How often do special education teachers hear that an intervention is “research based?” The answer is, just about every time a publisher tries to sell them intervention materials. Fortunately, teachers have become more adept at recognizing the ones that are supported by research. This is an important shift because education has such a long history of fads that Ellis (2005) concluded that in education, “today’s flagship is often tomorrow’s abandoned shipwreck” (p. 200).

The best way to avoid fads in educational practice is research. Too often in K-12 schools, interventions without a solid research base are widely implemented and interventions supported by empirical evidence are not. Thus, teachers are recognizing that when evaluating a potential intervention or educational practice, the first question should be “Is it a scientific, research-based intervention?” Currently, What Works Clearinghouse’s (WWC) research perspective, it makes perfect sense from a practical point of view because of the nature of RTI as a schoolwide initiative, there are some components of an RTI model, unlike a schoolwide model, can be examined correctly targeted to be effective, but students cannot learn to use the sum of the parts to evaluate the whole because components of RTI (e.g., data-based decision making, collaboration, and problem-analysis), the focus of this article is research that addresses Tier 1 (quality core instruction), Tier 2 (supplemental intervention), and Tier 3 (individualized interventions). Moreover, this article will identify and discuss relevant meta-analytic research for the topics listed above. Readers interested in syntheses of core components should read the summary available at www.nasdse.org provided by Griffith, Parson, Burns, VanDerHeyden, and Tilly (2007).

RTI Models as a Whole

Many articles provide descriptions of RTI models in their entirety and data to support their effectiveness (e.g., Marston, Muyskens, Lau, & Canter, 2003; McNamara & Hollinger, 2003). A recent meta-analysis of RTI research found large effects for both systemic (e.g., reductions in special education referrals) and student outcomes (e.g., increased increase reading scores) (Burns, Appleton, & Stehouwer, 2005). The data provided within this meta-analysis suggest that RTI is an effective practice, but the data were not disaggregated by study design primarily because of the lack of randomized studies for reasons mentioned above.

VanDerHeyden, Witt, and Gilbertson (2007) conducted an evaluation of an RTI model over multiple years. Instead of random assignment, their study used a multiple baseline design, which examines outcome data from an intervention with a staggered onset of implementation. The WWC (2008) recognizes research from multiple baseline designs as meeting standards for evidence base. Moreover, a multiple baseline design allows for data to be studied for groups of schools whose RTI implementation start dates are staggered across a few years. Data gathered before and after implementation of the intervention can then be used to determine the impact of the intervention. The results of this comprehensive study indicated that the RTI model reduced the number of students evaluated for special education services, essentially eliminated the disproportional rate at which ethnic minority and male students were referred for special education evaluations, and substantially reduced the amount of financial resources dedicated to unnecessary special education evaluations.

Researching the Parts of RTI

Tier 1

An effective RTI model should begin with quality core instruction that adequately addresses the needs of most of the students. If more than 20-25% of the students require additional support than what is provided in Tier 1, then the school will not have the resources necessary to address the needs of those students. Moreover, interventions should be highly and correctly targeted to be effective, but students cannot learn to...
read and do math if they are not receiving quality balanced instruction in addition to supplemental support. Fortunately, the National Reading Panel (2000) and National Mathematics Advisory Panel (2008) have both conducted meta-analyses to determine what constitutes quality instruction in those core areas. Moreover, individual studies of math (Crawford & Snider, 2000) and reading (Foorman, Francis, & Fletcher, 1998) have used strong research designs and found that the quality of the curriculum and the explicitness of the instruction led to improved student learning and reduced future student failures. It would go beyond the scope of this article to describe what these studies and meta-analyses found to be critical components of quality instruction and curriculum, but there is a well-confirmed research base that quality instruction leads to fewer students needing additional support. Readers are encouraged to examine the Florida Center for Reading Research website (www.fcrr.org) and the report of the National Reading Panel (2000) for more information about quality instructional practices.

Tier 2

According to many publications about the three-tier model of RTI, a school’s goal is for no more than 20% of students to require additional support beyond good Tier 1 curriculum and instruction (Burns et al., 2005). For those students, an RTI model relies on supplemental interventions delivered in small groups for 20 to 30 minutes daily (Vaughn, Wanzek, Linan-Thompson, & Murray, 2007). The few meta-analyses of small-group interventions that have been conducted found moderate to strong effects of daily Tier 2 instruction (Elbaum, Vaughn, Hughes, & Moody, 2000). However, a panel convened by the Institute for Education Science (IES) found strong evidence for the effectiveness of providing small-group interventions as supplemental instruction to support the Tier 1 core curriculum (Gersten et al., 2009a). According to the panel, small-group supplemental instruction should a) target the components of reading instruction in which the student needs additional support, b) be implemented three to five times each week for approximately 20 to 40 minutes each session, and c) build skills gradually with high student-teacher interaction and frequent opportunities to practice the specific skill and receive feedback. It is also important to note, that the instruction provided within Tier 2 needs to focus on an aspect of reading (e.g., decoding) and that students need practice in that specific skill. Simply allowing a struggling reader more time to read, even if the text is carefully selected to provide an appropriate level of challenge, will likely not remediate the deficit in the long run.

After reviewing research on math instruction, the IES panel reached a similar conclusion regarding Tier 2 for math as did the reading experts. Tier 2 interventions are critical for success in math as well, and there is strong evidence to support the effectiveness of the interventions if they include explicit and systematic instruction and focus on common underlying structures of problems (Gersten et al., 2009b).

Tier 3

Schools implementing effective Tier 1 and Tier 2 instruction should find no more than 5% of students requiring more intensive interventions than those provided in Tier 2 (Burns et al., 2005). Students who need individualized support receive it from a Tier 3 intervention, the hallmark of which is the intensity of the intervention rather than how it is delivered. Some educators assume that Tier 3 interventions are delivered one-on-one, but that may not be necessary and is not the essential attribute of an effective Tier 3 intervention. Instead, Tier 3 interventions should be specific to individual student needs and involve sufficient resources to address those needs (Burns & Gibbons, 2008).

Meta-analytic research has found several effective interventions for students with severe learning difficulties and identified learning disabilities including mnemonic strategies, explicit reading comprehension instruction (e.g., vocabulary, pre- and mid-reading, and direct instruction of strategies), behavior modification, and direct instruction (Kavale & Forness, 2000). Moreover, several components of effective interventions for students with learning disabilities that could inform Tier 3 interventions were identified with meta-analytic research (Swanson & Sachse-Lee, 2000) and a research synthesis (Burns, VanDerHeyden, & Boice, 2008). Again, to fully describe the components would go beyond the scope of this article, but there is a strong research base from which to work that is summarized in Table 1.

Research Continues

It is difficult to make any summative statements about RTI research given that the research is ongoing and the research base is still not definitive for essential aspects of RTI. For example, most RTI models rely on a problem-solving team (PST) to identify interventions within Tier 3 (Burns & Ysseldyke, 2005). Meta-analytic research found strong effects associated with PSTs (Burns & Symington, 2002), but the quality of the research of the studies within the meta-analysis is unknown. Moreover, practitioners should take great strides to assure that the RTI model is implemented with fidelity, but we are unsure how to best accomplish this important objective. There is also little empirical support for various problem-solving and problem-analysis models implemented within RTI, and research on RTI models for middle and high schools is only just beginning.

Practitioners should implement a three-tiered RTI model with confidence that they are engaging in research-based practice that benefits students. RTI is a promising practice that already has positively influenced the lives of countless children. If we can take what research has already taught us, develop ways to directly translate that research into practice, and continue to evolve our practices based on cutting edge research, then RTI will be the accepted, ongoing approach to instruction rather than just another fad. RTI may be a collection of parts accumulated and pieced together over decades of research and practice, but the result of this compilation of parts is a sum that equals positive outcomes for kids.
TABLE 1: Research-based effective intervention practices for tiers 2 and 3

<table>
<thead>
<tr>
<th>Tier</th>
<th>Practice</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Use explicit and systematic instruction</td>
<td>Gersten et al. (2009a)</td>
</tr>
<tr>
<td>2</td>
<td>Use groups of three to five students</td>
<td>Elbaum et al. (2000)</td>
</tr>
<tr>
<td>2</td>
<td>Provide instruction in up to three foundational reading skills</td>
<td>Gersten et al. (2009a)</td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>Focus on underlying skills and structures for math and reading</td>
<td>Gersten et al. (2009a)</td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>Progress should be closely monitored until approximately eight data points are collected to assure sufficient reliability</td>
<td>Christ (2006)</td>
</tr>
<tr>
<td>3</td>
<td>Use an intervention with at least three components that are different from Tiers 1 and 2</td>
<td>Swanson &amp; Sachse-Lee (2000)</td>
</tr>
<tr>
<td>3</td>
<td>Potential intervention components include (a) highly targeted, (b) provides an appropriate level of challenge for the individual student, (c) explicitly teaches a specific skill, (d) allows many opportunities to respond, and (e) provides immediate corrective feedback for an individual student</td>
<td>Burns et al. (2008)</td>
</tr>
</tbody>
</table>

References


Matthew K. Burns, Ph.D., is an Associate Professor of Educational Psychology and coordinator of the School Psychology program at the University of Minnesota. He has authored over 100 national publications including co-editing or co-authoring five books regarding response to intervention. He is also a highly sought after national speaker regarding RTI, and has assisted in local school district implementation efforts in dozens of districts across many states. Dr. Burns is the editor of Assessment for Effective Intervention and the Editor-Elect for School Psychology Review. Moreover, Dr. Burns was a member of the task force and co-author of School Psychology: A Blueprint for Training and Practice III. Finally, Dr. Burns was a practicing school psychologist and special education administrator in three districts across two states before becoming an academic.
However, researchers hope to be able to make the spiders walk faster and further in the future. Furthermore, present research is focusing on making the nano-spiders able to follow more commands and to make more decisions. Molecular robotics is a new field in scientific research. Although it has not produced a long list of great inventions yet, scientists believe that nanotechnology could become one of the most important industries in the near future. The nano-spider is considered to be an important step in research which could one day lead to devices being created for various medical applications. Response to intervention research: Is the sum of the parts as great as the whole. Perspectives on language and literacy, 36(2), 13–15. Google Scholar. Calhoon, M. B., Al Otaiba, S., Cihak, D., King, A., & Avalos, A. (2007). Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office. Noell, G. H., & Gansle, K. A. (2006). Assuring the form has substance: Treatment plan implementation as the foundation of assessing response to intervention. Assessment for Effective Intervention, 32, 32–39. CrossRef Google Scholar. Rafdal, B. H., McMaster, K. L., McConnell, S. R., Fuchs, D., & Fuchs, L. S. (2011). To return to the difficulty which has been stated with respect both to definitions and to numbers, what is the cause of their unity? In the case of all things which have several parts and in which the totality is not, as it were, a mere heap, but the whole is something beside the parts, there is a cause; for even in bodies contact is the cause of unity in some cases, and in others viscosity or some other such quality. That the whole is not the same as the sum of its parts are useful in meeting the type just described; for a man who defines in this way seems to assert that the parts are the same as the whole. Start studying Chapter 8 Interventions. Learn vocabulary, terms and more with flashcards, games and other study tools. An intervention is the: A. easiest part of health behavior change. B. least expensive part of health promotion. C. first step in conducting an evaluation. D. activity that occurs between two things, events, or points in time. Which of the following intervention strategies generally has the highest penetration rate? A. Health education B. Health policy C. Health communication D. Health engineering. C. Health communication. The first three considerations when creating a health promotion intervention, as described in our text,