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Introduction of Response to Intervention in Mathematics

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RESPONSE TO INTERVENTION CLASSROOM SCENARIO

Ms. Johnson has just finished her first month of teaching sixth-grade mathematics. She has utilized the instructional strategies that she was taught as an undergraduate mathematics education major: 1) Allow for independent inquiry and practice, 2) incorporate cooperative learning groups, 3) provide feedback in a timely manner, 4) scaffold instruction when necessary, and 5) provide multiple opportunities for student response and reflection. She recently began providing differentiated instruction by utilizing various methods to present instruction. It has been a very tiring, but also rewarding, first 4 weeks.

Two days ago during class, Ms. Johnson implemented the district's universal screening measures in the areas of computation, operations, concepts, and applications. Overall, she was pleased with the results; 17 of her 20 students were on track to meet end-of-year math benchmarks. But it is not the 17 students who drew her attention; it was the 3 students who were struggling with the material she was presenting.

As she contemplated the fact that three of her students were struggling in math, she remembered receiving a memo from her principal regarding something called *response to intervention*, or RTI for short. As she read the memo, Ms. Johnson remembered hearing very briefly about RTI in one of her undergraduate courses, but she could not quite remember what it was, whom it pertained to, or who was responsible for implementing it. She thought it had something to do with special education.

Later that night, she accessed the National Center on Response to Intervention's web site (<http://www.rti4success.org>). Within a few minutes, most of her questions were answered. According to the web site, RTI helps schools "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." All of these components sounded logical but very intimidating at the same time. After spending some more time browsing the web site, she was left with one lingering question: How was she, the classroom teacher, supposed to "adjust the intensity and nature of interventions depending on a student's responsiveness, and identify students with learning disabilities or other disabilities"? She thought to herself, *Isn't that something they do in special education?* For the first time this school year, she felt inadequate about her knowledge and skills.

The next morning, Ms. Johnson reread the memo regarding RTI. In it, her principal asked for teachers to submit the names of students who were not making adequate academic progress. The memo included a chart of scores arranged into three categories:

1. Low risk
2. Some risk
3. At risk

She was disappointed to have to submit the names of the three students who were in the categories of "some risk" or "at risk" according to the chart, but she was confident that she had done all she could do in the classroom. *Maybe they do have a learning disability—this would at least explain why they are not making progress like the rest of my students*, she thought. Ms. Johnson submitted the names of the three students, and then made the conscious decision to continue instructing the way she had been for the past 4 weeks; she was certain she was doing all that she could.

During sixth period, Ms. Johnson received a hand-written memo from her principal. This memo was again regarding RTI; her presence was being requested at a meeting that afternoon. As she entered the conference room, she was relieved to notice that her friend and colleague Mrs. Potter, a special education teacher, would also be in attendance along with the school psychologist. As Ms. Johnson sat at the small table and the meeting progressed, she became more and more at ease with her initial concerns regarding the RTI process, and she realized that this would be a team process.

The three students whom she had identified as not making adequate academic progress, as indicated on the district universal screening measures for math—Matthew, "some risk," and Jeremy and Tasha, both "at risk"—would continue receiving instruction in Ms. Johnson's class as they had for the past 4 weeks, along with receiving additional focused and more intensive instruction during class in small group settings (something Mrs. Potter would be helping Ms. Johnson plan and implement). Ms. Johnson, with the assistance of Mrs. Potter, would also monitor the progress of each of the three students once per week. After 5 weeks, Ms.

Johnson, Mrs. Potter, and the school psychologist would again meet to discuss the progress of the three students.

It has now been 5 weeks since their previous meeting, and the school psychologist, Ms. Johnson, and Mrs. Potter are beginning to review the strategies that were implemented in Ms. Johnson's class, along with the progress that each of the three students has made. They will use variety of performance data such as chapter tests and quizzes as well as the progress monitoring data on a valid and reliable measure collected weekly.

One of the students, Tasha, has excelled on her curriculum-embedded assessments as well as her progress-monitoring assessments. Last week, Tasha had the third-highest score on Friday's quiz. In addition, all five progress-monitoring data points indicated a trajectory that would meet or exceed the district benchmarks for math by the end of the year.

The other two students, Matthew and Jeremy, have not responded like Tasha to the additional instruction that was provided by Ms. Johnson in class during Tier 1 of the RTI process. Both students' progress-monitoring data showed little to no increase, and all five data points were below the students' goal line. The school psychologist explained that the students had not responded (increased learning) with the instruction they had received over the past 5 weeks and a more intensive intervention was warranted. A decision is made by the RTI team that both Matthew and Jeremy will receive an additional intervention in Tier 2. The more intensive intervention in Tier 2 will involve systematic and explicit instruction delivered in a small-group setting (fewer than five students). During Tier 2, Matthew and Jeremy will receive 30 minutes of additional needs-based small-group instruction 3 days a week (based on their individual requirements) in an intervention block delivered by a math interventionist. This 30 minutes is in addition to the general education math instruction Ms. Johnson will continue to deliver (Tier 1).

Mrs. Potter, the special education teacher, and the math interventionist will spend more time instructing and assessing the progress of both students. Matthew and Jeremy will continue to receive this focused instruction for the next 10 weeks. Following the conclusion of this 10-week Tier 2 instructional period, another meeting will take place to reevaluate the academic progress of both students.

Both Matthew and Jeremy have now spent a total of 15 weeks (i.e., 5 weeks in Tier 1 and 10 weeks in Tier 2) in the RTI process. During this meeting, and for each student, the RTI team has a decision to make on the basis of their student data: 1) to return the student to a Tier 1-only schedule (if he has met the mathematical goals established by the district), 2) to have the student continue Tier 1 with Tier 2 instruction (if he has made progress and is on track for his goal), or 3) to begin Tier 3 individual instruction (if he is not responding to Tier 1 plus Tier 2 instruction).

Over the past 10 weeks in Tier 2, Matthew has made significant progress. His progress-monitoring data have significantly increased; Matthew is now on track (i.e., low risk) to meet or exceed the district math benchmarks. Ms. Johnson and Mrs. Potter feel that Matthew can successfully learn in Tier 1 and no longer requires the additional Tier 2 supports. Even though Matthew's data have significantly improved, the RTI team decides to continue to monitor his progress for the next 6 weeks but will do so less frequently. Instead of monitoring weekly, Ms. Johnson will monitor his progress once a month to make sure he is still on track.

Jeremy, however, has not responded to the individualized instruction that he has received in Tier 2. The flat trend on his progress-monitoring data is alarming. Visual inspection of his progress-monitoring graph clearly shows that Jeremy has not made any progress. The school psychologist explains that Jeremy's trendline, which is flat and not on track to meet district benchmarks, shows that he is still in the at-risk category. Because of the lack of response to the instruction and intervention Jeremy has received in Tier 1 and Tier 2 of the RTI process, the RTI team decides to move him from Tier 2 to the most intense instructional component of the RTI process, Tier 3. The nature of instruction in Tier 3 is very intensive both in terms of instruction and time as well as being focused on specific student needs. Tier 3 is reserved for students with marked difficulties in mathematics who have not responded sufficiently to Tiers 1 and 2.

Recognizing the differences in Tier 3 options that were discussed by the team, they decide that during Tier 3, Jeremy will not only continue to receive math instruction from Ms. Johnson in the general education classroom but will also receive 60 minutes of an intensive and explicit mathematics intervention (once per day for 5 days a week) delivered by Mrs. Potter, the special education teacher. Jeremy, along with a few other students who have not responded to instruction in Tier 2 in other math classes, will receive an evidence-based instructional intervention program during the next 12 weeks. After this 12-week period, another meeting will take place between the school psychologist, Ms. Johnson, and Mrs. Potter to discuss Jeremy's progress.

It is now mid-April, and Jeremy has spent a total of 27 weeks in the RTI process. According to the weekly progress monitoring assessments given by both Ms. Johnson and Mrs. Potter, Jeremy has failed to respond to the intense intervention program provided to him during Tier 3 of the RTI process. It is determined that he has not made adequate academic progress. The RTI team was hoping to be able to make the decision to either 1) move him back to Tier 2 (if he had made sufficient progress, and was on-track to meet the district benchmarks) or 2) continue with Tier 3 instruction (if he had made gradual progress). However, because of his unresponsiveness to the instruction that he received not only in Tier 3 but also in Tiers 1 and 2, the RTI team decides to move forward with a more comprehensive evaluation for special education services.

Ms. Johnson is pleased with her participation in the RTI process; she has learned a great deal, especially regarding instructional strategies she will now use in her math classes for all students. She no longer feels inadequate about her knowledge and skills when it comes to instructing students who struggle and may have learning disabilities. Two of her three students (Tasha and Matthew) who were initially lacking progress in math are now succeeding in her classroom. The third student, Jeremy, is in the process of being evaluated for a learning disability. Because of her involvement in the RTI process, Ms. Johnson has become an advocate for the early screening and intense instruction of students who struggle to make adequate academic progress in the general education classroom.

INTRODUCTION

A leading concern among educators, policy makers, and parents is the number of students in the United States who demonstrate low achievement levels in mathematics. This is especially true for students with high-incidence disabilities and their low-achieving peers without disabilities in the elementary and middle grades (see Gersten et al., 2009; National Mathematics Advisory Panel, 2008). The 2007 National Assessment of Educational Progress report stated that 81% of fourth-grade students with disabilities and 92% of eighth-grade students with disabilities failed to achieve a basic level of proficiency in mathematics (Lee, Grigg, & Dion, 2007). The day-to-day impact of deficits in mathematical knowledge is unmistakably evident in the following statistics reported in the *Foundations for Success: Final Report of the National Mathematics Advisory Panel* (2008): 1) 78% of adults cannot explain how to compute interest on a monetary loan, 2) 71% of adults cannot calculate miles driven per gallon of gasoline used, and 3) 58% of adults cannot calculate a 10% gratuity tip when dining out.

In response to poor academic performance and possible negative societal consequences, schools are aggressively implementing a variety of early and preventive interventions:

- Accentuating number sense and critical foundations of algebra
- Emphasizing the importance of mathematics instruction and learning to teachers
- Providing before- and after-school programs that provide additional mathematics instruction
- Increasing parental involvement
- Refocusing professional development efforts for teachers and staff in the area of effective mathematics instruction

These efforts by educators are described in the context of additional targeted interventions to supplement the mathematics program for struggling students through an instructional tiered approach often referred to as *response to intervention* (RTI; Hughes & Dexter, 2008a; Hughes & Dexter, 2008b; Riccomini & Witzel, 2010) and *response to instruction and intervention* (RTII; California Department of

Education, 2009; Pennsylvania Department of Education, 2009; Pennsylvania Training & Technical Assistance Network, 2008).

The purpose of this chapter is to present a context for which the remaining chapters of this book are to be viewed when one is developing, implementing, and refining RTI in mathematics. The chapter begins with a general overview. We discuss the core components of RTI and essential roles of school staff. In the course of reading this and subsequent chapters, one should refer to the RTI vignette presented at the beginning of the chapter; the vignette will help the reader to make better sense of the information discussed in this chapter as it illustrates the practical implementation of the RTI process.

OVERVIEW OF RESPONSE TO INTERVENTION

Before 2004, the only recognized method of identifying students with specific learning disabilities (SLDs) was through a discrepancy model in which the main criteria used for determining eligibility was a discrepancy between a student's IQ score and his or her academic achievement levels. Over the years, this approach was criticized for at least four reasons:

1. A lack of consistency across states in how to measure the discrepancy
2. Ineffective early preventative efforts
3. Absence of instructionally relevant information for educators
4. Possible overidentification or misidentification of students with SLDs (Berkeley, Bender, Peaster, & Saunders, 2009)

When Congress reauthorized the Individuals with Disabilities Education Improvement Act (IDEA) of 2004 (PL 108-446), states were allowed and encouraged to explore RTI as an alternative option to identifying students with SLDs.

The historical roots of RTI are found in special education research dating back more than three decades, as well as in more recent public policy. The work of Deno and Bergan in the 1970s is often referenced as the initial pedigree of current RTI elements (National Association of State Directors of Special Education [NASDSE], 2006). Although aspects of RTI appear in many academic areas, most of the research was concentrated in the area of reading. This, however, should not come as a surprise. Reading is often a focus of special education research because many students who are at risk for SLDs experience difficulties in learning how to read. As more and more research on RTI demonstrated that improvements in reading outcomes for struggling students was both practical and possible, momentum and acceptance of this tiered instructional practice increased and thus resulted in the inclusion of RTI in the reauthorization of IDEA in 2004.

RTI DEFINED

In the years following the reauthorization of IDEA, RTI has taken many forms. For example, one school's RTI process may include procedures for identifying

struggling students through a computer-based assessment system and then providing those at-risk students 15 minutes of pull-out computer time. In another school's RTI process, at-risk students may be identified through a series of universal screening measures, and those students who are at or below the 50th percentile receive a double dose of an algebra program specifically designed for struggling students. Clearly, the RTI models in both schools would fall into the broad definition of RTI; however, the implementation processes, including the identification of those who are eligible for additional instruction and the actual interventions, are very different.

Next, we briefly examine a few common definitions of RTI, which identify some of the universally implemented core components of this practice and areas open to different interpretations. Regardless of the source and/or definition, common elements emerge across each definition that include assessment, instruction, interventions, and decision making. All of these core components are expanded upon in the forthcoming chapters of this book.

The NASDSE provided the following definition:

Response to Intervention (RtI) is the practice of providing high-quality instruction and interventions matched to student need, monitoring progress frequently to make decisions about changes in instruction or goals and applying child response data to important education decisions. (2005, p. 3)

The National Research Center on Learning Disabilities (NRCLD) provided the following definition:

RTI is an assessment and intervention process *for systematically monitoring student progress and making decisions about the need for instructional modifications or increasingly intensified services using progress monitoring data* [emphasis added]. (Johnson, Mellard, Fuchs, & McKnight, 2006, p. 2)

These definitions, like most others, stress regular monitoring of student progress and providing extra help to students who are failing to make progress in mathematics, reading, or other academic areas. It is intentionally broad as to precisely how a school or district or state puts it into operation, realizing that, as a field, we are only beginning to develop models for successful RTI implementation. At its most basic level, RTI is about informed instructional decisions aimed at improving learning outcomes.

CORE ELEMENTS OF RTI FOR MATHEMATICS

In the past few years, RTI has exploded into the discipline of mathematics instruction, which is refocusing educators on the importance of effective instruction by highlighting the fact that many students with and without disabilities struggle to learn mathematical computations, applications, and concepts. The following section provides a brief description of each of the core elements of RTI.

Assessment

The use of appropriate assessments is crucial to the RTI process. There are two main purposes of implementing assessments in the RTI process:

1. To identify students at risk for learning problems (screening)
2. To monitor the progress of students who have been identified as at risk (progress monitoring)

Universal screening measures are evaluations that are generally administered to all students three or four times per year. The results are used to identify students who are at risk for learning difficulties in math as well as to establish local norms. Typical universal screening measures are relatively brief and simple to administer and score, and remain technically adequate in terms of reliability and validity—especially predictive validity. After these screening measures are analyzed, students who are deemed to be at risk for learning problems are then monitored more frequently to determine the progress they are making.

Progress monitoring is the frequent academic assessment of students to determine whether the students are benefiting (i.e., learning) from their instructional program at an acceptable rate. Often the measures used for progress monitoring are similar (and in some cases the same) to the universal screening measures. Progress monitoring can occur biweekly or as little as one time per month. Because progress monitoring is intended to assess learning across the academic year, the results can also be used to make decisions regarding the effectiveness of curriculum, instruction, and interventions utilized.

Instructional Tiers

The organization of the process of RTI is founded on a tiered system of instruction and interventions that are based on student needs. The RTI models are commonly represented by a triangle with three or four tiers. Some schools utilize more tiers when implementing RTI than others (e.g., four tiers of instruction, as opposed to three); however, regardless of the number of tiers in a specific RTI model, the instructional supports, interventions, and assessments become more intensive as students move through the tiers (see Berkeley, Bender, Peaster, & Saunders, 2009; Burns & Gibbons, 2008).

Tier 1 is the instructional program that all students receive, or core instruction, which sometimes includes differentiated instruction for struggling students. Most models suggest that the core instructional program should appropriately address the learning needs of 80% of the student population (Burns, Deno, & Jimerson, 2007; Johnson et al., 2006; NASDSE, 2006). Tier 2 instruction is more intensive than the instruction in Tier 1 and almost always includes an increase in instructional time (Vaughn, 2003). Instead of replacing core instruction as in a pull-out model (Riccomini & Witzel, 2010), Tier 2 involves the addition of extra instructional opportunities that serve to supplement, enhance, and support the instruction in Tier 1.

Typically, but not always, Tier 1 and Tier 2 instruction take place within the general classroom. Most models (Bender & Shores, 2007; NASDSE, 2006)

suggest that 15% of a student population may require Tier 2 instruction. Tier 3 is the most intensive of the three tiers, and is reserved for students who have received evidence-based instruction at various levels of intensity in both Tier 1 and 2 and have yet to achieve adequate academic progress. If the effectiveness of Tiers 1 and 2 has been maximized, no more than 5% of a student population should require Tier 3 (Johnson et al., 2006; NASDSE, 2006).

Figure 1.1 contains a representation of Pennsylvania’s three-tiered RTII model. It is important to note that some states (e.g., California’s “RtI²” and Pennsylvania’s “RTII”) call the RTI process *response to instruction and intervention*; although the names are slightly different (an added *I*), the processes involved in each model are essentially identical to those of states who call the process *response to intervention*. Even though instruction is an important aspect of all RTI models, adding the additional *I* for *instruction* emphasizes the importance of the general education instruction, or Tier 1.

Figure 1.2 contains a representation of the Berkeley County School District’s four-tiered RTI model. The purpose of a system of tiers is to provide instructional supports that can be implemented at the onset of a student’s identified academic struggle, while also offering a realistic means of monitoring and maintaining such supports throughout the academic calendar year.

Content Emphasis

The discussion regarding what to teach in mathematics is often a contentious point of debate among educators, parents, researchers, and policy makers. A definition of mathematical proficiency is pertinent to any discussion of RTI.

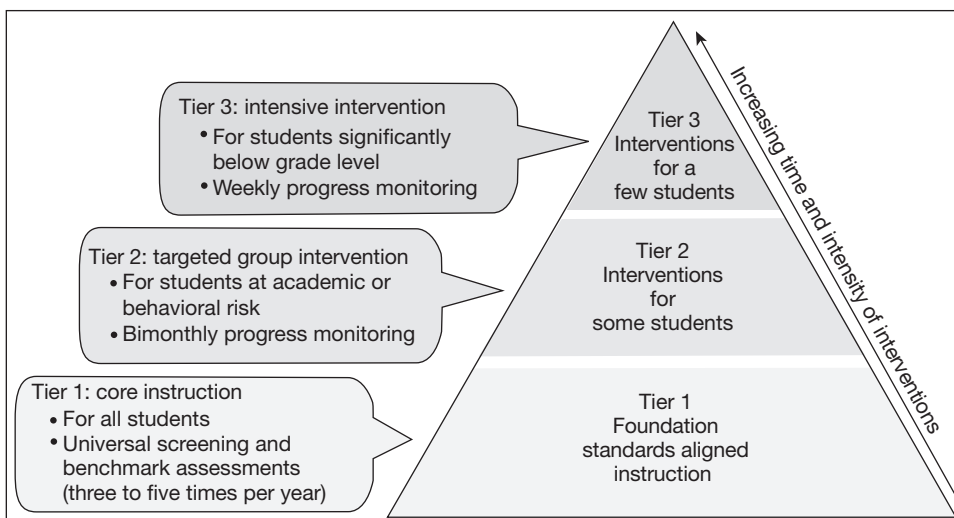


Figure 1.1. Pennsylvania’s three-tiered response to instruction and intervention model. (From Pennsylvania Training & Technical Assistance Network [2008]. *Response to instruction and intervention implementation guide*. Retrieved from <http://www.pattan.net/teachlead/responsetointervention.aspx>.)

RTI

Response to instruction

- Interventions prescribed on basis of student needs supported by data.
- Student movement throughout Tiers is fluid in nature.
- Identified special education students' Tiers placement is prescribed by their individualized education program.

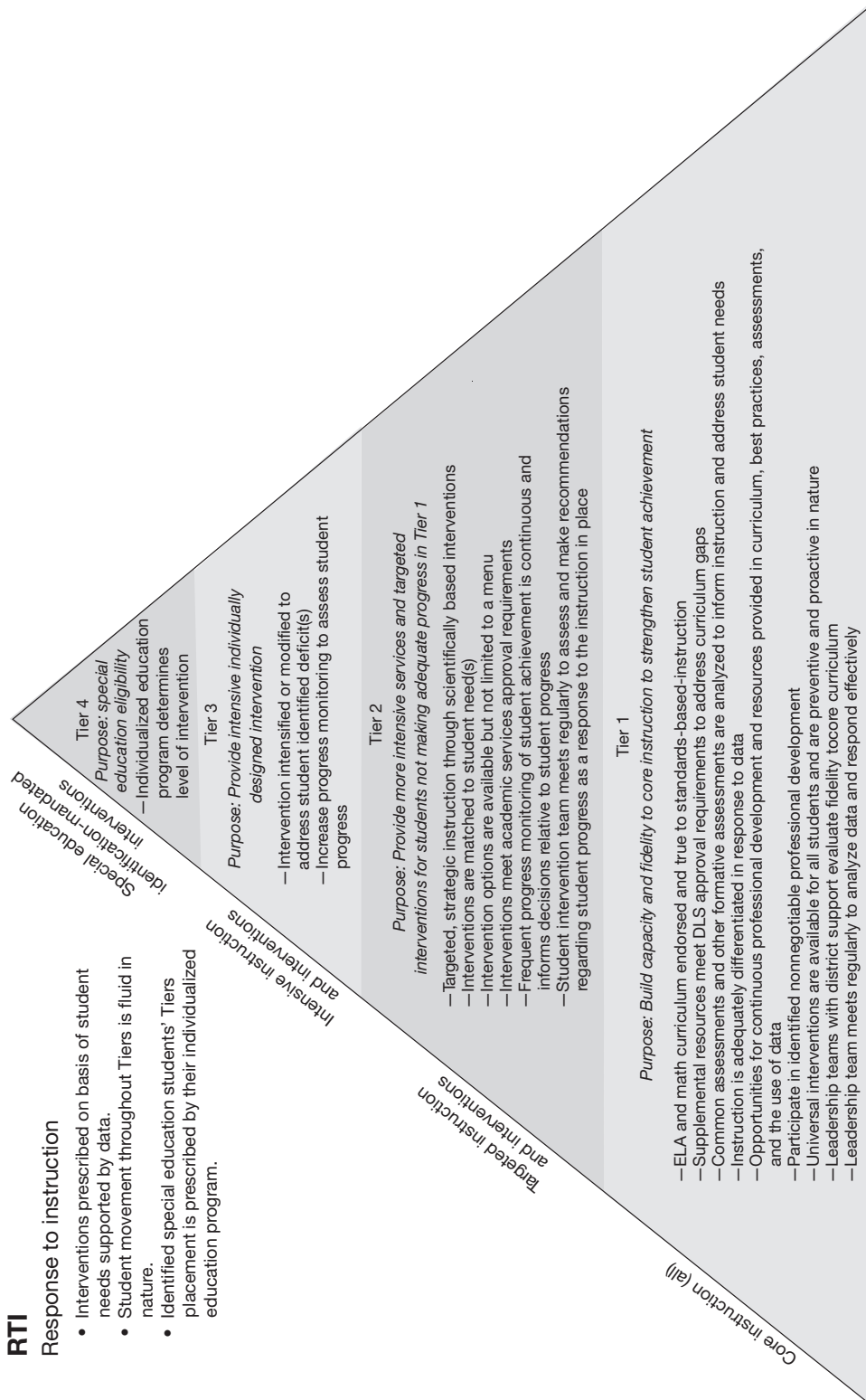


Figure 1.2. Berkeley County School District's four-tiered response to intervention model. (From Berkeley County School District [http://www.berkeley.k12.sc.us]; reprinted by permission.)

Therefore, educators operating within an RTI model must make decisions regarding what content to teach when students struggle (Gersten et al., 2009).

The National Mathematics Advisory Panel (NMAP, 2008) recommended that an effective mathematics program should adequately develop the following subcontent areas of mathematics: 1) conceptual understanding, 2) computational fluency, 3) factual knowledge, and 4) problem-solving skills. Any program that addresses each of these areas is likely to result in fewer students requiring additional tiers of instruction. To achieve proficiency when problem solving, students demonstrate a mastery of the following competencies: 1) understand key concepts, 2) achieve automaticity in addition and subtraction facts, and 3) develop flexible, accurate, and automatic execution of the standard algorithms (NMAP, 2008). Students must have a working knowledge of concepts, procedures, facts, and problem solving (see NMAP, 2008; Riccomini & Witzel, 2010; Siegler et al., 2010).

Essentially, math proficiency is not an either-or scenario; rather, it is the combination and interaction of mathematical knowledge that facilitates mathematical proficiency. Thus, the importance of selecting a core mathematics program that addresses and promotes student learning in each of these areas is imperative.

Instructional Approach

Much debate regarding how to teach mathematics to children has taken place over the past century; it is often contentious and frequently results in confusion on behalf of the teachers. This debate regularly revolves around how much instruction and guidance students should be provided. Either the instruction is *student centered* or *teacher directed*. The two approaches differ in when and how much instruction and guidance students are given during the learning of mathematical topics. Although both approaches can differ significantly, they both share the same goal: effective student learning.

Within any RTI model, it is imperative that the instructional approaches applied have a solid research base for support. The NMAP (2008) report attempted to address this ongoing debate by reviewing all available high-quality research on effective instructional approaches for mathematics for students performing well below average. The recommendation put forth by the NMAP is that all students should be exposed to a balance of student-centered and teacher-directed approaches. Furthermore, the panel clearly states that use of either approach exclusively is not supported in the research. The NMAP (2008) recommends that students who are low achieving, at risk for mathematical difficulties, and/or have disabilities should receive access to explicit methods of instruction on a regular basis. As students (with and without a documented disability) who are struggling with the material move through the tiers of an RTI model, instruction should become more systematic and explicit. Therefore, students moving into Tier 2 should receive more systematic and explicit instructional opportunities than they received in Tier 1. The degree of explicitness should vary depending on content and student learning characteristics. This concept of

Table 1.1. Research recommendations on effective mathematics instruction and interventions for struggling students

Themes from RTI math research ^a	NMAP (2008) recommendations	RTI in mathematics IES practice guide ^b
Increase instructional time	Explicit instructional methods	Screen and provide interventions
Small group	Development foundation needed for algebra	Focus on whole numbers
Explicit instruction	Focus on conceptual development with use of concrete models	Explicit and systematic instruction
Use of concrete representations	Development of fluency with operations and computation skills as well teaching a problem-solving strategy	Instruction on solving word problems that focus on underlying structure
Strategy instruction for problem solving		Use of pictorial representations
Focus on computation		At least 10 minutes of computational fluency practice
Alignment with Tier 1		Progress monitoring
Progress monitoring		Motivational strategies

Key: RTI, response to intervention; NMAP, National Mathematics Advisory Panel; IES, Institute of Education Sciences.

^aRiccomini, P.J., & Witzel, B.S. (2010). *Response to intervention in math*. Thousand Oaks, CA: Corwin Press.

^bGersten, R., Beckmann, S., Clarke, B., Foegen, A., Marsh, L., Star, J. R., et al. (2009). *Assisting students struggling with mathematics: Response to Intervention (RtI) for elementary and middle schools* (NCEE 2009-4060). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://ies.ed.gov/ncee/wwc/publications/>

providing explicit instruction to students who struggle or have learning disabilities is thoroughly supported by current research (see Gersten et al., 2009; Jayanthi, Gersten, & Baker, 2008; Newman-Gonchar, Clarke, & Gersten, 2009; NMAP, 2008; Riccomini & Witzel, 2010).

Explicit instruction generally involves teachers providing students with clear explanations and multiple demonstrations of specific and inconspicuous strategies for the targeted mathematics content. In addition, students are provided numerous opportunities for questions as well as time to contemplate the process of problem solving (NMAP, 2008). The key elements of explicit instruction generally include teacher modeling followed by guided and independent practice opportunities using carefully developed and sequenced examples. Furthermore, teacher corrective feedback occurs routinely during all aspects of the instructional episode as needed, and maintenance and generalization opportunities are numerous (see Table 1.1).

Reliance on Evidence-Based Instruction

The RTI process requires educators to use effective instructional programs. If students are not making adequate progress, instructional changes are considered. These instructional changes can include many different approaches and strategies. Until recently, these approaches were based on educators' experiences and current fads. Now, the No Child Left Behind Act of 2001 (107-110) and IDEA 2004 require that evidence-based strategies be used in all academic interventions. This is a problem given the paucity of research on the topic.

It is crucial for school districts to be mindful of the fact that the implementation of evidence-based approaches by teachers is imperative for the success of any RTI model. If the best-available research findings are not used to guide the instructional approaches used within the RTI process, far too many students will require Tier 2 and Tier 3 instructional supports. It is important to keep in mind that RTI is not a teaching *strategy*, but a model of *how* evidence-based educational practices should be utilized in the classroom to facilitate instruction.

Decision Making

Educational decisions are a major part of the RTI process and can serve several purposes. In the RTI classroom vignette presented at the beginning of this chapter, four educational decisions were made. First, students were identified (based on a universal screening assessment) to receive additional targeted instructional assistance. Second, the effectiveness of the intervention was determined on the basis of the progress monitoring data. Third, decisions were made as to which students return to or advance through the instructional tiers. Finally, the RTI team concluded that a decision of eligibility for special education services was warranted.

Because the RTI process is based on the collection of scientific data, school districts are afforded the opportunity to make decisions pertaining to additional educational procedures, including

- Effectiveness of instructional program curriculum and instruction
- Effectiveness of interventions
- Determination of when an intervention is required
- Progress toward end-of-year learning goals
- Eligibility for special education

Regardless of the number of steps in the RTI process, educational decisions (periodically required throughout the implementation phase) are an integral part of the model. Ultimately, the success of RTI relies upon the effectiveness of the decision-making process by the RTI team.

ESSENTIAL ROLES IN RTI PROCESSES IN MATH

The importance of active participation of classroom teachers in an effective RTI process cannot be overstated. The importance of carefully aligning Tiers 1 and 2 to supplement each other is well documented (Fuchs, Fuchs, & Hollenbeck, 2007; Newman-Gonchar et al., 2009; Vaughn, 2003). Careful alignment of Tier 1 and Tier 2 is likely only if classroom teachers are involved in the process from the beginning. In addition, as described previously, the RTI process is founded on assessment, instruction, and decision making—all of which occur in the first instructional tier in the general education classroom.

The classroom teacher should be involved with 1) all of the facets of the universal screening measures and 2) the progress monitoring of each student identified as at risk for academic failure. Assessment results are used by the

classroom teacher to identify students in need of additional instructional supports. It is the combination of progress monitoring and instructional strategies delivered by the general education classroom teachers that allows for early and appropriate decision making regarding the implementation of additional interventions. A fundamental premise of RTI is that additional instruction is provided early and quickly when students struggle. Often, this is done in consultation with school psychologists, RTI coordinators, interventionists, math coaches, or special education teachers.

School psychologists have specialized training and knowledge of assessment administration, data collection, and analysis. Often, school psychologists are asked to provide support in collecting and interpreting data results in the decisions to move students through the tiers, and in some cases, assist in the selection of interventions.

Interventionists are teachers or paraprofessionals whose primary responsibility is to deliver specific intervention programs that are not delivered within the general education classroom. These interventions often 1) require specialized training, 2) involve small groups of students, and 3) require specific time allotments beyond that of the core instruction. Interventionists, school psychologists, and special education teachers work closely in the decision-making process for students who do not exhibit adequate academic progress.

A relatively new role in the RTI process is that of the math coach or RTI coordinator. The responsibilities of these professionals vary widely but generally include managing data, providing classroom teachers with instructional support, and making recommendations for students who are struggling according to progress monitoring data. In addition, coaches and coordinators are often in a position to offer insight into the professional development needs, as well as other types of needed support, for members of the RTI team.

Because of their expertise in identifying effective instructional practices for students who are struggling with the curriculum, special educators also serve a vital role on the RTI team. As illustrated in the RTI classroom scenario, special education teachers are involved with many aspects of the RTI model. They have specialized training in data collection, analysis, and interventions for struggling students and often collaborate with classroom teachers to help provide specialized instruction for struggling students as well as students with disabilities included in Tier 1. The role of the special educator will likely, but not always, include *supplementing* the core program, or delivering an additional mathematics program.

The success of RTI hinges on the involvement of professionals in the educational system working together as a team. Once the classroom teacher provides a student with the necessary additional instructional supports and no meaningful progress is documented, efforts are then focused on instructional supports at Tiers 2 and 3. Regardless of the tier level, collaboration between the classroom teacher and the rest of the RTI team is essential for successful implementation of the RTI process.

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