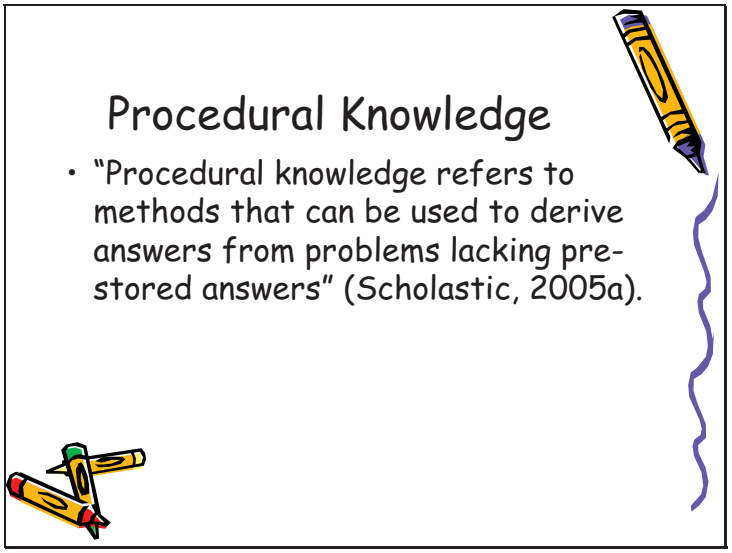


Slide 15



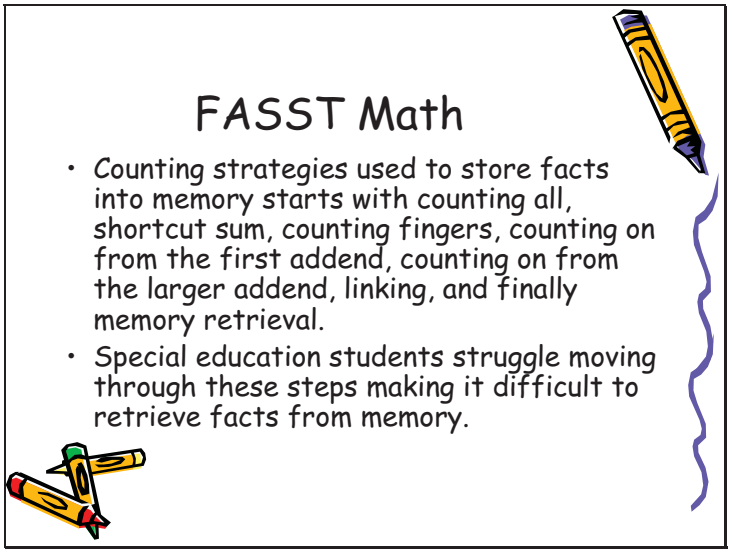
Mathematical knowledge can be classified into two categories: declarative knowledge and procedural knowledge. "Declarative knowledge can be conceptualized as an interrelated network of relationships containing basic problems and their answers" (Scholastic, 2005a). Students have different strengths depending on how long it takes them to recall an answer. Students are more likely to be able to recall the answer to 2 + 3 at a faster pace then they are 7 + 5. Students are able to recall numbers from memory quickly and accurately using their declarative knowledge.

Slide 16



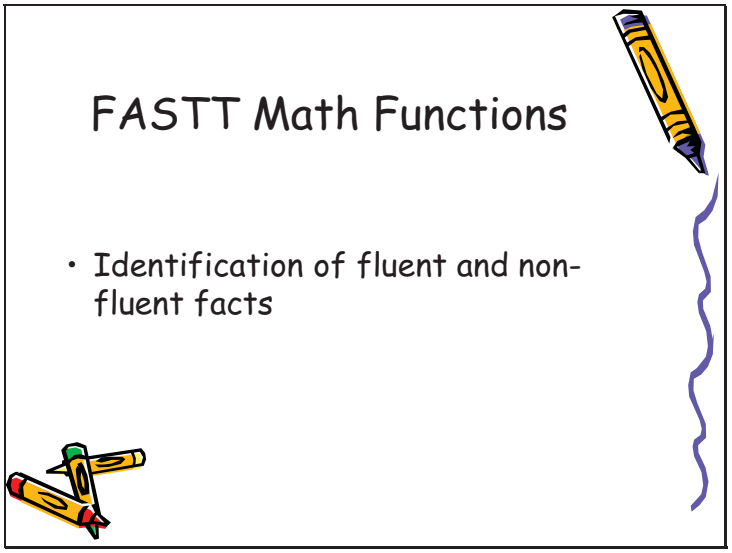
"Procedural knowledge refers to methods that can be used to derive answers from problems lacking pre-stored answers" (Scholastic, 2005a). Students will use different strategies, such as counting on, to find the answer to unknown problems. Even though students are able to find the answers using these strategies, they often are time consuming and can lead students to make errors. Both of these categories represent number sense. "Children with number sense recognize the relative differences in number quantity and how those differences can be represented" (Scholastic, 2005a).

Slide 17



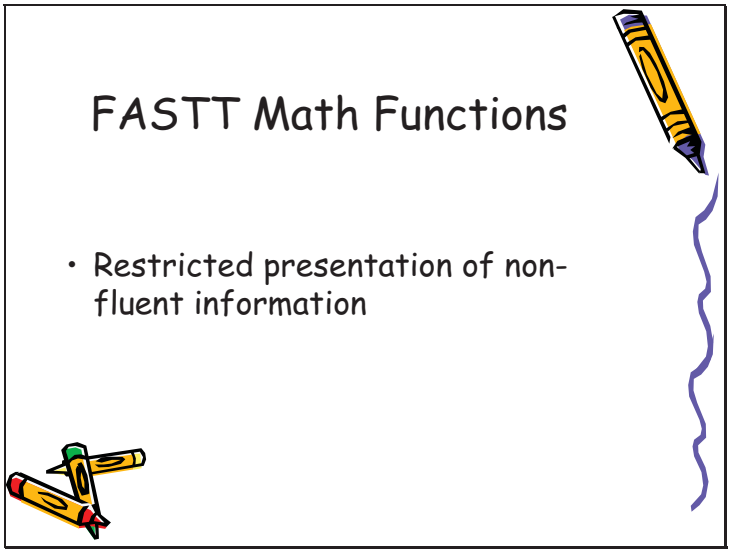
Before students reach the fourth grade they have some facts stored in their memory, but with others they have to use counting strategies to find the answer. After the fourth grade more and more facts are stored in their memory, which allows them to increase the fluency of their math facts. Students also begin to use more complex strategies as they continue to store facts into their memory. They start by counting all, which leads to shortcut sum, counting their fingers, counting on from the first addend, counting on from the larger addend, linking, and finally memory retrieval. Students with learning disabilities have a hard time moving through these sequential steps and often do not make it to the memory retrieval component. Even though these students often have good number sense and procedural knowledge they have poor declarative knowledge and so they struggle recalling basic facts from memory. As students get older the discrepancy between math-delayed and non math-delayed student's increases. The FASTT Math program was created to help bridge this gap (Scholastic, 2005a).

Slide 18



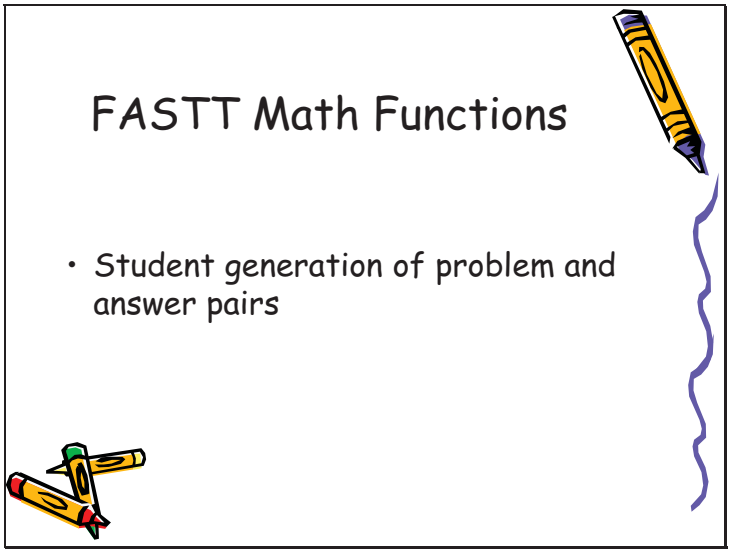
Identifying fluent and non-fluent facts is important because drill and practice programs are useful with memorized facts, but not with facts that are considered non-recall facts. The FASTT Math program uses their computer-based assessment to record how much time students take to answer fact problems correctly. If students are able to answer the question quickly then it is probably a fact that they have stored in their memory, but if it takes them a while then they are probably using a counting strategy to figure out the answer. The program uses a grid to show students which facts are fluent or considered fast and which facts they need to "study" (Scholastic, 2005a). This grid shows both the student and the teacher which facts the student has memorized and which facts they need to work on.

Slide 19



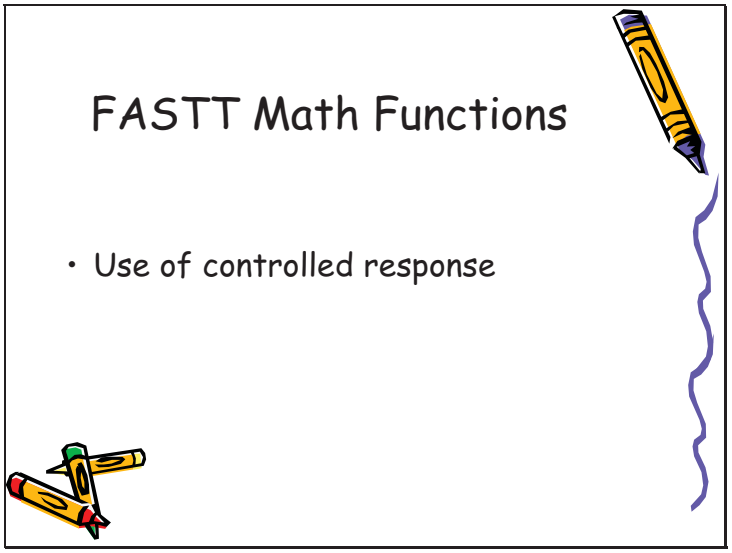
The restricted presentation of non-fluent information feature's main focus is to build on existing knowledge. After looking at a student's fact tracker grid a teacher might notice that the entire zero and one addends are considered known facts, then the computer program would focus on the two addends until they have been memorized. The program will continue to add onto the student's knowledge in this order. This gives the students a better opportunity to master facts because the information is building on itself. Research also shows that students are more successful at building their declarative knowledge if they focus on a small amount of target facts instead of all of them at once (Scholastic, 2005a).

Slide 20



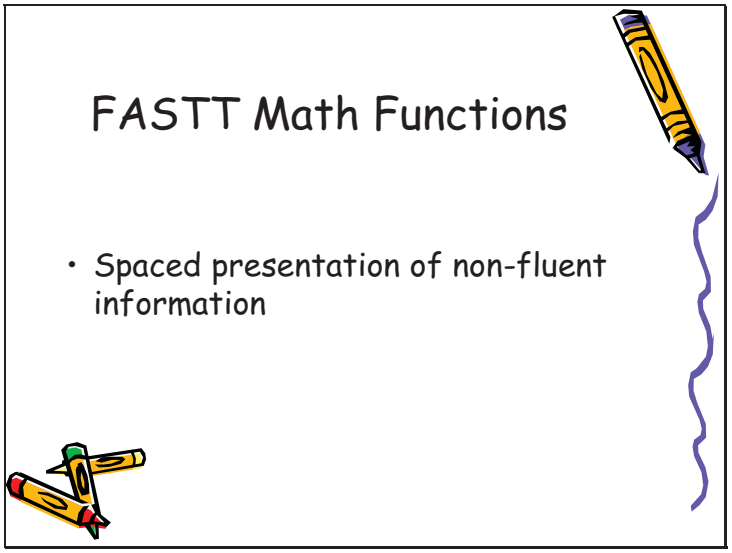
In the student generation of problem and answer pairs feature students must type out newly introduced facts. This allows the student to make a connection between the calculation and its answer. Research has shown that automatically retrieved facts are located in the same region of the brain as word associations (Scholastic, 2005a). The purpose of retyping the information gives the brain a chance to make a connection with the information and store it into memory.

Slide 21



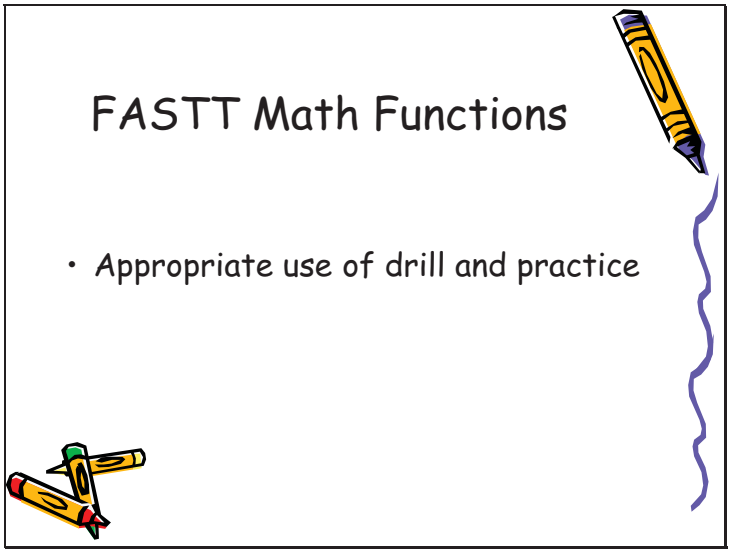
The use of controlled response time's feature helps reinforce committing the information to memory instead of using a counting strategy to answer problems. "A controlled response time is the amount of time allotted to retrieve and provide the answer to the fact" (Scholastic, 2005a). In the FASTT Math program the controlled response time is very quick so that students cannot rely on their counting strategies and begin to memorize the facts. If the student is unable to give the correct answer in the time allotted then the student is presented with the problem and answer relationship until they can answer the problem correctly in the time given.

Slide 22



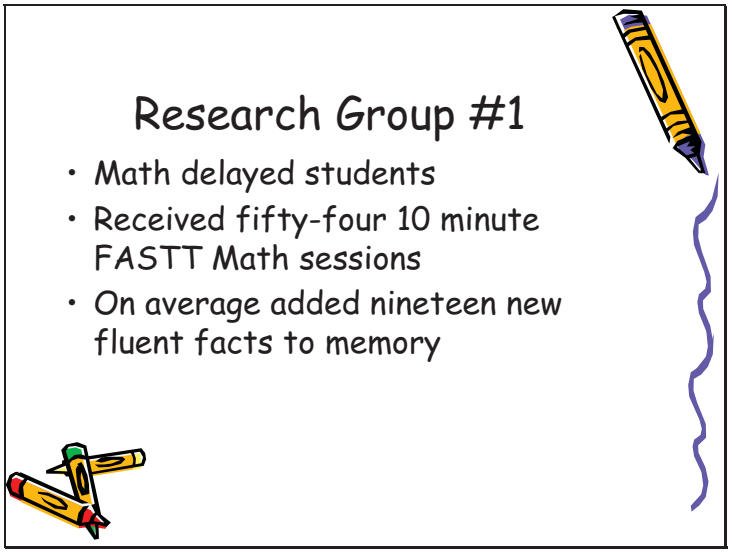
The spaced presentation of non-fluent information feature focuses on mixing in non-fluent facts with already mastered facts. When target facts have been specified they are separated by learned facts. This is known as the "expanding recall" model and allows students to focus on target facts over a longer period of time (Scholastic, 2005a). This gives the students a better chance of adding the target facts to their declarative knowledge network.

Slide 23



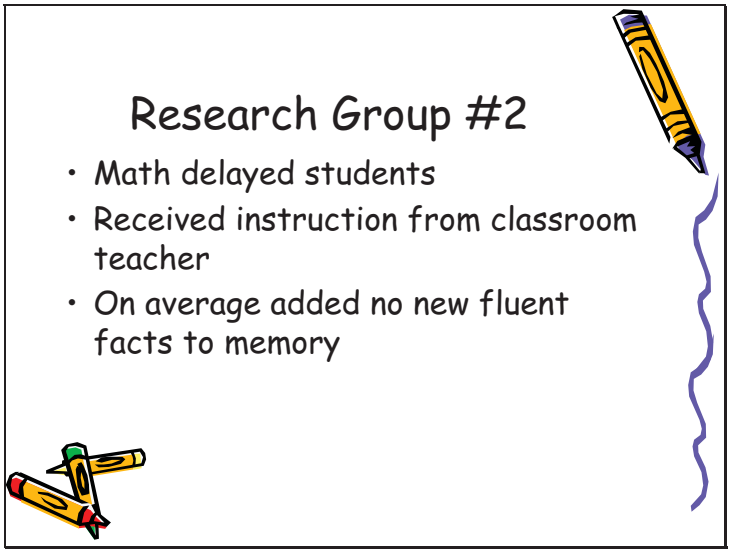
Lastly, the appropriate use of drill and practice feature refers to the facts that the student can answer accurately and within the controlled response time. These facts are added to the drill and practice facts. This feature is only effective with the facts that have already been added to the student's memory. The FASTT Math program wants students to build their memory of basic facts before focusing on the speed of recall through drills and activities (Scholastic, 2005a).

Slide 24

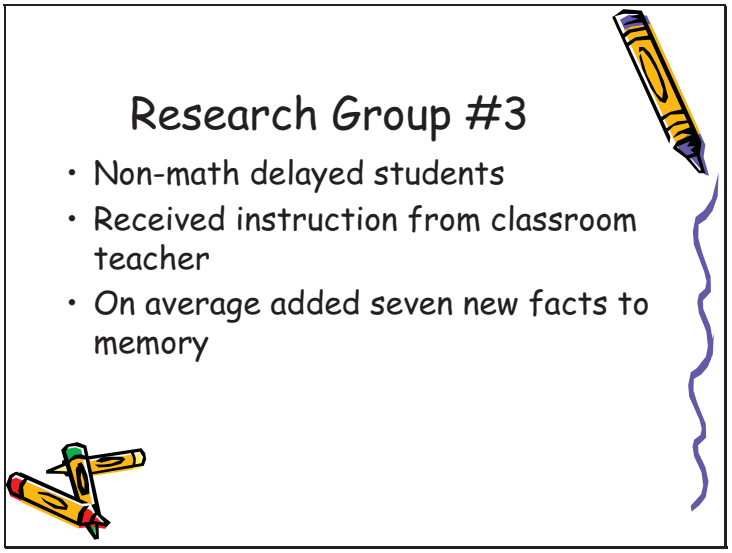


Researchers conducted a study using FASTT Math on three groups of students. Two of the groups had math-delayed students in them and the other group had non math-delayed students in it. One of the math-delayed groups received fifty-four 10 minutes sessions using the software program, while the other groups received instruction from their classroom teachers. The study showed that if this program is used everyday for about ten minutes, students who are considered math-delayed will develop fluency with basic math facts after approximately 100 sessions (Scholastic, 2005a). Students who use the program on a regular basis will produce better results then those who use the program sparingly. The students in the research group that received the FASTT Math instruction on average added nineteen new fluent facts to memory. The math-delayed students who received traditional instruction added no new fluent facts to memory and the non math-delayed students added only seven new facts to memory. The students who participated in the FASTT Math instruction were additionally assessed after the summer break and the researchers found that the facts were retained at a high level after being added to the student's memory with this program (Scholastic, 2005a).

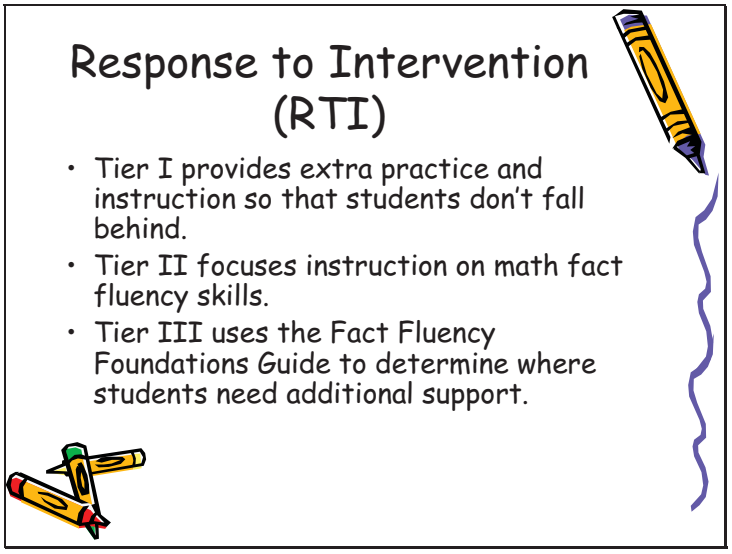
Slide 25


Research Group #2
• Math delayed students
• Received instruction from classroom teacher
• On average added no new fluent facts to memory

Slide 26

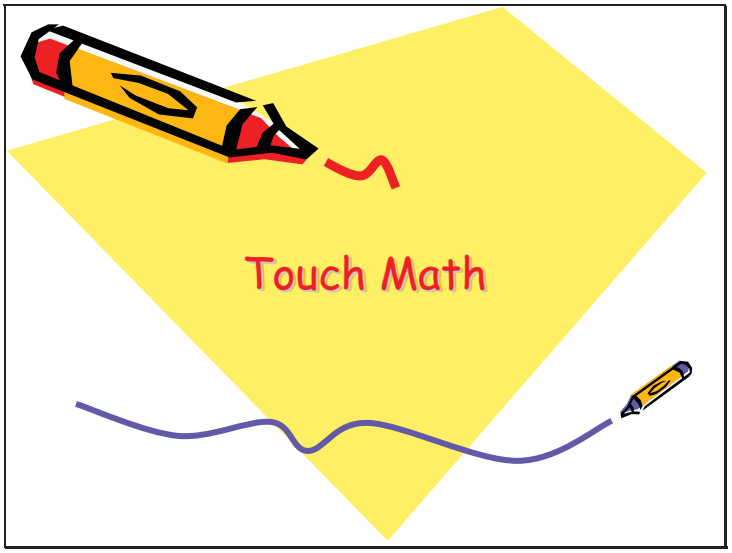

Research Group #3
• Non-math delayed students
• Received instruction from classroom teacher
• On average added seven new facts to memory

Slide 27



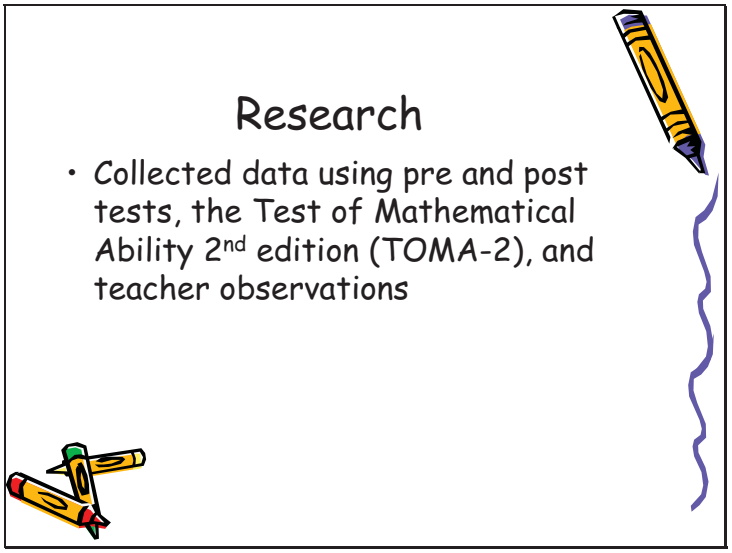
The FASTT Math program also aligns with the Response to Intervention (RTI) tiers. In Tier I, FASTT Math provides extra practice and instruction to students to help prevent them from falling behind. In Tier II, FASTT Math provides additional instruction on math fact fluency skills that students might not have mastered in earlier grades. The teacher can choose which math operation the student needs additional support with. In Tier III, FASTT Math uses the Fact Fluency Foundations Guide to determine where the student needs additional support: quantity concepts, the counting system, or number-fact linking (Scholastic, 2005b).

Slide 28



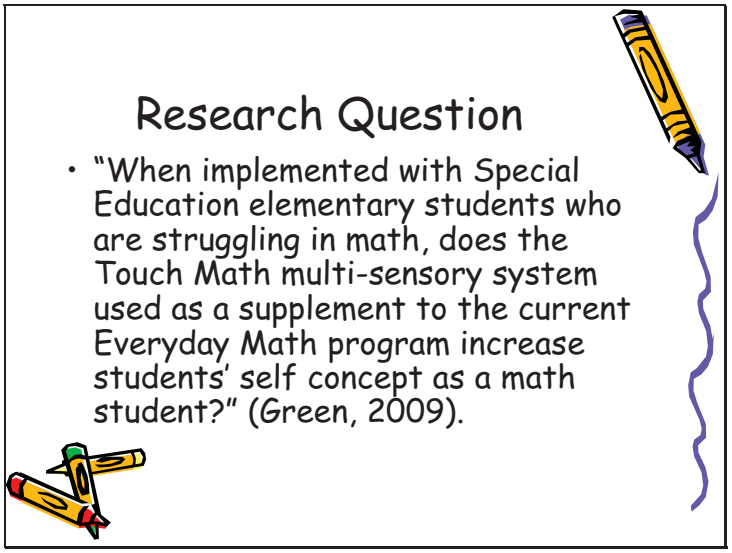
Like many teachers, Janet Bullock used manipulatives and number lines to help her students visually count out numbers. Bullock was always trying to come up with easy ways to help her students understand math concepts in a more effortless way. She decided to add dots onto the numbers as a helpful tool for her students and one that they could use in any setting. The idea came from other researchers who had used a similar technique based off of their students playing with dominoes and dice. "The active manipulation of touching points helps students to gain an understanding of the math concepts being taught: addition, subtraction, multiplication, and division" (Green, 2009).

Slide 29



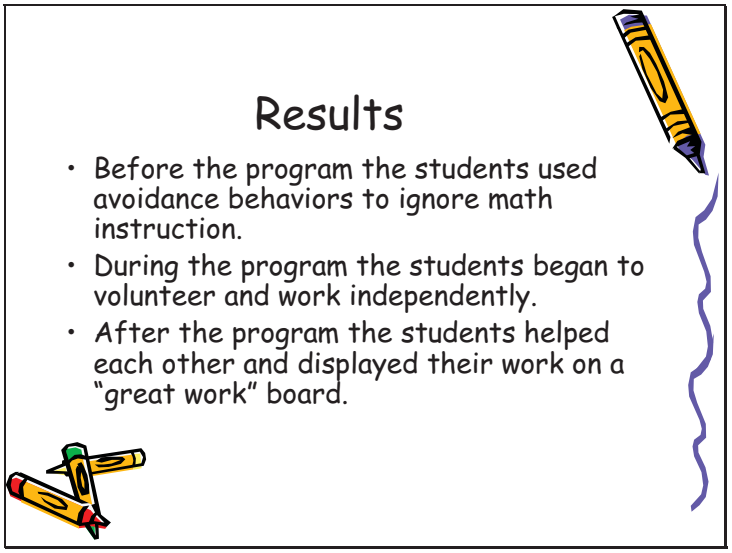
This program was researched to determine if it is an appropriate supplement to the Everyday Math curriculum (Green, 2009). The researcher collected data using teacher made pre and post tests, the Test of Mathematical Ability 2nd edition (TOMA-2), and teacher observations. The pre and post tests focused on gathering data on how well the students were able to solve addition, subtraction, multiplication, and division problems. The TOMA-2 was given to asses the students overall math ability. The test was given before instruction using the Touch Math program and after to determine what growth the students had made. The teacher observations focused on the student's behaviors and frustration levels throughout the lessons. The teacher used an individual student anecdotal form to collect this data. The Touch Math program was used with the students for a six week period (Green, 2009).

Slide 30



The question that researchers were trying to answer with this study was, "When implemented with Special Education elementary students who are struggling in math, does the Touch Math multi-sensory system used as a supplement to the current Everyday Math program increase students' self concept as a math student?" (Green, 2009). According to the data analyzed with the t-test there was significant growth made between the pre and post tests created by the teacher. There was also an increase in the TOMA-2 scores, which proves that not only were basic math skills increased, overall math achievement improved using the Touch Math program.

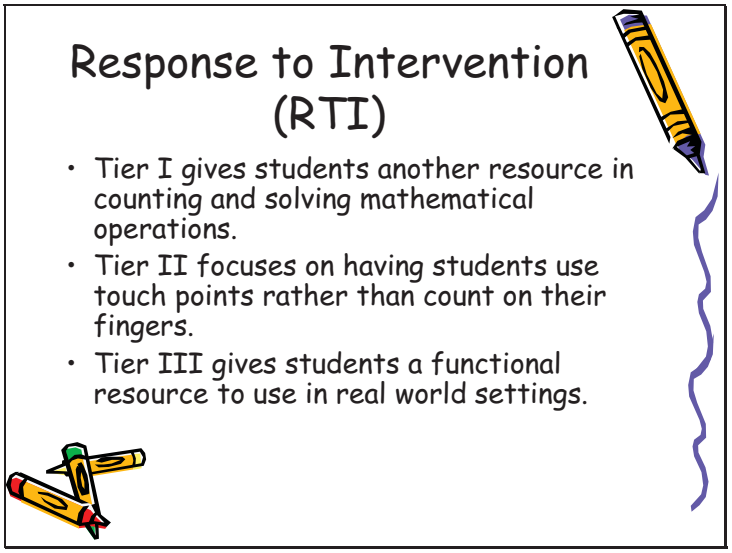
Slide 31



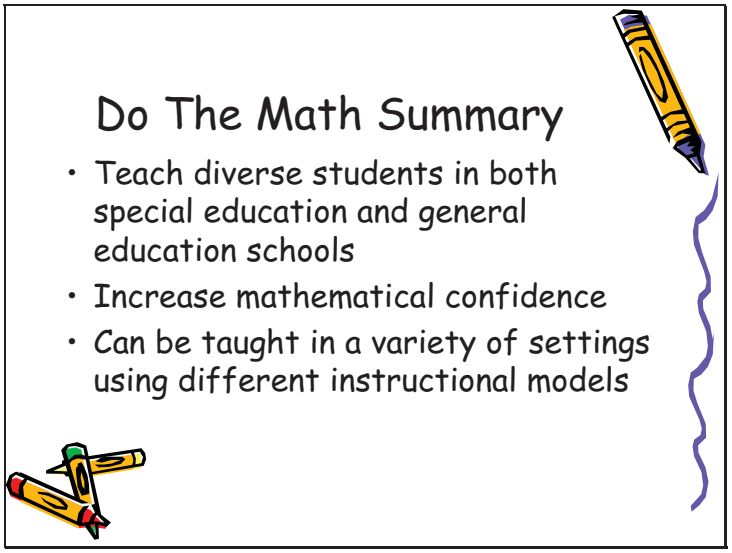
The teacher observations were recorded as well throughout the six weeks the program was administered. Before the program started the students used many avoidance behaviors to ignore math instruction. The pre-instruction observations showed that twenty-six percent of the students frequently asked to use the bathroom, twenty-five percent of students were frequently out of their seats, ten percent of the students needed to be reminded by the teacher to stay on task, sixteen percent of the students were fooling around, five percent of the students complained that they didn't know what to do, and ninety-five percent of the students needed assistance during independent work time. The during instruction observations showed that sixteen percent of the students frequently asked to use the bathroom, thirty-three percent of the students began volunteering, less than one percent of students were fooling around, five percent of the students still complained that they didn't know what to do, thirty-three percent of the students needed assistance during independent work time, and eighty-three percent of the students were engaged in the lessons. The post-instruction observations showed that students created a board to display "great work", sixteen percent of the students were helping others, less than one percent of students were taking frequent bathroom breaks, students rarely complained about not knowing what to do, ninety-five percent of students exhibited positive behavior, and ninety-five percent of the students were able to complete

work independently. "As the Touch Math strategy was introduced students' behavior and work completion, as well as self concept increased" (Green, 2009).

Slide 32

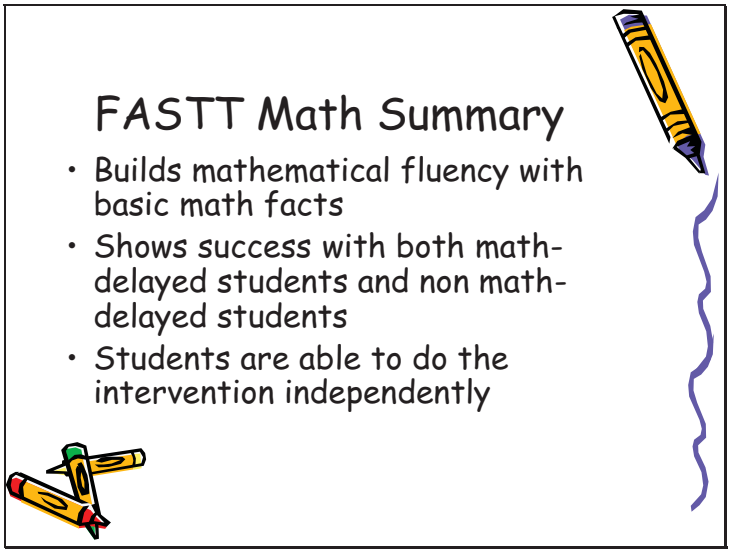

Response to Intervention (RTI)
• Tier I gives students another resource in counting and solving mathematical operations.
• Tier II focuses on having students use touch points rather than count on their fingers.
• Tier III gives students a functional resource to use in real world settings.

Slide 33



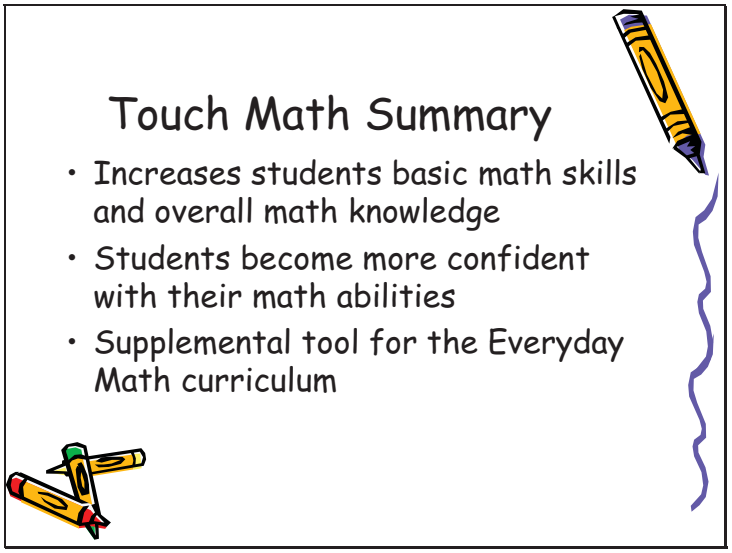
The Scholastic Researchers (2008) considered the Do The Math intervention program a success. It not only was able to teach diverse students in general education schools and special educations schools, but the students also increased their confidence pertaining to their mathematic skills. It is also important that this program can be taught in a variety of settings and using different instructional models because of the fact that teachers need to incorporate it into their instruction for thirty minutes everyday. "The results are promising for schools, teachers, and students searching for a research-based intervention program that supports struggling students to become proficient in elementary mathematics" (Scholastic, 2008).

Slide 34



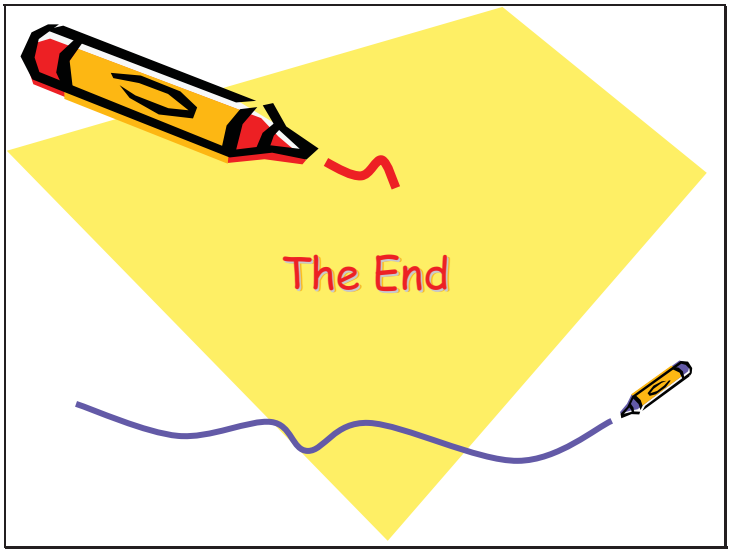
The FASTT Math program is a fast way for teachers to help students build their mathematical fluency with basic math facts. Teachers do not have much available time in their day to devote to interventions, so it is important for an intervention to show success with both math-delayed students and non math-delayed students. It is also a benefit for students to be able to do this intervention independently for ten minutes a day. This gives the teacher needed time to work with students who need extra assistance. Progress monitoring is an important piece to interventions and it is beneficial for students to see the improvement they are making. It can give them incentive if they know what facts they are successful with and which facts they need to spend more time on.

Slide 35



"The research conducted found that the Touch Math program did significantly increase students' achievements on both a teacher made test as well as the Test of Mathematical Ability 2nd edition (TOMA-2) computation test" (Green, 2009). Students not only increased their basic math skills and their overall math knowledge, they also became more confident and proud of their math abilities. The students created a wall to display their math achievements for the rest of the students and teachers to see. This research showed that the Touch Math program is an important supplemental tool for students who are struggling with their current math instruction. The Touch Math program is a successful intervention that teachers should use with their students.

Slide 36



Chapter Summary

The focus of chapter four was to research three commonly used math intervention programs. The three programs were presented to educators to give them a background of the programs and to describe their effectiveness with students. There are many interventions available for educators to use, but it can be an overwhelming task to locate interventions that are research based and show success with a variety of students in a variety of settings. The presentation not only described the benefits of the programs, but some problems with which teachers have struggled. Not all programs meet the teachers and students needs. The presentation also described how the three programs align with Response to Intervention. Each program can be used in some capacity at all three Response to Intervention tiers. The benefit to this is that teachers would not need separate programs for each tier.

Chapter five is a final discussion of the research project. It includes how this project was a contribution to the education community. This chapter also includes peer assessment results, which show what the evaluators of this project thought. It incorporates the limitations of the study and gives recommendations for further development of math intervention programs. Chapter five concludes the study.

Chapter 5

DISCUSSION

The purpose of this project was to research three mathematical intervention programs and summarize their effectiveness using different instructional models. This researcher's purpose was to give informative information to teachers about three mathematical intervention programs that are being implemented in schools, so that they can make an educated decision about interventions that will benefit their students. It was the intention of this project to give teachers a better understanding of Response to Intervention (RtI) and examples of interventions that they could use in their classrooms. Additionally, this project provided teachers with resources on these interventions so that they will know where to find the information necessary to implement these programs in their own classrooms.

Contribution of this Project

This project contributes to the world of education because it not only gives teachers in-depth information about Response to Intervention (RtI), but it also gives them background information on three mathematical interventions that are being implemented in schools. When students are struggling, teachers don't have time to try many different interventions hoping that one of them will be successful. Teachers need to implement interventions that they know have been successful and that will benefit their students.

Teachers also need to be flexible with the instructional models they use to teach their students. Some students are more successful working in a small group pull-out

setting, some work better one-on-one with the teacher, while others are more successful when technology is involved. These three programs represent interventions that can be used in multiple settings and that can even be used together to supplement the curriculum in place.

Peer Assessment Results

Three teachers received information about these intervention programs using the PowerPoint presentation. After the presentation they were asked to fill out a presentation evaluation form and these are the results of the questionnaire. All three teachers thought that the organization of the material, the visual aids, and the presentation were excellent. Two of the teachers thought that the introduction was average, while one teacher thought that it was excellent. One of the teachers ranked the clear understanding of topic questions as average, while the other two teachers felt that this section was excellent. One of the teachers thought the conclusion was average, while the other two teachers thought that it was excellent. The teachers commented that the presentation was very informative and that the interventions were very interesting. One of the teachers wanted to find out more information about other mathematical intervention programs. The teachers gave insightful feedback to the researcher and their evaluation forms can be found in Appendix A.

Limitations of the Study

This project was beneficial to the educators who participated in it. Many good ideas developed from this project, but there were also some limitations. Some of the limitations that arose included the number of interventions used, the content areas addressed, and the staff involved.

This project focused on three intervention programs that are being implemented in school districts. These three intervention programs were chosen because they can be used at different tier levels and because of their usefulness. One of these interventions has been around longer and more teachers are familiar with it. The other two programs were more recently developed. It was important to this researcher to incorporate interventions that teachers might not be as familiar with, give them important information on these interventions, and show how the teachers can incorporate them with other programs that they might be using.

This project focused solely on researching math intervention programs. Since many school districts are using the Response to Intervention (RtI) model, they are looking to supplement their curriculum with interventions at all three tiers and in all content areas. Because there are so many interventions available, this project focused specifically on math intervention programs. Teachers did not receive useful information on other content interventions from this project.

This project involved teachers at one suburban elementary school. The teachers who were involved in this project teach at the intermediate grade levels, third, fourth, and fifth grades. This project did not involve teachers at the primary grade levels or at the middle school level. These interventions are used with students at intermediate grades because they are meant to assist students who are struggling in math.

Recommendations for Further Development

An important recommendation for this project would be to research other mathematical interventions and compare the results to this project. If more interventions were researched and summarized then teachers would be able to try different

interventions depending upon students needs. This project is limited in the interventions that teachers have available.

It would also be beneficial for teachers to research and create a similar PowerPoint presentation for additional content areas. There are many different interventions that have been created in the area of reading. It would be valuable for teachers if they could have these programs summarized for them. It would be important for them to see whether or not these reading interventions were successful with students who are similar learners to their students.

Project Summary

The purpose of this project was to research three mathematical intervention programs and summarize their effectiveness using different instructional models. This researcher felt that this project was successful because the teachers involved were excited about these interventions and hopeful that they would be useful in helping their students succeed. They appreciated the information put together in this project and were hoping that another project would be completed on reading intervention programs. The information presented in this project will be useful to teachers and schools looking for intervention programs to help their students. Future studies of interventions will hopefully fill in the gaps that this project did not cover.

REFERENCES

Burns, M. (2008a). *Do The Math: Program Guide*. New York: Scholastic Inc.

Burns, M. (2008b). *Do The Math: Teacher Implementation Guide*. New York: Scholastic Inc.

Buffum, A., Mattos, M., & Weber, C. (2009). *Pyramid Response to Intervention: RTI, Professional Learning Communities, and How to Respond When Kids Don't Learn.* Bloomington, IN: Solution Tree.

Council for Exceptional Children. (2007) *Response-to-Intervention—The Promise and the Peril.* Retrieved from www.cec.sped.org/AM/Template.cfm?Section=Search&template=/CM/HTMLDisplay.cfm&ContentID=8427

Gentry, R., & Windfield, G. (2010). *Response to Intervention – See Johnny Run*. Retrieved from http://www.eric.ed.gov/PDFS/ED509170.pdf

Good, R. H., Simmons, D.C., & Smith, S.B. (1998). Effective Academic Interventions in the United States: Evaluating and Enhancing the Acquisition of Early Reading Skills. *Educational and Child Psychology, 15* (1), 56-70. Retrieved from http://www.bps.org.uk/downloadfile.cfm?file_uuid=3B16EAF7-1143-DFD0-7EAC-A390FB3731E2&ext=pdf#page=58

Green, N.D. (2009). *The Effectiveness of the Touch Math Program with Fourth and Fifth Grade Special Education Students*. Retrieved from http://www.eric.ed.gov/PDFS/ED507708.pdf

LaRocco, D.J., & Murdica, P. (2009). *Understanding Teachers' Concerns about Implementing Response to Intervention (RTI): Practical Implications for Educational Leaders*. Retrieved from http://www.eric.ed.gov/PDFS/ED506768.pdf

Pavri, S. (2010). Response to Intervention in the Social-Emotional-Behavioral Domain: Perspectives from Urban Schools. *TEACHING Exceptional Children Plus, 6* (3), 3-4. Retrieved from http://www.eric.ed.gov/PDFS/EJ879596.pdf

Scholastic Corporation. (2005a). *Research Foundation and Evidence of Effectiveness for FASTT Math*. New York City: Scholastic Inc. Retrieved from http://www.tomsnyder.com/fasttmath/index.html

Scholastic Corporation. (2005b). *Response to Intervention: An Alignment Guide for FASTT Math*. New York City: Scholastic Inc. Retrieved from http://www.tomsnyder.com/fasttmath/index.html

Scholastic Research and Validation Department. (2008). *Do The Math: Math Intervention in New York City Schools*. New York City: Scholastic Inc. Retrieved from http://teacher.scholastic.com/products/dothemath/research.htm

Vinson, B. M. (2004). *A Foundational Research Base for the TouchMath Program*. Retrieved from http://www.touchmath.com/index.cfm?fuseaction=about.welcome&gPage=26

Wedl, R.J. (2005). *Response to Intervention: An Alternative to Traditional Eligibility Criteria for Students with Disabilities*. Retrieved from http://www.educationevolving.org/pdf/Response_to_Intervention.pdf

APPENDIX A

Presentation Form

Presentation Evaluation Form

Presenter: Megan Souther

Topic: Response to Intervention and Implementing Early Math Intervention Programs

Date:

RATING	POOR	AVERAGE	EXCELLENT	COMMENTS
Introduction				
Organization of Material				
Clear Understanding of Topic				
Conclusion				
Visual Aids				
Presentation				
Questions				
Comments				
Evaluator's Signature				