

# Learning Strategies: An Instructional Alternative for Low-Achieving Adolescents

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*ABSTRACT: As mildly handicapped students move from elementary to secondary school, they are expected to deal with increased curricular demands. The University of Kansas Institute for Research in Learning Disabilities has designed and validated a set of task-specific learning strategies as an instructional alternative for these students. Learning strategies teach students "how to learn" so that they can more effectively cope with increased curriculum expectations.*

■ The challenge inherent in designing interventions to overcome or lessen the effects of a learning disability is a significant one. This challenge often grows in magnitude as learning disabled (LD) students move into adolescence and are expected to cope with the rigorous demands of the secondary school. While a number of different instructional approaches for LD adolescents have been described in the literature (Deshler, Schumaker, Lentz, & Ellis, 1984; Deshler, Warner, Schumaker, & Alley, 1983; Deshler, Lowrey, & Alley, 1979), little, if any, data have been reported regarding their efficacy.

## INTERVENTION DESCRIPTION AND RATIONALE

One of the major research goals of the University of Kansas Institute for Research in Learn-

ing Disabilities (KU-IRLD) has been to address this void by designing and evaluating interventions for mildly handicapped adolescents (Meyen & Deshler, 1978). Given the broad range of academic deficits evidenced by older students (Deshler, Schumaker, Alley, Warner, & Clark, 1982,) that result in their inability to cope with secondary school curriculum demands. KU-IRLD staff adopted a learning strategies approach as the core component of an intervention model which has been developed and validated through 8 years of programmatic research. This intervention model is called the Strategies Intervention Model (see Schumaker, Deshler, & Ellis, 1986, for a detailed description of this model). This approach has been designed to teach students how to learn rather than to teach students specific curriculum content. Learning strategies, as defined by Deshler and Schumaker (1984), are techniques, principles, or rules that enable a student to learn, to solve problems, and to complete tasks independently.

In short, instruction in the use of learning strategies is instruction on how to learn and

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how to perform tasks. For example, through a learning strategies approach, the instructional goal is to teach students strategies for summarizing and memorizing material that has to be learned for social studies tests, rather than teaching them actual social studies content. Thus, while learning to use summarization and memorization strategies to improve their comprehension and retention of social studies concepts, students also learn a skill that, theoretically, will help them acquire information in other subject areas. An ultimate goal of learning strategies instruction is to enable students to successfully analyze and solve novel problems that they encounter in both academic and nonacademic environments. The overall intent of learning strategies instruction, therefore, is to teach students skills that will allow them not only to meet immediate requirements successfully, but also to generalize these skills to other situations and settings over time (Deshler & Schumaker, 1984).

Three major rationales underlie a learning strategies intervention approach for adolescents. First, the development and application of learning strategies or metacognitive skills is significantly related to age; that is, older students consistently are more proficient in the use of such behaviors (Armbruster, Echols, & Brown, 1984). Second, adolescents who "learn how to learn" in secondary schools will be in a much better position to learn new skills and to respond to rapidly changing information and conditions in the future (Deshler & Schumaker, 1984). Third, a learning strategies instruction approach requires students to accept major responsibility for their learning and progress (Wong, 1985). Such a commitment must be made by students if they are to truly become independent.

To operationalize this learning strategies instructional approach, a set of learning strategy instructional packets was designed and field-tested. Together, these instructional packets make up the Learning Strategies Curriculum (Schumaker, Deshler, Alley, & Warner, 1983). Each packet consists of the instructional materials and procedures needed by a teacher to train students in a given learning strategy. The Learning Strategies Curriculum is organized in three major strands that correspond to the major demands of the secondary curriculum.

The first strand includes strategies that help students acquire information from written materials. The Word Identification Strategy (Lenz,

Schumaker, Deshler, & Beals, 1984) is aimed at the quick decoding of multisyllabled words. Three other strategies are aimed at increasing a student's reading comprehension. The Visual Imagery Strategy (Clark, Deshler, Schumaker, & Alley, 1984) is used to form a mental picture of events described in passage. The Self-Questioning Strategy (Clark et al., 1984) is used to form questions about information that has not been provided by the author and to find the answers to those questions later in the passage. The Paraphrasing Strategy (Schumaker, Denton, & Deshler, 1984) is used to paraphrase the main idea and important details of each paragraph after it is read. The Interpreting Visual Aids Strategy (Lenz, Schumaker, & Deshler, in press) is used by students to gain information from pictures, diagrams, charts, tables, and maps. Finally, the Multipass Strategy (Schumaker, Deshler, Alley, & Denton, 1982) is used for attacking textbooks' chapters by using three passes over the chapter to survey it, to obtain key information from it, and to study the critical information.

The second strand in the Learning Strategy Curriculum includes strategies that enable students to identify and store important information. The Listening and Notetaking Strategy (Deshler, Denton, & Schumaker, in press) enables students to identify organizational cues in lectures, to note key words, and to organize key words into outline form. The First-Letter Mnemonic Strategy (Robbins, 1982) and the Paired-Associates Strategy (Bulgren & Schumaker, in preparation) provide students with several options for memorizing key information for tests.

The final strand of the Learning Strategies Curriculum includes strategies for facilitating written expression and demonstration of competence. Four strategies have been designed to enable students to cope with the heavy written expression demands in secondary schools. The Sentence Writing Strategy (Schumaker & Sheldon, 1985) provides students with a set of steps for using a variety of formulas when writing sentences. The Paragraph Writing Strategy (Schumaker, in preparation [a]) helps students organize and write a cohesive paragraph. Likewise, the Theme Writing Strategy (Schumaker, in preparation [b]) helps students organize and write an integrated five-paragraph theme. The Error Monitoring Strategy (Schumaker, Nolan, & Deshler, 1985) is

used to detect and correct errors in written products. An Assignment Completion Strategy (Whitaker, 1982) is used by students to schedule and organize themselves to complete assignments on time. Finally, the Test Taking Strategy (Hughes, 1985) enables students to effectively take classroom tests.

The task-specific strategies comprising the Learning Strategies Curriculum are not a comprehensive set of learning strategies required for school success by poor learners; rather, they are representative of the types of learning behaviors required by students to respond successfully to curriculum demands. They have been chosen and developed after carefully reviewing the literature on the demands secondary settings (Schumaker & Deshler, 1984).

### **GUIDING PRINCIPLES**

Three factors have influenced the way in which learning strategies have been designed for and taught to LD adolescents. First, it has been important to recognize that most LD students bring a long history of failure with them to remedial situations (Alley & Deshler, 1979). The ramifications of this negative experience in learning have been carefully considered as instructional activities have been designed such that students can experience success throughout the learning process. Second, many LD adolescents display minimal motivation for participation in academic instruction because of interest in nonacademic and peer associations (Goodlad, 1984). Thus, methods of motivating students have been interwoven throughout the instructional process. Third, as LD students move through the secondary grades, they encounter significant time constraints. That is, the amount of instructional time available to acquire deficient skills becomes more limited as a student gets older. Therefore, methods of enhancing the intensity of learning strategy instruction have had to be developed. In addition to these factors, the following instructional principles have guided our implementation of learning strategy interventions.

#### **Match Instruction with Curriculum Demands**

The first step in the learning strategy instructional process is to understand the types of curriculum demands that the student is failing to meet (e.g., taking notes or writing well-

organized paragraphs). This information is used in determining what task-specific strategy(ies) should be taught to the student. By matching the learning strategy instruction to existing (or forecasted) curriculum demands, students acquire skills that will enable them to cope with immediate academic pressures as well as prepare them for future curriculum requirements. This approach to instructional decision making is different from the course of action traditionally followed in special education in which student deficits (rather than environmental demands) are assessed to determine remediation. While we are interested in the unique deficits evidenced by students, our major concern is to understand the demands in the criterion environment that students are not meeting so we can structure instruction to help them cope with those demands.

#### **Use Structured Teaching Methodology**

For learning strategies to be useful "tools" for older students, these strategies must be learned to an automatic, fluent level. For that reason, a teaching methodology that is based on sound learning principles has been developed (Deshler, Alley, Warner, & Schumaker, 1981; Deshler, Warner, Schumaker, & Alley, 1983). The purpose of the acquisition steps of the teaching methodology is to give students the knowledge, motivation and practice necessary to apply the learning strategy successfully to materials and tasks in the resource room settings.

To this end, the acquisition methodology includes the following steps. First, the student is tested to determine his or her current learning habits regarding a particular task. The student is informed of his or her strengths and weaknesses and commits himself or herself to learning a new strategy to remedy the weaknesses.

In the second step, the new strategy is described to the student. It is broken down into component steps, rationales for learning the strategy are given, the types of results students can expect to achieve are provided, and situations in which the strategy can be used are delineated. Also in the step, students write their own goals regarding how fast they will learn the new strategy.

In the third step, the new strategy is modeled for the student from start to finish by the

teacher while "thinking aloud." Next, students are involved in subsequent demonstrations of the strategy.

In the fourth step, the student uses verbal rehearsal to learn to name all of the steps of the strategy in order.

In the fifth step, the student practices the new strategy to a specified criterion performance in controlled materials (i.e., materials that are reduced in complexity, length, and difficulty level).

In the sixth step, the student practices the skill to a mastery criterion (both accuracy and speed are emphasized) in materials and situations that closely approximate tasks encountered in regular classes. Reinforcement and corrective feedback are given after each practice attempt in both steps 5 and 6.

In the final step, the student receives a post-test to determine if performance has progressed to a point that allows him or her to cope with curriculum demands in the target area. Each of these steps is used in teaching all of the task-specific learning strategies in the Learning Strategies Curriculum.

### **Deliberately Promote Generalization**

The acid test of an academic intervention applied to mainstreamed students is the degree to which the skill taught under controlled conditions (e.g., the resource room) is generalized across settings and maintained over time. Our research has built on the work of Haring, Lovitt, Eaton, and Hanson (1978) and Stokes and Baer (1977) who have stressed the importance of carefully programming instructional activities to ensure generalization. Specifically, after students have demonstrated mastery of a learning strategy in a resource room, research results have shown that it is necessary to take them through a set of generalization steps designed to broaden their understanding of the strategy and to increase their facility in approaching regular classroom assignments.

The first generalization phase, the orientation phase, involves making students aware of the variety of contexts (e.g., classes, job situations, home situations) within which the recently learned strategy can be applied. A discussion is held to identify cues that should tell the student when to use the strategy and to brainstorm ways in which the strategy can be adapted to meet the unique requirements of a variety of class situations.

The next phase of generalization is activation. The purpose of this phase is to provide students with ample opportunities to practice the strategy in a broad array of materials, situations, and settings. The goal of this phase is to increase the degree to which students can automatically apply the strategy to novel tasks regardless of the setting in which those tasks are encountered. Thus, in this phase, students are required to use the newly learned strategy outside of the resource room and to report back to the resource teacher regarding their success.

The final generalization phase is called maintenance. To ensure continued use of the strategy over time, periodic probes are conducted to determine whether the student continues to use the strategy at an acceptable proficiency level.

Central to the entire generalization process just described are regular cooperative planning efforts between the resource and regular classroom teacher. Regular communication is essential to determine the degree to which the newly acquired learning strategies are being used in the regular classroom. In addition, in such meetings, classroom teachers can be encouraged to cue students to use the strategy at the appropriate time.

### **Apply "Critical Teaching Behaviors"**

For adolescents to gain maximum benefit in the shortest period from learning strategies instruction in the resource room, it is essential for the teacher to regularly apply "critical teaching behaviors" in his or her instruction. We have defined critical teaching behaviors as those behaviors of a teacher that enhance the intensity or quality of instruction in a classroom.

Obviously, there are a broad array of such behaviors that are central to good instruction. The following teacher behaviors appear to be critical to optimizing instructional gains through learning strategy instruction: providing appropriate positive and corrective feedback, using organizers throughout the instructional session, ensuring high levels of active academic responding, programming youth involvement in discussions, providing regular reviews of key instructional points and checks of comprehension, monitoring student performance, requiring mastery learning, communicating high expectations to students, communicating rationales for instructional activi-

ties, and facilitating independence. It is interesting to note that in a recently completed study, Kea, Deshler, and Schumaker (in preparation) found that many middle and secondary resource teachers fail to regularly use many of these behaviors.

### **Use Scope and Sequence in Teaching**

Most low-achieving adolescents show deficits in several academic areas (Deshler et al., 1982). To teach these students enough learning strategies to become competitive in the secondary setting, it is important to carefully organize both the scope and sequence of learning strategy instruction over several years (e.g., Grades 7 through 12).

Students benefit most if they master approximately three to four learning strategies per year. When a systematic sequence of instruction is planned for students over a span of several years, they are ensured of receiving sufficient instructional coverage (i.e., scope). Furthermore, teachers have repeatedly noted that a "snowballing" effect takes place; that is, each learning strategy seems to build on the previous ones learned in a synergistic fashion such that students become capable of success in mainstream courses after learning several strategies across the three strands.

### **Ensure That Teaching Decisions Are Governed by Outcome Goals**

A major goal associated with the learning strategies intervention approach is to make LD students independent learners and performers. While experiencing the day-to-day pressures of teaching these students, it is often easy to lose sight of this goal.

Students truly become independent learners and performers when they start to generate their own learning strategies independent of teacher assistance. Thus, during the instructional process, in addition to learning task-specific learning strategies, it is important for students to become aware of how they learn and how they can take control over much of their learning (Brown, 1980). To accomplish this, students are first required to master approximately five specific strategies from the Learning Strategies Curriculum. They are then taught an executive strategy (Ellis, 1985) that,

in essence, enables them to analyze a novel problem or demand and to design their own learning strategy.

### **Maximize Student Involvement**

If adolescents are expected to ultimately become independent learners and performers, it is critical that they feel a vested interest in their intervention program. The learning strategies approach to instruction endorses the notion students understand that they must actively participate in their learning to ultimately assume control of the learning situation (Reid & Hresko, 1981; Torgeson, 1977). This is accomplished through a variety of mechanisms such as having students regularly set goals and evaluate their progress (Seabaugh & Schumaker, 1981), take part in individualized education program conferences as an active participant (Van Reusen, 1985), and regularly obtain their commitment to learn specific strategies (Schumaker et al., 1983).

### **Maintain Realistic Point-of-view**

It is important that educators keep this intervention approach in proper perspective. The complex nature of school failure does not lend itself to one intervention approach. It would be a major error to attribute the poor performance of some older students solely to learning strategy or metacognitive deficiencies. While some students may be strategy-deficient, the intervention of choice may lie in another, more important area (e.g., social skill training). Likewise, adolescents who are significantly deficient in key skill areas (e.g., reading at the primary reading level) require intervention programs with a different focus and intensity.

Furthermore, while our research has documented the effectiveness of learning strategy instruction, it has also shown us that interventions besides those included in the Learning Strategies Curriculum are required to markedly impact the overall academic success and life adjustment of adolescents. Included within the curriculum of the overall intervention model that has evolved through KU-IRLD research are Social Skill Strategies, Motivation Strategies, Transition Strategies, and Executive Strategies (Schumaker et al., 1986). While a description of these curriculum components and other components of the model is beyond

the scope of this article, it is important to stress that the conditions of LD in adolescents are sufficiently complex and resistant to intervention that they require the application of a comprehensive intervention model.

### DATA ILLUSTRATING EFFECTIVENESS OF LEARNING STRATEGIES

The learning strategy interventions just described have been tested in a variety of ways to determine their effectiveness. Initially each strategy underwent a series of development and research activities to ensure soundness of design. Over the course of about 7 years, each of the strategies in the curriculum was tested through multiple-baseline design studies to determine how students responded to the strategy instruction (e.g., Clark et al., 1984; Schumaker et al., 1983). In most instances, before training, students demonstrated limited evidence of strategy use. For example, they evidenced poor reading strategies in such areas as paraphrasing, self-questioning, and identifying critical features of tests. Similarly, their performance in writing skills, such as error monitoring and paragraph organization, were extremely low.

In all of the studies to date, once training in a strategy had been implemented, the students showed marked gains. For example, once students learned the Paraphrasing Strategy, their reading comprehension went from 48% to 84% on passages written at their current grade level. Mastery of the Error Monitoring Strategy reduced the number of errors that they made in written materials from 1 in every 4 words to 1 in every 33 words. Similar results have been found with each of the other strategies. In each of these carefully controlled studies, only a few students have been unsuccessful in learning the strategies.

As a result of many replications of these phenomena, it has become apparent that handicapped adolescents can learn to use a variety of learning strategies. Current research on these learning strategy interventions has moved into a phase of broad scale adoption of the interventions by different educational agencies (e.g., individual schools, school districts, intermediate units, or entire states). The Learning Strategies Curriculum is currently being implemented by teachers in dozens of school districts throughout the country. Similar results are reported by the participants in

these sites. It is important to note, however, that significant student gains seem highly correlated with the level of staff training. In essence, we have found that it is essential to provide the kind of careful staff development called for by Showers (1985). When this occurs, student progress follows. In its absence, often little change is noted. (See author note following reference section.)

### CONCLUSION

While KU-IRLD staff members are encouraged by the kinds of gains students who are exposed to learning strategy interventions are making, many questions still remain to be addressed concerning this intervention approach. Among the key areas of investigation are the following: (a) determining what students benefit most/least from these interventions; (b) determining if and how students in upper elementary grades (4, 5, and 6) can benefit from these interventions to better prepare them to transition into secondary schools; (c) determining how to effectively and efficiently enable these students to acquire much of the prior knowledge that they lack in core curriculum areas; (d) determining the long-term impact of these interventions on the academic success and life adjustment of these students; and (e) determining the types of teaching practices that promote optimal success for students who have been taught learning strategies.

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Since the data in this article clearly show student gains to be highly correlated with staff training, the KU-IRLD makes the Learning Strategies Curriculum available to those educational agencies who commit to a staff development program designed to make their staff proficient in the use of these materials. Information for this training can be obtained by contacting Dr. Frances L. Clark, Coordinator of Training, KU-IRLD, University of Kansas, LD Research Institute, Lawrence, Kansas 66045.

### Index to Advertisers

Academic Press, p. 486  
American Guidance Service, p. 481  
The Brown Schools, p. 552  
Charles C Thomas, cover 3  
The Council for Exceptional Children,  
pp. 542, 551, 561, 572, 581, 582, 594, 599  
CTB/McGraw-Hill, p. 600  
DLM Teaching Resources, pp. 509, 551,  
cover 4  
Elwyn Institutes, cover 2  
Lake Grove School, p. 590  
Library of Special Education and Speech  
Pathology, pp. 520-521  
McCarron-Dial Systems, p. 483  
Patterns for Learning, p. 533  
Simon and Schuster, p. 581

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