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Response to Intervention

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With the passage of the Individuals with Disabilities Education Improvement Act (IDEA), the federal government officially allowed students to be classified as learning disabled based on documentation of how well they respond to interventions—a procedure commonly referred to as RTI (Bradley, Danielson, & Doolittle, 2005; Fuchs & Fuchs, 2005; Gersten & Dimino, 2006; Marston, 2005; Mastropieri & Scruggs, 2005; Scruggs & Mastropieri, 2002). IDEA 2004 specifies that, for the purpose of determining learning disability (LD) eligibility, a school district may implement a procedure that involves documentation of how a child responds to scientific, research-based interventions as part of its evaluation procedures.

Although the earliest research on the RTI process began in the 1960s, it has only been in the past decade or so that the process has gained significant momentum among researchers and practitioners as a plausible means of identifying learning and/or reading disabilities. Even so, the process in general terms has been untested for use in determining eligibility, or deciding how students are identified for learning disability services. With that stated, ample evidence exists for use of RTI as a progress-monitoring tool for students with or without disabilities (Fuchs & Fuchs, 2005, 2006; Marston, Muyskens, Lau, & Canter, 2003; Vaughn, Linan-Thompson, & Hickman, 2003; Vellutino et al., 1996).

VALID IDENTIFICATION OF LEARNING DISABILITIES

The exploration of RTI as an approach to LD eligibility determination resulted from the general dissatisfaction with the previous approaches for documentation of a learning disability. In particular, many in the field

have expressed dissatisfaction with the discrepancy procedure that documents a disability by demonstrating a large difference between a child's cognitive level (using IQ scores) and his or her achievement. Since the late 1990s, many policymakers have indicated that the discrepancy procedure results in over-identification of students with learning disabilities, and thus, that the procedure seemed to be somewhat inexact in documenting exactly who manifested a learning disability and who did not.

Reflection 1.1 Your Experience With Discrepancies

As an educator, you may have had experiences in documenting a discrepancy for a child suspected of having a learning disability that was less than positive. Have you ever experienced a situation where you were sure, based on reversal errors (e.g., a child reverses letters or words), oral reading errors, or spelling problems, that a child exhibited a learning disability, but the discrepancy was not quite "large enough" to have that student qualified as disabled? What other difficulties have you experienced with implementation of the discrepancy criteria?

The construct for LD was controversial when first included in the Federal Education of the Handicapped Act in 1975, and the controversy continued through the passage of the Individuals with Disabilities Education Act of 1997. Much of the debate stemmed from the use of discrepancies between IQ and achievement as the definitive factor in the definition of Specific Learning Disability (Reschly, Hosp, & Schmied, 2003).

Prior to IDEA of 2004, Specific Learning Disability was defined as:

A disorder in one of more of the basic psychological process involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.

The term does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage. (U.S. Office of Education, 1977)

In short, the seven areas of Specific Learning Disabilities are listening, thinking, speaking, reading, writing, spelling, and doing mathematical calculations. In addition to delineating these aspects of a learning disability,

the law also outlined classification criteria, or rules, which would be used to determine LD eligibility. These criteria did not include low achievement and severe discrepancy, but the criteria did mention basic psychological processes, which is the foundation of Specific Learning Disability. Thus, this definition placed the major emphasis on the severe discrepancy between IQ and achievement, but neither criterion was specifically stated in the definition. In a report submitted to the U.S. Department of Education, Office of Special Education Programs, Reschly, Hosp, and Schmied (2003) identified this inconsistency as a major flaw in the LD construct. They noted that “as definitions and classification criteria have less consistency, increasing problems emerge about meaning and eligibility” (p. 3).

Research has revealed that the severe discrepancy formula as a definition for LD has poor reliability and validity when predicting student achievement (Fletcher, Denton, & Francis, 2005; Siegel, 1989; Vellutino, Scanlon, Small, & Fanuele, 2006; Ysseldyke, 2005). The model is often called a “wait to fail” approach because it is difficult to apply until students are in third grade or beyond (Reschly et al., 2003), because students must be exposed to some level of curricular content in order to have a valid measure of their achievement and calculate a discrepancy between IQ and achievement. Further, over-identification of students with learning disability has increased the overall costs of special education (Fuchs & Fuchs, 2006). When special education was first identified as a national priority, estimates of the prevalence of learning disabilities indicated that perhaps 2% of students in public schools would be classified as learning disabled. Today, well in excess of 5% of students in public schools are so classified, and that number seems to increase each year. According to a 2003 national survey, prevalence varies widely throughout the states, ranging from a low of 2.96% in Kentucky to a high of 9.46% in Rhode Island (Reschly et al., 2003). The discrepancy across states seems to be attributable to another problem with the definition, which is a lack of uniformity between state eligibility criteria. The results of the aforementioned survey revealed state-to-state differences in the requirements for IQ, psychological process disorders, achievement domains, exclusion criteria, and methods for determining discrepancy. Based on these discrepancies, a child receiving specialized services in one state may be deemed ineligible for services if they move across the state line.

Other problems with the LD definition have been noted as well. For example, children may be diagnosed as disabled in reading based on evaluation instruments that have poor validity. Further, evaluation and application of diagnostic criteria in the LD definition provide no guidance for instruction. In addition, the severe discrepancy model does not distinguish

between reading deficits caused by poor instruction versus reading deficits caused by biologically based deficits (Vellutino et al., 2006).

Clearly, the need for clarification and revision of the definition and eligibility procedures for documenting learning disabilities is apparent. Through the discussion and debates of expert researchers and educators, response to intervention has risen to the top of the myriad of options for determining LD eligibility. However, many practitioners have not had direct experience with RTI because this option for eligibility is so recent. Further, few states have devised methods for implementation of this option, as the new federal regulations went into effect in August 2006.

WHY DID RTI EVOLVE?

In 1982, a National Research Council Study (Heller, Holtzman, & Messick, 1982) outlined three criteria on which special education classification should be based. The first criterion involves determining if the quality of instruction received in the general education environment is sufficient for adequate learning. The second criterion examines whether the special education program is appropriate and of value in improving student outcomes. Finally, the third criterion is that the evaluation process must be valid and meaningful. When all three criteria are achieved, special education placement is considered valid (Vaughn & Fuchs, 2003).

The study by Heller and colleagues (1982) began the momentum for use of responsiveness to instruction in eligibility determinations. This process had been used in two earlier studies (Bergan, 1977; Deno & Mirkin, 1977) that involved similar methodologies; one explored behavioral issues and the other focused on academics. In these studies, a definition of the problem was clearly established and measurable goals were developed based on the student's functioning level. An intervention plan was developed utilizing research-based interventions. Progress was monitored through curriculum-based assessment tools. Finally, decisions regarding continuation or dismissal of interventions were based on achievement of goals and benchmarks.

Over the next two decades, RTI would be heavily debated and researched. Numerous organizations, discussion panels, roundtables, and summits were convened to bring together experts from the field to make recommendations for policy changes (see Table 1.1). In 2001, President George W. Bush established the Commission on Excellence in Special Education (2002) to study special education issues and make recommendations

Table 1.1 Research and Policy Reports Supporting Response to Intervention

<i>Reporting Organization</i>	<i>Date Published</i>	<i>Content of Report</i>
National Institute for Child Health and Development (NIHCD) Studies	Ongoing	Concluded that IQ achievement discrepancy delays services to children. Supports early intervention services as provided through RTI.
National Reading Panel	2000	Outlined major components of reading.
National Research Council Panel on Minority Overrepresentation	2002	Emphasized importance of early identification and intervention for poor and minority children and youth. Made recommendations for LD eligibility criteria.
National Summit on Learning Disabilities	2001	Recommended Response to Intervention as the “most promising” method of LD identification.
President’s Commission on Excellence in Special Education	2001	Recommended a focus on results and prevention in LD eligibility determination.

SOURCE: Batsche et al. (2006), Fuchs et al. (2005).

concerning how services might be improved. That commission issued a report that recommended early intervention and assessment practices that were closely linked to instruction. In summation, the commission strongly suggested changing LD eligibility criteria from a discrepancy model to a response to intervention model, which documents how a student suspected of having a learning disability responds to appropriate instruction. This RTI model is described in detail in the following section.

In 2002, the National Research Center on Learning Disabilities issued the *Common Ground Report*, which identified fourteen recommendations regarding identification, eligibility, and intervention for learning disabilities. The report was the product of leaders from eight national organizations coming together to form a consensus on their philosophies regarding LD. Marston (2005) compared the consensus statements to three sound RTI projects in order to determine if the RTI process fulfilled the requirements outlined in the *Common Ground Report*. He determined that RTI positively corresponded to each of the statements, making the process a viable option for LD determination. The consensus statements are listed in Table 1.2.

Table 1.2 Consensus Statements From the *Common Ground Report* of the National Research Center on Learning Disabilities (2002)

- Identification should include a student-centered, comprehensive evaluation and problem-solving approach that ensures students who have a specific learning disability are efficiently identified.
- The field should continue to advocate for the use of scientifically based practices. However, in areas where an adequate research base does not exist, data should be gathered on the success of promising practices.
- Regular education must assume active responsibility for delivery of high-quality instruction, research-based interventions, and prompt identification of individuals at risk while collaborating with special education and related services personnel.
- Schools and educators must have access to information about scientifically based practices and promising practices that have been validated in the settings where they are to be implemented.
- The ability-achievement discrepancy formula should not be used for determining eligibility.
- Students with specific learning disabilities require intensive, iterative (recursive), explicit scientifically based instruction that is monitored on an ongoing basis to achieve academic success.
- Students with specific learning disabilities require a continuum of intervention options through regular and special education across all grades and ages.
- Decisions on eligibility must be made through an interdisciplinary team, using informed clinical judgment, directed by relevant data, and based on student needs and strengths.
- Interventions must be timely and matched to the specific learning and behavioral needs of the student.
- An intervention is most effective when it is implemented consistently, with fidelity to its design, and at a sufficient level of intensity and duration.
- Based on an individualized evaluation and continuous progress monitoring, a student who has been identified as having a specific learning disability may need different levels of special education and related services under IDEA at various times during the school experience.

Reflection 1.2 Who Determines Policy on LD Definition?

As described previously, several national study groups have determined that RTI is an effective way to identify students with a learning disability. Both the Commission on Excellence in Education and the National Research Center on Learning Disabilities have weighed in and supported the RTI concept. However, this begs the question of who determines policy on LD definitions. One frequently overlooked fact is that each individual state, via rules and regulations from the state department of education, effectively sets the LD definition and the procedures whereby eligibility determinations may be made. Thus, one critical question for practitioners is: Has your state department of education begun the process of adjusting their rules, regulations, and procedures to accommodate the new rules and regulations that became effective in August 2006? The website for those federal rules and regulations is: www.ed.gov/idea.

WHAT IS RTI?

Response to Intervention is, simply put, a process of implementing high-quality, scientifically validated instructional practices based on learner needs, monitoring student progress, and adjusting instruction based on the student's response. When a student's response is dramatically inferior to that of his peers, the student may be determined to have a learning disability (Fuchs, 2003). The assumption is that failure to respond to otherwise effective instruction indicates the possible presence of a disabling condition. Interventions are most often divided into tiers of instruction. Although the RTI model seems relatively simple and straightforward, the actual implementation of the process requires much consideration and planning of the specific intricacies to make it valid, reliable, and feasible.

The two studies that formed the early research support for RTI (Bergan, 1977; Deno & Mirkin, 1977) were discussed previously. These studies varied in their RTI procedures; those variations have evolved into the problem-solving RTI model and the standard protocol RTI approach. It is important to understand both approaches in order to determine the most effective means of implementation.

In his research, Bergan (1977) utilized a problem-solving approach to address behavioral issues among students in special education. In this process, the behavioral problem was first defined and then measured as accurately as possible. The student's functioning and performance gap in comparison to peers was then established. The intervention team applied a problem-solving process to interpret the data and establish a goal for the student based on the performance of his or her peers. Next, the team designed an intervention plan based on scientifically validated practices for behavior change. Interventions designed specifically for that student were implemented over a period of time and progress was monitored frequently. Data collected from the ongoing progress monitoring was then evaluated and results were, again, compared to peer performance. Finally, the team used the data to make programming decisions for the student (Batsche, et al., 2006). Thus, the team-based "problem-solving approach" evolved based on this general design.

Deno and Mirkin (1977) implemented a different approach in their research. They utilized curriculum-based measurement, a technique that has been proven as an effective method for assessing a pupil's academic progress over time. They then developed an intervention plan to remediate certain reading difficulties among students with learning disabilities. In the growing RTI literature, this method became known as the "standard treatment protocol."

Although there are numerous similarities between the approaches used in these studies, there are some very important differences. Deno and

Mirkin utilized curriculum-based measures to establish benchmarks for student achievement. In this model, each student was essentially compared to his or her own prior performance. This is different from Bergan's problem-solving approach, which compares a pupil's performance to his or her peers. Further, the curriculum-based measures in the standard protocol approach were administered quite often, allowing for a constant adjustment of instruction based on student response. The team determined whether to discontinue, continue, adjust, or intensify instruction based on the student's responsiveness to the adjusted instruction (Kukic, Tilly, & Michelson, 2006).

Reflection 1.3 Your Use of Curriculum-Based Measurement

As you can tell from these initial studies on RTI, the standard treatment protocol is more heavily dependent on curriculum-based measurement than the problem-solving approach, although both incorporate curriculum-based measurement. What is your previous experience with curriculum-based measurement on a weekly, biweekly, or daily basis? Are you currently using such a progress-monitoring tool to follow students' academic growth in your class, or will you need to learn new skills in order to implement curriculum-based measurement?

Thus, from these original studies, two distinct RTI models emerged; the problem-solving model and the standard protocol model. Although the models exhibit similar structure, the processes involved in developing and evaluating the impact or efficacy of the educational interventions are quite different. In essence, the problem-solving approach involves the implementation of interventions designed for individual student needs. The standard protocol approach relies on interventions designed for small groups of students experiencing the same academic problem (e.g., reading comprehension). Both approaches require research-based interventions, ongoing progress monitoring, and measures to assure fidelity and integrity of the intervention and assessment (National Research Center on Learning Disabilities, 2005). In the remainder of this chapter, we will explore examples of each model, noting strengths and weaknesses for both.

THE PROBLEM-SOLVING APPROACH TO RTI

As previously stated, the problem-solving model involves individualized decision making and intervention implementation for each student. Problem-solving teams at the school or system level evaluate student data and make decisions about the need for interventions, the interventions to

be used, and the amount of time allotted for each intervention (McCook, 2006). The problem-solving model has been replicated and refined in several school systems, including Minneapolis Public Schools and the Heartland Area Educational Agency in Iowa.

The Minneapolis Public Schools began formal implementation of the problem-solving model in 1992 (Marston, Muyskens, Lau, & Canter, 2003). Their problem-solving model is a sequential pattern of steps divided into three tiers or stages. They are:

Stage 1. Classroom Interventions: This stage is implemented by classroom teachers in general education classrooms. Teachers identify students who are experiencing difficulties, implement instructional strategies or modifications based on individual student needs, and begin to monitor the student's progress. Teachers gather information regarding strengths and specific weaknesses, previous strategies attempted and outcomes, any available screening data, student health, and other information from parents. If the teacher determines the intervention is not successful, the student is referred to Stage 2.

Stage 2. Problem-Solving Team Interventions: Student information is reviewed by a multidisciplinary team, which may include school psychologists, general education and special education teachers, reading specialists, and school administrators. The team considers whether other risk factors (language, poverty, cultural factors) are attributing to or causing the student's lack of progress. Interventions are reviewed and adjusted to more specifically address student needs. Teachers continue to monitor progress and adjust instruction. If teachers determine the student is not sufficiently responding to instruction, the student is referred to Stage 3.

Stage 3. Special Education Referral and Initiation of Due Process Procedures: The school district obtains parental consent and begins evaluation procedures for the student. The evaluation consists of a review of all information available on the student from Stages 1 and 2, including data on the student's response to interventions, direct observation, and the formulation of a means of obtaining cognitive, achievement, and adaptive behavior functioning. The team utilizes all available information to determine eligibility while considering the possible impact of risk factors such as culture, language, and socioeconomic status (Marston et al., 2003).

In 2002, the Minneapolis School District (approximately one hundred total schools) had implemented the problem-solving model in all K–8 schools and was in the training phase for all secondary schools. Outcome data revealed that the prevalence of students with high-incidence

disabilities remained constant (7%) before and after implementation. Further, the achievement level of these students on the Minnesota Basic Standards Tests and the Minnesota State Special Education Goals was similar to that of students placed in special education using more traditional methods. Finally, the number of students referred to Stage 3 and placed in special education did not increase (Marston et al., 2003), nor was any decrease in placement noted. Instead, the placement rate remained stable at approximately 7% for the areas of LD and mild mental impairment.

A second example of the problem-solving model was implemented by the Heartland Area Educational Agency. That agency serves approximately 24% of students in the Iowa Public Schools. In 1990, the agency began implementation of a four-tiered problem-solving model. The transition to the problem-solving model involved a shift from traditional special education and general education resources to a seamless model of resource allocation. Similar to the Minnesota Public Schools problem-solving model, Heartland's model involved instruction and assessment at an individual student level (Tilley, 2003).

Tilley (2003) identified several "operational challenges" involved with the four-tiered, individually based system. These challenges included the fact that it is often not feasible to work with student problems at an individual level on a large scale. The resources required make the instructional process somewhat inefficient, especially when working with mild educational problems among large numbers of students. In the past three years, Heartland has shifted to a three-tiered model using the following tiers:

Tier One: Core Instructional Curriculum (all students involved)

Tier Two: Core Instruction and Supplemental Instructional Resources (students who need additional assistance—group or individual assistance)

Tier Three: Core Instructional and Intensive Resources (students who need intensive interventions and specialized resources on an individual basis)

Heartland defines their problem-solving model as "a process that includes an objective definition of student behavior problems or academic difficulties, systematic analysis of the student's problem and implementation of a planned systematic set of interventions" (Grimes & Kurns, 2003). Heartland incorporated "science into practice" by applying the scientific method in the decision-making process (Tilley, 2003). This process was applied at each intervention tier, utilizing four components (see following box).

Define the problem: What is the problem? Why is it happening?

The team looks at the gap between expected and actual student behavior or performance. Appropriate assessment and data analysis are used to distinguish specific problems and to attempt to rule out inappropriate instruction as the cause for this gap.

Develop a plan: What is going to be done about the problem?

Interventions are formulated based on student weaknesses and needs. Research-based strategies are key elements of the plan.

Implement the plan: Is the plan being implemented as intended?

The intervention is implemented as designed. Ongoing progress monitoring is used to evaluate intervention effectiveness.

Evaluate: Did the plan work as intended?

Data gathered throughout the implementation period are evaluated to determine the next course of action (Grimes & Kurns, 2003).

The multidisciplinary team utilizes this ongoing process to make appropriate decisions regarding instructional programming. Intensive support is provided through the Heartland Agency to each school involved in the project. This support most frequently takes the form of additional personnel such as school psychologists, educational consultants, social workers, and/or speech-language pathologists. Students who progress through each tier without making acceptable progress are considered for possible special education eligibility and placement (Jankowski, 2003).

Another important aspect of Heartland's model is teacher training. Teachers in all participating schools receive intensive training in research-based strategies and assessment. In addition, Heartland provides training on problem solving, team building, data collection, and data interpretation. Ongoing training and support have proven to be essential components of the model (Grimes & Kurns, 2003).

The Heartland Agency reports a significant reduction in special education placement rates among kindergarten through third graders. After implementation of the Heartland Early Literacy Project in coordination with the problem-solving model, thirty-nine participating schools reported the following results for the years 1999–2004 (Tilley, 2003):

- Forty-one percent reduction in special education initial placements in kindergarten
- Thirty-four percent reduction in special education initial placements in first grade

- Twenty-five percent reduction in special education initial placements in second grade
- Nineteen percent reduction in special education initial placements in third grade

As you might note, the reduction percentage of students eligible for special education did decline. However, we should note that in the Heartland Agency example, that reduction percentage was noted among students referred for all categories of special education, not merely learning disabilities.

THE STANDARD PROTOCOL RTI MODEL

The standard protocol model utilizes a set of standard research-based interventions usually implemented in two, three, or four tiers or levels. In contrast to the problem-solving model, the interventions occur in a natural progression from tier to tier, and are similar for all students experiencing the same learning problems rather than being specially designed for each individual student. There is a large body of research using standard protocol. In this section, we will explore several studies performed by leading researchers in the RTI field.

McMaster, Fuchs, Fuchs, and Compton (2003) implemented a standard protocol RTI to identify reading problems in eight metropolitan Nashville schools. Students in first-grade classrooms were taught reading using a standard curriculum and the usual reading materials. Students were then assessed using a "Rapid Letter Naming" test. The eight lowest performing students in each classroom were placed in groups where they were instructed with one of two research-based strategies. These two strategies were Peer-Assisted Learning Strategies (PALS), or "PALS + Fluency." First-grade PALS reading (Fuchs et al., 2001) is a peer-assisted instructional process whereby students tutor each other in a reciprocal fashion for some brief period each day. Developed by researchers at Vanderbilt University, PALS focuses on phonological awareness, beginning decoding, word recognition, and fluency. "PALS + Fluency" has an added focus on reading fluency and comprehension (McMaster et al., 2003, p. 9).

In this study, students received ongoing progress monitoring using nonword fluency probes from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2001) and Dolch word probes. After seven weeks of instruction, students were classified as nonresponders if they scored 0.5 standard deviation below average readers on several criteria. Nonresponders were then placed in smaller groups where they received more intensive PALS, modified PALS, or tutoring for a period of thirteen weeks. Modified PALS places three modifications on the PALS

design: fewer sounds and words are introduced at once and students work at their functioning level, the student serving as the “coach” models the sounds and words, and phonological awareness and decoding skills are emphasized more (McMaster et al., 2003, p. 9). In the PALS and modified PALS groups, interventions were provided by peers, as the program design dictates. In the tutoring groups, intervention was provided by a trained adult. Again, progress was monitored for each student biweekly. The study explored issues such as appropriate identification criteria and effective instructional strategies.

One of the most comprehensive studies of the standard treatment protocol for RTI was conducted by Vellutino et al. (2006) in suburban and rural schools in New York. This five-year longitudinal study explored the impact of kindergarten and first-grade interventions for children identified as at risk for reading disabilities. The initial sample of 1,373 children was assessed on letter-name knowledge at the beginning of kindergarten. Results of those assessments indicated that approximately 30% of the children were at risk for reading difficulties. Those at-risk students were then divided equally into treatment and control groups. The treatment group members were provided with a small-group (two or three children) early literacy intervention program throughout their kindergarten year. The intervention was provided by a certified teacher who had been trained on that curriculum by project staff. Students were pulled from the general education classroom for two thirty-minute sessions each week. Progress was monitored three times during the school year (December, March, and June). Initial results indicated a significant improvement in reading ability for the treatment group.

During the following year, researchers reassessed all students who had been members of the kindergarten treatment and control groups. Based on this assessment, 50% of the treatment group participants qualified as poor readers whereas 60% of the control group members were considered to be poor readers. All students identified as poor readers in first grade were either given individual tutoring by project teachers or the remediation normally provided by the school in the first-grade classroom. Progress was monitored for all students through the completion of their third-grade year. Results of the study revealed that of the students receiving kindergarten-only interventions or both kindergarten and first-grade interventions, 84% performed in the average range on reading measures by the end of third grade. This is a dramatic turnaround among these poor readers. Perhaps the most important finding of this study is the impact of early intervention for preventing reading disabilities.

Both of these studies involved identification of reading problems in children in third grade or younger. However, the standard treatment protocol model for RTI has also been used to prevent and identify mathematics

disabilities. Fuchs et al., (2005) assessed the mathematics performance of children in forty-one first-grade classrooms (ten schools) using weekly curriculum-based measurement. The assessment tool consisted of twenty-five items related to math skills taught in the first-grade curriculum. Curriculum-based measurement scores were taken frequently and averaged across three to five weeks; based on those average scores, children who averaged less than eleven correct math problems were considered to be at risk for a mathematics disability.

These students were then placed into groups of two or three where they received tutoring and computer practice for a total of forty minutes, three times each week. An educational intervention involving tutoring based on the concrete-representational-abstract method for math instruction (Butler, Miller, Crehan, Babbitt, & Pierce, 2003; Cass, Cates, Smith, & Jackson, 2003; Mercer, Jordan, & Miller, 1996) was implemented until every member of the group achieved mastery or until every lesson on the topic had been taught. The method involves using manipulatives to provide for concept understanding. Seventeen topics were covered in up to sixty-six sessions (depending on mastery). Curriculum-based measures continued to be implemented throughout the study. The findings revealed improved performance on computation, concepts and applications, and completion of story problems. In these areas, at-risk students who received intervention outperformed students who received no intervention. Researchers also found that the growth of the at-risk tutored students was, on some measures, equal to or greater than students who were not considered to be at risk. Most important, the study revealed that early intervention in this case reduced the prevalence of math disability by an average of 35%.

In another study involving math performance, Fuchs et al. (2006) explored the effects of a curriculum called "Hot Math" (Fuchs, Fuchs, Prentice, Burch, & Paulsen, 2002) among third-grade students. Tier One involved Hot Math whole-class instruction in forty general education classrooms located in thirteen schools. Instruction was implemented two or three times each week for sixteen weeks, with each session lasting twenty-five to forty minutes. Students who scored lowest after this intervention were assigned to Tier Two Hot Math tutoring. This intervention occurred three times each week in twenty- to thirty-minute sessions for thirteen weeks. Groups composed of two to four students received this instruction together; a student was considered to be unresponsive to instruction if his or her daily performance was one standard deviation below the performance levels of the norm scores in the assessment. Thus, in this study, a student's performance was based on multiple measures and varied depending on how many tiers students participated in. Overall, the study revealed vast improvement on all measures for the

Table 1.3 Strengths and Weaknesses of Problem-Solving and Standard Protocol RTIs

<i>Model</i>	<i>Strengths</i>	<i>Weaknesses</i>
Problem-Solving Model	<ul style="list-style-type: none"> • Decisions based on individual student needs • Allows more flexibility in choices of interventions and allocation of resources 	<ul style="list-style-type: none"> • Dealing with learner problems at an individual level can become time consuming • Requires teachers and team members to have vast knowledge and expertise in research-based strategies
Standard Protocol Model	<ul style="list-style-type: none"> • Clear scientific process in literature for strategies and assessment • Standard interventions in place and readily available to students in need • Structured progression between tiers 	<ul style="list-style-type: none"> • Less flexibility with choice of interventions (one size doesn't fit all) • May require additional staff, depending on available resources

majority of students receiving any level of intervention. Unresponsiveness in problem solving for students receiving only traditional math instruction was an alarming 86%–100%. Unresponsiveness for students receiving both tiers of intervention was 12%–26%. This study illustrated that the RTI model had a substantial impact on reducing the number of children at risk for math disability in third grade.

FINAL THOUGHTS

With the release of final IDEA regulations in August 2006, it is expected that many, if not all, states will incorporate some form of RTI into their policies and procedures. However, those regulations do not propose or recommend any specific RTI model. In fact, those regulations do not require implementation of any RTI procedure at all. Rather, those regulations allow RTI as an eligibility procedure for documentation of learning disabilities. The relevant section of those regulations is presented in the following box (see www.ed.gov/idea and look under “Changes in Initial Evaluation or Reevaluation”). According to that source, the IDEA legislation of 2004 includes the following provision.

Establishes procedures for evaluating a child suspected of having a specific learning disability.

Notwithstanding Section 607(b), when determining whether a child has a specific learning disability as defined in Section 602:

An LEA shall not be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability in oral expression, listening comprehension, written expression, basic reading skill, reading comprehension, mathematical calculation, or mathematical reasoning.

An LEA may use a process that determines if the child responds to scientific, research-based intervention as a part of the evaluation procedures.

(614(b)(6))

As you can see, this provision eliminates the requirement for a discrepancy calculation, but it does not explicitly prohibit the use of discrepancies. Further, this provision gives no guidance on which type of RTI—standard treatment protocol or problem-solving model—should be implemented.

Although the research base on RTI is broad in some areas, such as reading instruction and interventions for young children, there are many unanswered questions about implementation of RTI. Educators are left with the dilemma of working out the specifics for efficient, cost-effective implementation while providing the desired benefit of early intervention and appropriate disability identification. The remainder of this book will address these issues and provide guidance for effective implementation.

For planning purposes, it may be beneficial for a school or school district to examine current instructional procedures. Appendix A presents a “Needs Assessment” that focuses on many aspects of RTI that are discussed in subsequent chapters. This form may be used as is or adapted as school district personnel deem necessary to assist in your planning as you move into RTI.