Self-Regulated Strategy Development for Students with Learning Disabilities

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Abstract: Self-Regulated Strategy Development (SRSD) is a well-established, thoroughly validated instructional model. In this article, we discuss the rationale and steps for implementing it. We also provide practical information for use in teaching and evaluating strategy instruction. This article is intended to guide teacher educators as they help future teachers develop a practical working knowledge of how to effectively implement strategy instruction in the classroom.

Students with learning disabilities (LD) constitute by far the largest group of students with special needs. According to the U.S. Department of Education, in 2003 there were 2,858,000 children birth to age 21 served in federally supported programs for LD. The category of LD is the largest area of special education, students with LD constitute 4.3% of the total school enrollment according to recent figures (U.S. Department of Education, 2005). Over the last 25 years the number of students identified as LD and served in federally supported programs has showed a steady increase. Since 1976 the numbers have more than tripled. Although the rate of increase has slowed, the overall numbers continue to increase.

A learning disability affects nearly every aspect of a student’s life and is a lifelong problem (Lerner, 2000). Students with LD are often caught in a spiral of school failure. Their learning difficulties lead to a lack of skills, which in turn impedes new learning and they fall farther and farther behind in school (Stanovich, 1986). According to the U.S. Department of Education, students with LD are at great risk for dropping out; around 70% of students with LD fail to graduate from high school with a standard diploma (U.S. Department of Education, 2005). Their academic problems also result in lower engagement rate (defined as being in post-secondary schooling, employment, or both) compared to typically achieving students (Murray, Goldstein, & Edgar, 1997). To stop the cycle of failure for these students, teacher educators must ensure that their graduates are proficient in the application of validated practices.

The No Child Left Behind Act (NCLB) mandates the use of effective, research-validated instructional methods in the schools. The question of what approaches are most effective for students with LD has been scientifically investigated using meta-analysis. Meta-analysis is a technique that allows researchers to combine the results of many individual studies and objectively assess the overall effectiveness of different instructional approaches. In the largest study of its kind, Swanson and his colleagues (Swanson, Hoskyn, & Lee, 1999) synthesized the findings of more than 260 studies of instructional interventions for stu-
Teaching Teachers to Use Cognitive Strategy Instruction

There are many models for strategy instruction, but few are as well researched and "user friendly" or as focused on both academic and motivational aspects of students with learning problems, as the Self-Regulated Strategy Development (SRSD) model. SRSD is based on well-established theory and has been thoroughly validated (cf. Harris & Graham, 1996; 2005). Our experience also indicates that SRSD is a model that students in preservice programs find easy to learn and implement in student teaching and other application-settings.

The basic stages of the SRSD model are designed to ensure that all necessary aspects of strategy instruction are fully addressed. They are intended to be recursive and teachers loop back through stages and activities as needed. Revisiting stages helps students to rethink and develop metacognitive skills and abilities. We present the stages in a commonly used sequence; however, they can be reordered or combined as deemed appropriate or necessary by the teacher.

Stage 1: Develop and Activate Background Knowledge

Developing background knowledge sometimes seems so obvious, but in practice it is just this type of obvious task that it is often overlooked. It is critical that students master prerequisite skills to use a strategy effectively. For example, trying to teach a long division strategy to a student who had not mastered multiplication or subtraction would be a fruitless endeavor. At this stage there are two essential tasks: (1) defining the skills a child needs to perform a strategy, and (2) assessing the child’s knowledge and/or ability to perform the skills.

Defining skills

While developing background knowledge, it is necessary to initially define the basic skills needed to perform the strategy. For example, to learn a long division strategy, students need to know basic subtraction, multiplication and division facts, and place value. It is also important to make certain that the students understand the components of the strategy. For example, some reading comprehension strategies involve the use of text structures that may not be familiar to students. The best way to identify the basic skills and strategy components necessary is to break down the task in terms of the knowledge needed for success. The task breakdown will help teachers to determine what the students need to know to perform the strategy. The easiest way to break down a task is to make two columns. Label one column Steps and the second Skills. In the first column list the steps the student would need to perform to accomplish the task. In the second list what a child would need to know to perform this step. The easiest way to break down a task is to actually do the task yourself, write down each step, and then ask yourself what you needed to know to perform the step.

Assessing knowledge

There are many ways that teachers can check students' knowledge. For example, for the long division strategy the teacher could simply use flash cards to assess the student's knowledge of basic multiplication and addition facts. Some commonly used methods include observing student performance, using curriculum-based measures, or simply asking students what they are doing (and how and why). Often, teachers will already be aware of student's knowledge. Skill deficits should be addressed prior to introducing the new strategy. This means teaching the skill to sufficient mastery for the student to perform the strategy successfully or providing a means for the student to compensate for a skill deficit. For example, if a student needed a long division strategy but had difficulty with multiplication facts, the teacher could provide a times table for the student to use. Note that the teacher should still work on building up the student's skill at multiplication in the interim.
Stage 2: Discuss the Strategy

Using a strategy is a more involved process than merely going through its steps. Remember that one major goal of SRSD is to help students develop into self-regulated learners. In order for this goal to be achieved, students need to be actively involved in and take ownership of the SRSD process. Discussing the strategy helps teachers to “sell” the strategy and get students to “buy” into it. Students need to believe that the strategy they are learning will help them perform better. This commitment enables them to be more actively involved and leads self-regulation. If a student does not want to use a strategy it is fair to assume that they will not use it. Teachers need to remember that motivational processes have significant effects on learning and effort. Throughout the SRSD process teachers need to be excited, committed and energized so that students will be too.

It is not difficult for teachers to sell a strategy when learning it results in improved academic performance. Teachers can provide students with examples of how this strategy or other strategies have improved student performance in the past and even how strategies have helped them in the past. It is helpful to know what motivates particular students. During this stage it is appropriate for the teachers to explain the benefits of using the strategy; while discussing and even providing examples of current performance. For example, teachers can create graphs to show current performance levels. The graphs can also be used to chart progress, which can help motivate students.

The final step of discussing a strategy involves introducing students to its steps. The teacher explains what each step of the strategy is for, how it is used, and where it is useful. This is also where teachers should stress that good performance is the result of effort and strategy use. During this stage, and those that follow, sensitivity to student feedback is very important. Teachers must match the strategy to the student. Strategies that are too easy or too difficult are of little use. Teachers should modify a strategy if a student doesn’t understand it or is uncomfortable with part of it. Throughout this process closely monitoring students’ understanding; ask questions on the steps and probe for understanding. Remember that strategy instruction is a reciprocal process. Students’ aptitudes, deficits, and needs should mold the instruction process.

Stage 3: Model the Strategy

Good modeling allows the student to see an “expert” learner employing the strategy. A critical part of modeling is the “think-aloud” process, where teachers or students verbalize their thought processes as they perform a strategy. Modeling increases students’ knowledge of the steps of the strategy and improves their cognitive and metacognitive knowledge of the strategy through exposure to the way a skilled learner implements and regulates strategy use. Note that a good think-aloud goes well beyond merely presenting the steps in a strategy—it provides students with the “why” and the “how” of various strategy steps (i.e., the knowledge and self-regulation processes associated with the performance of steps). Research clearly shows that without this knowledge students will not fully benefit from the strategy. Note that good modeling serves to teach students that using a strategy requires effort. It also addresses attributions (e.g., OK, that was easy. I can do this!) and establishes the value of strategy use—using the strategy results in better performance.

There are several ways to make the process of creating good think-alouds easier. One of the tools teachers can use is a “metacognitive task breakdown.” This is a straightforward process. For each step in the task, identify knowledge or self-regulation processes by asking “Why, How, and What” questions:

1. Why am I doing this step in the task?
2. How did I know to do it?
3. What are the important actions, cues or questions?
4. What knowledge do I need?

Stage 4: Memorize the Strategy

Memorizing the steps that constitute the strategy is probably the quickest and easiest of the stages of SSRD. The goal is for students to identify the steps of the strategy and use them automatically. For fluent and effective use of a strategy, they must be able to focus their energy and attention on the task at hand not
on struggling to remember the steps of what they are doing. Students with LD often have problems remembering; struggling to recall what to do next impedes performance. Note that this step may even be omitted for very simple strategies if students have no trouble remembering the steps.

To help students memorize the strategy many teachers make a game of practicing the steps by using round-robin activities or ball toss games. For example, a teacher says the first step of the strategy and then tosses the ball to a student who relates the second step and on. Students can go to the next stage in the process before they have reached automaticity if they are provided with prompts or other types of supports (e.g., a card listing the steps in order). Before completing all stages students must memorize the strategy steps. Note that memorizing a strategy goes well beyond parroting the steps of the strategy. Students need to know and understand what is involved with each step in the process. This understanding is crucial if students are to use the strategy successfully.

Stage 5: Support the Strategy

In this stage, the teacher and student(s) work together collaboratively and practice using the strategy until the student is able to perform the strategy effectively and independently. During this stage, teachers and students repeatedly model strategy use and discuss how, when, and why to use the strategy.

A key aspect of supporting the strategy is the “scaffolding” or “scaffolded instruction” process. The process of scaffolding is analogous to teaching a child to ride a bike. No one would put a child on his or her first bike, give them a push and expect them to ride well. Instead, we normally use a process where we start with extensive supports (literally!), which are progressively removed. First, we would typically start with training wheels, and let the child practice with the training wheels. Then, we might move the training wheels up, for less support and more practice balancing and riding a little bit more independently. Next, we could take the training wheels off and run behind the child holding the seat. Finally, we would completely let go and let the child ride independently with out any support, just your supervision.

Scaffolding instruction works in much the same manner. Initially, teachers perform all or most of a task while modeling and soliciting student input. Over time, the teacher will increasingly shift responsibility for performance to the student. As students gain experience and confidence with the use of the strategy, teacher support is gradually withdrawn until the student is able to use the strategy independently. Note that the transfer of strategy performance from teacher to student is gradual. It’s not realistic to expect a student to master a strategy the first time they try it. It’s critically important for students to be given adequate time and support to master the strategy. Collaborative practice also gives the teacher an opportunity to check for student understanding, provide corrective feedback, and develop any necessary knowledge the student may be lacking. It’s also useful in assessment. For example, teachers may discover that interacting with the student that the strategy should be modified, or that earlier SRSD stages need to be revisited. It also gives the teacher another opportunity to make sure that the students possess the skills necessary to complete the task successfully.

Exactly how the teacher goes about supporting strategy development through scaffolding and collaborative practice will depend upon the strategies and the needs of the students. There are some commonly used activities and supports used in the scaffolding process (Dickson, Collins, Simmons, & Kameenui, 1998):

- **Content Scaffolding:** Examples of content scaffolding techniques include: (1) Using content materials that are at an easy level. For example, for a reading comprehension strategy teachers might use text that was one grade below the student’s current level. (2) Using content that the students are familiar with or interested in. Thus, content that featured cars or sports might be highly appropriate for adolescent males. (3) Teaching the easier steps of the strategy first, followed by the more difficult steps. Thus, during the initial practice sessions, the student would perform the easy steps while the teacher modeled how to perform the more difficult steps. The student gradually is given responsibility for the more difficult steps.
• **Task Scaffolding:** Ownership of the strategy is gradually transferred by allowing the student to do more and more of the strategy during collaborative practice. For example: (1) the teacher asks the student to name the strategy step that should be performed, then the teacher describes the step and models its use; (2) the teacher asks the student to name the step and describe the step, then the teacher models, (3) the student names, describes, and models the step.

• **Material Scaffolding:** This type of scaffolding uses prompts and cues to help the student use a strategy. This may take the form of posters or help sheets that list strategy steps. Students can use these as a reference or if they get confused. Typically these prompt and aids are faded over time.

Teachers can also use cooperative groups or peers to help scaffold instruction. For example, a teacher might create heterogeneous groups and have each group go through the steps of a strategy. The group as a whole would be responsible for completing the strategy and for making sure that all group members understood each step of the strategy.

The goal of this stage is for the students to be able to use the strategy effectively and independently. The time it takes for students to reach this level of skill may vary widely. When SRSD procedures are used with appropriate strategies, most students can master a strategy after two to four collaborative, scaffolded experiences. Cutting this stage short will likely mean that students will not fully master the strategy or may not reach mastery at all. This in turn means that both the teacher’s and student’s efforts have been for naught.

**Stage 6: Independent Performance**

In this stage, a student should be ready to use the strategy independently. The teacher’s main task will be to monitor the student’s performance and to check on proper and consistent strategy use. Monitoring academic performance is critical. Remember that the goal of strategy instruction is increased academic performance. The student’s work should show a marked improvement, and it should also remain at a consistent level. There are a number of ways to monitor performance that we elaborate on in the next section. Monitoring strategy use is also very important as students sometimes distort the strategy or skip steps when using them independently. If a student modifies a strategy, but performance remains high, there is no cause for concern. Many students adapt the strategy to meet their needs. This is acceptable as long as the student is still successful in completing the task. Alternatively, if a student is performing the strategy correctly and consistently but a high level of performance is not attained (or maintained) then reteaching the strategy or considering a different strategy is probably in order.

**Monitoring and Evaluating SRSD**

With the advent of No Child Left Behind and the passage of IDEA 2004, accountability is receiving ever-increasing attention in schools and teachers must now be able to assess the effectiveness of the instructional interventions they have implemented. One additional benefit of SRSD is that evaluation is an integral component of the approach. Teachers must systematically assess the outcomes or there is no way of gauging the effect of strategy instruction. SRSD facilitates meaningful assessment: The interactive, collaborative nature of the process allows teachers to easily assess changes in students’ cognition, affect, and performance. Harris and Graham (1996) offered basic principles for evaluating the methods and procedures used in strategy instruction. The list is not exhaustive, but provides sufficient knowledge of how to accomplish effective strategy evaluation.

**Include Students as Co-Evaluators**

Students should be encouraged to become partners in the strategy evaluation process. This increases students’ sense of ownership in the strategy, reinforces progress, and provides a practical way to reduce a teacher’s load. Students can help in many ways, such as learning to evaluate their final products or deciding if the necessary criteria for each step of a strategy have been met. Helping students ask appropriate self-questions (e.g., Am I ready to move on to the next step?) is another effective way to help students evaluate their own progress. Students can also graph or chart their progress.
Consider the Level of Evaluation Needed

The time and effort needed for evaluation depends on a number of factors. At a minimum, teachers should know if students are actually using the strategy, the effect of the strategy on task performance, and whether students see the strategy as being valuable and easily used. Teachers may also find that evaluating their instruction may be useful. The type of strategy used and previous experience with a strategy is also an important factor in evaluation. For example, strategies, methods, and procedures that have been previously used and which have demonstrated their effectiveness, will need less scrutiny than a first-time strategy. As a general rule, the amount of time and effort needed to evaluate the usefulness of a strategy depends on its established validity and teacher’s experience with it. However, since interventions are not uniformly effective with students with disabilities, even validated strategies still require some evaluation.

Assess Changes in Performance, Attitudes, and Cognition

Motivation and emotion are important factors that are considered in SRSD. Changing a student’s attitude toward a task and success are critical components of strategy instruction. As a result, the benefits of strategy instruction can go beyond improving academic performance, students’ attitudes and cognition may also be affected. For example, after teaching a math strategy, a teacher might observe whether students’ attitudes toward math and confidence in their abilities improve. The teacher might also check to see if the student performs the task outside the classroom. For example, after teaching a writing strategy check the amount of writing the student does outside of school. Spontaneous statements are also pertinent. For example, one student we worked with on a math strategy who had struggled previously, suddenly stopped in the middle of a problem and stated, “You know, this stuff is really easy!” The use of open-ended questions such as, “What is good writing?” or “What do you most like to say to yourself while answering history study question?” can also help determine if a strategy changed the students’ perception of a task. It is important to remember that some changes (such as attitude improvements) take more time than others to obtain. It takes time to overcome years of previous frustration.

Assess While Instruction is in Progress

Most assessment occurs after instruction has occurred. However strategy instruction depends upon frequent and ongoing assessment. Assessment procedures for strategy instruction should reflect the developmental and ongoing process of learning to use a strategy. This means that teachers must evaluate success at learning the strategy. Establishing realistic performance criteria for each step of instruction is one way to facilitate this process. For example, if a student can tell you when and where it would be appropriate to use a strategy then one of the goals of Stage 2 has been accomplished. When the student can list and explain steps of the strategy then Stage 3 objectives have been met. By clearly defining what is expected at each stage of strategy instruction, both teachers and students know what needs to be accomplished and what standards will be used to measure progress.

Assess How Students Actually Use the Strategy

Students often modify their use of a strategy over time. Sometimes this is a natural effect and positive effect of becoming fluent with the strategy. Use of steps may become automatic and not readily observable (Alexander, Graham, & Harris, 1998). Students may also change things for the worse. Teachers should not automatically assume that students are using a strategy as intended. Some modifications allow the strategy to meet a student’s unique needs, but others, such as eliminating a necessary step, may be detrimental. The best way for teachers to monitor strategy usage is to directly observe what students do as they use the strategy. Ask the student to work through a strategy. While the student does this, ask questions and discuss how things are working. Looking for evidence of strategy use in students’ work is often useful. Often, students will leave “tracks” that indicate they are using a strategy. For example student will often write out mnemonics they use to remember a strategy.
Assess’ Use of the Strategy Over Time and in New Situations

Teachers should not assume that students will continue to use a particular strategy or successfully adapt it to new situations. One of the common problems experienced by students LD is that they do not automatically generalize skills or strategies to new situations. Karen Harris tells the story of the student who had learned a comprehension strategy and effectively used it in one class. When asked about using it in other classes the child responded, “Was I supposed to?” If you wish for the strategy use to maintain and generalize you will need to prompt it. Therefore, it is beneficial to actively promote maintenance and generalization of strategy usage from the inception of strategy instruction. For example to promote maintenance, teachers could periodically have students explain the purpose of a strategy or have them share ways they have used the strategy. Students also can keep a record of each time they use a strategy or how they modify it for other tasks. It’s also useful to chart performance (which hopefully has improved) review it at regular intervals, and relate improvements to the use of the strategy. Generalization may be tougher. It will often be necessary to involve other teachers who were not involved in the strategy instruction process. The teachers will need to be acquainted with the strategy and any procedures involved with its use (e.g. graphic organizers or prompts) and will at a minimum need to remind the student to use the strategy and encourage its use. One major goal of strategy instruction is generalization. Thus, it is necessary to determine if students need additional support to consistently apply the strategy in all appropriate situations. Note that if other teachers are involved these teachers should also be involved in evaluating strategy use and promoting its generalization.

Use Portfolio Assessment Procedures

Portfolio assessment is an excellent way to implement many of the recommendations we have presented for evaluation of strategy instruction. This type of assessment requires teachers to establish the credibility of, and become intimately involved in, the maintenance and evaluation of student portfolios. Portfolios offer many practical advantages. At a very basic level, portfolios can often help to graphically demonstrate progress. For example, collecting samples of writing over time can make improvements highly visible. It can also help to improve motivation and demonstrate the benefits of strategy use. For example, one junior high teacher collected pre- and post-strategy instruction examples of her students’ stories. Pre-strategy stories were typically around one-half page long. Post-strategy stories averaged over three pages! Students were extremely proud of their obvious progress. Note that these examples can also be effective when used to try to get future students to “buy in” to using a strategy. Portfolios can also help students engage in reflective self-evaluation, understand that development is as important as achievement, and take greater responsibility for their own learning. Teachers will also gain new insights and understandings about assessment, teaching, and their students’ development and learning. As an aside, it important to note that teachers will also receive some reinforcement since they can see that their instruction resulted in meaningful change.

Share Tips with Teachers

The SRSD model is powerful and effective, but it only works if done correctly. There are some common pitfalls; therefore, it is important that teacher educators be certain their students understand and avoid these pitfalls. Here are a few practical tips to help those implementing SRSD in classroom settings.

Take your time

Strategy instruction must be closely tailored to the needs of students; so, students, whether individuals or in groups, must proceed at their own pace. Therefore, it is not possible to set a precise time to expect mastery. Though there are some exceptions—it is critical for students to attain mastery at each stage before proceeding. Also, remember that “One swallow doesn’t make a summer,” using a strategy well one time does not mean the student has mastered the strategy. Students need to use the strategy correctly and consistently and develop the knowledge of ‘why’ and ‘how’ before they have truly mastered the strategy.
**Start small and build on your success**

Because strategy instruction is so powerful and practical there’s a natural tendency to want to use it as much as possible. If using one strategy is good, two would be even better. At this point teachers might want to remember the old saying that “You can have too much of a good thing.” The same is true of strategy instruction. We recommend using the “small is golden” principle advocated by Pressley (Pressley, Woloshyn, & Associates, 1995). Focus on a small number of strategies and support their use over a sufficient period of time. This will result in students developing a deeper understanding of the strategy and a realization of how strategy use can improve performance.

**Plan for generalization**

Generalized use of learning strategies must be prompted—it won’t occur on its own. Many students who can benefit the most from strategy instruction will not spontaneously generalize a strategy across settings. Teachers in other settings or grades must know what strategies students have learned and how to encourage their continued development. Note also that getting another teacher to support the use of a strategy in his/her class may also involve a “buy in” process. One of the best ways to motivate other teachers to help in the generalization process is to show them (by using the evaluation materials such as portfolios) how much the strategy has improved performance.

**Teach “strategically.”**

Deciding which strategies to use and which students to use them with are important decisions. First, begin with a relatively simple strategy in a content area where you are comfortable and can reasonably anticipate success. Particularly for beginning teachers, initially avoiding difficult curriculum areas where students are struggling the most allows teachers to become more acquainted with the instructional process, hone their skills, and build confidence. Remember that teachers need to develop mastery just as students do. Second, be sure to implement validated strategies. Some teachers think that because existing strategies look simple that it is easy to develop their own. Use electronic resources (http://www.unl.edu/csi/) to help teachers find proven strategies that match learners’ needs.

**Final Thoughts on Preparing Teachers to Use Self-Regulated Strategy Development**

In closing we want to stress three things. First, strategy instruction should be seen as a process. It is the process that is powerful. Strategies themselves are useless unless the teacher utilizes an effective strategy instruction process that attends to instilling the metacognitive knowledge that students need and helps to change maladaptive motivational processes. Second, the strategy instruction process depends on collaboration. The teacher and students should work together to develop and evaluate new strategies. Remember that strategies are not “off the rack;” rather, they are custom made. Third, teachers should collaborate with other teachers, as well as their students during the strategy instruction process. Professional cooperation allows teachers to share their personal triumphs and challenges and serves to facilitate supportive feedback and problem solving. Teachers who use strategy instruction construct powerful new knowledge about what works for students.

There is now ample evidence that students with LD can be taught to utilize strategies and that these strategies do make a difference in these students’ learning outcomes (e.g., Graham & Harris, 2005; Swanson, 1990). Note that the use of SRSD directly empowers both students with disabilities and their educators. It places the control of learning directly in the hands of students and teachers. Students can always learn new strategies, and educators can always teach them. Most importantly, this strategy approach has a twenty-year track record of success. Clearly, teacher educators, particularly at this time of emphases on the preparation of high quality special education teachers and accountability about the services delivered to students with disabilities and their families, must infuse mastery of validated practices into their preparation programs. We believe that SRSD should become one of those approaches that become part of the “core” in every program that prepares teachers of
students with high incidence disabilities. Given number of these students, new requirements of NCLB and IDEA '04, and our responsibilities to prepare the best future generation of special educators possible, we simply cannot afford to use anything less than the best methods we have for improving academic learning.

References


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