CHAPTER 29

Ensuring Success in the Secondary General Education Curriculum
Through the Use of Teaching Routines

Jean B. Schumaker, Donald D. Deshler, and Philip McKnight

The University of Kansas

INTRODUCTION

Several trends within the education field and our society today are presenting new challenges to educators who work with students with learning problems. First, the amount and complexity of information that is now available to be taught is expanding rapidly. As a result, textbooks are getting thicker and more and more difficult to digest, and students are expected to learn more and more each year (Kame’enui & Carnine, 1998). Second, the standards-based education movement, which is based on the notion that students must meet certain academic standards and is predicated on the national goal of increasing student achievement throughout the country, permeates education today. Indeed, all learners, including those with disabilities, are expected to meet curriculum standards adopted by states and professional organizations (Erickson, Ysseldyke, Thurlow, & Elliot, 1998). Third, many students with disabilities are included in general education classes for a majority of the school day (Wagner, Blackorby, & Hebbeler, 1993), and federal law (P.L. 105-17) dictates that these students be given real access to the curriculum in those classes.

These trends have resulted in an increasingly difficult task for educators who work with secondary students with learning problems. Unfortunately, the academic failure of this group is well documented (e.g., Boyer, 1983; Deshler & Schumaker, 1988; Goodlad, 1984; Powell, Farrar, & Cohen, 1985), and the reasons for this failure are often varied, exceedingly complex, and highly interrelated (Sinclair & Ghory, 1987). Recent research on low-achieving adolescents has indicated that these students’ problems are related primarily to three major factors that appear singly or in combination: (a) learning inefficiencies or disabilities inherent in the student, (b) complex curricular
and setting demands in secondary schools, and (c) ineffective teaching practices (Deshler, Schumaker, Lenz, & Ellis, 1984).

The first factor, the learning deficiencies evidenced by at-risk adolescents, has received significant attention from researchers, resulting in a profile of these youths that reflects a reduced probability of success for this population in secondary general education classes. First, these students’ performance on reading, writing, and math achievement tests plateaus at approximately the fourth- or fifth-grade level when they reach the tenth grade in school (Warner, Schumaker, Alley, & Deshler, 1980). Thus, the “performance gap” between their skill levels and their grade level in school continues to grow as they move from one high school grade level to the next and as curricular demands escalate (Schumaker & Deshler, 1988). Second, these students often lack much of the prior knowledge of facts and concepts necessary for benefiting from the secondary curriculum (Bos & Anders, 1987). Third, they tend not to use effective strategies for coping with specific academic demands (Carlson, 1985) and often fail to invent strategies when approaching novel tasks (Ellis, Deshler, & Schumaker, 1989; Warner, Schumaker, Alley & Deshler, 1989). Fourth, these students often have difficulty when taking notes from lectures (Carlson & Alley, 1981), tending only to write what the teacher writes on the board (Bulgren, Schumaker, & Deshler, 1988). Fifth, when asked to write a paragraph or theme, these students generally write incomplete sentences or poorly structured complete sentences containing many spelling and grammatical errors. In addition, their written products suffer from lack of organization (Deshler, Kass, & Ferrell, 1978; Moran, Schumaker, & Vetter, 1981; Schmidt, Deshler, Schumaker, & Alley, 1989; Schumaker, Deshler, Alley, et al., 1982). Sixth, the majority of these students are concrete thinkers (Skrtic, 1980) and have difficulty making complex discriminations between main ideas and details as well as important versus unimportant information (Carlson & Alley, 1981; Lenz, 1984). Seventh, some of these students do not spontaneously generalize newly learned skills across settings, conditions, and time unless they are specifically taught to do so (Ellis, Lenz, & Sabornie, 1987; Schmidt et al., 1989). Finally, they tend not to be motivated to learn (Seabaugh & Schumaker, 1981a, 1981b). In essence, research has shown that these students are severely deficient in the critical skills required for coping with the rigors of the secondary curriculum and associated higher-order learning tasks.

The second factor that often precipitates the failure of low-achieving adolescents relates to the complex curricular and setting demands in secondary schools. Putnam (1988), for example, found that success in secondary grades depends upon students’ ability to gain information from textbooks that are often both poorly organized and written, typically at an eleventh-grade reading level. In addition, the classroom lectures and discussions from which they are expected to gain information (Schumaker, Wildgen, Sherman, 1980) often are characterized as lacking: (a) advance organizers and postorganizers, (b) appropriate pacing to permit notetaking, (c) adequate instruction on prerequisite vocabulary, and (d) sufficient repetition of information (Lenz, Alley, & Schumaker, 1987; Moran, 1980). Grades in secondary content courses are largely dependent on the students’ ability to succeed on tests that contain primarily objective-
type questions and require about 40 responses about factual information (Putnam, 1988). Grades on written products depend mainly on students’ ability to write cor-
rectly spelled words and grammatically error-free, long sentences (Moran & DeLoach, 1982). In short, success in secondary schools is, in large measure, directly related to a
student’s ability to acquire, manipulate, store, and express or use large amounts of
information that can be obtained only from sources that do not allow for learning ineff-
ciciencies in key areas.

A third factor that may contribute to student failure in secondary schools is the
application of ineffective or inappropriate teaching practices by many teachers respon-
sible for content instruction (e.g., chemistry, social studies, English literature) (Cuban,
1984; Cusick, 1983). Secondary teachers often report that their primary role is to serve
as “content experts” who have major responsibility for delivering accurate and current
content information to students; in addition, they do not feel responsible for spoon-
feeding students who are ill prepared to learn (Lieberman & Miller, 1978). Consequently, secondary teachers do not exhibit much variation in the pedagogical
approaches they employ, and the predominant instructional method used by these
teachers is the lecture (Goodlad, 1984; Moran, 1980; Schumaker et al., 1980). Although lecturing, per se, is not an ineffective format, Moran’s (1980) and Lenz’s
(1984) research studies have underscored the failure of many secondary teachers to
incorporate effective teaching skills within their lectures (e.g., organizing statements,
clarifying questions).

Secondary content teachers’ reliance on the lecture format may be the result of the
fact that many preservice curricula offered by schools of education prepare secondary
teachers to be primarily content rather than instructional experts. Specifically, the over-
whelming majority of course hours taken by secondary trainees are in the content
areas; relatively few deal with instructional methods (Scanlon, 1982). In short, many
secondary teachers lack the technical teaching skills required to facilitate learning for
all students, especially students with disabilities (McKnight, 1980).

Any combination of these three major factors in the learning situation can result
in several potentially negative ramifications for student achievement and school adjust-
ment. For example, suppose that one of the factors causes an increased number of stu-
dents to be referred for special education services (Mellard & Deshler, 1984). Once stu-
dents are placed in special education classes, much of the responsibility for their total
educational program is shifted from general education teachers to the special class
teacher, including delivery of content information (Alley & Deshler, 1979). Allington
(1984) strongly questioned the ability of special class teachers to teach all content sub-
jects when they are not certified to do so. Furthermore, when the policy of readily
referring students with learning problems to special education is followed over time
within a given school building, the accepted norm is that the special class teacher car-
ries the major responsibility for educating low–achieving students. Such a mind set
might preclude the introduction of instructional changes in the regular classroom to
accommodate students with learning problems. Additionally, unless the majority of
teachers within a given school building assume some responsibility for low student
achievement and unless their instructional practices are modified accordingly, the reintegration of at-risk students who have been receiving services in the special classroom into the general education curriculum becomes difficult (Licopoli, 1984). Not surprisingly, the high dropout rate among high-risk populations is reported to be, in part, due to the existing environment in secondary schools that is predominately unfriendly to learners with problems (Howe & Edelman, 1985).

The challenges related to educating at-risk students certainly must be addressed. While the solution to these challenges will be multifaceted, a significant part of the solution will be providing secondary teachers the instructional methods that they need to teach these students as well as providing at-risk students the skills they need to succeed in mainstream learning environments. Improving the technical skills with which teachers teach content will go a long way toward enabling at-risk learners to benefit from the information taught in the content classroom. As the needs of low-achievers are better met in general education classrooms, there will be less need to refer large numbers of students for special services. Equally important, students who are referred to special classes can be taught specific strategies for enabling them to cope independently with general class instruction instead of becoming dependent on tutoring from the special education teacher. The probability of school success will be greatly improved because of more accommodating learning environments in general education classes.

**A NEW INSTRUCTIONAL MODEL FOR AT-RISK STUDENTS**

Staff members of the University of Kansas Center for Research on Learning (KU-CRL) have designed a new instructional model for at-risk secondary students that takes into account these students’ need to learn how to independently succeed in mainstream environments as well as their instructional needs within these environments (Deshler & Schumaker, 1988). In this model, hereinafter referred to as the Strategic Instruction Model (SIM), 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. In this model, the special education teacher’s major role is that of the “learning specialist,” one who teaches students how to learn and how to succeed in response to academic demands in general education classes. In turn, the major role of the general education teacher is to deliver content to the students in such a way that they can understand and remember it. The partnership between the two types of teachers comes through their communication about: (a) the demands related to succeeding in general education classes, (b) the skills needed by particular students, (c) students’ progress, and (d) techniques that can be used to help at-risk students within general education classes.

Other persons also play critical roles in this model. The students must not only be willing and motivated participants, they must take major responsibility for their learning and performance. Administrators, school psychologists, other support staff, family members, and personnel in other community agencies also can play an important part in a SIM program.
How teachers, students, and others interact to promote successful participation of at-risk adolescents within the general education curriculum as well as facilitate their successful transition to post-secondary life has been the subject of a programmatic line of research for 23 years at the KU-CRL. The products of this research have served as building blocks for the comprehensive SIM program. As the roles of participants in a SIM program are described in the following sections, the components of the model are clarified.

The Role of the Learning Specialist

The learning specialist’s major responsibility in a SIM program is to teach students specific strategies by using a validated instructional methodology. Usually, this instruction takes place in a support class (e.g., a special education classroom, a strategies course, a remedial course) or in a general education class in which the curriculum is tightly aligned with the strategy being taught (e.g., teaching a paragraph writing strategy in a co-teaching arrangement in an English class in which students are learning to write paragraphs). The strategies to be taught include: learning strategies, which enable students to learn and perform academic tasks (Deshler & Schumaker, 1988); social skills strategies, which enable students to interact effectively with others (Schumaker, 1992); motivational strategies, which enable students to motivate themselves and exercise self-control (Seabaugh & Schumaker, 1981a, 1981b; VanReusen, 1998); transition strategies, which enable students to solve their own problems and plan for the future (Crank, Deshler, & Schumaker, 1995; Vernon, Deshler, & Schumaker, 1999); and executive strategies, which enable students to analyze a task, then select, adapt, or invent a strategy for use, and evaluate the results of applying the strategy (Ellis et al., 1989).

The instructional methodology used in teaching these strategies comprises eight major instructional stages to: (a) obtain a pretraining measure of the students’ skills and gain the students’ commitment for learning; (b) make the students aware of the strategy steps, where the strategy can be applied, and how the strategy will benefit them; (c) demonstrate for students how to use the strategy; (d) ensure that students understand and can name the strategy steps; (e) ensure that students master the use of the strategy in simplified materials/situations; (f) ensure that students master the use of the strategy in materials and situations similar to those encountered in general education classes; (g) obtain a post-training measure of the students’ skills; and (h) ensure that the students generalize the use of the strategy to general education classes (Ellis, Deshler, Lenz, Schumaker, & Clark, 1991). The materials and procedures to be used by the learning specialist in these undertakings have been empirically validated in a series of studies (e.g., Clark, Deshler, Schumaker, Alley, & Warner, 1984; Hughes, Deshler, Ruhl, & Schumaker, 1993; Hughes & Schumaker, 1991; Lenz & Hughes, 1990; Robbins, 1982; Schmidt et al., 1989; Schumaker, Deshler, Alley, et al., 1982; Schumaker, Deshler, Denton, et al., 1982). Some of the materials have been published for teachers’ use (e.g., Hazel, Schumaker, Sherman, & Sheldon-Wildgen, 1981; Hughes, Schumaker, Deshler, & Mercer, 1988; Lenz, Schumaker, Deshler, & Beals, 1984; Nagel, Schumaker, & Deshler, 1986; Schumaker, Denton, & Deshler, 1984;
Schumaker, Hazel, Pederson, 1988; Schumaker, Nolan, & Deshler, 1985; Schumaker & Sheldon, 1985; and Van Reusen, Bos, Schumaker, & Deshler, 1994); others currently are being prepared for publication. (Some of these materials [i.e., those associated with the Learning Strategies Curriculum and the Content Enhancement Series] are available only through training sessions led by trainers associated with the KU-CRL. For more information, contact the Coordinator of Professional Development, KU-CRL, 517 J. R. Pearson Hall, 1122 West Campus Road, Lawrence, KS 66045.).

In addition to fulfilling the major role of teaching students strategies by means of intensive instruction, the learning specialist also must perform other functions that ultimately facilitate this major role. One function is to create a strategic environment within the support service setting. The strategic environment serves as the context in which specific strategies can be learned and generalized most effectively. In other words, if strategies are taught in an isolated fashion, unrelated to the solution of day-to-day problems within a broader context, students will have difficulty generalizing mastered strategies. Therefore, the learning specialist must model the use of strategic approaches to new problems and engage the students in strategic activities whenever possible in order to teach the students the generality of the approach to life situations.

Additionally, the learning specialist must promote students’ independent functioning in academic and social realms. In partial fulfillment of this goal, the learning specialist must refrain from tutoring students in content subjects to avoid encouraging the dependence that typically results from such tutoring (Carlson, 1985; Hock, Deshler, & Schumaker, 1999). Also, the learning specialist must deliberately involve students in planning their instructional programs, setting their own learning goals, and advocating for themselves in instructional planning sessions (Van Reusen et al., 1994). Finally, the learning specialist must require students to think and act on their own rather than performing tasks for the students. For example, when asked a question by a student, the teacher should redirect the question in a way that students can answer it themselves. Materials and equipment should be accessible to students so they can obtain needed resources and start work on their own. Academic work should never be done “for” students. They should be given the tools to complete the work independently.

Besides fulfilling these complex responsibilities within the support setting, the learning specialist also must perform a leadership role outside the support setting to promote a cooperative partnership with general education teachers. A set of “Teaming Strategies” has been developed and validated for use in this partnership. These strategies allow learning specialists and mainstream teachers to work together to identify mainstream setting demands, discuss and solve problems, negotiate conflicts, and encourage the use of validated instructional techniques in general education classrooms (Knackendoffel, 1989; Knackendoffel, Robinson, Deshler, & Schumaker, 1992).

To summarize, the learning specialist must create a strategic environment in which a specialized set of curriculum materials is used in conjunction with a validated instructional methodology designed to promote students’ independent functioning in general education classes. Additionally, this teacher must work cooperatively with general education teachers to ensure that the goal of independent student functioning is met.
The Role of the General Education Teacher

The major role of the general education teacher is straightforward; it involves the delivery of content to students so as to promote (a) their application of the strategies they have learned, (b) their understanding of the content information, and (c) their recall of that information. Occasionally (e.g., in the case of an English teacher who needs to teach students how to write complete sentences), the general education teacher also may be responsible for teaching a particular strategy—for example, the Sentence Writing Strategy (Schumaker & Sheldon, 1985).

To promote the use of strategies learned in the support setting, general education teachers can rely on a variety of cueing devices to remind students to use the strategies when appropriate; they can also structure their delivery of content so that strategies can be applied easily. For example, a teacher can organize a lecture into four major sections, orally cue students to use the Listening and Notetaking Strategy (Berry, 1999) before the lecture begins, and cue students when a transition is being made during the lecture to each of the four major sections.

To teach strategies in large classes, which are so prevalent in the mainstream at the secondary level, general education teachers can use a variety of instructional arrangements and techniques. To promote students’ understanding and retention of the content of lectures and other lessons, these teachers can use teaching routines and devices designed specifically to be integrated into the class routine while promoting gains in student performance. These routines and devices, as well as the cueing techniques and instructional arrangements that can be used by general education teachers, are described in detail later in this chapter.

The Role of Students

Two types of students have been served successfully in SIM programs: students who qualify for special services in support classes and other at-risk students. Normally, students with disabilities have been served both in support classes and in general education classrooms. Other at-risk students (i.e., low-achievers, those at-risk for dropping out of school) traditionally have been served in general education classrooms, but some educators now are designing support-class settings (e.g., courses in learning strategies) for these students as well. Thus, students typically enrolled in a SIM program have roles to fulfill in both settings. In the support service setting, students are responsible for (a) planning their instructional programs, (b) specifying what they will learn and how fast they will learn it, (c) learning specific strategies to mastery, (d) recording their own progress, (e) evaluating their own progress, and (f) changing goals accordingly. In general education classes, they are responsible for applying, adapting, and inventing strategies where they are needed and for monitoring and evaluating their own progress. They are also responsible for learning the content and meeting the demands of their courses. Thus, students within a SIM program assume an active role in their learning; they are viewed by educators as persons who can learn to succeed independently instead of being dependent entities whose lives must be arranged for them.
The Role of Others

As the SIM has evolved, the roles that administrators, school psychologists, other support staff, family members, and community agency personnel can play in promoting at-risk students’ success within the general education curriculum have become clearer. School administrators, for example, can play a critical role in ensuring that the program operates as specified. Not only must they provide the necessary financial and other support, they must voice the necessary expectations so that learning specialists and general education teachers, in turn, can fulfill their roles and can work together productively. They must arrange appropriate and ongoing professional development experiences for their staff. They must require accountability in the form of reports of student progress.

Support staff also can be helpful in promoting the program’s success. School psychologists, for example, can help identify general education class demands (e.g., the readability level of textbooks, the types and length of assignments, the types of tests given) and ensure that all participants in educational planning meetings (including students and parents) have a voice in making decisions about students’ learning. Likewise, scheduling officers can contribute by hand-scheduling (versus computer-scheduling) students’ programs so that they can be grouped for appropriate instruction in certain general education classes and in the support setting as needed. Furthermore, parents can participate by offering support and encouragement in the home and by promoting the generalization of strategies to homework and other situations encountered in the home and community.

Finally, personnel in community agencies can aid the transition of graduates of SIM programs into adult life. For example, personnel in one community mental health center worked with school district staff to match each SIM student with a community volunteer who served as the youth’s mentor through the transition process. Agency staff recruited and trained mentors, had regular contact with mentors, and monitored a youth’s progress through a series of goal-setting and evaluation sessions with mentor-youth pairs. This type of program has proved very successful in getting youths involved in postsecondary education and training and employed in meaningful jobs (Moccia, Schumaker, Hazel, Vernon, & Deshler, 1989; Schumaker, Hazel, & Deshler, 1985).

An Example of the Strategic Instruction Model

An example of how a SIM program might work for a student under certain circumstances illustrates some of the processes that have been activated in school districts across the nation. Suppose that in a school in which teachers, support staff, and administrators have worked together to promote a SIM program, the school psychologist has determined that students have to be able to memorize lists of items and learn the meaning of vocabulary terms to succeed on a particular biology teacher’s tests. A student enrolled in the learning specialist’s support class also is enrolled in the targeted biology class. The school psychologist informs the learning specialist of this class demand. The learning specialist then works with the student to determine whether he or she
wants to learn strategies that will help meet this class demand. First, pretests are given to determine how well the student can organize and memorize lists as well as learn the definitions of vocabulary. Next, the results of the pretest are shared with the student. If the results indicate that the student needs to learn one or both strategies, the student decides whether he/she wants to learn a strategy and, if necessary, which strategy to learn first. Upon deciding to learn a strategy, the student writes a goal to that effect. Then the learning specialist teaches the student (and others who have written a similar goal) the chosen strategy. For example, the learning specialist might teach the student the FIRST-Letter Mnemonic Strategy (Nagel et al., 1986), a strategy for (a) organizing information into list form, (b) memorizing the information, and (c) utilizing the information to answer test questions. After working hard over a period of about 3 weeks, the student masters the strategy and applies it to the textbook used in the biology class and the notes taken in that class.

Meanwhile, the learning specialist and the biology teacher work together to ensure that the biology teacher understands the strategy the student (and other students in the class) is learning in order to be better able to facilitate the student’s use of the strategy. Whenever possible, the biology teacher presents lecture information in list form and, in addition to writing lists on the board, cues students when information in the lists must be learned for tests. When time permits, the teacher helps design a mnemonic device for a given list or asks students to work cooperatively to design the devices themselves. When the biology teacher reviews information the day before a test or when he or she gives students a study guide, the necessary information is provided in list form. The day before the test, the students who have learned the strategy are reminded to use the FIRST-Letter Mnemonic Strategy as they study for the test.

Throughout instruction on each new biology unit, the target student builds up a file of 3” x 5” cards containing important lists. The night before a test, in a study session supported by the student’s parents, the student applies the FIRST-Letter Mnemonic Strategy to the lists taken from lectures as well as other lists derived from the assigned textbook chapter to ensure that he or she has memorized the necessary information. As the student takes each test, the student recalls information through the use of the memory devices he or she has designed.

This student receives grades of As and Bs on the tests. After learning and integrating several strategies like this and applying them to several courses, the student graduates from high school. By working with a mentor, the student later enrolls in junior college courses, taking biology and other courses at the local junior college and continuing to apply the strategies learned in high school. The student has become an independent learner and performer.

**CONTENT ENHANCEMENT ROUTINES FOR IMPROVING PERFORMANCE IN GENERAL EDUCATION CLASSES**

As described earlier, the role of the content teacher in a SIM program is not only to teach a prescribed body of subject matter to students but to do so in a way that facil-
itates students’ understanding and recall of that content. This additional aspect of the role of content teachers is particularly pertinent in light of the increasingly heavy challenge that they are expected to meet with respect to teaching not only more content but also more advanced and complex content (Powell et al., 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 et al., 1998) as mentioned above.

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. Researchers at the KU-CRL have applied five criteria when designing and researching instructional routines or devices. First, such routines and devices must be straightforward and easy to master in a relatively short time. Second, they 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 and devices versus having to sacrifice large amounts of their content because they are using the routines. Fourth, they 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, normal-achieving and high-achieving students must perceive the teacher’s use of the routines and devices as facilitative, not as “extra baggage” that gets in the way of learning. Fifth, the routines and devices 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. Further, 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 following sections describe a variety of routines and devices that have been developed by KU-CRL researchers and associates and that fulfill these criteria. All have been validated experimentally.

Routines for Teaching Strategies in General Education Environments

In some instances, instructional routines can be used to teach learning in general education classes, as detailed earlier. For example, learning strategies in the written expression strand of the Learning Strategies Curriculum—for example, the Sentence Writing Strategy (Schumaker & Sheldon, 1985), the Paragraph Writing Strategy (Schumaker & Lyerla, 1991), the Error Monitoring Strategy (Schumaker, Nolan, & Deshler, 1985), the InSPECT Strategy (a strategy for using computerized spellcheckers) (McNaughtin & Hughes, 2000), and the Theme Writing Strategy (Schumaker, in preparation)—can be taught in English and language arts classes. Strategies that enable students to study for tests (Bulgren, & Schumaker, 1996; Ellis, 1993; Nagel, et al., 1986) and take tests (Hughes et al., 1988) can be taught in content classes such as history and science. Alternatively, learning strategies classes or study skills classes can become a standard part of the curriculum, as has happened in many school districts across the nation.
Large numbers of students and heterogeneous groupings of students usually characterize these classes. Such characteristics create especially heavy demands on learning-strategies instructors because (a) students must practice using a strategy several times before mastering it; (b) they master the use of a strategy after varying numbers of practice attempts in relation to their skills and abilities; and (c) they must receive specific, individual feedback about each of their practice attempts to make progress toward mastery. Ensuring mastery and providing individual feedback in large classes is often problematic. Thus, teaching strategies to large numbers of students with a variety of learning characteristics requires special methods. Recently, a number of methods have been validated experimentally for accomplishing this type of instruction, including the use of special feedback systems, cooperative group instruction, and peer tutoring.

**Special feedback systems.** One method that has proved useful is a special way of giving individualized feedback to students. Typically, this involves a feedback sheet on which the teacher can indicate the type of error(s) the student made on the last practice attempt. This sheet is given back to the student along with the student’s product. The teacher allows the students a couple of minutes to review the feedback sheet and then gives feedback to the class. For example, the teacher asks students whose feedback sheets indicated that they failed to include a transition sentence between paragraphs to pay attention to her feedback. After giving feedback to those students, she asks those students who failed to use a logical sequence across paragraphs to pay attention to her feedback, and so forth.

This method has been shown to be effective by Howell (1986), who used it while teaching the Theme Writing Strategy (Schumaker, in preparation) in her five general education English classes to a total of 150 students. In addition to following the instructions for teaching her students to acquire and generalize the strategy just as a support class teacher would, she provided specific written individual feedback to all 150 students after each attempt via a specially designed Feedback Sheet. The Feedback Sheet contained a list of descriptions of areas in which students could do well and a list of descriptions of possible errors. After reading and scoring a theme, Howell simply checked those items that had been done well and those that needed improvement. She also wrote brief comments on the sheet as needed. The Feedback Sheet allowed the teacher to give the majority of her feedback in written form so that class time could be spent on additional instructional activities, reviewing common trouble spots for the class, and providing oral feedback and help to individual students having major difficulties. Students were told to review their Feedback Sheets, listen to the oral whole-class feedback, ask the teacher for help with items that were unclear, and pay particular attention to the Feedback Sheets as they wrote their subsequent papers. Howell found that her students mastered the strategy at levels comparable to those of students who had received individual instruction and individual feedback.

**Cooperative group instruction.** Another method that has been validated experimentally for teaching strategies within general education classes is cooperative group instruction. In essence, with this method, the teacher introduces the strategy to the whole class, and then students work in cooperative groups during the practice activi-
ties to help each other master the strategy. Beals (1983) used this method in a study in which two strategies, the Sentence Writing Strategy (Schumaker & Sheldon, 1985) and the Paraphrasing Strategy (Schumaker et al., 1984), were taught in general education English classes. After the strategy was introduced to each class, the students were divided into small heterogeneous groups, and practice assignments were given to the groups. At the end of a given lesson, one group member was selected randomly from each group to perform the target skill for the lesson. The group’s grade for the day was contingent on that person’s performance. Individual grades also were given for individual performance on the lesson. At the beginning of each subsequent lesson, group members were required to review and discuss the feedback received by each member on individual work and to help each other understand relevant concepts. Beals (1983) found that all the students (high-achievers, normal-achievers, low-achievers, and students with learning disabilities) showed improvement in their skills and mastered the use of the strategy. The students with learning disabilities achieved at levels comparable to levels attained when similar students were taught the strategies in resource room programs.

**Peer tutoring.** Peer tutoring also can be used when teaching strategies to large groups of students in heterogeneous general education classes. This method has been validated as effective in resource classes; thus, its use in general education classes seems to be a logical extension. Keimig (in preparation) developed a method by which learning disabled (LD) students who had mastered the Error Monitoring Strategy (Schumaker et al., 1985) taught this strategy to other students with learning disabilities (LD) in a resource room. Simple instructions were written on cards for the student tutors to follow as they taught each lesson. The student tutors were responsible for providing instruction, answering questions, scoring lessons according to answer keys, giving individual feedback after each practice attempt, and stating that mastery of the skills would be required. The tutors were taught how to perform these teaching tasks in 1 1/2 hours of instruction. Keimig found that the students with LD in his study learned to use the strategy at levels comparable to levels exhibited by students with LD who had been taught the strategy by a teacher. They had mastered the strategy after comparable amounts of instruction. Keimig’s study shows that, given some training, students with LD who have mastered a learning strategy can serve as effective instructors of those strategies to other dysfunctional learners.

A logical extension of Keimig’s work includes teaching learning strategies to small groups of students enrolled in general education classes by student tutors who have mastered these strategies and the necessary instructional procedures. Such an arrangement would allow students with disabilities or other learning problems to “shine” in their general education classes and conceivably could enhance their self-esteem. Additionally, if supposed “dysfunctional” learners can be successful instructors of learning strategies, other, more functional learners might be recruited as “student aides” to perform some of the teaching tasks that must be carried out in settings with large numbers of students. For example, they might lead verbal rehearsal exercises, check off verbal mastery of the concepts and steps of a strategy, and provide explanations and/or additional feedback on graded work.
Routines for Cueing Use of Strategies

When students with disabilities are taught strategies to mastery levels in support classes, they sometimes fail to generalize the use of those strategies to other classrooms. Several methods involving cueing (i.e., prompting the student to use strategies) in the general education classroom have been found to help ensure generalization.

Visual cueing methods. The first type of method involves visually cueing students to use a given strategy. One effective format for visual cueing (Schmidt, 1983) involves the use of cue cards. The student writes the steps of a strategy on a 3” x 5” or 4” x 6” card that is affixed to the appropriate textbook or notebook. For example, students who have learned a strategy for extracting important facts from textbook chapters would make cue cards that list the steps of the strategy and attach them to the cover of each of their textbooks or use them as bookmarks. Students who have learned a strategy for taking notes during lectures would make cue cards listing the steps of the strategy and affix them to each of their notebooks for classes in which notetaking is appropriate. In the case of writing strategies, students make a set of cue cards of formulas and rules to which they can refer as they write. They keep these aids in their notebooks for classes in which they are asked to write. The cards must be colorful and assigned a visually prominent place so that the student will see them as the textbook or notebook is opened.

Another type of visual cueing technique was built into one of the strategies, the Test Taking Strategy (Hughes et al., 1988). To perform the first step of the Test Taking Strategy, students must write a cue word on their test papers before they begin taking the test and applying the strategy. Each letter of the cue word represents something the students must do or attend to as they take the test. Thus, in effect, by writing the cue word in a visually prominent place, the students cue themselves to use the strategy.

The general education teacher’s role with respect to these visual cueing systems is to encourage their use; that is, general education teachers must be aware of the rationale for using these visual cueing devices and must allow their use. They also must be sensitive to adolescent students’ need to “be like” other students and, therefore, avoid drawing attention to the fact that they are different because they use these visual cueing devices.

Verbal cueing devices. Another type of cueing that has been found effective in encouraging generalized use of a learning strategy is verbal cueing. For one verbal cueing technique, the general education teacher is designated as the person who supplies the cues. For example, if the student has mastered the Sentence Writing Strategy (called “PENS” by the students), the teacher surreptitiously says to the student, “Be sure to use ‘PENS’ on today’s assignment,” after giving the class an assignment to write a paragraph. Specifically, the general education teacher’s role with verbal cueing consists of being aware of the strategies a student has mastered, matching those strategies appropriately to given assignments, and remembering to cue the student before she or he begins a task.

The other verbal cueing technique that has been found to be effective (Keimig, in preparation) involves student peers. Here, students who have learned a strategy in the
special class also learn to cue each other to use the strategy in other classes and to help each other when needed. For example, two students who have learned the Error Monitoring Strategy (Schumaker et al., 1985), a strategy for detecting and correcting errors in written work, can learn to become responsible for cueing each other to use the strategy any time written work is assigned in their shared classes. That is, the students can be responsible for discriminating the conditions for which the use of the strategy is appropriate; in addition, they can be responsible for briefly communicating to each other about those conditions (e.g., “We should use the Error Monitoring Strategy on this assignment.”). The general education teacher must allow the students to be seated close enough to each other so that they can cue each other without disturbing others and let them briefly chat at the beginning of an assignment so that they can determine which strategies are most applicable and whether certain adjustments need to be made in the strategies.

Routines for Teaching Content

As emphasized earlier, the primary role of most secondary teachers is to convey information in such a way as to ensure that students understand it and remember it. When students with disabilities and other at-risk students are enrolled in content courses, the teacher’s role becomes more complex. Thus, in classrooms where these types of students are being educated, effective techniques or teaching routines that correspond to these students’ particular characteristics are needed. Over the past 15 years, a number of specifically designed routines have been proved effective for helping at-risk students learn in general education classes (Table 1). These routines are called Content Enhancement Routines (Lenz & Bulgren, 1995) because they enable teachers to enhance the learning of content by all the students in their classes. 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 the 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: (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. Teachers use the Content Enhancement Routines to create a learning apprenticeship (Bulgren & Lenz, 1996; Hock, Deshler, & Schumaker, 1993; Hock, Schumaker, & Deshler, 1999) in their classrooms whereby they show students how to learn information through modeling the processes involved in manipulating and transforming it.

Four types of Content Enhancement Routines have been developed and validated: Organizing Routines, Understanding Routines, Recall Routines, and Application
# TABLE 1

## Content Enhancement Routines

<table>
<thead>
<tr>
<th>Routine</th>
<th>When Used</th>
<th>Purpose</th>
<th>Teacher Materials</th>
<th>Student Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Organizer</td>
<td>At the beginning of a course and between units</td>
<td>To introduce the course, to keep students informed of progress through the course</td>
<td>Textbook, course notes, other resources, Course Organizer</td>
<td>Course Organizer and pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit Organizer</td>
<td>At the beginning of a unit, during the unit, at the end of the unit</td>
<td>To introduce a unit and to keep students informed of progress through the unit, to review the unit</td>
<td>Textbook, unit notes, other resources, Unit Organizer</td>
<td>Unit Organizer and pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesson Organizer</td>
<td>At the beginning of a lesson (or group of lessons), during a lesson, at the end of the lesson</td>
<td>To introduce a lesson and to keep students informed of progress through the lesson, to review the lesson</td>
<td>Textbook, lesson notes, other resources, Lesson Organizer</td>
<td>Lesson Organizer and pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey Routine</td>
<td>When students are given an assignment to read a chapter</td>
<td>To provide an overview of a chapter and the information to be learned</td>
<td>Textbook, &quot;TRIMS&quot; Worksheet</td>
<td>Textbook, &quot;TRIMS&quot; Worksheet, pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Framing Routine</td>
<td>During a lesson</td>
<td>To depict relationships among main ideas and details in a lesson</td>
<td>Textbook, resources, The Frame</td>
<td>The Frame and pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept Mastery</td>
<td>During a unit of study</td>
<td>To introduce a major concept in the unit</td>
<td>Textbook, resources, Concept Diagram</td>
<td>Concept Diagram and pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept Anchoring</td>
<td>During a unit of study</td>
<td>To connect a major concept to students’ background knowledge</td>
<td>Textbook, resources, Concept Anchoring Table</td>
<td>Concept Anchoring Table and pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept Comparison</td>
<td>During a unit of study</td>
<td>To compare and contrast two or more concepts</td>
<td>Textbook, resources, Concept Comparison Table</td>
<td>Concept Comparison Table and pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recall Enhancement</td>
<td>During a lesson</td>
<td>To help students remember information</td>
<td>Lesson notes, textbook, chalkboard</td>
<td>Paper and pencils</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clarifying Routine</td>
<td>During a lesson</td>
<td>To introduce a new term and help students remember it</td>
<td>Lesson notes, textbook, Clarifying Table</td>
<td>Clarifying Table and pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality Assignment</td>
<td>When an assignment is to be given</td>
<td>To plan, present, and evaluate an assignment</td>
<td>Quality Assignment Planning Worksheet, Assignment Window or Handout</td>
<td>Assignment notebook and pencil</td>
</tr>
<tr>
<td>Routine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 major concepts and main ideas in a course. Recall Routines are used to help students understand and remember important details related to a course. Application Routines are used to set up situations in which students can practice with new information and apply what they have learned.

**Organizing Routines.** Several Organizing Routines have been developed. Teachers can use the Course Organizer Routine (Lenz with Schumaker, Deshler, & Bulgren, 1998) to introduce a whole course to students and to review progress through the course. They can use the Unit Organizer Routine (Lenz with Bulgren, Schumaker, Deshler, & Boudah, 1994) to introduce and review progress through a unit of study. They can use the Lesson Organizer Routine (Lenz, Marrs, Schumaker, & Deshler, 1993) to present a prescribed set of information as an advance organizer for a lesson.

Indeed, all three of these routines serve as advance organizers. An advance organizer has been defined as 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 a paucity of background knowledge or an inability to organize information such that it can be easily retrieved, and for those with poor motivational and/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 the 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.

Teachers were trained to design and deliver lesson organizers containing the 12 components in their secondary content classes (e.g., history, English, physical science) at the beginning of each class period. Lenz et al. 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 an 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 to the number of statements they made after lessons when they had not been informed about how to attend to the lesson organizer.

Lenz (1984) also conducted another study to determine the effects of a lesson organizer on students’ learning and retention of written information. Basically, the same format was used for the lesson organizer as described for the Lenz et al. (1987) study; a few adjustments were necessitated by the reading task as opposed to the lecture/discussion task. In addition, the usefulness of the lesson organizer was explained specifically to the students, who were instructed to take advantage of it before reading the assigned passage. Lenz found substantial differences between the recall performance of students with LD when they received an organizer before reading a passage and their performance when they did not receive the organizer. Students with LD who had not received an organizer correctly answered more questions about unimportant information than questions about important information in the passage. In contrast, students with LD who had received an organizer answered more questions correctly about important information than about unimportant information. In fact, they correctly answered about the same number of questions correctly about important information (an average of 19 out of 30 questions) as a group of normal achievers who had not received an organizer (an average of 21 out of 30 questions). The use of the organizer only slightly improved the typical achievers’ recall of important information (from an average of 21 to 22 answers correct), but it substantially improved the performance of the students with LD (from an average of 13 to 19 answers correct).

These data indicate that the use of organizers by a teacher helps students with disabilities discriminate important information from unimportant information. In addition, organizers help them store that information so that it can be recalled later for a test over the information. The result of this more efficient storage is that their performance on a test covering important information is not substantially different from the performance of non-handicapped learners. These findings suggest that an organizing routine that precede a classroom lesson or a reading assignment can be a beneficial tool for enhancing the performance of low-performing students. Although the research conducted to date has not identified the effects of an organizing routine used on a daily basis on students’ grades in general education courses, one logically might assume that the effects noted in the tests in Lenz’s study (1984) would be reflected in higher scores on unit tests. Since a large percentage of a student’s grade is based on test scores in secondary classrooms (Putnam, 1988), one also might suppose that course grades would be improved.

In a study in which unit test scores were used as a measure of the effects of teacher use of a routine, Lenz and his colleagues found that the unit test performance of students with and without learning disabilities increased an average of 10 points above baseline when the Unit Organizer Routine (Lenz, with Bulgren, Schumaker, Deshler, & Boudah, 1994) was used to introduce each unit of study in secondary general education science and history courses and to continue to inform students about relationships among information during each. Seven of the eight students with LD who participated in the study and who were earning failing scores on unit tests during the base-
line condition earned average scores of 72% or higher on unit tests after their teachers started using the Unit Organizer Routine unit (Joint Committee on Teacher Planning for Students with Disabilities, 1995).

Another Organizing Routine that appears to hold promise for enhancing the achievement of low-achieving students is the Survey Routine (Deshler, Schumaker, & McKnight, 1997). This routine was designed to enable general education teachers to provide an overview of a new textbook chapter to their students before initiating instruction related to that chapter. Low-achieving students frequently have difficulty reading textbooks written at grade level (Schumaker & Deshler, 1984), often demonstrate limited background knowledge related to lessons and assignments (Graff, 1987), and have difficulty discriminating important from unimportant written information (Lenz, 1984). In addition, textbooks often are written in a way that is “inconsiderate” (Armbruster, 1984) for the reader.

The Survey Routine was designed to help students compensate for these problems; it is an interactive routine in which the teacher leads students through a step-by-step process of analyzing the content of the new chapter while taking notes on a specially constructed worksheet. There are places on this worksheet for the students to record information derived from each step. In the first step, students read and paraphrase the chapter’s title. Next, the relationship of the new chapter to previous and subsequent chapters is discussed by reference to the table of contents in the textbook. Third, the introduction of the chapter (or the first paragraph) is read aloud and paraphrased by the students. Fourth, the major sections of the chapter are delineated. Here, the teacher draws a diagram of the chapter on the board, using boxes to represent each part of the chapter. The title of a major section is paraphrased and written at the top of each box. The most important items to which the students should attend within each section (e.g., new vocabulary, a diagram, a map, or an important explanation) then are listed within each box by the teacher. Finally, the summary of the chapter is read and paraphrased.

The results achieved through the use of this routine have been promising but inconsistent. For some teachers who used the routine, students’ test scores on regularly scheduled chapter tests increased an average of 10 percentage points above baseline levels. All students, including normally achieving students, realized some improvement, with the students with LD achieving the largest gains; when the teachers stopped using the routine, all students’ test scores returned to baseline levels. Other teachers did not achieve the same positive results. The reasons for these differences remain unclear. Perhaps the way in which the overall organization of the chapter is described and the ways in which important details are highlighted are factors. Perhaps the kinds of details that are highlighted or the enthusiasm with which the teacher delivers the information influences the results. Clearly, additional research is needed on this routine.

One more Organizing Routine that can be used to facilitate subject-matter learning is the Framing Routine (Ellis, 1998). Teachers use this routine to organize information in a lesson or series of lessons and to portray the relationships among information. The routine is used in conjunction with a graphic organizer called the “Frame.” The Frame helps students see the relationships among abstract pieces of information.
because it is a concrete representation of the structure of the information. It also helps them to see the relationship between main ideas and details within a lesson. The teacher prepares a draft of the Frame before class and then uses the routine to interactively discuss the information with students in class. Both the teacher and the students fill in blank Frames as the class proceeds. Thus, the final Frame is a joint product created by the teacher and students working together.

In one study by Ellis, Raines, & Hansford (in preparation), the Framing Routine was used for some lessons and not for other lessons in a fourth and fifth-grade multi-age social studies class. The results indicated that essay test scores were an average of 21 percentage points higher when the routine had been used as opposed to when it was not used. Similar gains were achieved by students with and without disabilities.

Another study focused on the writing performance of eighth graders who received Framing Routine instruction versus the writing performance of students who did not receive the instruction. Results showed that the performance of the experimental students was significantly higher than that of the comparison students on every writing measure. For example, the experimental students wrote an average of 102 words more than the comparison students (Ellis & Feldman, 1994).

Understanding Routines. Other routines that have had positive effects on the test performance of students with disabilities and other students in secondary general education courses are the Understanding Routines. The purpose of these routines 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 (Bulgren, Deshler, & Schumaker, 1993), for example, entails the use of a Concept Diagram, which serves to organize the information related to the concept into categories of information that (a) name and define the concept; (b) are related to the characteristics that are always, sometimes, and never present in the concept; and (c) are related to examples and nonexamples of the concept. Symbols and shapes are used on the diagram to make the differences between information categories distinct and concrete for the students. A rough draft of the Concept Diagram is prepared by the teacher before class. Through an interactive discussion, which comprises the Concept Mastery Routine, the teacher and students fill in blank Concept Diagrams about the concept in class. The final diagram, then, is a product that is co-constructed by the teacher and students working together.

Bulgren, Schumaker, & Deshler (1988) evaluated whether teachers could learn to use the Concept Teaching Routine and the subsequent effects of its use on students’ performance in general education courses. They found that content teachers readily learned to use the routine at mastery levels in less than 3 hours of instructional time. When the teachers settled into a routine of presenting one major concept during each unit of study, students’ performances were enhanced in a variety of ways. For example, both students with LD and other students wrote three times more items of concept-related information in their notes than before the Concept Teaching Routine was used. When the students took a test over the concept information covered in a given unit, mean test scores also increased above baseline levels for all students. Test scores
improved even further when the concept information was reviewed the day prior to
the test along with other material in the regularly scheduled review session. Test scores
on regularly scheduled unit tests also showed a significant improvement when the con-
cept information was reviewed as a part of the regular review. During baseline, only
57% of the students with learning disabilities were passing the regularly scheduled unit
tests. During the concept training and review condition, however, 75% of the students
with learning disabilities were passing the tests. Thus, the learning and retention of
conceptual knowledge enhanced students’ performance on unit tests, all of which were
publisher-made tests designed to measure factual knowledge.

Similar results have been achieved through the use of the Concept Anchoring
Routine (Bulgren, Schumaker & Deshler, 1994a), a routine for helping students con-
nect new knowledge about a concept to their prior knowledge, and the use of the
Concept Comparison Routine (Bulgren, Lenz, Deshler, & Schumaker, 1995), a rou-
tine for helping students compare and contrast two or more concepts. When students
with LD participated in the Concept Anchoring Routine along with other students in
their general education classes, they earned an average test score of 69%; other students
with LD who participated in traditional instruction about the same concept earned
average test scores of 40%. Comparable differences were found for other low-achiev-
ing students and for normally achieving students in the same classes (Bulgren, Lenz,
Schumaker, Deshler, & Marquis, in press).

Similarly, when the Concept Comparison Routine was used, students recalled
more information than when it was not used. Control students with LD earned a mean
test score of 57%, whereas experimental students with LD earned a mean test score of
71%. Other low-achieving students in the control group earned a mean test score of
63% and in the experimental group earned a mean test score of 86%. Similarly, nor-
mally 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% (Bulgren, Schumaker,
Deshler, & Lenz, in preparation).

Recall Routines. A third type of routine that has been used by general education
teachers and that produces 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 experi-
mental studies. This routine involves the co-construction of mnemonic devices (mem-
ory 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 lightbulb, they might make a mental picture of a swan holding a lightbulb
that shines weakly. To use the routine, the teacher cues students that certain informa-
tion 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. One experimental study showed that students with LD scored signif-
ically higher on content tests when this routine was used (their mean score was 71%)
as opposed to when it was not used (their mean score was 42%) (Bulgren, Schumaker,
& Deshler, 1994b). Another experimental 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).

Another Recall Routine is called the Clarifying Routine (Ellis, 1997). It is used by teachers to help students understand and master the meaning of important words or phrases (e.g., vocabulary, names of historical figures, events, ideas) within the context of subject-matter instruction. The Clarifying Routine is used to reveal (a) the name of the term to be explored, (b) important information or facts related to the term, (c) examples of how the term might be used correctly and incorrectly, (d) the core idea behind the term, (e) a connection between the term and something within the students’ lives, and (f) the correct usage of the term in a sentence. A graphic device called the Clarifying Table is completed by the teacher and students as they discuss the term and information related to the term. One of the instructional principles on which this routine is based is that students must encounter a term a minimum of 14–20 times within meaningful contexts if they are to master its meaning and significance. Other principles on which it is based are that students must have opportunities to use a term several times and to connect the term to their personal lives if they are to learn it. Thus, during the routine, students hear the term spoken by the teacher and other students many times, use it and write it themselves, and are asked to connect the term to their own lives.

In a study focused on the effects of the Clarifying Routine, Ellis, Raines, Farmer, and Tyree (1997) found that students in general education classes answered substantially more test questions related to information that had been presented through the use of the Clarifying Routine than questions that were related to information that had been presented through traditional instruction. For example, students answered 63% of the questions on the traditionally presented information and 83% of the questions on information presented with the Clarifying Routine.

**Application Routines.** Through the use of Application Routines, the teacher dramatically shifts control of learning to the students and sets up conditions in which students can demonstrate their competence with regard to using or manipulating information. One Application Routine that has been developed is called the Quality Assignment Routine (Rademacher, Deshler, Schumaker, & Lenz, 1998). Teachers use this routine to plan assignments for and with students, present assignments, evaluate assignment products, and give feedback to students about the quality of their work. This routine is based on several principles that were derived by working with students and teachers in focus groups. For example, students are more likely to complete assignments which they have created themselves and within which they have choices. Additionally, students must understand the purpose of the assignment, what they are to do, and how they can do well. They must see the assignment as personally relevant and optimally challenging (i.e., not too difficult or too easy).

Research related to this routine has focused on its implementation by teachers. Before instruction in the routine, teachers used an average of 51% of the planning behaviors, 33% of the presentation behaviors, and 8% of the evaluation behaviors specified by focus groups of students and teachers. After instruction, the teachers used an
average of 96% of the planning behaviors, 89% of the presentation behaviors, and 94% of the evaluation behaviors that had been specified. A comparison group of teachers used only 45% of the planning behaviors, 26% of the presentation behaviors, and 10% of the evaluation behaviors at the end of the study. The students of the experimental teachers and the teachers themselves were significantly more satisfied with various aspects of their assignments than the students of the comparison teachers and the comparison teachers (Rademacher, 1993).

Integration of routines. Certainly, additional research is required to study further the usefulness of the notion that general education teachers can enhance the understanding and recall of information by students with disabilities and other low-achieving students. Some of the routines (e.g., the Survey Routine) 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 Survey Routine might be used to introduce especially difficult chapters in the textbook, the Concept Teaching Routine might be used to present information related to a major concept in each unit, the Lesson Organizer and Framing Routines might be used to enhance difficult lessons, the Recall Enhancement Routine and the Clarifying Routine might be used to highlight information as it is presented in each lesson, and the Quality Assignment Routine might be used to plan, present, and evaluate assignments. Conceivably, such an integrated sequence might have an even greater effect on students’ performance than can be created when the routines or devices are used in isolation.

TRANSLATING RESEARCH INTO PRACTICE

The instructional devices and routines described in this chapter for use by general education teachers as well as those developed by other researchers (e.g., Brophy & Good, 1985; Weinstein, Goetz, & Alexander, 1988) provide reasons to be optimistic about being able to address effectively the learning and academic achievement problems of low-achieving adolescents in today’s secondary schools. Regardless of the nature or magnitude of the results achieved through recent research efforts, however, little change in school practices will occur unless appropriate steps are taken to ensure effective translation of these instructional procedures into usable teaching products and ongoing staff-development and teacher-training efforts.

The task of translating research prototypes into usable teaching products is a critical one if educational change is to occur. The literature is replete with research studies reporting that positive learning effects have been achieved as a result of using specific teaching procedures. Unfortunately, in the vast majority of cases, practitioners must extrapolate the procedures for implementing the instructional practice from the methodology section of a journal article. If they request additional information from the researcher, they often get a lengthy field-test protocol of the instructional procedures used during data collection, or they receive an abbreviated synopsis of the procedure.
In either case, the teacher still lacks the information needed to translate the instructional routine accurately, and with relative ease, into classroom practice. Researchers must rethink their responsibility to the educational community with regard to translating validated teaching routines into usable, teacher-friendly instructional packets or materials. The gap between research and practice that has existed historically in education may, in large part, be accounted for by the failure of researchers to view the research process as including the extra steps of translating the field-test versions of innovative procedures into instructional materials conducive to use in the classroom.

When KU-CRL staff members completed the first phases of intervention research on the SIM, they thought that the magnitude of the reported improvement would be sufficiently powerful to encourage teachers to use the procedures. Only after discovering that classroom implementation rates were abysmally low did they realize that, as researchers, they needed to make a significant commitment to the translation process. Since then, KU-CRL staff members have committed themselves to going the extra step of translating validated instructional routines or devices into teachers’ manuals (and, where appropriate, student materials) that are available to educators. To do so has required a significant investment of time and resources. In addition, staff members have had to make trade-offs between doing new research and translating completed research into usable products. In the process of making this translation, staff members have found that working very closely with the ultimate consumers of the instructional packages is imperative to ensure that the packages are designed in a way that meets their instructional and classroom organization and management needs.

A second area to consider when attempting to optimize the translation of research into practice has to do with professional staff development. Each year, school districts pour millions of dollars into efforts to upgrade the instructional effectiveness of their teachers through inservice training programs. The majority of these efforts tend to be one-shot programs (e.g., a 1- to 2-hour training session on a new teaching routine) with no follow-up included as a part of the overall professional development design. Research findings on the efficacy of such training efforts are clear. Very little, if any, permanent change in instructional practice results (Fullan, 1982; Hord, Rutherford, Huling-Austin, & Hall, 1987).

Thus, as a profession, educators must stop ignoring documented principles of staff development and system change. The current course of action will have little or no effect on bringing about significant changes in educating students and will lead to inappropriate conclusions about the efficacy of new teaching procedures. In other words, teachers may conclude that new procedures lack power when the real reason for their failure may be that teachers were not given enough exposure to and practice with the procedure under controlled conditions with sufficient feedback from others to enable them to reach a level of comfort and fluency.

The following principles of effective staff development should be applied to facilitate translation of any new teaching routine into the instructional practices of general education teachers. First, key stakeholders in a school district (e.g., administrators, teachers, and school psychologists) must be involved in deciding whether to adopt and
receive instruction in a given procedure. In short, this step in a system’s adoption of an educational innovation is evaluative. Questions as to whether the innovation is consistent with the district’s philosophy, goals, and other current teaching practices must be addressed.

Second, the issue of trade-offs must be resolved. That is, the incorporation of any innovation usually adds significantly to teachers’ planning and/or instructional load initially; hence, decisions must be made regarding the elimination or reduction of current programs or practices. Since such decisions are often difficult to make in education, educators often follow the course of least resistance and simply view the new procedure as an add-on. In turn, they often elect to keep using practices with which they feel most comfortable (the old practices); thus, the probability of adopting a new practice is greatly minimized. Strong administrative support and endorsement (including permission to make necessary trade-offs) are very important.

Third, to ensure the adoption of complex educational innovations, a professional development sequence must be offered over a sustained period of time rather than as a one-shot event. Sustained efforts allow time for modeling, practice, feedback, and questions. In addition, teachers need the opportunity to try out the new procedure (or portions of the new procedure if it consists of many steps or is complex) in their classroom and to debrief with the instructor on problems encountered. Finally, following the formal professional development session(s), teachers must have the opportunity to receive ongoing support in their efforts to implement the new procedure. Initial support can be provided through the use of support teams (i.e., small groups of teachers who meet to discuss implementation problems and other issues) (Huberman & Miles, 1984) and peer coaching (Joyce & Showers, 1982).

Another area that must be considered in an effort to increase the likelihood of innovative adoptions is the role of pre-service teacher-training programs. The current teaching corps in the United States will be undergoing significant changes in the next decade (Ingersoll, 1999). There will be a large turnover in the nation’s teaching staff owing to retirements and decisions to leave the teaching profession for another career (Ingersoll, 2001). Filling this void represents not only a tremendous challenge, but also a significant opportunity to affect the types of skills new teachers should possess in respect to the instruction of low-achieving students. The first step toward meeting this challenge requires careful review of the content of current teacher preparation programs. Especially in the preparation of secondary teachers, additional time is needed to train teacher trainees in specific procedures for effectively delivering their content. Prospective teachers not only need to be made aware of specific teaching routines and devices for enhancing the delivery of curriculum content but also need ample opportunities to practice such procedures to mastery in practicum and field experiences. Many authors who have written about the educational crisis confronting our nation’s schools have argued that meaningful solutions will mean having to make dramatic departures from traditional practices (National Commission on Teaching and America’s Future, 1997). As dropout and low-achievement problems escalate in magnitude (524,000 students dropped out in 1999; another 700,000 were barely function-
ally literate), steps must be taken to equip teachers with skills that will enable them to organize and present content information more effectively to at-risk students. This process should begin most logically in the formative years of teacher preparation. The climate for such reform is right in the light of current efforts to raise the quality of teacher preparation (e.g., Wise, 1999).

Finally, the important role that school psychologists can play in effective translation and utilization of the teaching procedures discussed in this chapter must be underscored. To fulfill this role, school psychologists must expand the focus of their assessment efforts to include a profile of the different setting demands (e.g., the types of tests, the readability and “considerate” nature of the textbooks, the format of assignments) that students encounter in their regular classrooms. If teachers are informed about the setting demands that particular students will have difficulty in meeting, then they will be better able to work with school psychologists and other personnel to adapt instruction to correspond with particular students’ needs. Teachers will understand more fully how teaching practices and curriculum materials can precipitate failure as much as specific student deficits, and they will be more able to accommodate special learners in their classes.

Additionally, as contributors to Individual Education Planning meetings and other educational planning meetings, school psychologists must recognize the importance of having all members of the committee (teachers, parents, and students) actively participate in the decision-making process (VanReusen, Deshler, & Schumaker, 1989; Van Reusen et al., 1994). Providing opportunities for participation in such meetings is central to obtaining the necessary commitment and support of key participants (general education and support service teachers, parents, and the student). The school psychologist should view his or her role in such meetings as a conveyor of information, problem solver, and advocate of change in teaching practices on the part of teachers as well as change on the part of the student.

Also, the school psychologist can do much to promote cooperative planning and other interactions among teaching staff. Cooperative planning between special class teachers and general education teachers is particularly challenging because of the schedule conflicts that arise during a typical school day (e.g., planning periods or lunch periods that do not match). Because of school psychologists’ relatively more flexible schedules, they can facilitate the efforts of different staff members in cooperative planning by being mediators or by encouraging a reluctant staff member to interact with other teachers on behalf of targeted students. Finally, school psychologists can play a valuable role by making staff aware of newly validated teaching routines and by modeling their use. They also can team with general education teachers in efforts to increase the effectiveness of their presentations of subject matter. This teaming relationship can be established, for example, in the form of a peer-coaching arrangement (Joyce & Showers, 1982). In brief, school psychologists can do a great deal to support and facilitate the processes that are critical to bringing about instructional improvements in school settings.

In summary, research has shown that to bring about a strong impact on the academic success and life adjustment of at-risk students requires the use of a broad array
of instructional strategies and techniques in a coordinated fashion by several teaching and support personnel (Hock, Deshler, & Schumaker, 1993; Deshler & Schumaker, 1988). The major components of an innovative model for providing such services have been summarized in this chapter. A key element of that model is the effective use, by general education teachers, of a host of validated teaching routines and devices that can facilitate students’ understanding and retention of content information presented in the general education class. Given the results presented here, general education teachers clearly possess the means of significantly halting the decline in school achievement of many at-risk students as well as reducing the escalation of referral rates of these students to special education. Research data suggest that teachers who manipulate, organize, and present their content information in such a way that it becomes easy to understand and remember produce greater learning in their students. Thus, ensuring teachers learn these new methods becomes a priority for all educators interested in the achievement of students.
REFERENCES


Ellis, E. S. (1998). The Framing Routine. Lawrence, KS: Edge Enterprises


