SELF-REGULATION EMPOWERMENT PROGRAM: A SCHOOL-BASED PROGRAM TO ENHANCE SELF-REGULATED AND SELF-MOTIVATED CYCLES OF STUDENT LEARNING

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This article describes a training program, Self-Regulation Empowerment Program (SREP), that school professionals can use to empower adolescent students to engage in more positive, self-motivating cycles of learning. It is a two-part approach whereby self-regulated learning coaches (SRC) (a) use microanalytic assessment procedures to assess students' self-regulation beliefs and study strategies and (b) train students to use these strategies in a cyclical, self-regulation feedback loop. Ultimately, students learn how to set goals, select and monitor strategy effectiveness, make strategic attributions, and adjust their goals and strategies. The program was developed from social-cognitive theory and research and integrates many of the essential features of the problem-solving model. Interventions used in the SREP include graphing, cognitive modeling, cognitive coaching, and structured practice sessions. A case study is presented to illustrate procedures for implementing the program. Implications for school psychologists and teachers also are presented and discussed. © 2004 Wiley Periodicals, Inc.

There is widespread concern that many adolescents possess maladaptive motivational profiles (Eccles et al., 1993; Pintrich & Schunk, 2002). Developmental motivation researchers have shown that as students make the transition to middle school, they often suffer decreases in self-esteem, task values, and intrinsic interest in academic tasks (Eccles et al., 1989; Fredericks & Eccles, 2002; Wigfield, Eccles, MacIver, Reuman, & Midgley, 1991). Of greatest concern, however, is when students no longer believe they possess the ability to learn a particular academic task—a belief called a lack a self-efficacy. Poor self-efficacy beliefs will often undermine students' motivation and may cause them to devalue the task (Bandura, 1997; Pajares, 1996). They also may lead to breakdowns in academic self-regulation such as a lack of attention in class, failure to prepare for examinations, and even failure to attend school (Zimmerman, 2002).

Eccles et al. (1993) argued that the motivational declines noted in middle-school students are often the result of a poor fit between the students' psychological needs and the educational environments in middle schools. While adolescents need to feel autonomous and are cognitively and developmentally able to take on greater levels of independence and personal control (Pintrich & Schunk, 2002), they often are not provided with sufficient opportunities to develop and exercise their autonomy within the classroom (Feldlaufer, Midgley, & Eccles, 1988). Thus, when students are given less choices about curriculum activities and are given less opportunities to assume personal responsibility, they may develop self-defeating cycles of self-motivational beliefs (Eccles et al., 1993). Paradoxically, middle-school teachers expect greater student independence and self-sufficiency *outside* the classroom (Zimmerman, 2002). Students are generally expected to engage in more independent study time, are usually assigned more homework assignments, and must be able to manage different assignments from multiple teachers. To be able to meet these expectations, students need to have a repertoire of study and self-regulation strategies that they can access and utilize. Unfortunately, students who struggle in school not only have a poor knowledge base of effective strategies but also do not understand how to select, evaluate, and adjust faulty strategies when they are not working effectively (Dembo & Eaton, 2000; Weinstein, Husman, & Dierking, 2000; Zimmerman, 2002).

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In sum, as students make the transition to middle school, many of them develop negative self-motivational beliefs and struggle to deal with the academic demands for greater self-management. The key issue addressed in this article is how middle-school students can be empowered to exert greater control over their learning so that they become more proactive, self-motivated learners.

A CYCLICAL MODEL OF ACADEMIC SELF-REGULATION

Self-regulation is a complex, multifaceted process that integrates key motivational variables and self-processes. Although different theories of self-regulation have been developed over the past 20 years, they all share many similar features and characteristics (Zeidner, Boekarts, & Pintrich, 2000). In general, self-regulation involves learners who proactively direct their behavior or strategies to achieve self-set goals. They also rely on affective, cognitive, motivational, and behavioral feedback to modify or adjust their strategies and behaviors when unable to initially attain their goals (Zimmerman, 1989).

To understand the structure of self-regulation processes and their relation to important academic motivational beliefs, Zimmerman (1989, 2000) developed a cyclical model of self-regulation from social-cognitive theory and research. This model has been successfully applied to education (Zimmermamn & Martinez-Pons, 1992), athletics (Cleary & Zimmerman, 2001; Kitsantas & Zimmerman, 2002), and health domains (Zimmerman, Bonner, Evans, & Mellins, 1999). From this perspective, self-regulation is defined as self-generated thoughts, feelings, and behaviors that are planned and cyclically adapted based on performance feedback to attain self-set goals (Zimmerman, 1989). In general, self-regulated learners are proactive learners who incorporate various self-regulation processes (e.g., goal setting, self-observation, self-evaluation) with task strategies (e.g., study, time-management, and organizational strategies) and self-motivational beliefs (e.g., self-efficacy, intrinsic interest). It is assumed that these types of learners will regulate their academic behaviors and beliefs in three cyclical phases: forethought (i.e., processes that precede any effort to act), performance control (i.e., processes occurring during learning efforts), and self-reflection (i.e., processes occurring after learning or performance). The forethought processes influence the performance control processes, which in turn influence self-reflection phase processes. A cycle is completed when the self-reflection processes impact forethought phase processes during future learning attempts. It should be noted that these phases are cyclical in that feedback from previous performances is used to make adjustments during future learning efforts and attempts (Zimmerman, 2000).

The forethought processes set the stage for learning. They involve the beliefs, attitudes, and processes that a student possesses prior to engaging in a school-related activity such as studying or taking notes in class. According to the model, these processes include *goal setting* and *strategic planning* as well as a variety of underlying motivational beliefs such as self-efficacy, goal orientation, intrinsic interest, and outcome expectations. Goal setting has been defined as deciding on specific outcomes of learning or performance (Locke & Latham, 1990) while strategic planning involves selecting or creating a strategy to optimize one's performance during learning attempts (Zimmerman, 2000). Although all self-motivational beliefs are important, self-efficacy is the key motivational process because of its validity in predicting students' choice of activities, effort, and persistence (Bandura, 1997; Pajares, 1996; Zimmerman, 1989). It is defined as the person's beliefs about performing actions at a specific standard of performance (Bandura, 1997). In essence, highly self-regulated learners approach learning tasks in a mindful, confident manner, proactively set goals, and develop a plan for attaining those goals. For example, before an upcoming exam in school, a sophisticated self-regulated learner may decide to select a goal of 90 for the exam, and then develop a plan for attaining that goal such as studying for 4 hr and using graphic organizers and practice quizzes.

These forethought processes will influence a student's propensity and ability to engage in the performance control phase processes, *self-control* and *self-observation*. During this phase,

students actively engage in a specific learning activity and employ self-control and self-observation processes to maximize their learning. Self-control processes help guide the learning or performance of a skill and include subprocesses such as self-instruction, imagery, attention focusing, or task strategies. Self-observation is the other performance control process and has been defined as students' systematically monitoring their own performance (Zimmerman, 1989). A common and effective self-observation technique is self-recording, which involves writing down the processes and outcomes of one's actions. During the performance control phase, sophisticated self-regulated learners will implement their strategic plan (e.g., study for 4 hr and use graphic organizers/practice quizzes) and will use various self-monitoring techniques (e.g., self-questioning, writing down grades for exams) to keep track of and gauge learning success. The second phase is critical because the student gathers information that will ultimately be used to evaluate the effectiveness of the strategic plan and to improve future learning attempts.

The final phase of the cyclical feedback loop involves reflecting on the self-monitored information to evaluate one's performance and to make adjustments during future learning attempts. The two general processes in this phase include *self-judgments* and *self-reactions*. Self-judgments consist of two subprocesses: self-evaluation and causal attributions. Self-evaluation allows a person to judge how well he or she performs by systematically comparing one's performance with specific mastery criteria, with earlier levels of one's behavior, or against the performance of others. The related subprocess, causal attributions, refers to a person's perceived causes of the outcomes of some behavior or event (Weiner, 1986). The other general self-reflection process is self-reactions, which include levels of satisfaction and adaptive inferences. Adaptive inferences are conclusions drawn by students about whether to modify their learning strategies or methods of learning during future learning or performance attempts (Zimmerman, 2000). In essence, after engaging in a learning situation, sophisticated self-regulated learners typically evaluate their performance relative to self-standards (e.g., previous test scores), attribute poor performance to faulty strategies (i.e., their strategic plan), and will make strategic adjustments before the next learning situation (i.e., study for 6 hr rather than 4 hr). Making strategic attributions and adaptive inferences is particularly important because they enable students to sustain their motivation in the face of failure, fatigue, or frustration (Clifford, 1986).

There is a large body of research showing that students who have been trained in self-regulation processes during learning such as goal setting, self-monitoring, and self-reflection processes display high levels of motivation and achievement (Schunk, 1996; Wood, Bandura, & Bailey, 1990). The importance of self-regulation also has been recognized in several domains including health (Creer, 2000), academics (Paris & Paris, 2001; Schunk & Ertmer, 2000), and athletics (Cleary & Zimmerman, 2001). Within the academic realm, self-regulation principles have been incorporated into academic intervention programs to help students learn specific academic and study skills. For example, Weinstein et al. (2000) developed an adjunct course at the University of Texas that focuses on enhancing students' repertoire of learning strategies and enabling them to select, implement, and evaluate the effectiveness of these strategies over the course of a semester. This program is designed to enhance students' self-regulated functioning through training in many of the forethought (e.g., goal setting, strategy selection), performance control (e.g., self-monitoring), and self-reflection phase processes (e.g., self-evaluation, adaptive inferences) outlined in Zimmerman's (2000) dynamic feedback model.

The Self-Regulation Empowerment Program (SREP) seeks to empower middle-school students by cultivating positive self-motivational beliefs, increasing their knowledge base of learning strategies, and helping them to apply these strategies to academic-related tasks in a self-regulated manner. In essence, a self-regulated learning coach (SRC) is the change agent who provides explicit training in the cyclical, feedback loop of self-regulation developed by Zimmerman (2000).

A SELF-REGULATION EMPOWERMENT PROGRAM FOR MIDDLE SCHOOL STUDENTS

Self-Regulation Problem-Solving Process

The SREP is a school-based training program that integrates many of the essential features of the problem-solving approach with those of Zimmerman's (2000) cyclical model of self-regulation. The problem-solving model is a process involving explicitly defining problem areas, directly measuring behaviors, developing and implementing interventions, and assessing intervention efficacy (Deno, 1995). School psychologists have relied on this process when writing psychoeducational reports, conducting assessments, and providing individualized interventions for students with special needs (Deno, 1995; Surber, 1995). However, since the application of the problem-solving model in schools is typically adult driven, students are often relegated to a passive role whereby they wait for professionals to decide which intervention will work most effectively for them. The SREP seeks to reduce student passivity by shifting the responsibility for the problem-solving process from the "professionals" to the students.

Self-regulation models and the problem-solving approach are closely linked because they emphasize similar processes, such as identifying a specific problem area, developing individualized strategies, and assessing strategy effectiveness (Pressley, Borkowski, & Schneider, 1987; Reschly & Ysseldyke, 1995). The primary difference, however, is that self-regulation models empower students to actively engage in the problem-solving process, thereby increasing their autonomy and personal agency over their learning methods (Schunk & Ertmer, 2000; Zimmerman, 2000). The self-regulation problem-solving process is effectively illustrated by Zimmerman's (2000) cyclical feedback model. During this process, students are taught to develop a strategic plan for attaining self-set goals (i.e., forethought processes), to implement study strategies and monitor performance processes and outcomes (i.e., performance control processes), and to evaluate strategy effectiveness and to make strategic adjustments as needed (i.e., self-reflection processes).

Assumptions

The SREP is based on a few important assumptions. First, the SREP assumes that poor student motivation, use of ineffective strategies, and poor self-regulation are key factors contributing to low academic achievement (Gettinger & Seibert, 2002; Pintrich & Schunk, 2002; Weinstein et al., 2000). Although the literature clearly supports this assumption, it must be emphasized that we are not suggesting that they are the only or the most important variables influencing students' academic competence. To the contrary, a variety of factors such as students' cognitive and academic skills, their interpersonal relationships, and their cultural background as well as the context in which they learn have important influences on their success in school (Christenson & Anderson, 2002; DiPerna & Elliot, 2002). Still, students' self-motivational beliefs and use of strategies are emphasized in this training program because they are key features of self-regulation.

The SREP is an application of social-cognitive theory and research (Bandura, 1997; Zimmerman, 2000) and thus assumes that specific contextual or situational variables play a prominent role in student motivation and self-regulation (Linnenbrink & Pintrich, 2002; Zimmerman, 1989). Therefore, it is expected that students' self-motivational beliefs and behaviors will vary depending on the nature of their educational setting or the specific tasks they are asked to perform. To capture these context-specific self-perceptions and behaviors, the SREP relies on qualitative (e.g., interviews, observations) and microanalytic assessment procedures rather than more global, norm-referenced procedures. In general, microanalysis is an approach whereby one examines students' specific thoughts and actions as they perform practical, academic-related tasks. This type of "online" assessment approach differs from most retrospective procedures because it assesses students' specific mental and behavioral processes as they occur and change. For example, it will

yield information about the thoughts underlying a student's goal setting and motivation to perform a specific task as well as the student's ability to adjust learning strategies when not performing adequately. Qualitative and microanalytic assessment procedures have been gaining increased acceptance as a reliable and valid approach for assessing self-regulation in students (Cleary & Zimmerman, 2001; Perry, VandeKamp, Mercer, & Nordby, 2002).

<div align="center">Components of SREP</div>

The SREP consists of two primary components: (a) diagnostic assessment and (b) developing the self-regulated learner. Although a variety of procedures within each component will be presented and discussed, it is important to note the SREP is an inherently flexible approach whereby the SRC may utilize all or only a few of the procedures. Consistent with a student-centered approach, the SREP can be adapted or modified to meet the specific motivational and self-regulatory needs of the students.

Component One: Diagnostic Assessment

Paul (1967) described the "ultimate" research question as "*What* treatment, by *whom*, is most effective for *this* individual with *that* specific problem, under *which* set of circumstances?" (p. 111). Although this question has many implications, it suggests that a highly specific research question will lead to the most meaningful and practical results. This same line of thinking can be extended to academic-related questions. From our point of view, the "essential" academic assessment question is, "To what extent does *this* student have knowledge of, select, and regulate the use of *these* specific study and self-regulation strategies to enhance his or her performance on *these* performance outcomes in *that* particular class?" Answering this specific, context-based question will provide information about students' repertoire of study or learning strategies, motivation to sustain and utilize these strategies, and skill in adjusting ineffective strategies when they are not leading to positive outcomes in a particular class.

The authors developed an assessment guide for answering the essential academic question. In general, this methodology entails beginning an assessment at the most general level, but then systematically progressing to a more specific, microanalytic level (see Table 1). Thus, an SRC begins this process by identifying the class(es) in which students struggle (i.e., class level) and then assessing the performance criteria (e.g., homework completion, test grades) within each of the class(es) that are having the greatest negative impact on their performance (i.e., grading criteria level). An analysis at these two levels involves reviewing objective data (i.e., test grades,

Table 1
Assessment Specificity Guide Used During Diagnostic Assessment Component

Level of Specificity	Assessment Question	Assessment Procedures
Class	In which class(es) does the student struggle?	Review report cards, teacher interviews
Grading Criteria	On which grading criteria in that class does the student perform poorly?	Review tests/quizzes/lab reports, teacher interview
Strategy	Which study and self-regulation strategies does the student use to perform well in that class?	Retrospective self-reports, structured interview, study material review
Microanalytic	How does the student select, use, and regulate specific strategies to perform specific tasks within that particular class?	Think alouds, microanalytic assessment procedures

essays, homework performance) to identify the specific activities within a class that gives students the most difficulty. For example, if an SRC identified that a student is failing science, he or she should focus the grading criteria assessment for science. Thus, one could examine the number of missed homework assignments, test grades over the semester, and the student's performance on lab reports. After the SRC identifies the student's primary areas of weakness, an assessment of the student's repertoire of learning or study strategies for those activities (i.e., labs, tests) in that class is made. The SRC can evaluate the student's knowledge base of strategies by using self-reports and semistructured and unstructured interviews as well as qualitative analysis of class notes and study materials. Gettinger and Seibert (2002) noted, "most of what is known about study skills among secondary students is derived from self-report methods, such as interviews, student-completed checklists, or self-ratings" (p. 352). Retrospective unstructured interviews, whereby students are asked to describe or demonstrate the strategies that they use during learning activities, are useful for assessing how mindful or aware students are of their repertoire of learning strategies. This type of interview could be supplemented with more structured self-reports or interview procedures, such as the one developed by Zimmerman and Martinez-Pons (1988). This assessment procedure was developed to assess the self-regulation strategies of high-school students (Zimmerman & Martinez-Pons, 1988). In general, students are presented with specific learning situations or problems and then asked to convey how they would handle these problems. Their responses are then coded into specific self-regulation strategies (e.g., seeking social assistance, environmental structuring).

After identifying the context-specific strategies that students use, the SRC uses microanalytic procedures to assess *how* students implement and regulate their use of these strategies during academic-related activities. This procedure involves using a semistructured interview to assess students' self-regulation and motivational processes during their execution of the strategies. The questions used in the interview are of a highly specific, contextual-based nature and involve assessing the processes within the forethought, performance control, and self-reflection phases of the cyclical feedback loop (see Table 2). For example, this assessment protocol will provide detailed information about a student's propensity to set goals, to monitor strategy effectiveness, to self-evaluate, and to make strategic adjustments when not learning effectively. It should be noted that the semistructured interview used in the SREP has been pilot tested and is in the process of being validated for use with middle-school youth.

Component Two: Developing the Self-Regulated Learner

The ultimate goal of the SREP is to enable and empower students to become more self-sufficient, independent learners. While the diagnostic component of the SREP involves identifying motivational and strategic weaknesses in students, the goal of the second component is to modify or change these deficits into strengths. This will be accomplished in three steps: (a) enhancing student empowerment, (b) expanding students' repertoire of study/learning strategies, and (c) enabling students to utilize the cyclical feedback loop of self-regulation. The first two steps provide the foundation or set the stage for the explicit training in the feedback loop (see Table 3).

Empowerment.   In a general sense, empowerment can be thought of as a process by which individuals gain control over their lives (Perkins & Zimmerman, 1995). Empowered individuals often exhibit various self-regulatory qualities such as high self-efficacy perceptions and a sense of agency or personal control. Conversely, highly self-regulated learners will often feel empowered because of an underlying self-belief that success is largely dependent on one's skill in effectively using and adjusting strategies. As such, the first step in training individuals to become self-regulated is to cultivate the belief that *academic success is under student control*.

Table 2
Examples of Self-Regulation Microanalytic Assessment Questions

Phases of Cyclical Feedback Loop	Self-Regulation Processes	Assessment Questions
Forethought	Goal Setting	Do you have a goal when studying for your math tests? Explain.
		Do have a goal you are trying to achieve on your math tests? Explain.
	Strategy Choice	How did you decide to use this strategy when preparing for math tests?
	Self-Efficacy[a]	How sure are you that you can get an 85 on your next math test?
		How sure are you that you can solve 70% of these math problems?
	Intrinsic Interest[a]	How interesting is studying/preparing for your math tests?
		How much do you enjoy studying/preparing for your math tests?
Performance	Attention Focusing	Do you have to try to motivate yourself when studying for math tests?
		What do you do when you don't feel like studying for your math tests?
	Self-Recording	Do you keep track of where you study for your math tests?
		Do you keep track of how long you study for your math tests?
Self-Reflection	Self-Evaluation	How do you determine if you performed well on your math test?
	Satisfaction[a]	How satisfied are you with your performance on your last math test?
	Causal Attributions	What is the main reason why you got a 75 on your last math test?
	Adaptive Inferences	What do you need to do to improve your performance on your next math test?

Note. The reference to math tests was for illustrative purposes only. Microanalytic assessment questions are context specific and thus can be modified to assess any subject area.
[a]Students are asked to respond based on a 100-point scale.

To cultivate this belief, the SRC will increase students' awareness of their strategic errors and will highlight the important link between strategy use and success/failure in school. One of the most powerful methods for increasing student awareness is the use of self-observational techniques, such as self-recording (Zimmerman & Paulsen, 1995). Enabling students to keep track of their performance processes and outcomes is important because it helps them to "isolate the source of error, confusion, or inefficiency" (Zimmerman & Paulsen, 1995, p. 15). For example, suppose a student failed most science lab reports because of extremely low scores on the results and discussion sections. If the student was not aware of this pattern, he or she may attribute poor performance to uncontrollable factors such as weak ability or teacher difficulty. An important empowerment technique is to have students use self-recording forms to increase their awareness

Table 3
Goals and Intervention Procedures Used in Self-Regulated Learner Development Component

Intervention Steps	Goal of Intervention Steps	Interventions
Empowerment	To enhance student perceptions of control over academic performance and learning processes	Self-monitoring forms, graphing procedures
Study/Learning Strategies	To teach the student various study/learning strategies and self-regulation strategies	Cognitive modeling, cognitive coaching, guided practice
Cyclical Feedback Loop	To teach the student how to use forethought, performance control, and self-reflection phase processes in a cyclical manner	Self-regulation graph, cognitive modeling, cognitive coaching

of the errors they make so that appropriate strategies can be developed and implemented. For example, in this situation an SRC could teach the student how to self-record the number of points that were lost on each section of previous lab reports. This self-recorded information could be used to identify the specific reasons for difficulties and then to develop solutions to improve performance (e.g., ask for teacher assistance on those sections of the lab).

Graphing is another method that an SRC can use to help students develop the belief that they have power or control over their learning and performance in school. One particular graphing procedure involves plotting school grades and writing down the study or learning strategies used to achieve these grades. After these outcomes and processes are recorded on the graph, the SRC highlights the link between the strategies used and the performance outcomes. Thus, suppose a student earned a score of 65, 56, and 58 on the last three math quizzes, but only used "reading notes" as a study strategy. In this example, the student would plot the three quiz grades and then write down study strategies for each quiz underneath the plotted score (see Figure 1). After this information is recorded, the SRC highlights the link between the student's ineffective study strategies and the failing grades. This discussion should convey to the student that the failing grades are the result of faulty strategies and that he or she can assume greater control over grades by learning more effective strategies.

Study/learning strategies.   After helping students recognize the link between strategy use and school performance, the next step is to enhance their repertoire of study and learning strategies. The SREP advocates the use of a social-cognitive model of strategy instruction whereby students initially learn to use strategies from social sources (e.g., models), but gradually use them in a more independent manner during guided practice sessions. Although more specific procedures are provided elsewhere (King, 1995; Schunk & Zimmerman, 1997), this social-cognitive approach involves using cognitive modeling (i.e., thinking aloud during execution of strategy), cognitive coaching (i.e., hints and feedback provided to the student as they execute a strategy), and guided practice sessions. Thus, students watch and listen to the SRC as he or she demonstrates the procedures for
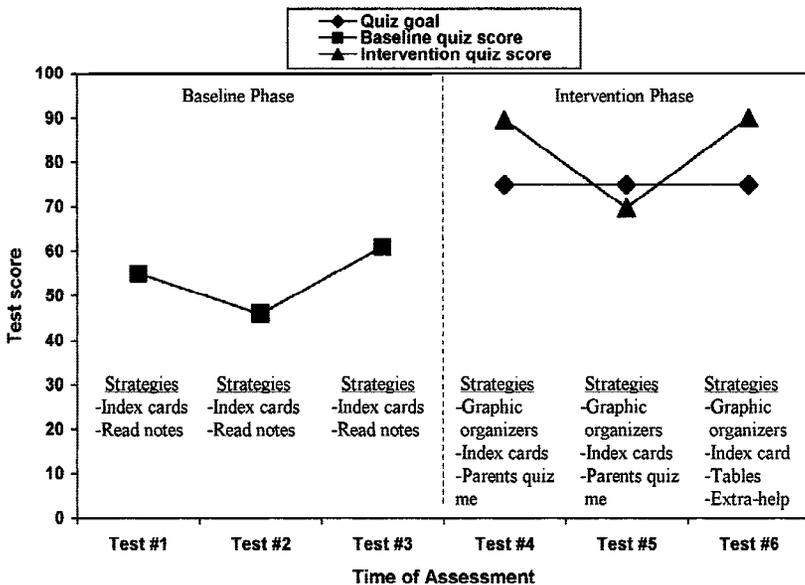

FIGURE 1.   Self-regulation graph used to train students in cyclical feedback loop of self-regulation.

using a strategy. After the strategy is demonstrated, the SRC provides the students with an opportunity to practice using the strategy. These practice sessions are highly structured in that the SRC closely monitors students' accuracy in developing and executing specific strategies and provides continuous and immediate feedback to the student.

Cyclical feedback loop.   The final step of the SREP involves teaching students how to use their newly acquired study and learning strategies in a cyclical, self-regulated manner. The SRC will use a graphing procedure to teach students how to (a) set goals and develop a strategic plan, (b) self-record performance outcomes (e.g., test grades) and processes (i.e., specific learning strategies), (c) evaluate goal attainment, and (d) make strategic attributions and adaptive inferences. Ultimately, this graph will serve as the vehicle through which students independently use strategies in a cyclical, self-regulated manner as illustrated by the following cycle of thought and action: (a) "My goal is . . . and will be attained by . . . .", (b) "I have earned grades of . . . and used the following strategy . . . .", (c) "On my last test I did not reach my goal . . . .", and (d) "The strategy I used was ineffective . . . . To improve, I need to change . . . ." Graphing is an integral part of the SREP because it has been shown to be an effective method for improving school-related outcomes and behaviors, such as academic performance and homework completion (Bryan, Burstein, & Bryan, 2001; Kasper-Ferguson & Moxley, 2002). In addition, graphing is a particularly efficient technique for teaching the feedback loop to students because it enables the SRC to use one form to integrate multiple self-regulation processes.

Implementation of the SREP in a School Setting

The SREP has been pilot tested with a variety of middle-school students in a suburban school district. Although the case studies were not experimental in nature, they are important because they illustrate the procedures for implementing the different components and steps of the SREP in a secondary-school setting. A case study is presented to highlight the primary processes and techniques used by an SRC when working with Anna, a 12-year-old Caucasian student. Anna participated in a mainstreamed educational program and performed well in many of her classes. However, she struggled in science and social studies due primarily to her failing test grades. A previous psychoeducational evaluation revealed that Anna was of average intellectual potential and possessed age-appropriate memory, reading comprehension, and written expression skills. However, she displayed below-average word attack skills and weak computational skills. As a result, she was provided with a variety of school-based support services (e.g., achievement center, remedial math and reading) to support her educational program. Despite these support services, Anna showed minimal improvement and was recommended to participate in the SREP. She was provided with eight 35-min sessions of individualized training with the SRC. It should be noted that the training procedures used in this case study were not based on a script or manual of specific procedures that must be followed in all situations.

Component One: Diagnostic Assessment

The main goal of this component was to answer the essential academic question. Adhering to the Assessment Specificity Guide, the SRC began by identifying the classes and grading criteria within each class that were most difficult for Anna. After reviewing her progress notes and report cards, it was apparent that Anna was performing most poorly in her science class (i.e., grade of *D*). Further analysis showed that although Anna completed most of her homework assignments, participated in class, and passed her lab reports, she failed the majority of her tests. The SRC proceeded to examine Anna's repertoire of study strategies that she used to prepare for her science tests (i.e., strategy level). He asked Anna to report retrospectively the various organizational, rehearsal, and procedural strategies or methods that were used as part of her test preparation. The

SRC also reviewed her study notes and classroom materials to develop additional hypotheses about her study methods. In general, the results showed that Anna did not exhibit any time-management problems, but exhibited limited knowledge of effective study strategies. For example, she relied exclusively on rehearsal strategies, such as reading her class notes and using index cards to memorize words.

Although these qualitative assessment procedures yielded important diagnostic information, the essential assessment question was not yet answered. The SRC still needed to assess Anna's motivational profile as well as how she regulated her use of these strategies. He utilized micro-analytic procedures whereby he asked Anna various forethought, performance control, and self-reflection phase questions as she thought aloud and executed her two strategies (i.e., index cards and reading notes). He began this procedure by asking Anna forethought phase questions about goal setting, self-efficacy, and intrinsic interest. Once this was completed, the SRC asked Anna to think aloud as she used her index cards and reviewed her notes. The SRC observed her behaviors and then asked her questions pertaining to performance control processes (e.g., self-recording and attention focusing). These questions targeted whether she kept track of her studying behaviors (e.g., how long she studied, where she studied) as well as if she used various self-control procedures to maintain her motivation and focus. The SRC completed the microanalytic assessment protocol by asking self-reflection phase questions (e.g., self-evaluation, causal attributions, and adaptive inferences) to determine how Anna evaluated her performance on previous science tests and whether she made any strategic adjustments.

Component Two: Developing the Self-Regulated Learner

Empowerment.   The microanalytic assessment procedures showed that Anna was engaged in a negative motivational cycle characterized by low self-efficacy perceptions, a poor self-awareness of the causes of her struggles, and the belief that she could not improve her failing grades. As a result, the SRC used a graphing procedure to enhance her self-awareness of her study strategies and to highlight the link between her ineffective study strategies and failing test grades. He first asked her to plot the previous three test grades as well as the strategies that she used to prepare for the tests (see baseline of Figure 1). These scores were considered baseline scores because they occurred prior to the SREP. The SRC then attempted to establish the link between her test grades and study strategies by stating (paraphrased), "You are using strategies, which is fantastic . . . but it is possible that the strategies you are using are not working or helping you get good test grades. You're failing grades have more to do with the strategies that you used to prepare for the tests than how smart you are or how hard the teacher is." This intervention helped cultivate the belief that her failing test grades were not fixed and could be improved by learning new strategies or by changing her existing ones.

Study/learning strategies.   During many of the training sessions, the SRC and Anna discussed a variety of alternative strategies that she could use to study for her science tests (i.e., graphic organizers, tables, attending extra help). These discussions were supplemented by the SRC employing cognitive modeling and cognitive coaching procedures. For example, during one particular session, the SRC modeled how to use graphic organizers for comparing and contrasting information about the different human systems (i.e., digestive and skeletal). He demonstrated how to execute the steps for creating a graphic organizer while verbalizing his thoughts. Anna was then provided with several opportunities to practice using this strategy and was encouraged to develop her own graphic organizers. As she practiced, the SRC provided her with feedback and prompts to facilitate her internalization of the learning strategy. This procedure of SRC modeling and guided practice sessions was followed during most sessions when new strategies were introduced to Anna.

Cyclical feedback loop.   The self-regulation graph was the primary intervention tool used to empower Anna to engage in positive cycles of motivation and learning. It involved teaching her to set performance goals, to self-record performance processes (i.e., strategies used) and outcomes (i.e., test grades), and to evaluate goal progress and strategy effectiveness (see Figure 1). Anna was asked to record the three prior test grades as well as the strategies that she used to study or organize the information for each test. He proceeded to reinforce the premise that her poor grades were the result of ineffective strategies rather than uncontrollable factors such as her ability, teacher difficulty, or test difficulty.

After reviewing her baseline grades, the SRC and Anna collaboratively set a moderately difficult performance goal (i.e., grade of 75) that she would try to achieve during the training. After the goal was set and plotted on the graph, the SRC followed a systematic procedure for teaching the self-regulation feedback loop. Prior to each of her science tests, Anna was encouraged to write on the self-regulation graph the study strategies that she used in preparation for the tests. After Anna received a test score, the SRC instructed her to plot it on the graph and then engaged her in a discussion about three critical self-reflection processes: (a) self-evaluating, (b) making causal attributions, and (c) making adaptive inferences. For example, after Anna earned a grade of 90 on her first intervention-phase test grade, the SRC asked her to plot the score. He then showed her how to evaluate her performance by using self-criteria, such as comparing her current grade with her previous grades or with her performance goal. In terms of making appropriate attributions and adaptive inferences, the SRC highlighted the connection between her grades and the strategies that she used to prepare for the tests. It was emphasized that her improved test score of 90 was the result of her newly acquired study strategies. The SRC then reinforced the premise that success in school was largely under her control and depended on her ability to effectively use study and learning strategies.

Limitations of SREP

Despite having the potential to be an effective intervention, the SREP has a few shortcomings in terms of its breadth and applicability across diverse learners and classroom environments. The SREP was developed to assist school professionals (i.e., school psychologists, counselors, and teachers) in enhancing the motivation, study strategies, and self-regulatory skills of adolescent students. Although optimizing these processes will undoubtedly have a positive impact on students' academic achievement, one must realize that these processes are not the only factors impacting student success in school. For example, the quality of students' participation in class as well as the quality of their peer relationships are related to students' ability to succeed. In addition, if students possess weak academic skills, such as word attack or mathematical reasoning ability, they will have a more difficult time earning high grades. In essence, the SREP is a highly specialized program that targets key motivational and strategic processes, but does not impact all essential areas of functioning. As a result, the SREP will probably be most effective when used concurrently with other academic interventions or social programs.

Student differences across cognitive, motivational, and cultural domains also may limit the efficacy of the intervention program. For example, students who have low intellectual potential or extremely weak executive-functioning skills would be expected to have more difficulty planning, keeping track of performance processes or outcomes, and effectively regulating their thoughts and behaviors. Similarly, students who have emotional disabilities (e.g., depression) may be resistant to participating in the training program because of the personal effort needed to self-regulate during school-related activities (Zimmerman, 2000). Thus, one should not assume that the SREP involves a set of specific procedures that can be rigidly applied to all students in the same manner. When using this program, an SRC must take into account the characteristics of individual students as well as their specific strengths and weaknesses.

Classroom and instructional variables also may undermine the effectiveness of the SREP. These variables include quality of teacher feedback, type of student evaluations, and frequency of performance evaluations (i.e., tests, quizzes, etc.) (Pintrich & Schunk, 2002). For students to learn how to think and behave in a cyclical, self-regulated manner, they need to have frequent opportunities to engage in these processes. Students who take many tests in a particular class have a tremendous advantage because they will have more chances to engage in the cyclical feedback loop. Unfortunately, when students are given only one or two tests per semester, they will not be able to practice evaluating goal attainment, monitoring strategy effectiveness, and adjusting ineffective strategies during future learning attempts.

The type of feedback that students receive from teachers also will influence their ability to reflect on performance outcomes. For example, teachers who do not provide students with strategic feedback or with a clear explanation of their specific errors will make it more difficult for students to understand why they are performing poorly and what they need to do to improve. For example, suppose a student received a score of 62 on a math test that consisted of numerical and word problems involving fractions. If the teacher simply marked the number of incorrect items and wrote the student's grade on the test, the student would be left to figure out the specific reasons for the failure and the strategies needed to employ for future tests.

Implications for School Personnel

The SREP is a school-based training program that has many implications for school psychologists, counselors, and teachers. Traditionally, school psychologists have used norm-referenced psychological, educational, and personality tests to evaluate a child's functioning relative to his or her peers. Although these types of tests are critical in evaluating a student's cognitive, academic, and emotional profiles, they typically do not provide adequate information about student's knowledge and use of specific study and learning strategies as they perform school-related activities. In addition, they are not designed to assess context-related shifts in a student's motivation and self-regulation processes during learning activities. To assess these processes, school psychologists need to rely on more naturalistic and dynamic forms of assessment including qualitative and microanalytic procedures. These types of procedures have received increased support for assessing student's motivation and self-regulatory processes because of their sensitivity to measuring dynamic processes (Cleary & Zimmerman, 2001; Kitsantas & Zimmerman, 2002; Perry et al., 2002). Thus, it is highly recommended that school psychologists supplement their norm-referenced assessment batteries with microanalytic procedures, particularly when assessing children who have motivational and strategy deficiencies.

The training program presented in this article is an assessment and intervention approach for working with individual students. Although school psychologists and counselors may be able to provide this type of individualized training, teachers may find it more difficult because of large class sizes. However, teachers can create self-regulation problem-solving classrooms by incorporating some of the SREP principles into their daily activities. For example, in self-regulation classrooms, teachers would provide frequent performance outcomes (e.g., tests, quizzes), give immediate strategic feedback, encourage graphing procedures to self-record performance outcomes and processes, and teach various study or learning strategies. Although all of these features can have positive changes on students' self-regulated beliefs and behaviors, the key element is teachers giving frequent performance opportunities for students.

Conclusion

An assessment and intervention program designed to enhance motivational and self-regulated cycles of learning in middle-school and high-school students was presented and discussed. This program integrates many of the essential features of the problem-solving model with

key self-regulation processes from Zimmerman's (2000) dynamic feedback model of self-regulation. It focuses primarily on empowering students to become self-directed problem solvers whereby they proactively set goals, monitor performance processes and outcomes, evaluate their performance, and then make strategic adjustments to improve their performance. Although this model has yet to be formally tested using experimental designs, anecdotal data from case studies suggest that it may have positive effects on student achievement and motivation. The potential effectiveness of this model is based not only on its development of self-regulatory processes but also on its message for establishing "hope" and "empowerment" in students and their respective parents and/or teachers. Empowering students to become more self-directed learners and helping teachers and parents further develop these skills in their children can significantly increase students' motivation and achievement in school (Zimmerman, 1989, 2002).

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