INFLUENCING CHILDREN'S SELF-EFFICACY AND SELF-REGULATION OF READING AND WRITING THROUGH MODELING

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Abstract:
According to Bandura's social cognitive theory, self-efficacy and self-regulation are key processes that affect students' learning and achievement. This article discusses students' reading and writing performances using Zimmerman's four -phase social cognitive model of the development of self-regulatory competence. Modeling is an effective means of building self-regulatory and academic skills and of raising self-efficacy. Reading and writing research is discussed in which modeling was employed to enhance self-efficacy, skills, and self-regulation across multiple phases of Zimmerman's model. The article concludes by suggesting instructional applications based on social cognitive theory and research findings.

Article:
Recent years have witnessed an increasing emphasis on the development of students' literacy skills—especially reading and writing. Although these two literacy skills depend in part on students' verbal abilities, research shows that cognitive and motivational variables also play a significant role (Zimmerman & Bandura, 1994).

Two key cognitive and motivational variables in reading and writing are self-efficacy and self-regulation. Self-efficacy refers to learners' perceived capabilities for learning or performing actions at designated levels (Bandura, 1997), while self-regulation (or self-regulated learning) refers to self-generated thoughts, feelings, and actions that are systematically designed to affect one's learning of knowledge and skills (Zimmerman, 2000, 2001). Modeling—an important variable in Bandura's (1986) social cognitive theory—is a means for promoting students' self-efficacy and self-regulation.

This article summarizes research supporting the idea that self-efficacy and self-regulation are critical influences on reading and writing achievement. The next section presents a brief theoretical background based on Bandura's (1986) social cognitive theory to include the key concepts of reciprocal interactions, self-efficacy, modeling, and self-regulation. Zimmerman's (1998) phases of self-regulation then are described, along with a model for the development of self-regulatory skill based on the writings of Zimmerman (2000) and Schunk (1999). Research interventions are discussed in which modeling was used to promote self-efficacy and self-regulation in reading and writing among children. The article concludes with suggested ways to apply research findings to instructional contexts to foster learners' reading and writing skills.

THEORETICAL BACKGROUND
Reciprocal Interactions
Our conceptual framework is based on Bandura's (1986, 2001) social cognitive theory, which construes human functioning as a series of reciprocal interactions between personal influences (e.g., thoughts, beliefs), environmental features, and behaviors (Fig. 1). For example, one's personal self-efficacy beliefs about writing an essay can influence one's writing behaviors, such as choice of literary topics, effort, and persistence. Self-efficacy beliefs also can affect a person's environment; for example, efficacious students who are trying to write in a noisy social or physical environment may redouble their personal concentration to avoid distractions.

Conversely, one's social environment can affect personal variables and behaviors. Students who receive encouraging feedback from teachers may feel more personally efficacious and work harder to succeed. Teachers can inspire students to write by creating a favorable classroom environment, such as by giving children adequate time to write and revise.

The influence of behavior on personal variables can be seen in the student who succeeds in reading a moderately difficult book and then experiences higher self-efficacy and motivation to try reading another book of comparable difficulty. Behaviors also can affect the environment, as when students eliminate distractions from their environments (e.g., turn off the television so they can read better).
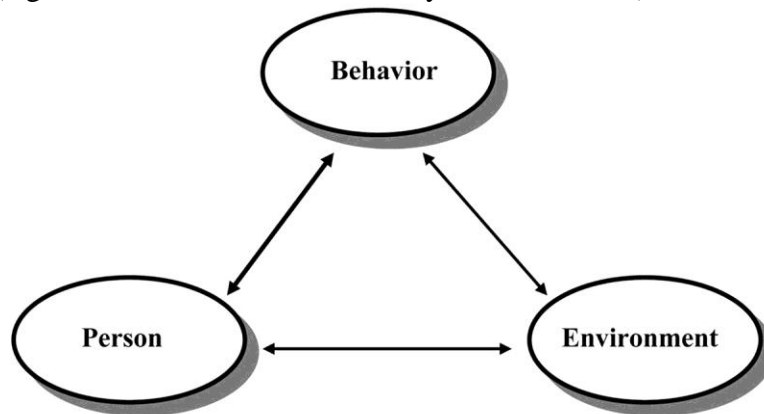

Figure 1. Bandura's model of reciprocal interactions.

Bandura (2001) noted that people seek to exert control over important aspects of their lives. The notion of reciprocal interactions illustrates how people can affect their behaviors and environments with their thoughts and beliefs. Important processes that people use to exert control are their self-efficacy and self-regulation.

Self-Efficacy
Self-efficacy is hypothesized to influence choice of activities, effort expenditure, persistence, and achievement (Bandura, 1997; Schunk, 2001). Compared with students who doubt their learning capabilities, those with high self-efficacy for acquiring a skill or performing a task participate more readily, work harder, persist longer when they encounter difficulties, and achieve at higher levels.

Learners obtain information to appraise their self-efficacy from their actual performances, vicarious (modeled) experiences, forms of persuasion, and physiological reactions. One's own performances offer reliable guides for assessing self-efficacy. In general, successes raise self-efficacy and failures lower it, although an occasional failure/ success after many successes/failures may not have much effect.

Learners also acquire much self-efficacy information vicariously— primarily through exposure to models. Although adult models can teach children skills, children derive the best self-efficacy information from models who are similar to themselves (e.g., peers; Schunk, 1987). Observing similar others succeed at a task, such as reading aloud in front of the class, may raise observers' self-efficacy. Children are apt to believe that if the peers can succeed, they can as well. Children may not experience the same sense of self-efficacy from observing a competent adult read to the class. Conversely, observing similar peers have difficulty on a task may lead observers to believe that they also may have trouble, which can lower their self-efficacy.

Students also receive persuasive information from others that can influence their self-efficacy to engage in activities; for example, when teachers tell them, "You can do it," or, "Work hard and you'll do well." Such information can raise self-efficacy, but actual performance will validate or invalidate the information. The increased self-efficacy will be substantiated if learners subsequently succeed, but the effect will be short-lived if students subsequently attempt the task and perform poorly.

Finally, physiological reactions (e.g., sweating, heart rate) offer information to gauge self-efficacy. Children who notice that they are less anxious than usual while taking tests may interpret that to mean that they are more skillful, which can promote self-efficacy.

Self-efficacy, however, is not the only influence on achievement. High self-efficacy will not produce competent performance when requisite knowledge and skills are lacking. Outcome expectations, or anticipated consequences of actions (e.g., making a high grade on a test after studying hard), are influential because learners engage in activities they believe will lead to positive outcomes (Shell, Murphy, & Bruning, 1989). Even students with high self-efficacy are not apt to attempt a task if they believe that performance will not lead to positive outcomes. Perceived value, or the utility of the learning, affects behavior because learners show little interest in activities they do not value (Wigfield & Eccles, 2002). Conversely, students who value an activity and believe that it will lead to positive outcomes (e.g., playing sports leads to social status among peers) may attempt the activity even if they lack self-efficacy for performing well. Assuming that learners hold positive outcome expectations and value the activity, their self-efficacy is predicted to influence their effort, persistence, and achievement (Bandura, 1986).

The effects of self-efficacy also may depend on students' conceptions of ability. Dweck (1991, 1999) proposed that people may hold an entity or incremental theory of ability. Students with an entity theory believe that ability is relatively fixed and unchanging over time, whereas those holding an incremental view believe that ability can be improved with effort and learning. With some exceptions, students who hold an incremental theory are likely to adopt learning goals, which can raise self-efficacy and motivate them to engage in self-regulation to learn. Those holding an entity theory are less likely to adopt learning goals because they believe that learning will not raise their ability. Their self-efficacy may be lower because they believe that their performance is limited by their ability. Thus, self-efficacy may exert its strongest effects on learning and self-regulation among students who espouse an incremental theory of ability.

Modeling
We noted earlier that models provide information about learners' self-efficacy. Modeling refers to the process in which observers pattern their thoughts, beliefs, and behaviors, after those displayed by one or more models (Schunk, 1987). Modeling is an important means for acquiring literacy skills, beliefs, attitudes, and behaviors (Rosenthal & Zimmerman, 1978). Adults and peers serve as key models in children's lives.

Observational learning through modeling occurs when observers display new behaviors that they could not perform prior to being exposed to the models (Schunk, 1987), such as learning to use examples to illustrate abstract concepts (e.g., honesty, fairness). Observational learning through modeling consists of four processes: attention, retention, production, and motivation (Bandura, 1986). Modeling will not occur unless observers attend to relevant environmental events. Retention requires that observers mentally code and transform modeled information to store in memory, as well as cognitively organize and rehearse information. Production involves observers translating their mental conceptions of modeled events into actual behaviors, such as when they translate their thoughts into written sentences and paragraphs. Motivation influences observational learning because when students believe that models possess a useful skill they are likely to attend to such models and attempt to retain what they learn.

Models can inform and motivate observers (Schunk, 2001). Observing competent models perform actions that result in success conveys information to observers about the sequence of actions to use to be successful. By watching models, observers form outcome expectations about the expected consequences of actions. Observers are more likely to perform modeled actions that have been successful and whose outcomes they value. Students who value doing well in school and who observe a teacher successfully model how to use an outline to write a paper are likely to try outlining before they write. Models also can influence observers' self-efficacy. Seeing a successful model may lead observers to believe that if the model can learn they can as well. As students perform actions and note their learning progress their sense of self-efficacy is strengthened, which maintains their motivation for learning.

Self-Regulation

Along with self-efficacy, self-regulation helps to promote reading and writing achievement, and models can teach students self-regulation skills (Schunk & Zimmerman, 1997a). Zimmerman (1998) conceptualized self-regulation as consisting of three phases: forethought, performance control, and self-reflection. The forethought phase precedes actual performance and refers to processes that set the stage for action, such as goal setting and modeling. The performance control phase involves processes that occur during learning and affect attention and action, such as social comparisons, feedback, and use of learning strategies. During the self-reflection phase that occurs after performance, learners respond to their efforts by evaluating their goal progress and adjusting strategies as needed.

Zimmerman and Schunk (Schunk, 1999; Schunk & Zimmerman, 1997a, 1997b; Zimmerman, 2000) formulated a social cognitive model of the development of self-regulation (Table 1). This model postulates four levels of development—observational, emulative, self-controlled, self-regulated—that begin with social sources and subsequently shift to self-sources. Although there is some overlap, the first two levels (observational, emulative) rely primarily on social factors, whereas the second two (self-controlled, self-regulated) depend more on influence by the learner.

In the early stages of learning a skill, students benefit from observing models explain and demonstrate the skill. At this observational level, students learn the major features of skills and strategies cognitively, such as when an aspiring news announcer observes a veteran anchor on television and learns that one must pause and inflect one's voice to communicate more effectively.

Table 1. Social cognitive model of the development of self-regulation

Phase	Major feature
Observation	Cognitive acquisition of skill from modeled and verbal instruction
Emulation	Demonstration of skill with social guidance and feedback
Self-controlled	Internalization of skill and its independent demonstration
Self-regulated	Adaptation of skill to changes in personal and contextual conditions

An emulative level is attained when the learner's performance approximates the general form of the model's. The learner is not copying the model's actions but rather emulates the model's general pattern or style, such as when the aspiring news announcer practices pausing and inflecting his or her voice on news articles and receives feedback from others. The major difference between the first two levels is that observational learning involves acquisition only at an observational level, whereas emulative learning also includes a performance capability.

These two sources are primarily social because they require that students be exposed to models. Internalization (i.e., learner control) of the skill or strategy being learned has begun, but the process increases with the shift to the third and fourth sources that reside primarily within the learner.

The third, self-controlled level, represents the capability of learners to use the skill or strategy independently when performing related tasks. The skill or strategy becomes internalized (self-controlled) during this phase, although the learner's mental representation is patterned after the model's performance; for example, when the aspiring news announcer listens to recordings of his or her voice and compares these against his or her memory (archived representation) of the anchor's readings. Learners at this point have not developed a mental representation of the skill or strategy independent of that displayed by the models, nor have they mentally modified the skill or strategy based on what they believe will be most effective.

During the final self-regulated level, learners adapt their skills and strategies to changes in personal and contextual conditions. Now learners can initiate use of the skills and strategies, incorporate adjustments based on situational features, and maintain their motivation through personal goals and a sense of self-efficacy for

attaining them. Thus, the aspiring news announcer will notice that he or she makes fewer errors when reading slightly slower.

Bandura's reciprocal interactions are evident throughout the phases. Environmental variables influence behaviors and personal variables, which in turn affect the environment. Teachers who observe problems in learners' performances provide correction, learners who do not fully comprehend how to perform a skill or strategy at the emulative level may ask teachers for help, and learners' performances affect their self-efficacy. At more-advanced levels, learners mentally and overtly practice skills and seek out teachers, coaches, and tutors to help them refine their skills.

Social influences (e.g., models) are most prevalent during the early phases but they never completely disappear. Self-controlled and self-regulated learners use social sources less frequently but they continue to call upon them as needed (Zimmerman, 2000). It also is noteworthy that this is not a stage model and learners may not progress in this fashion. Learners without models in their environments may bypass these levels and learn largely on their own. Despite the frequent use of self-teaching, it fails to capitalize on the potential benefits of the social environment on learning. Also, not using models may limit the level of skill acquisition unless learners are exceptionally self-regulated and can develop effective learning strategies and maintain their motivation for learning.

The emphasis on internalization shares some overlap with Vygotsky's (1962) sociocultural theory, which postulates that socially-mediated activity is an important influence on thought. The social environment, along with personal factors, produced learning through its "tools"— cultural objects, language, social institutions. Cognitive change results from using cultural tools in social interactions and from internalizing and mentally transforming those interactions.

Our social cognitive model with its emphasis on internalization shares with Vygotsky's theory the key role played by cognitive and metacognitive mediation (Schunk, 1999). One difference is that Vygotsky stressed private (internal) speech (Tudge & Scrimsher, 2003), which is one means of promoting internalization but not the only means. In the social cognitive view, internalization also can be based on visual images, verbal meanings, and nonverbalized rules and strategies—all of which can be conveyed through modeling. Internalization produced through the latter means facilitates learning, given that private speech does not commonly occur in children (Schunk & Zimmerman, 1997b).

RESEARCH EVIDENCE
This section summarizes research on reading and writing achievement that highlights the key roles of modeling, self-efficacy and self-regulation, as explained in the preceding section. The research focus in this section is on intervention studies in which programs were implemented to improve students' academic skills. Space limits preclude summarizing non-intervention research. Readers interested in these studies should consult other sources (e.g., Pajares & Johnson, 1994; Shell et al., 1989; Zimmerman & Martinez-Pons, 1990).

Reading Achievement
Schunk and Rice (1989) worked with fourth- and fifth-grade children who had low reading comprehension skills but not excessive decoding problems. Children were pretested on comprehension of main ideas (self-efficacy and achievement). They then were assigned to one of three conditions: process goal, product goal, general goal.

All children received 35-minute sessions each day for 15 consecutive school days. During these sessions an adult teacher modeled (explained and demonstrated) a strategy to answer questions involving main ideas. The strategy included five steps: read the questions; read the passage to find out what it is mostly about; think about what the details have in common; think about what would make a good title; reread the story if I don't know the answer to a question. Following the initial modeled demonstration, the model called on children to read and apply the strategy's steps to passages they were reading.

Treatment conditions were distinguished by the type of goal instructions provided to children at the start of each of the 15 sessions. Process-goal children were advised to try to learn how to use the steps to answer questions about what they read. Product-goal children were told to try to answer questions about what they read. General-goal students were encouraged to try to do their best. Posttest results showed that process- and product-goal children judged self-efficacy for answering comprehension questions higher than did general-goal students, and process-goal children demonstrated higher reading comprehension achievement.

The modeling that occurred in this study addressed the first two levels in self-regulatory skill development: observational and emulative. Students were able to apply the strategy on their own during the instructional sessions, as well as on the posttest, which suggests that they progressed to the self-controlled level. Although informative, this study did not explicitly address the self-regulated level.

A follow-up study used the same methodology with fifth-grade students with low comprehension skills but not excessive decoding problems (Schunk & Rice, 1991). Children were assigned to a product goal, a process goal, or a process goal plus progress feedback condition. The latter condition was similar to the process-goal condition except that the model periodically provided children with verbal feedback that linked their improved performance to strategy use (e.g., "You got it right because you followed the steps in order."). Goalplus-feedback students demonstrated higher self-efficacy and comprehension than did process- and product-goal learners. Process-goal and goal-plus-feedback children evaluated their progress in strategy learning greater than did product-goal children. These remedial readers benefited from explicit feedback on their progress toward attainment of a process goal. As with the preceding study, modeling was used at the observational and emulative levels, and students practiced strategy application to develop a self-controlled level of competence.

In another project that examined how feedback affected learners' achievement outcomes, Schunk and Rice (1987) found in two studies that multiple sources of information stressing the value of a strategy to identify main ideas raised achievement outcomes. The participants were elementary children who had been receiving remedial instruction because they scored below the 20th percentile on a standardized reading test. The methodology was similar to that of Schunk and Rice (1989). In the first study, children were assigned to one of four conditions: specific strategy value information, general strategy value information, specific plus general (combined) strategy value information, no strategy value information. Strategy value information was given to children at the start and finish of each of 15 instructional sessions. For specific strategy value children the teacher verbally linked using the strategy with answering questions about main ideas. For general strategy value information children the teacher linked strategy use with answering any type of questions about reading passages. Children in the combined group received both types of feedback, and children in the no strategy value information group received only modeled strategy instruction. In the second study some children received specific strategy value information, others periodically received strategy effectiveness feedback that linked their strategy use with successful performance (similar to the progress feedback condition in the Schunk and Rice (1991) study), and those in a third condition received both types of feedback.

In both studies, children's self-efficacy and skills showed the greatest improvements from the combined conditions. The combination may have led children to believe that they could improve their comprehension, which raises self-efficacy. As in the prior studies, modeling was used to teach the strategy and children were able to develop self-regulatory competence in strategy application at the self-controlled level.

Further information that poor readers benefit from strategy usefulness information was obtained in two studies by Schunk and Rice (1992). Children who regularly received remedial reading instruction because they scored in the lowest 30th percentile on a standardized reading test received comprehension instruction on main ideas (same methodology as Schunk and Rice (1989)). In the first study, some students received modeled strategy instruction, others received modeled strategy instruction plus strategy-value feedback linking strategy use with improved performance (similar to the progress feedback in the Schunk and Rice (1991) study), and those in a third condition received instruction without the strategy. In the second study, children received modeled strategy instruction or instruction without strategy modeling; they then were given comprehension instruction

on locating details. Some received modeled instruction on how to modify the strategy for the new comprehension task, whereas others did not employ the strategy on details. Children who received strategy-value feedback (Study 1) and strategy-modification instruction (Study 2) demonstrated the highest self-efficacy, comprehension, strategy use, and transfer of the strategy to the new comprehension task. Unlike the preceding studies, this study provides evidence that modeling with instruction on how to adapt a strategy for a different use facilitates children's strategy internalization that is necessary to advance to the self-regulated level.

In similar fashion, Schunk and Rice (1993) found that reading comprehension benefits from procedures that combine modeling with information about strategy usefulness and efforts to internalize the strategy. Children with the same qualifications as those in the Schunk and Rice (1992) study received instruction on locating main ideas. The methodology was similar to that of Schunk and Rice (1989) except that the teacher called on children to verbalize the strategy's steps as they performed them. With increased practice, some children were asked to fade their overt verbalizations to silent (inner) speech. Half of the children in the fading and no-fading conditions periodically received feedback linking strategy use with improved performance (similar to the progress feedback in the Schunk and Rice (199 1) study). The no-fading/no-feedback condition scored lower than the other three conditions on self-efficacy and reading achievement. Fading plus feedback led children to judge that they used the strategy's steps more often when answering comprehension questions, compared with the fading-only and feedback-only conditions, and to higher comprehension compared with the feedback-only condition. The fading treatment helps to promote strategy internalization, with corresponding benefits for higher levels of self-regulatory skill development (noted above).

Using a similar methodology, Schunk and Rice (1985) also found that children who verbalized aloud the strategy's steps as they applied them to passages demonstrated higher reading comprehension and self-efficacy, compared with children who applied the strategy without verbalizing the steps. These results show that verbalization is an effective way to transition from social to self-influences.

The reading achievement literature contains many other examples of research projects in which adult or peer models were used to teach children reading comprehension strategies (Pressley, El-Dinary, Wharton-McDonald, & Brown, 1998). In some cases the modeling was not systematic as in the preceding research studies but rather was provided by teachers as the need arose (e.g., to teach students a strategy for use on a specific task). These projects are not described here because they did not include measures of self-efficacy or self-regulation. Their results do support a central contention of this article—that modeling is an effective means of teaching reading strategies.

The research described in this section shows that observing models can raise children's self-efficacy for learning and motivate them to work diligently. Modeling is a key component of the first two (observational and emulative) levels of self-regulation development. Most of the research summarized in this section did not progress beyond the self-controlled level. Moving to the self-regulated level requires that students internalize strategies. Although students can internalize strategies on their own, much research shows that internalization can be accomplished through overt strategy verbalization and fading to a covert (silent) level.

Writing Achievement
Consistent with the results for reading comprehension discussed in the previous section, research on writing achievement also shows that modeling is an effective means of teaching self-regulatory skills and raising self-efficacy. Schunk and Swartz (1993a, 1993b) found that modeled strategy instruction combined with goal setting raised elementary children's writing skills and self-efficacy and helped them maintain and transfer use of the strategy beyond the instructional context. Average-ability and gifted students received instruction on writing paragraphs over 20 sessions that included five sessions each on descriptive, informative, narrative story, and narrative descriptive paragraphs. Students were taught a five-step strategy: choose a topic to write about; write down ideas about the topic; pick the main idea; plan the paragraph; write down the main idea and the other sentences. The teacher modeled and explained the strategy, after which the students received guided and independent practice. At the start of each session, some students received a learning (process) goal: The teacher

advised them to try to use the strategy to write paragraphs. Other children received a product (outcome) goal: The teacher told them to try to write paragraphs. General-goal children were advised to work productively. During the sessions, half of the process-goal students periodically received verbal feedback from the teacher that linked their use of the strategy's steps with improved performance.

Across both average and gifted students, process-goal plus feedback students generally outperformed product- and general-goal children on self-efficacy and writing achievement, evaluated the effectiveness of the strategy the highest, and demonstrated the greatest strategy use. Gains made by process-goal plus feedback children were maintained after six weeks and generalized to types of paragraphs on which children received no instruction. These results suggest that modeling, practice, and feedback, combined with learning goals and evaluations of strategy effectiveness, moved children to a self-controlled level, and the results for transfer and maintenance suggest that they were operating at a self-regulated level.

Additional evidence on the effectiveness of goals in promoting self-regulation was provided by Zimmerman and Kitsantas (1999), who investigated the development of high-school students' self-regulatory writing revision skills. Students observed a modeled demonstration of a writing revision strategy. The three-step strategy was designed to teach students how to combine multiple sentences into a single sentence by eliminating redundancies and adding transitions. Students were assigned to a condition and practiced the strategy. Process-goal students were advised to concentrate on executing key steps in the revision strategy. Outcome-goal students were told to rewrite the sentences using a minimal number of words. Shifting-goal learners initially were asked to concentrate on properly performing the strategy's steps, but after a few minutes they were advised to shift to the outcome goal. Within each of these three conditions some of the students were asked to record the number of strategy steps done correctly (process goal) or the number of words in the sentence (outcome goal). No-goals students received the same modeling and feedback without goals or self-recording. The results showed that students who received the shifting goal demonstrated higher self-efficacy and writing skill compared with the other conditions, and that process-goals were more effective than outcome goals and no goals. Self-recording increased writing skill and self-efficacy.

This study has several noteworthy features. The modeling with practice was designed to address the first two self-regulation levels of observation and emulation, the process goals addressed the third, self-controlled level, and the outcome goals tapped the fourth, self-regulated level. The results showed that it was possible to move students to the fourth level but only after progressing through the third level. Those who skipped the third level (outcome goal group) showed poorer performance and lower self-efficacy compared with the process and shifting goal conditions. Despite our earlier contention that our model was not a stage model, this study suggests that under some conditions there are benefits to not skipping phases.

In a series of studies, Graham and Harris (1989a, 1989b; Sawyer, Graham, & Harris, 1992) found that using modeling to teach children with learning disabilities a strategy for writing essays or stories improved self-efficacy and composition and that gains were maintained following instruction and generalized to other content and settings. The strategy was taught with a cognitive modeling procedure, in which models explained and demonstrated the strategy while applying its steps to write stories. The models also conveyed strategy value by stressing that strategy use would help students reach their learning goals. To enhance the perception of progress and thereby build self-efficacy, students were asked to monitor their writing performances and evaluate their progress by comparing their learning goals with their achievement. The fact that this research demonstrated maintenance and generalization suggests that the instructional procedure helped students advance to the self-regulated level.

Other research by Graham, Harris and their colleagues has yielded benefits of modeled instruction on writing performance and revision (De La Paz & Graham, 1997; Page-Voth & Graham, 1999; Sexton, Harris, & Graham, 1998; Troia, Graham, & Harris, 1999). Not all of these studies assessed self-efficacy or self-regulatory competence, although Page-Voth and Graham (1999) found that self-efficacy was not increased as a result of providing students with writing goals (e.g., including a specific number of reasons to support the writer's

premise). It is possible that their participants—who had learning disabilities—did not have sufficient time to perceive their writing improvement because the study involved only three writing sessions.

Although this article focuses on children's reading and writing achievement, we will briefly summarize a study by Zimmerman and Kitsantas (2002), which explored the effects of modeling and social feedback on self-regulatory writing revision skill acquisition among college students. Students were assigned to one of six conditions. Mastery modeling students observed a model demonstrate the revision strategy flawlessly; coping-model students observed a model who initially made and corrected errors but gradually improved performance; no-model students were not exposed to a model. Within each of these conditions some students received feedback during the practice session that followed the modeling: Students were given feedback about the strategy steps that they performed correctly.

The results showed that observing a coping model led to greater increases in writing self-efficacy and skill compared with the other conditions, and that the mastery model improved outcomes more than the no-model condition. Feedback also led to gains in self-efficacy and revision skill. These results suggest that the benefits of the coping model may have stemmed from the information conveyed about error corrections, which may help move students from the observational to emulative levels. Witnessing a flawless performance does not convey the same type of information. The benefits of feedback may derive from its capacity to help students move to the self-controlled and self-regulated levels.

In summary, research evidence shows that interventions that include modeling can effectively teach learners self-regulatory skills and raise their self-efficacy for applying them. For learners to move beyond the first two levels of skill development requires modeled instruction and practice on adapting the strategy for use on different tasks.

APPLICATIONS TO INSTRUCTION

Theory and research findings suggest potential applications to instruction. One suggestion is that to ensure that students acquire self-regulation skills they must be taught them and allowed to practice them. Teachers should teach self-regulation strategies along with content so that students understand how to apply the strategies. For example, to teach literary analysis a teacher might model on sample passages a strategy for finding similes, metaphors, irony, foreshadowing, and the like. While teaching reading comprehension a teacher might read a paragraph and them summarize it in his or her own words before moving to the next paragraph.

Another suggestion is that environments need to accommodate to differences in students' self-regulation skills. Like other cognitive skills, students will differ in their knowledge and use of strategies. Some may need teaching in basic comprehension strategies (e.g., summarizing), whereas others will be proficient in these. Some students may need instruction on writing strategy revision. Teachers may find it helpful to form students into small groups and tailor self-regulation instruction according to each group's needs. Most teachers understand how to differentiate instruction depending on students' learning capabilities, and they also need to practice differentiation with respect to students' self-regulation capabilities.

The theory and research summarized in this article suggest that to build students' self-efficacy teachers should ensure that students experience learning progress and success, expose them to successful models, and provide encouraging feedback substantiated by success. Teachers can incorporate these sources of self-efficacy information into classrooms by teaching self-regulation strategies to use during reading and writing activities, employing adult and peer models, and providing persuasive information (i.e., progress feedback). Although actual performance successes constitute the best source of self-efficacy information, the vicarious and persuasive sources also are effective (Bandura, 1986). When using models it often is advantageous to expose students to multiple models, which can increase the likelihood that the students will perceive themselves as similar to at least one model (Schunk, 1987). Teachers often do this, as when they form students into groups to work on projects. Students who have encountered previous learning difficulties also may benefit from observing models who initially experience some problems but through effective coping methods gradually become

successful. When students perceive the peer models as similar to themselves they are apt to feel self-efficacious for learning, believing that if the peers could learn they can as well.

CONCLUSION

Theory and research show that self-efficacy and self-regulation can be developed through exposure to models who explain and demonstrate strategies. In this article we have linked reading and writing instructional procedures with the four-phase self-regulation development model of Zimmerman and Schunk. This model is effective for teaching self-regulatory skills and it aligns well with a typical instructional sequence because it progresses from modeled demonstration to guided practice to independent practice. By linking self-regulatory strategies with instruction and allowing students to practice self-regulation skills, teachers provide an integrated instructional package that will benefit students and may generalize beyond the instructional setting.

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