

# CHAPTER 23

## *Using a Tiered Intervention Model in Secondary Schools to Improve Academic Outcomes in Subject-Area Courses*

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### INTRODUCTION

During the early part of the 21st century, educators are facing a growing number of challenges. Two of the most significant ones involve implementing policies and practices that (a) raise the bar for all students so they will be adequately prepared to successfully compete in the global economy, where increasingly complex skill sets are required to obtain jobs that provide adequate compensation and quality of life; and (b) close the achievement gap for growing numbers of adolescents who are performing markedly below grade level and who lack the necessary skills and work habits to enable them to successfully respond to rigorous academic demands. To address these challenges, school leaders often need to determine how very limited financial, staffing, and professional-development resources will be allocated. How school leaders make decisions to address these two challenges can have important ramifications for adolescents in middle and high school settings.

The purpose of this chapter is to discuss how to implement an array of evidence-based interventions within a school-wide framework designed to improve academic outcomes in subject-area courses for *all* secondary students (high, average, and low achievers, including those with disabilities) in a coordinated, synergistic manner. The framework described in this chapter is a multitiered intervention system that provides increasingly intense instruction across the tiers and outlines the important role that every secondary teacher should play relative to academic outcomes. Although the roles played by various teachers within this framework are often unique, they also must be complementary. Prior to addressing these roles and the various components of this

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framework, the two challenges mentioned above will be described in detail to portray the context within which the different tiers of the model and intervention practices associated with each must be embedded. The second section of this chapter will explain the rationale for, importance of, and unique challenges in implementing a multitiered framework for instruction in secondary schools. The third section provides a detailed description of the tiered intervention framework (i.e., the Content Literacy Continuum), as well as sample interventions found at the various tiers. Finally, the last section provides a brief description of those factors that experience has indicated are important in supporting reform initiatives in middle and high school settings.

### **Critical Challenges Facing School Leaders and Teachers**

In 2006, the National Academy of Sciences released a report—*Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*—to explain more clearly America’s current economic standing within the world and to make recommendations for steps to be taken to ensure a vibrant economy in the future. The conclusion was that, to prevent other nations from surpassing the United States economically, the performance of America’s youth must be markedly improved, particularly in the STEM areas (science, technology, engineering, and math). For example, in this report, a representative of Intel Corporation was quoted as saying: “We go where the smart people are. Now our business operations are 2/3 in the U.S. and 1/3 overseas. But that ratio will flip over the next 10 years.” To counter such predictions and to increase U.S. competitiveness, the report concluded that schools must increase expectations for all students. As a result, school personnel are feeling considerable pressure to respond to the calls for raising the bar on student achievement (Deshler, Palincsar, Biancarosa, & Nair, 2007).

The number of reports detailing the poor performance of struggling adolescent learners, including those with disabilities, is voluminous (e.g., Deshler & Schumaker, 2006; Kamil, 2003; Wagner, Newman, Cameto, & Levine, 2006). Almost without exception, these reports underscore the magnitude of the achievement gap that these students face, between their actual level of performance and the demands they are expected to meet, both in skill areas and in subject-area classes. An example of the significant size of the gap is found in the most recent National Assessment of Educational Progress report, in which 68% of all eighth graders were found to be performing *below proficiency*, and 26% of eighth graders were performing at the *below-basic* level (National Center for Education Statistics, 2005). To illustrate the significance of these large achievement gaps, consider those Grade 9 students who are performing at the fourth-grade level in terms of skill achievement. In order to be performing at grade level at the time of graduation, these students will need to make 2 years of gain *per year* in school for each of their 4 years of high school. The challenge of closing this gap in a 4-year period is very daunting.

Thus, educators in secondary schools are confronted with a very difficult instructional assignment: simultaneously raising the bar to make students more competitive while closing the achievement gap so that a large percentage of adolescents

are not marginalized or, in the most extreme circumstance, eliminated from school altogether because they choose to drop out.

### **Use of a Tiered Framework to Improve Academic Outcomes in Secondary Schools**

One of the greatest barriers to student growth and achievement in secondary schools (especially high schools) is the issue of *fragmentation*. That is, students have multiple teachers throughout each day, and these teachers rarely, if ever, coordinate what or how they teach students. Unlike elementary students, secondary students who struggle with learning do not get the necessary reinforcement of critical skills, strategies, and subject-area information. Hence, the often disjointed, uncoordinated educational programs that secondary students experience rarely lead to the type of instructional synergy that is required for students to make dramatic achievement gains. One strategy for counteracting this dynamic is to implement a tiered instructional framework throughout a school. The overriding goals of a tiered system are to (a) minimize fragmentation for students, (b) facilitate coordination of instruction across teachers, (c) engage all teachers in assuming responsibility for improving academic outcomes, and (d) differentiate instruction through increased levels of intensity of instruction across tiers, with higher tiers involving more and more intensive instruction.

Experience in implementing tiered instructional models in secondary schools underscores the importance of providing high-quality instruction at each tier in the model. The success of a tiered model of instruction is dependent on the commitment of a large majority of the members of a school staff and a willingness on the part of different staff members to provide the type of instruction that is expected at the tier in which they are involved. That is, if teachers provide instruction at higher tiers, the instruction they provide must be individualized, intensive, explicit, and relentless. If unique, high-quality instruction is not offered at each tier in the model, eventually the model will become weak and ineffective. In short, tiered models of instruction depend on a broad level of support from teachers and administrators and a commitment to developing strength at each tier, so student needs are optimally met.

### **A TIERED INSTRUCTIONAL MODEL FOR SECONDARY STUDENTS**

To provide some background information on the new instructional model to be described in this section, in 1978, the University of Kansas Institute for Research on Learning Disabilities was founded to develop an intervention model for secondary students who have learning disabilities. The early work of institute staff members focused on developing instructional tools that could be used in resource rooms to enhance the learning of these students. The resulting instructional model was called the Strategic Instruction Model and focused on teaching students how to be good learners by teaching them learning strategies in an intensive way (Deshler & Schumaker, 1988).

As the emphasis on mainstreaming and then full inclusion grew, institute staff members also began to develop instructional methods that could be used by secondary

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general educators to enhance the learning of at-risk students in their courses. Meanwhile, the name of the institute changed to the University of Kansas Center for Research on Learning (KU-CRL) so that the population served could be broadened to all learners. Nevertheless, the emphasis of KU-CRL work remained the student who is at-risk for failure. After a number of effective interventions had been developed, KU-CRL staff members began investigating ways that these interventions might be combined within whole-school reform efforts.

As a result, these staff members have designed a tiered intervention model for at-risk secondary students that takes into account these students' need to learn how to succeed independently in subject-area classes, as well as their instructional needs within these environments. Called the Content Literacy Continuum (CLC; Lenz, Ehren, & Deshler, 2005), the model is necessarily an adaptation of a response-to-intervention (RTI) logic model (Sugai, 2007). Such an adaptation was necessary because the emphasis within secondary environments is not on *early* identification of learning disabilities, but on the support of students with specific learning disabilities (SLD) and other at-risk students within these environments. In essence, the CLC is one way that schools can operationalize the Strategic Instruction Model to provide instruction across the curriculum in strategic learning skills.

Within the CLC, which is a framework that cuts across classes and departments within a secondary school, special education teachers and general education teachers maintain different roles as they work cooperatively to improve the performance of low-achieving students in general education classes. Both types of teachers take on the role of a "learning specialist," one who teaches students *how to learn and how to succeed* in response to academic demands in required general education classes.

Within the context of the "learning apprenticeship" (Hock, Deshler, & Schumaker, 1993, 1999) that takes place within the CLC framework, the major roles of the general education teacher are to (a) teach students how to learn the particular type of content that is the focus of the course, and (b) teach them critical content that is fundamental to understanding core concepts in the subject area. The role of the special education teacher and others in support roles (e.g., teachers in after-school programs, reading instructors, and speech and language therapists) is to teach the students the skills and strategies they need to succeed in the required subject-area courses. The partnership between the two types of teachers comes through their communication about (a) the demands related to succeeding in particular subject-area classes, (b) the skills needed by particular students, (c) students' progress, and (d) techniques that can be used to help at-risk students within required subject-area classes.

### **Features of the CLC Model**

The CLC model combines important features of assessment and instruction to promote literacy and learning. Although some of these features have been empirically validated, others still need to be developed and tested. The features include the following.

***Universal Screening***

All of the students enrolled in required secondary subject-area classes are initially tested to determine their knowledge and skill levels prior to instruction. Some of the tests are general; others are course specific. For an example of a general test, all students entering middle school are tested to determine their basic reading and math skills. In addition, for each required course, the teacher(s) teaching that course develop and administer a test to measure students' content knowledge and prerequisite skills required in the discipline (e.g., dictionary usage, report writing). Specific criteria are set and applied by the school and by each teacher for identifying those students who might need closer monitoring or immediate intervention.

***Progress Monitoring***

Each student's performance is monitored throughout the instruction using assessments that are matched with the instructional targets. During skill-based instruction, progress monitoring can be conducted using criterion-based measures specially designed for each type of skill being taught (Duffy, 2007). With regard to subject-area courses, assessments are most often in the form of unit tests or activities that measure student acquisition of content that all students must learn, some students must learn, and only a few students must learn. Instructional decisions for groups of students and individual students are made based on individual student performance on these unit tests. These data may be used as part of the set of information needed to make referral decisions, which may lead to categorical as well as noncategorical placement decisions for students with disabilities and other at-risk students. For example, the data may be used to refer students to additional levels of the CLC model or for additional evaluation to determine eligibility for disability status.

***Levels of Intervention***

There are several tiers, or levels, of instruction and intervention within the CLC model. The first level, or the primary intervention, involves whole-group instruction of all the students enrolled in a required subject-area class by the general education teacher who utilizes research-based instructional methods (e.g., high rates of academic responding, modeling, graphic organizers, behavioral management) to deliver the course content. Subsequent levels of the model involve increasingly more intensive instruction by altering the content of the instruction, the teacher-student ratio, the type of feedback and additional instruction given, and the duration and frequency of instruction. Teacher use of, and student placement in, subsequent levels is based on the results of administering progress-monitoring measures.

***Fidelity of Instruction***

CLC teachers, including general educators and special educators, are trained to deliver the initial tier of instruction as well as more intensive levels of intervention. The teachers' implementation is observed and recorded by administrators, and they receive

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additional coaching and instruction in the classroom as needed until they reach (and continue to maintain) a level of quality of instruction above 95% of the specified behaviors according to fidelity checklists.

### ***Standard Treatment Protocols***

Written protocols for instructional delivery are used by CLC teachers across the tiers of intervention to help ensure that the tiers are implemented with fidelity.

### **Levels of Intervention Within the CLC Model**

Although schools and other agencies (e.g., McPeak & Trygg, 2007) have adapted the CLC model in a variety of ways, the original CLC as described by Lenz et al. (2005) has five levels of intervention (see Table 1). These levels are briefly introduced here; more detailed information follows in later sections. At Level 1, teachers of general education courses use research-based methods, called Content Enhancement Routines, to enhance their delivery of content information (Bulgren & Schumaker, 2006). At Level 2, these same general education teachers embed the instruction of learning strategies (Deshler, Schumaker, & Woodruff, 2004) within their course curriculum as needed. Such strategies are specially selected to correspond to the content of the course. At Level 3, students are given intensive instruction in learning strategies. At Level 4, students are given intensive instruction in basic skills (e.g., reading and math skills). At Level 5, students are involved in clinical services related to particular needs (e.g., speech and hearing services). Upon entry into a CLC school, students are assessed and placed in as many levels as needed in order to meet their needs. Through progress monitoring, additional decisions can be made with regard to level placements.

In Level 1 of the CFC, general education teachers use Content Enhancement Routines to identify the most important content of their courses, corresponding to state and district standards. They also use these routines to organize that content and communicate that organization to students, present the content, and ensure that students learn the content. In other words, they present the content in learner-friendly

**Table 1. The Content Literacy Continuum: A Continuum of Action for Educators**

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Level 1: Enhanced Content–Area Instruction

General education teacher’s role: Use content enhancement routines to teach the content.

Level 2: Embedded Learning Strategy Instruction

General education teacher’s role: Teach or prompt use of learning strategies, coordinated with subject–area content delivery.

Level 3: Intensive Learning Strategy Instruction

Support teacher’s role: Teach learning strategies to mastery levels.

Level 4: Intensive Basic Skills Instruction

Support teacher’s role: Teach basic skills (e.g., math facts, phonics) to mastery.

Level 5: Clinical Interventions

Clinician’s role: Teach the language skills needed for participation in the other levels.

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ways. Each routine is a set of instructional procedures with a specific purpose. For example, the Concept Mastery Routine is a set of methods for teaching students the meaning of a key concept like “democracy” (Bulgren, Deshler, & Schumaker, 1993; Bulgren, Schumaker, & Deshler, 1988).

If general education teachers find that a large group of students in a class are not mastering the content that has been identified for all students to learn, they can implement research-based instructional methods for embedding learning strategy instruction within their content instruction to implement Level 2. For example, if students are required to learn vocabulary words each week and take a vocabulary test, the teacher might teach them a learning strategy for learning the meaning of vocabulary words. This learning strategy instruction is necessarily brief because of the demand that certain amounts of content be taught in each course. Nevertheless, this instruction is content specific and provides students with the necessary strategy or strategies that will enable them to succeed in the given course.

If students are continuing to have difficulty learning, they can be referred to the remaining three levels of intervention. In the third level, support teachers (e.g., special education teachers, teachers in before- and after-school programs, teachers of learning strategy courses, teachers of special courses) teach small groups of students how to apply learning strategies to succeed in their courses. The instruction is intensive and focused, and research-based instructional methods are used.

In the fourth level of the CLC model, support teachers (e.g., special education teachers, reading specialists) teach basic skills such as basic reading skills (e.g., phonics) or math skills (e.g., math facts) to small groups of students with severe deficits, using research-based curricula. Again, the instruction is intensive and focused, and the emphasis is on learning the skills as quickly as possible so students can progress to the third level of intervention, where they can learn strategies. Finally, the CLC offers a fifth level of intervention for those students who have severe language deficits and who need one-on-one or one-on-two attention from a clinical specialist such as a speech-and-language clinician.

The various levels of CLC intervention might occur together or in pairs for an individual student, based on that student’s needs. For example, a student might be enrolled in a required English course (Levels 1 and 2), might be enrolled in a learning strategy course (Level 3) to learn how to study for tests, might attend an after-school program to learn a strategy for completing assignments (Level 3), might take part in an intensive reading program (Level 4), and might have weekly speech-and-language sessions (Level 5). The following sections describe the intervention options that might be available within the different levels and the research that has been completed related to these options.

## **LEVEL 1: ENHANCED CONTENT-AREA INSTRUCTION**

As described earlier, the role of the content-area teacher within the CLC framework is not only to teach a prescribed subject matter to students but to do so in a way that aids

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students' understanding and recall of that content and helps them learn how to learn that particular type of content. These additional aspects of the role of content-area teachers are particularly pertinent in light of the increasingly intense challenge that they are expected to meet with respect to teaching not only large amounts of content but also more advanced and complex content (Powell, Farrar, & Cohen, 1985). These increased pressures have surfaced in recent years as a result of the Excellence in Education movement (Spady & Marx, 1984) and the adoption of high-stakes assessment tests (Erickson, Ysseldyke, Thurlow, & Elliott, 1998).

In order to fulfill these aspects of their role, general education teachers must use a variety of routines, devices, and instructional arrangements to promote performance gains by students. Several criteria have been applied by researchers at the KU-CRL when designing and researching teaching routines for use in content-area courses. First, such teaching routines must be straightforward and easy to master in a relatively short time. Second, the routines must be perceived by teachers as practical and easy to use. Third, teachers must be able to teach similar amounts of content through the use of these routines versus having to sacrifice large amounts of their content because they are using the routines. Fourth, the routines must be perceived by teachers as being effective for normal-achieving and high-achieving students, as well as for at-risk students and students with disabilities. Similarly, typically achieving and high-achieving students must perceive the teacher's use of the routines as facilitative, not as "extra baggage" that gets in the way of learning. Fifth, the routines must be sufficiently powerful to improve the performance of students with disabilities and other at-risk learners in required general education classes in which heterogeneous groupings of students are enrolled. Furthermore, their performance must be improved to a level where they are at least passing classes, and hopefully to a level where they can feel good about their progress (i.e., they earn grades of C and above). Finally, the routines must lend themselves to easy integration with current teaching practices.

The routines that have been developed by KU-CRL researchers and associates that fulfill these criteria are called Content Enhancement Routines because they enable teachers to enhance the learning of content by all the students in their classes (Lenz & Bulgren, 1995; Bulgren & Lenz, 1996; also see Schumaker, Deshler, & McKnight, 2002, and Bulgren & Schumaker, 2006, for reviews of the content enhancement interventions not described in detail here). In general, through the use of Content Enhancement Routines, teachers think deeply about the content that students need to learn, organize and manipulate that content in a way that makes the content learner friendly, and deliver that content to students in a way that keeps them active in the learning process and enhances their retention of the content.

The design of the routines is based on several principles, such as the following: (a) students learn more when they are actively involved; (b) students learn abstract content easier if it is presented in concrete form; (c) students learn more information when the structure or organization of that information is presented to them first and when relationships among pieces of information are explicitly taught; (d) students are more likely to learn new information if it is tied to information they already know; and

(e) students learn more important information if that information is distinguished from unimportant information (Deshler, Schumaker, Lenz, et al., 2001).

A total of 16 Content Enhancement Routines have been developed and empirically validated within three categories: *organizing* routines, *understanding* routines, and *recall* routines. Organizing routines are used to show students how the information related to a course is organized and related. Understanding routines are used to teach students about the major concepts and main ideas in a course. Recall routines are used to help students understand and remember important details related to a course.

## Organizing Routines

Several organizing routines have been developed. Teachers can use the Course Organizer Routine to introduce a whole course to students and to review progress through the course (Lenz, Schumaker, Deshler, & Bulgren, 1998). They can use the Unit Organizer Routine to introduce and review progress through a unit of study (Lenz, Bulgren, Schumaker, Deshler, & Boudah, 1994). They can use the Lesson Organizer Routine as an advance organizer for a lesson or a small group of lessons within a unit (Lenz, Marrs, Schumaker, & Deshler, 1993).

Indeed, all three of these routines serve as advance organizers, that is, information that is delivered “in advance of and at a higher level of generality, inclusiveness, and abstraction than the learning task itself” (Ausubel & Robinson, 1969, p. 606). The purpose of an advance organizer is to strengthen a student’s cognitive structures, which are defined by Ausubel (1963) as the student’s knowledge of a given subject matter at a given time with regard to its organization, clarity, and stability. For students with little background knowledge or an inability to organize information so it can be easily retrieved, and for those with poor motivation or inactive learning styles, advance organizers take on special roles. They can serve as vehicles for presenting background knowledge that is required for understanding a lesson, for highlighting organizational patterns about which the students should be aware, for motivating students to learn, and for communicating to students expectations about what they should be doing during instructional activities.

In one of the studies that has been conducted on organizing routines, Lenz, Alley, and Schumaker (1987) designed a Lesson Organizer Routine consisting of 12 components and evaluated its effectiveness in terms of students’ learning in general education classrooms. These 12 components can be used to inform the learner about (a) the purpose of the advance organizer for the lesson, (b) the actions to be taken by the teacher and the students during the lesson, (c) the topic and subtopics to be covered in the lesson, (d) background knowledge related to the lesson, (e) concepts to be learned, (f) reasons for learning the information, (g) new vocabulary, (h) organizational frameworks, and (i) desired lesson outcomes.

In the Lenz et al. (1987) study, teachers were trained to design and deliver lesson organizers containing the 12 components in their secondary content classes (e.g., history, English, physical sciences) at the beginning of each class period. The

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researchers monitored the effects of the routine on students' acquisition of the information presented in the class period by interviewing the students after each class. They found that teachers who used few of the lesson organizer components at the start of their lessons could be trained in less than one hour to use them at mastery levels in the classroom. When students with disabilities were specifically taught to attend to the teacher's use of the routine, the number of relevant statements they made about the content of the lesson after the lesson increased substantially compared with the number of statements they made after lessons when they had not been informed about how to attend to the lesson organizer. A multiple-baseline across-students design showed that the improvement occurred only after students had been instructed to attend to the lesson organizer.

### **Understanding Routines**

The purpose of routines in this category is to deliver information about complex, abstract concepts (e.g., democracy, thesis, equation) in such a way that students' understanding and memory of the information will be enhanced. The Concept Mastery Routine involves teaching students about the basic information related to a major concept using a graphic organizer called the Concept Diagram and interactive discussion (Bulgren et al., 1988; Bulgren et al., 1993). Basic information includes the characteristics that are always, sometimes, and never present in examples of the concept. The Concept Anchoring Routine involves teaching students about a new concept, such as *white blood cell*, by "anchoring" it to or relating it to a concept that they already understand, such as *army* (Bulgren, Deshler, Schumaker, & Lenz, 2000; Bulgren, Schumaker, & Deshler, 1994a; Deshler, Schumaker, Bulgren, et al., 2001). The Concept Comparison Routine involves comparing and contrasting two or more related concepts, such as socialism, capitalism, and communism (Bulgren, Schumaker, Deshler, Lenz, & Marquis, 2002).

Empirical support for the effectiveness of Understanding Routines is exemplified by a study conducted by Bulgren and colleagues (2002), in which 107 students in Grades 7–12 participated. For this study, a Comparison Table, a graphic display showing how two or more concepts are alike and how they are different, was drafted. A counterbalanced design with randomly assigned stratified subgroups of students was used, with a researcher delivering the instruction. In selected classes, a researcher used the Concept Comparison Routine to lead an interactive discussion to help the students create a Comparison Table. The final product of the lesson was a graphic device constructed by the teacher or researcher and students working together. Other classes participated in a traditional lecture or discussion about the same information covered in the graphic device. Thus, the subject-area content was controlled across the classes.

When the Concept Comparison Routine was used, all subgroups of students, including students with SLD and high-, medium-, and low-achieving students, recalled significantly more information on written tests than when it was not used. Students with SLD in the control group earned a mean test score of 57%, whereas students with SLD in

the experimental group earned a mean test score of 71%. Other low-achieving students in the control group earned a mean test score of 63%, and low-achieving students in the experimental group earned a mean test score of 86%. Similarly, typically achieving students in the control group earned a mean test score of 76% and in the experimental group earned a mean test score of 84%. Thus, all types of students benefited from the use of the routine, and students with SLD earned passing scores when the routine was used and failing scores when it was not. Large effect sizes were achieved.

Similar positive outcomes have been achieved in other studies as well. For example, Bulgren et al. (2002) conducted a study with 10 secondary subject-area teachers. Through the use of a multiple-baseline design, these researchers showed that teachers could be trained to use the Concept Comparison Routine in their classrooms at mastery levels after 3 hours of training. These results were replicated by Schumaker, Fisher, and Walsh (2009), who also demonstrated that teachers could learn to use the routine at high levels of fidelity through a virtual workshop on a CD-Rom and that the results these teachers achieved with students were equivalent to the results achieved by teachers who delivered live instruction. Students with and without disabilities ( $N = 292$ ) in the classes of both groups of teachers made significant gains on concept tests ( $p < .0001$ ).

### Recall Routines

A third category of routines that have been used by general education teachers and that produce gains in the performance of students with learning problems is the recall routines. One of these routines, the Recall Enhancement Routine (Schumaker, Bulgren, Deshler, & Lenz, 1998), has been the focus of two experimental studies. This routine involves the construction of mnemonic devices (i.e., memory tools) by the teacher and students to help the students remember information. For example, if students are required to remember that Joseph Swan developed an early form of the light bulb, they might make a mental picture of a swan holding a light bulb that shines weakly. To use the routine, the teacher cues students that certain information is important to remember and explains why, helps the students construct a mnemonic device for remembering the information, and supervises student review of the information. The first study showed that students with SLD scored significantly higher on content tests when this routine was used as opposed to when it was not used (71% vs. 42%; Bulgren, Schumaker, & Deshler, 1994b). The second study showed that students whose teachers used the routine scored significantly higher on a test that measured their ability to construct mnemonic devices than students of teachers who did not use the routine (Bulgren, Deshler, & Schumaker, 1997).

### Integration of Routines

Certainly, additional research is required to further study the usefulness of the notion that general education teachers can enhance the understanding and recall of

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information by all students, including those with disabilities or who are at risk for failure. Some of the routines need further study in isolation to determine under what conditions they are most effective. Additionally, the effects of the integration of the routines should be studied as well. For example, the Course Organizer Routine might be used to introduce a course, the Unit Organizer Routine might be used to introduce each unit in the course, the Concept Mastery Routine might be used to present information related to a major concept in each unit, the Lesson Organizer Routine might be used to enhance difficult lessons, and the Recall Enhancement Routine might be used to highlight information as it is presented in each lesson. Conceivably, such an integrated sequence might have an even greater effect on students' performance than can be created when the teaching routines are used in isolation.

## **LEVEL 2: EMBEDDED LEARNING STRATEGY INSTRUCTION**

For Level 2 of the CLC model, general education teachers embed learning strategy instruction within their subject-matter instruction. Either they select learning strategies that are particularly pertinent to their courses, or, through cooperative planning with other teachers in their departments and across departments, they select a strategy or strategies within a sequence of strategies that are to be taught to all students at the school.

Learning strategy instruction is instruction in a set of steps or behaviors that students can use to complete a learning task. It has been validated as one of the most effective types of instruction for students with SLD (Swanson, 1999). When provided effectively, learning strategy instruction typically involves (a) describing the strategy, (b) modeling the strategy, (c) giving students opportunities to practice the strategy starting with easy tasks and progressing to more and more difficult ones, (d) requiring mastery, and (e) providing individual feedback to students about their performance (Schumaker & Deshler, 2006).

However, because of the conditions of secondary subject-area classes (i.e., large numbers of students, heterogeneous classes) and the enormous demands associated with covering certain amounts of content (Schumaker, Deshler, Bui, & Vernon, 2006), the implementation of embedded learning strategy instruction in these environments requires the sacrifice of some of these validated methods. For example, individual feedback for every student just is not possible. However, adaptations have been made in learning strategy instruction for these types of classes, and teachers have been successful in promoting the acquisition of learning strategies in these environments.

Empirical investigations provide evidence of improved outcomes when learning strategy instruction is employed in large classes. For example, Faggella-Luby, Schumaker, and Deshler (2007) randomly assigned 79 ninth graders with and without disabilities to six literature classes. The students in the three experimental classes were taught three strategies related to story grammar: (a) self-questioning about story grammar elements as a prereading activity, (b) story structure analysis through creation

of a story grammar diagram during reading, and (c) summarizing of the story in writing based on story grammar elements after reading. Students in the three control classes were taught three comprehension skills: (a) the LINC'S vocabulary strategy, to use prior to reading (Ellis, 1992), (b) Question–Answer Relationships, to use during reading (Raphael, 1982, 1986), and (c) semantic summary mapping, to use after reading (Englert, Mariage, Garmon, & Tarrant, 1998).

The interventions were embedded within the instruction of a unit consisting of eight short stories. The strategy and skill instruction consisted of five introductory lessons and four additional lessons in which the strategies and skills were taught across a sequence, during which the teacher first described and modeled the strategies and skills in relation to stories, then the teacher conducted guided-practice and cooperative-practice activities in relation to stories, and finally the students practiced independently with stories. The final lesson consisted of review activities. The same teacher taught all six classes.

Students in the experimental classes earned significantly higher scores than students in the control classes on measures of story-structure strategy use, story-structure knowledge, and retention of information about the eight stories. No differences were found related to the gains made by students with and without disabilities in the experimental classes. Thus, this study shows that strategies can be taught in a subject-area class in such a way that student learning of the subject matter of the course is enhanced. Moreover, all types of students can benefit.

Another study conducted by Harris, Schumaker, & Deshler (2009) supports the contention that learning strategies can be learned in general education classes. These researchers conducted a study in nine English classes in which 230 ninth graders were enrolled. Six of the classes were randomly assigned to one of two intervention groups. In one group, students were taught the Word Mapping Strategy (WM, a morphological analysis strategy; Harris, Schumaker, & Deshler, 2008); students in the other group (LV) were taught the LINC'S Vocabulary Strategy, a mnemonic strategy (Ellis, 1992). The remaining three intact classes established a baseline comparison for knowledge of targeted words.

The WM and LV strategy groups were taught their targeted strategy in four introductory class periods by the same teacher. The same 20 new vocabulary words were targeted for instruction for both groups. The teacher described and modeled the strategy and involved the students in guided-practice and independent-practice activities using a few example words. In the next three lessons, the students practiced using the strategy in whole-group guided-practice activities for the first 10 targeted words. In the following three lessons, the students practiced using the strategy in pairs for the final 10 targeted words.

Results showed that both the WM and LV groups mastered their targeted strategy; that is, both groups earned mean scores of 87% on a test of strategy use. Both groups also learned the meaning of the targeted vocabulary words, and their scores were significantly higher than the scores of the comparison group. The WM group earned significantly higher scores than the other two groups on a test measuring their ability to

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predict the meaning of new words. On average, they predicted the meaning of about 50% of the new words presented to them. There were no differences between the posttest scores of the students with and without disabilities in the two strategy groups on the test of word knowledge, showing that students with disabilities were able to learn a vocabulary strategy within the context of a general education class. Again, this study showed that students can learn strategies when the instruction is embedded within a subject-area course (Harris, 2007).

In both of the studies reviewed here, the strategies were relatively simple, the instruction was limited to a few introductory lessons and then a few more days of practice, and the teacher provided primarily group feedback. Some students who were having difficulty were given individual feedback as the teacher circulated through the room, but this was not done systematically or regularly.

## **LEVEL 3: INTENSIVE LEARNING STRATEGY INSTRUCTION**

Level 3 of the CLC model is for students who need more intensive learning strategy instruction than what can take place in subject-area classes. This instruction might focus on strategies that are or are not the target of instruction in those subject-area classes. In the former case, a student might not be mastering a strategy that her English teacher is teaching in class, so the English teacher might refer the student for more intensive instruction. In the latter case, the ninth-grade English teacher might be teaching the entire class a vocabulary strategy, but the student is reading at the sixth-grade level, so the student is also enrolled in an intensive reading comprehension strategy class.

The venues within which intensive strategy instruction can take place vary. Traditionally, learning strategies have been taught in resource room programs across the nation. Since the early 1980s, more than 100,000 special education teachers have learned to teach learning strategies through workshops in their districts and states and in college courses. In some schools, students are enrolled in resource programs that focus on learning strategy instruction as a part of their special education services. Some school districts and even some states (e.g., Florida) have designed required learning strategy courses as a part of their curricula. Some schools have set up special courses focusing on a particular type of strategy, such as reading strategies or writing strategies. Students are enrolled in these courses based on their scores on universally administered tests. Some schools have created before- or after-school programs in which learning strategies are taught using a specially designed instructional methodology, called Strategic Tutoring (Hock, Deshler, & Schumaker, 2000), whereby students acquire learning strategies while they are helped to complete their assignments.

Regardless of the venue, teachers teach the learning strategies contained within the *Learning Strategies Curriculum* using validated instructional methods (Ellis, Deshler, Lenz, Schumaker, & Clark, 1991; Schumaker & Deshler, 2006). These strategies are organized in three groups, according to whether they help students acquire information from written materials, store information in their brains or in notes, or express

information on tests, in discussions, or in writing. When learning strategies are taught within Level 3 of the CLC, the teacher–student ratio is low, with students typically taught in small groups. The teacher has extensive training in how to teach the strategies to students who have difficulty learning. The frequency of the instruction is high (e.g., daily), and the duration is longer than can be accommodated in general education classes.

When a strategy is taught intensively, the teacher gives a pretest to determine students' skills, describes and models the strategy, leads students in verbal practice of the strategy steps, and provides many scaffolded practice opportunities for students. Each practice attempt is followed by individual and elaborated feedback (Kline, Schumaker, & Deshler, 1991), and the teacher monitors student progress until the student has mastered the skills. Finally, the teacher teaches the students how to use the strategy in other settings on typical learning tasks that they might encounter in subject-area classes. A modified version of this sequence of instruction occurs within Strategic Tutoring sessions, because the tutor is teaching the student how to complete a current assignment while simultaneously teaching the strategy (Hock et al., 2000).

One evidence-based learning strategy is the Word Identification Strategy, which enables students to decode the multisyllabic words they encounter in secondary content-area classes (Lenz & Hughes, 1990; Lenz, Schumaker, Deshler, & Beals, 1984). Because large numbers of low-achieving students and students with disabilities reach high school reading below grade level and earn scores averaging at the fourth- or fifth-grade level (Warner, Schumaker, Alley, & Deshler, 1980), some schools have created a short-term course for these students to teach them the Word Identification Strategy. For example, at Muskegon High School in Michigan, entering ninth-grade students are tested to determine their decoding skills. Students who score 2 or more years below grade level in decoding skills are enrolled in small groups in a short-term course to learn the strategy for a period of 4 to 8 weeks, depending on each student's progress. They are given credit in their English course for the work they complete in the short reading course.

The results of such courses are promising. When Deshler, Schumaker, and Woodruff (2004) evaluated the effects of this short Muskegon High School course, they found that the strategy course produced strong, positive gains in decoding skills. Their study used a comparison design in which 68 entering ninth graders at Muskegon High were matched to a comparison group of students who had the same level of decoding deficits and who were enrolled at a nearby high school. African American, Hispanic, and Caucasian students; female and male students; and students with and without learning disabilities at Muskegon High all showed similar gains. All of the 68 students in the experimental group at Muskegon High had gained at least one grade level in decoding skills (mean gain = 3.4 grade levels), compared with an average improvement of 0.2 grade levels for the students with whom they were matched.

Numerous studies have been conducted during the past three decades on individual interventions within the Learning Strategies Curriculum with small groups of students with SLD in secondary resource room programs (see Schumaker & Deshler,

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2006, for a review). One example is a study conducted by Schmidt, Deshler, Schumaker, and Alley (1988/89), which involved seven students with learning disabilities in Grades 10 through 12, who were taught at least two of four writing strategies: the Sentence Writing Strategy (Schumaker & Sheldon, 1999), the Paragraph Writing Strategy (Schumaker & Lyster, 1991), the Error Monitoring Strategy (Schumaker, Nolan, & Deshler, 1985), and the Theme Writing Strategy (Schumaker, 2003). For each student, a multiple-baseline across-strategies design was employed to show the effects of instruction in each strategy on assignments written in the special education class and in English and history general education classes before, during, and after instruction and in the following school year.

On all of the products written in the special education classroom immediately following instruction on a given strategy, all of the students exceeded the strategy mastery criteria. When the students' general education writing products were analyzed, the results were mixed. Students generalized their use of the writing strategies to some extent. Although their scores improved, they were not at the same level that they had achieved in their special education classroom. The teachers then used a variety of instructional procedures to promote generalization across classes. By the end of the school year, six of the seven students wrote as well in general education classes as they had in their special education resource room.

At the beginning of the study, the students' grade point average (GPA) was 2.1 in English and social studies courses taught in the resource room by a special education teacher; after strategy instruction, their GPA was 2.7 in English and social studies general education courses. Before the study, none of the students had earned GPAs of 3.0. After the study, four of the students did. On the written language subtest of the Woodcock-Johnson Psychoeducational Battery, the students earned a grade-level score of 6.2 at the beginning of the study and 8.2 at the end of the study. This outcome was higher than the predicted grade-level score of 7.0 based on the students' previous rate of improvement on the Woodcock-Johnson. Students who learned the Theme Writing Strategy performed significantly better on the district's writing competency exam compared to the district's average for all 11th graders (they earned a mean score of 3.5 versus 2.5). Students in the study who did not learn the Theme Writing Strategy earned a mean score of 2.4 on the district exam.

Learning strategy instruction can take place within before- and after-school programs, as well. In fact, learning strategy instruction is an important ingredient in these types of programs, since the outcomes of traditional tutoring programs are poor (e.g., Chicago Public Schools, 2005; Hock, Deshler, & Schumaker, 1999). As mentioned above, a special type of learning strategy instruction, called Strategic Tutoring (Hock, Schumaker, & Deshler, 2000), has been designed for the purpose of teaching students strategies while also helping them complete their current assignments. To do this, the strategic tutor first assesses the assignment to be completed, the student's current success level with that type of task, and the strategy the student is already using for that type of task. For example, the tutor might determine that the student needs to complete a worksheet using information in the textbook and that the student is

currently not turning in these types of worksheet assignments. Next, the strategic tutor selects a strategy to be taught or constructs a strategy with the student that includes elements of what the student is already doing. Then the tutor models the strategy while helping the student complete the task. For example, the tutor shows the student how she would read each question focusing on key words in the question, look for a heading or subheading in the text that corresponds to words in the question, skim the section for the answer, and translate the answer into her own words while writing it on the worksheet. Next, the tutor has the student practice using the strategy and provides feedback on each attempt to answer a question.

Over time and over the course of several additional similar assignments, the tutor fades out support and feedback until the student becomes independent in completing the task. The same student may receive other types of assignments, and similar procedures are used by the tutor to teach the student strategic ways to approach those tasks as well. As a result, the student not only completes assignments but also learns a process for completing similar assignments independently in the future.

Again, empirical studies provide evidence of effectiveness for Strategic Tutoring. In one study by Hock (1998), Strategic Tutoring was used to teach 28 underprepared student athletes enrolled in English 101 college courses to use the Theme Writing Strategy to complete their essay-writing assignments. These students had earned average scores of 17.7 on the ACT college admissions test and a mean grade point average of 2.8 in high school. Their grades at the end of the college English course were compared to the grades of 28 other student athletes who had earned average scores of 28.2 on the ACT, had a mean grade point average of 3.3 in high school, and who received traditional tutoring in the same English 101 course. Hock found that the students who received Strategic Tutoring earned an average English grade of 2.5, versus an average English grade of 2.6 earned by the comparison students. Moreover, the grade point average for their first freshman semester for the Strategic Tutoring group was 2.50 and for the comparison group was 2.54. Thus, the underprepared students who received Strategic Tutoring earned grades similar to those of a group of students who were more adequately prepared for college.

In a second research effort, Hock, Pulvers, Deshler, and Schumaker (2001) employed a multiple-baseline across-students design in two studies with nine junior-high students to evaluate the effects of Strategic Tutoring on the students' class test scores and report-card grades in general education math and biology courses. They found that the students learned the strategies they were taught, and also important, their test scores and grades improved substantially. For example, on average, before Strategic Tutoring, the three students in the first study were earning average algebra test scores during baseline of 46%, 54%, and 59%; after strategic tutoring, they earned average test scores of 70%, 86%, and 87%, respectively.

Finally, Lancaster and Lancaster (2006) conducted a study with 14 strategic tutors and 14 traditional tutors who were each randomly assigned one student with SLD. Strategic tutors taught their assigned students a strategy for paraphrasing textbook content while helping them complete their assignments. Traditional tutors only helped

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the students to do their assignments. At the end of the study, the posttest scores of the two groups of students on a strategy knowledge test and a strategy use test were significantly different, with large effect sizes in both cases in favor of the students who had received Strategic Tutoring.

### **LEVEL 4: INTENSIVE BASIC SKILLS INSTRUCTION**

Students are referred to Level 4 interventions if they have large deficits in basic skills. Typically, they are reading below the third-grade level. These students often do not have the skills needed to benefit from learning strategy instruction and from participation in the secondary general education curriculum. For example, they might be decoding words at the first- or second-grade level, and as a result, do not have the prerequisite skills needed for instruction in the Word Identification Strategy or any of the reading comprehension strategies. Students typically need to be reading at the fourth-grade level to benefit from this instruction. Thus, students with severe skill deficits need to be identified as they enter the secondary program and immediately enrolled in interventions in which they can learn the needed skills quickly.

Example Level 4 interventions that have been used in schools include the SRA Corrective Reading Series and the SRA Corrective Math Series (Adams & Engelmann, 1996; Borman, Hewes, Overman, & Brown, 2003). For these programs, students are assigned to small classes for daily instruction, and their progress is monitored each day.

### **LEVEL 5: CLINICAL INTERVENTIONS**

Level 5 is designed for those students who have not mastered the underlying language competencies that enable them to effectively process text or express information orally. They often are identified as having a specific disability or a unique manner of processing information. The skills required to meet the needs of these students generally are possessed by professionals such as speech language pathologists and reading specialists. These professionals can work individually with students and with their teachers to ensure that their work is directly tied to the information that students are expected to learn in their general education courses. For example, a speech language pathologist can work with a student individually to help her learn how to “talk through” and explain a Unit Organizer or a Concept Diagram. In this way, the student can learn not only language skills but also the content of the subject-area course.

### **OTHER IMPORTANT FACTORS FOR IMPROVING ACADEMIC OUTCOMES**

The preceding sections of this chapter have addressed one of the most essential factors for improving student achievement: a well-designed, coordinated framework within

which evidence-based interventions can be embedded. This framework, called the Content Literacy Continuum (CLC), might be thought of as the centerpiece of a school's instructional core. Other components of the instructional core that need to be developed and cultivated on an ongoing basis would be (a) motivational and behavioral supports to promote a school culture of orderliness and self-directed productivity (e.g., Sprick, 2008); (b) formative assessments to guide instructional decision making, including moving students within and across tiers; and (c) an array of engaging and diverse materials to provide students ample opportunities to practice targeted strategies and to build vocabulary and background knowledge.

Instruction that is scaffolded and coordinated across teachers and settings is found in those secondary schools that have in place a critical set of infrastructure supports (e.g., Coyne, Kame'enui, & Carnine, 2007; Lenz, Deshler, & Kissam, 2003.) The purpose of these supports is to provide the necessary conditions that will allow effective instruction to take root and be sustained over time. Important components of the infrastructure support system in secondary schools include a system of instructional coaching (Knight, 2007) that provides job-embedded professional development, flexible course scheduling options that enable students to move among the various instructional tiers, a mechanism for ongoing teacher planning that enables teachers to coordinate and reinforce key points of learning across classes, a system that works toward curriculum coherence and logic from both a knowledge and a skill-acquisition standpoint, and a literacy leadership team made up of key teachers and administrators who assume responsibility through a distributed leadership model for overseeing and driving literacy improvement efforts within the school.

Finally, undertaking efforts to improve student achievement in secondary schools is very difficult. It requires a long-term vision, hard work, strong leadership, and a commitment to the continuous growth and improvement of individual professionals and the school staff as a whole. According to Elmore (2004), continuous growth takes place when the school's leadership team creates the kinds of conditions that enable them to practice key leadership behaviors, such as the following: organizing work around important instructional activities and supervising that work; observing, describing, and analyzing instructional practice; creating and using internal accountability mechanisms; and building a common language and set of expectations. Additionally, Elmore contends that continuous growth is dependent on teachers practicing key instructional behaviors, including these behaviors: observing models of practice; developing protocols for observing practice; focusing on observing, describing, and analyzing instructional practice; and building a common language and set of expectations.

## **SUMMARY**

In summary, empirical evidence supports the notion that the academic performance of students who are at risk for failure in today's secondary schools can be improved

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through the use of instructional methods that are embedded throughout the curriculum. Specifically, Content Enhancement Routines can be used in general education courses to improve the level of performance of all of the students enrolled in these courses, much like a rising tide raises the level of all of the boats. Learning strategies can be taught in intensive and less intensive ways to ensure that students have the necessary skills to complete learning tasks in their courses. Additionally, students who need specialized instruction in basic skills and other areas can be provided with that instruction. By coordinating these methods across teachers and departments through the use of a tiered framework like the CLC, a great deal can be accomplished with regard to creating positive outcomes for at-risk students.

## REFERENCES

- Adams, G., & Engelmann, S. (1996). *Research on direct instruction: 25 years beyond DISTAR*. Seattle, WA: Educational Achievement Systems.
- Ausubel, D. P. (1963). *The psychology of meaningful verbal learning*. New York: Grune & Stratton.
- Ausubel, D. P., & Robinson, F. G. (1969). *School learning: An introduction to educational psychology*. New York: Holt, Rinehart & Winston.
- Borman, G. D., Hewes, G. M., Overman, L. T., & Brown, S. (2003). Comprehensive school reform and achievement: A meta-analysis. *Review of Educational Research*, 73(2), 125–230.
- Bulgren, J. A., Deshler, D. D., & Schumaker, J. B. (1993). *The Concept Mastery Routine: Instructor's manual*. Lawrence, KS: Edge Enterprises.
- Bulgren, J. A., Deshler, D. D., & Schumaker, J. B. (1997). Use of a recall enhancement routine and strategies in inclusive secondary classes. *Learning Disabilities Research and Practice*, 12(4), 198–208.
- Bulgren, J. A., Deshler, D. D., Schumaker, J. B., & Lenz, B. K. (2000). The use and effectiveness of analogical instruction in diverse secondary content classrooms. *Journal of Educational Psychology*, 92, 426–441.
- Bulgren, J. A., & Lenz, B. K. (1996). Strategic instruction in the content areas. In D. D. Deshler, E. S. Ellis, & B. K. Lenz (Eds.), *Teaching Adolescents with Learning Disabilities: Strategies and Methods*. (2nd ed., pp. 409–473). Denver: Love Publishing.
- Bulgren, J. A., & Schumaker, J. B. (2006). Teaching practices that optimize curriculum access. In D. D. Deshler & J. B. Schumaker (Eds.), *High school students with disabilities: Strategies for accessing the curriculum* (pp. 79–120). Thousand Oaks, CA: Corwin Press.
- Bulgren, J., Schumaker, J. B., & Deshler, D. D. (1988). Effectiveness of a concept teaching routine in enhancing the performance of LD students in secondary-level mainstream classes. *Learning Disability Quarterly*, 11(1), 3–17.
- Bulgren, J. A., Schumaker, J. B. & Deshler, D. D. (1994a). *The Concept Anchoring Routine: Instructor's manual*. Lawrence, KS: Edge Enterprises.

- Bulgren, J. A., Schumaker, J. B., & Deshler, D. D. (1994b). The effects of a recall enhancement routine on the test performance of secondary students with and without learning disabilities. *Learning Disabilities Research and Practice*, 9(1), 2–11.
- Bulgren, J. A., Schumaker, J. B., Deshler, D. D., Lenz, B. K., & Marquis, J. (2002). The use and effectiveness of a comparison routine in diverse secondary content classes. *Journal of Educational Psychology*, 94, 357–371.
- Chicago Public Schools. (2005). *SES Tutoring Programs: An evaluation of the second year—Part one of a two-part report*. Chicago, IL: Office of Research, Evaluation and Accountability, Chicago Public Schools.
- Coyne, M. D., Kame'enui, E. J., & Carnine, D. W. (2007). *Effective teaching strategies that accommodate diverse learners* (3rd ed.). Upper Saddle River, NJ: Pearson/Merrill Prentice Hall.
- Deshler, D. D., Palincsar, A. S., Biancarosa, G., & Nair, M. (2007). *Informed choices: Principles and programs for adolescent literacy*. Newark, DE: International Reading Association.
- Deshler, D. D. & Schumaker, J. B. (1988). An instructional model for teaching students how to learn. In J. L. Graden, J. E. Zins, and M. L. Curtis (Eds.), *Alternative education delivery systems: Enhancing instructional options for all students* (pp. 391–411). Washington, DC: National Association of School Psychologists.
- Deshler, D. D., & Schumaker, J. B. (2006). *High school students with disabilities: Strategies for accessing the curriculum*. Thousand Oaks, CA: Corwin Press.
- Deshler, D. D., Schumaker, J. B., Bulgren, J. A., Lenz, B. K., Jantzen, J. E., Adams, G., et al. (2001). Making learning easier: Connecting new knowledge to things students already know. *Teaching Exceptional Children*, 33(4), 82–85.
- Deshler, D. D., Schumaker, J. B., Lenz, B. K., Bulgren, J. A., Hock, M. F., Knight, J., et al. (2001). Ensuring content-area learning by secondary students with learning disabilities. *Learning Disabilities Research and Practice*, 16(2), 96–108.
- Deshler, D. D., Schumaker, J. B., & Woodruff, S. (2004). Improving literacy skills of at-risk adolescents: A school-wide response. In D. S. Strickland and D. E. Alvermann (Eds.), *Bridging the literacy achievement gap: Grades 4–12*. New York: Teachers College Press.
- Duffy, H. (2007). *Meeting the needs of significantly struggling learners in high school: A look at approaches to tiered interventions*. Washington, DC: National High School Center.
- Ellis, E. S. (1992). *The vocabulary strategy: LINCOS*. Lawrence, KS: Edge Enterprises.
- Ellis, E. S., Deshler, D. D., Lenz, B. K., Schumaker, J. B., & Clark, F. L. (1991). An instructional model for teaching learning strategies. *Focus on Exceptional Children*, 23(6), 1–24.
- Elmore, R. (2004). *School reform from the inside out*. Cambridge, MA: Harvard University Press.
- Englert, C. S., Mariage, T. V., Garmon, M. A., & Tarrant, K. L. (1998). Accelerating reading progress in early literacy project classrooms: Three exploratory studies. *Remedial and Special Education*, 19, 142–159.

## INTERVENTIONS

*for Achievement and Behavior Problems in a Three-Tier Model Including RTI*

- Erickson, R. N., Ysseldyke, J. E., Thurlow, M. L., & Elliott, J. L. (1998). Inclusive assessment and accountability systems: Tools of the trade in educational reform. *Teaching Exceptional Children, 31*(2), 4–9.
- Faggella-Luby, M. N., Schumaker, J. B., & Deshler, D. D. (2007). Embedded learning strategy instruction: Story-structure pedagogy in heterogeneous secondary literature classes. *Learning Disability Quarterly, 30*, 131–147.
- Harris, M. L., Schumaker, J. B., & Deshler, D. D. (2008). *The Word Mapping Strategy: Instructor's manual*. Lawrence, KS: Edge Enterprises.
- Harris, M. (2007). *Effects of strategic morphological analysis instruction on the vocabulary performance of secondary students with and without learning disabilities*. Unpublished doctoral dissertation. Lawrence, KS: University of Kansas.
- Hock, M. F. (1998). *The effectiveness of an instructional tutoring model and tutor training on the academic performance of underprepared college student athletes*. Unpublished doctoral dissertation. Lawrence, KS: University of Kansas.
- Hock, M. F., Deshler, D. D., & Schumaker, J. B. (1993). Learning strategy instruction for at-risk and learning disabled adults: The development of strategic learners through apprenticeship. *Preventing School Failure, 38*(1), 43–49.
- Hock, M. F., Deshler, D. D., & Schumaker, J. B. (1999). Tutoring programs for academically underprepared college students: A review of the literature. *Journal of College Reading and Learning, 29*(2), 101–122.
- Hock, M. F., Deshler, D. D., & Schumaker, J. B. (2000). *Strategic Tutoring*. Lawrence, KS: Edge Enterprises.
- Hock, M. F., Pulvers, K. A., Deshler, D. D., & Schumaker, J. B. (2001). The effects of an after-school tutoring program on the academic performance of at-risk and students with learning disabilities. *Remedial and Special Education, 22*, 172–186.
- Hock, M. F., Schumaker, J. B., & Deshler, D. D. (1999). Closing the gap to success in secondary schools: A model for cognitive apprenticeship. In D. D. Deshler, J. B. Schumaker, K. R. Harris, & S. Graham (Eds.), *Teaching every adolescent every day: Learning in diverse schools and classrooms* (pp. 1–52). Cambridge, MA: Brookline.
- Kamil, M. L. (2003). *Adolescents and literacy: Reading for the 21st century*. Washington, DC: Alliance for Excellent Education.
- Kline, F. M., Schumaker, J. B., & Deshler, D. D. (1991). Development and validation of feedback routines for instructing students with learning disabilities. *Learning Disability Quarterly, 14*, 191–207.
- Knight, J. (2007). *Instructional coaching: A partnership approach to improving instruction*. New York: Corwin Press.
- Lenz, B. K., Alley, G. R., & Schumaker, J. B. (1987). Activating the inactive learner through the presentation of advance organizers. *Learning Disability Quarterly, 10*, 53–67.
- Lenz, B. K., & Bulgren, J. A. (1995). Promoting learning in content classes. In P. T. Cegelka & W. H. Berdine (Eds.), *Effective instruction for students with learning disabilities* (pp. 385–417). Boston: Allyn and Bacon.

- Lenz, B. K., Bulgren, J. A., Schumaker, J. B., Deshler, D. D., & Boudah, D. A. (1994). *The Unit Organizer Routine*. Lawrence, KS: Edge Enterprises.
- Lenz, B. K., Deshler, D. D., & Kissam, B. R. (2003). *Teaching content to all: Evidence-based inclusive practices in middle and secondary schools*. Boston: Allyn & Bacon.
- Lenz, B. K., Ehren, B. J., Deshler, D. D. (2005). The Content Literacy Continuum: A school-reform framework for improving adolescent literacy for all students. *Teaching Exceptional Children*, 37(6), 60–63.
- Lenz, B. K., & Hughes, C. A. (1990). A word identification strategy for adolescents with disabilities. *Journal of Learning Disabilities*, 23(3), 149–158, 163.
- Lenz, B. K., Marrs, R.W., Schumaker, J. B., & Deshler, D. D. (1993). *The Lesson Organizer Routine*. Lawrence, KS: Edge Enterprises.
- Lenz, B. K., Schumaker, J. B., Deshler, D. D., & Beals, V. L. (1984). *The Word Identification Strategy: Instructor's manual*. Lawrence: University of Kansas Center for Research on Learning.
- Lenz, B. K., with Schumaker, J. B., Deshler, D. D., & Bulgren, J. A. (1998). *The Course Organizer Routine*. Lawrence, KS: Edge Enterprises.
- McPeak, L. & Trygg, L. (2007). *The secondary literacy instruction and intervention guide: Helping school districts transform into systems that produce life-changing results for all children*. Mill Valley, CA: The Stupski Foundation.
- National Academy of Sciences. (2006). *Rising above the gathering storm: Energizing and employing America for a brighter economic future*. Washington, DC: Author.
- National Center for Education Statistics. (2005). *Mapping 2005 state proficiency standards onto the NAEP scales* (NCES Report 2007–482). Washington, DC: U.S. Government Printing Office.
- Powell, A. G., Farrar, E., & Cohen, D. K. (1985). *The shopping mall high school: Winners and losers in the educational marketplace*. Boston: Houghton Mifflin.
- Raphael, T. (1982). Question-answering strategies for children. *Reading Teacher*, 36, 186–190.
- Raphael, T. (1986). Teaching question-answer relationships, revisited. *Reading Teacher*, 39, 516–522.
- Schmidt, J. L., Deshler, D. D., Schumaker, J. B., & Alley, G. R. (1988/89). Effects of generalization instruction on the written language performance of adolescents with learning disabilities in the mainstream classroom. *Reading, Writing, and Learning Disabilities*, 4(4), 291–309.
- Schumaker, J. B. (2003). *The Theme Writing Strategy: Instructor's manual*. Lawrence, KS: Edge Enterprises.
- Schumaker, J. B., Bulgren, J. A., Deshler, D. D., & Lenz, B. K. (1998). *The Recall Enhancement Routine*. Lawrence, KS: University of Kansas Center for Research on Learning.
- Schumaker, J. B., & Deshler, D. D. (2006). Teaching adolescents to be strategic learners. In D. D. Deshler & J. B. Schumaker (Eds.), *Teaching adolescents with disabilities: Accessing the general education curriculum* (pp. 121–156). New York: Corwin Press.

## INTERVENTIONS

*for Achievement and Behavior Problems in a Three-Tier Model Including RTI*

- Schumaker, J. B., Deshler, D. D., Bui, Y., & Vernon, S. (2006). High schools and adolescents with disabilities: Challenges at every turn. In D. D. Deshler & J. B. Schumaker (Eds.), *Teaching adolescents with disabilities: Accessing the general education curriculum* (pp. 1–34). New York: Corwin Press.
- Schumaker, J. B., Deshler, D. D., & McKnight, P. (2002). Ensuring success in the secondary general education curriculum through the use of teaching routines. In M. R. Shinn, H. M. Walker, & G. Stoner (Eds.), *Interventions for achievement and behavior problems II: Preventive and remedial approaches* (pp. 791–824). Bethesda, MD: National Association of School Psychologists.
- Schumaker, J. B., Fisher, J., & Walsh, L. (2009). *The effects of e-learning on teachers' knowledge and behavior and students' resulting knowledge of concepts*. Unpublished manuscript. Lawrence, KS: Edge Enterprises.
- Schumaker, J. B., & Lyerla, K. D. (1991). *The Paragraph Writing Strategy: Instructor's manual*. Lawrence, KS: University of Kansas Institute for Research in Learning Disabilities.
- Schumaker, J. B., Nolan, S. M., & Deshler, D. D. (1985). *The Error Monitoring Strategy: Instructor's manual*. Lawrence, KS: University of Kansas Institute for Research in Learning Disabilities.
- Schumaker, J. B., & Sheldon, J. A. (1999). *Proficiency in the Sentence Writing Strategy: Instructor's manual*. Lawrence, KS: University of Kansas Center for Research on Learning.
- Spady, W. G., & Marx, G. (1984). *Excellence in our schools: Making it happen*. San Francisco: Far West Laboratory.
- Sprick, R. S. (2008). *Discipline in the secondary classroom* (2nd ed.). San Francisco: Jossey-Bass.
- Sugai, G. (2007, December). *RTI: Reasons, practices, systems, and considerations*. Keynote speech delivered at the RTI Summit sponsored by the Office of Special Education Programs, Washington, DC.
- Swanson, H. L. (1999). Instructional components that predict treatment outcomes for Students with learning disabilities: Support for a combined strategy and direct instruction model. *Learning Disabilities Research and Practice*, 14(3), 129–140.
- Wagner, M., Newman, L., Cameto, R., & Levine, P. (2006). The academic achievement and functional performance of youth with disabilities: A report from the national longitudinal transition study-2. Berkeley, CA: SRI International.
- Warner, M. M., Schumaker, J. B., Alley, G. R., & Deshler, D. D. (1980). Learning disabled adolescents in the public schools: Are they different from other low achievers? *Exceptional Education Quarterly*, 1(2), 27–35. Reprinted in the *Mainstreamed Library: Issues, Ideas, Innovations* (American Library Association), 1982.