SELF-EFFICACY AND CLASSROOM LEARNING

By: Dale H. Schunk

Schunk, D. H. (1985). Self-efficacy and classroom learning. *Psychology in the Schools, 22(2),* 208-223.

Abstract:
This article discusses the role of perceived self-efficacy during classroom learning of cognitive skills. Self-efficacy refers to personal judgments of performance capabilities in a given domain of activity. Students enter classroom activities with various aptitudes and prior experiences, which affect their initial sense of self-efficacy for learning. During task engagement, students may assess self-efficacy by utilizing cues made cognitively salient by educational practices and which convey information about their capability to acquire knowledge and skills, such as performance outcomes, attributions, situational circumstances, outcome patterns, perceived model similarity, and persuader credibility. In turn, heightened learning self-efficacy enhances motivated learning, or motivation to acquire knowledge and skills. Research findings are presented showing how different educational practices affect self-efficacy. Future research needs to determine how students derive efficacy information from multiple cues, and to specify in finer detail how the cognitive processes involved in understanding instruction and appraising self-efficacy influence one another.

Article:
Educational psychologists have shown increasing interest in exploring students' cognitive processes during classroom learning (Corno & Mandinach, 1983; Peterson, Swing, Braverman, & Buss, 1982; Winne, in press). Such research relates to theoretical perspectives stressing the influence of personal cognitions on achievement behaviors (Bandura, I982b; Covington & Omelich, 1979; DeCharms, 1968; Kukla, 1972; Schunk, 1984; Weiner, 1979).

The present article examines the role of one type of personal cognition—perceived self-efficacy—during classroom learning of cognitive skills. The central idea is that self-efficacy is an important variable in understanding *motivated learning,* which refers to motivation to acquire skills and knowledge, rather than merely to complete activities (Brophy, 1983). Self-efficacy will be discussed in conjunction with a model of motivated learning. Relevant research evidence will be presented and also suggestions for future research.

SELF-EFFICACY: ANTECEDENTS AND CONSEQUENCES
Self-efficacy refers to personal judgments of performance capabilities in a given do-main of activity that may contain novel, unpredictable, and possibly stressful features (Bandura, 1977a, 1981, 1982b). Self-efficacy is hypothesized to have diverse effects in achievement settings (Bandura, 1977a; Schunk, 1984). Self-efficacy can influence choice of activities. Students who have a low sense of efficacy for acquiring cognitive skills may attempt to avoid tasks, whereas those who judge themselves more efficacious should participate more eagerly. Self-efficacy also can affect motivation. When facing difficulties, students who have a high sense of efficacy for learning should expend greater effort and persist longer than those who doubt their capabilities (Bandura & Schunk, 1981; Brown & Inouye, 1978; Schunk, 1982). Percepts of self-efficacy also influence level of skillful performance (Schunk, 1981, 1984).

According to Bandura (1981, 1982b), people acquire information about their self-efficacy in a given domain of activity from performance accomplishments, vicarious (observational) experiences, social persuasion, and inferences from physiological states. Performances are hypothesized to offer the most valid information for assessing self-efficacy. In general, repeated successes raise self-efficacy, whereas failures lower it. In classrooms, students acquire much information about their own capabilities through knowledge of how others perform (Schunk, in press). The modeling literature supports the idea that similar others offer the best basis for comparison (Bandura, 1971; Brown & Inouye, 1978; Rosenthal & Bandura, 1978; Rosenthal & Zimmerman, 1978). Observing similar peers succeed at a task can convey a vicarious sense of efficacy to students that they too can accomplish the task; however, a vicarious increase in efficacy can be negated by subsequent personal failures. Students often receive persuasory information, such as from teachers, that they possess the capability to perform well (e.g., "You can do this"). Although positive persuasory feedback can enhance self-efficacy, this increase is apt to be short-lived if students subsequently perform poorly. Students also acquire some efficacy information from their physiological reactivity. For example, emotional symptoms such as trembling or sweating could be interpreted by students to mean that they are not very capable of learning. When students notice that they are reacting in a less agitated fashion, they may experience a heightened sense of efficacy for mastering the task.

Information acquired from these sources does not influence self-efficacy directly; rather, the effect of such information on self-efficacy depends on how the information is appraised cognitively (Bandura, 1977a). Efficacy appraisal is an inferential process in which persons weight and combine the contributions of personal and situational factors (Bandura, 1981). In forming efficacy assessments, students take into account factors such as self-perceptions of task outcomes, ability, effort expenditure, task difficulty, situational circumstances, and the pattern of successes and failures, among others (Bandura, 1981; Schunk, 1984).

Even when students acquire efficacy information primarily from self-performances, efficacy appraisals are not mere reflections of those performances (Bandura, 1982b; Schunk, 1984). Although task outcomes exert an important influence on self-efficacy, successful performances will not guarantee a stronger sense of efficacy, nor will failures necessarily have a negative impact. Research has demonstrated that educational practices can moderate the effects of task outcomes on self-efficacy (Schunk, 1984). In the context of classroom learning, for example, students should develop a higher sense of efficacy for learning as they work at a task and experience some success. Some educational practices may validate this sense of efficacy by clearly conveying that students are acquiring skills and knowledge, which should help to sustain motivation and develop self-efficacy and skills. Other practices may offer less clear information about skill acquisition or even convey that students are not particularly skillful. In these latter situations, motivation may suffer and students may remain uncertain of their capabilities. In short, educational practices are hypothesized to be important contextual influences on students' self-efficacy (Schunk, 1984).

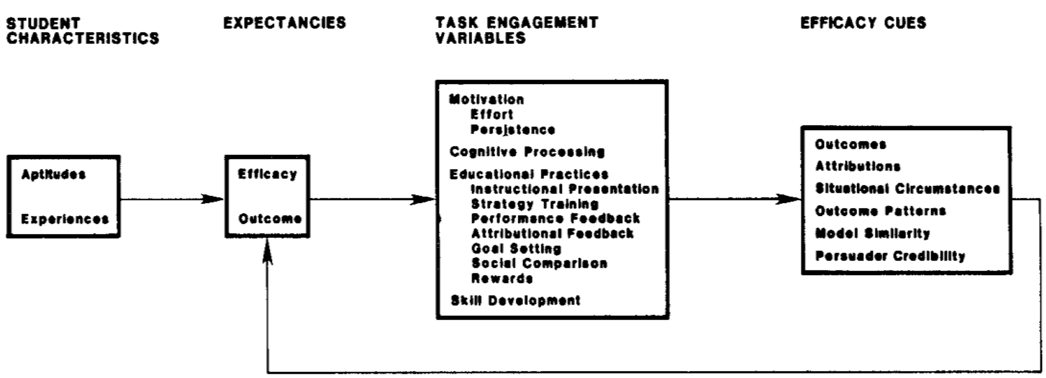

FIGURE 1. A model of motivated classroom learning of cognitive skills.

A MODEL OF MOTIVATED LEARNING

The model of motivated classroom learning of cognitive skills portrayed in Figure 1 comprises four general classes of variables: student entry characteristics, expectancies regarding the learning situation, processes and practices occurring during task engagement, and cues utilized to appraise self-efficacy. This model was derived from theoretical perspectives and research encompassing different traditions, such as social learning, attribution, and instructional psychology (Bandura, 1977a, 1982a; Corno & Mandinach, 1983; Schunk, 1984; Weiner, 1979; Winne, in press). The components portrayed should be viewed as indicative of what I believe are important features of motivated learning, rather than as an exhaustive listing.

Student Characteristics

Students approach learning tasks with various aptitudes and prior experiences. Aptitudes include general abilities, task-specific skills, interests, attitudes, and personality characteristics (Cronbach & Snow, 1977; Peterson, et al., 1982). Students also differ in their prior educational experiences, such as number of schools attended, types of teachers they have had, and amount of time spent on various subjects. It should be noted that aptitudes and prior experiences are interdependent. For example, mathematical ability and interest may have contributed to students' successes during prior classroom work, and previous teacher encouragement in math may have helped develop positive attitudes and interest.

Expectancies

Although self-efficacy refers to performance expectations about capabilities in a particular domain of activity, more generic aptitudes and prior experiences can influence students' self-efficacy for learning new material. At the outset of a learning endeavor, we may speak of self-efficacy for "learning," "acquiring knowledge," "developing skills," "mastering the material," and so on. Thus, students who previously have performed well on mathematical tasks ought to perceive themselves as more efficacious for "learning how to divide fractions" than students who have experienced repeated difficulties with mathematics.

At the same time, self-efficacy is not simply a reflection of aptitudes and prior experiences. Collins (1982) identified students of low, average, and high mathematical ability based on standardized tests, and within each ability level also identified students of high and low mathematical self-efficacy. Students then were given mathematical problems to solve and opportunity to rework those they missed. Although ability was positively related to skillful performance, regardless of ability level, students with higher self-efficacy solved more problems correctly and chose to rework more problems they had missed.

In addition to efficacy expectations, students may have outcome expectations at the outset of learning activity. Outcome expectations, which refer to persons' beliefs con-cerning the outcomes of their actions (Bandura, 1977a), relate to Rotter's (1966) conception of *locus of control.* According to Rotter, people differ in whether they believe that outcomes occur independently of how one behaves (external control) or are highly contingent on one's behavior (internal control). These expectancies have differential effects on behavior. Students who believe that they possess much control over their successes and failures should be more inclined to engage in such activities and persist at them than students who believe that their behaviors have little impact on outcomes (Schunk, 1984).

Expectancies about how performances affect outcomes must be distinguished from judgments concerning one's capability to produce those performances. The former reflect perceptions about contingencies between actions and outcomes, whereas the latter are self-appraisals of what one can do. Students may work halfheartedly on a task because they doubt their ability to master it (low self-efficacy). Conversely, they may be highly efficacious but may give up because they do not expect a competent performance to produce satisfying results (negative outcome expectancy), as might be the case if they believed that the teacher disliked them.

Outcome expectancies and self-efficacy often are related, because students who perceive themselves as capable of performing well expect (and usually receive) positive reactions from their teachers following successful performances, which in turn promote self-efficacy. Outcome and efficacy expectations are separable where outcomes are only loosely tied to level of performance through social contingencies such that variations in demonstrated capabilities do not produce differential outcomes (Bandura, 1982b). Such partial independence of competence and outcomes does not arise often in classroom activities except when very lenient standards are used so that different levels of performance produce similar reactions (Schunk, 1984).

Task Engagement Variables

Efficacy and outcome expectancies influence students' motivation (i.e., effort expenditure and persistence), which, in turn, promotes task success and skill development. I have omitted "choice of activities" as a motivational outcome because students often do not have a choice of whether to participate in classroom learning activities (Brophy, 1983).

Theory and research have begun to identify the types of cognitive processing in which students engage during classroom learning (Corno & Mandinach, 1983; Peterson, et al., 1982; Resnick, 1981; Winne, in press). According to Winne, classroom learning occurs through reciprocal interactions between instructional events and the following cognitive processes: *attending* includes focusing on incoming information from instructional events, as well as activating concepts in memory; *coding* is employed to translate information into a form compatible with the processing system; *associating* refers to relating new information with information in memory; *rehearsing* involves maintaining information in an activated state without altering it; and *monitoring* includes processes such as comparing one's level of learning to the task goal and deciding whether further cognitive processing is needed.

The cognitive processing that students employ during a learning activity should influence their self-efficacy (Corno & Mandinach, 1983; Winne, in press). From a self-efficacy perspective, the belief that one can effectively process information can convey a sense of personal control over learning outcomes, which further strengthens perceived self-efficacy for learning (Bandura, 1982a). This sense of efficacy is validated through progress in developing skills. In contrast, students who encounter difficulty in cognitively processing new material come to doubt their capabilities.

Educational practices include the many contextual factors associated with classroom learning. Some important factors are listed and will be discussed in depth later. An important issue is how educational practices convey information to students about their capability for acquiring knowledge and cognitive skills. One possibility is that educational practices differ in the cues they make salient and which, along with performance successes and failures, students use to appraise their self-efficacy. Nisbett and Ross (1980) note that, in making judgments, people rely on two general strategies: availability and representativeness. Availability refers to how accessible potential causes of events are in persons' perceptions or memories, whereas representativeness reflects the degree to which an outcome is likely to follow given antecedents (Kahneman & Tversky, 1972; Nisbett & Ross, 1980; Tversky & Kahneman, 1973).

In processing efficacy information, therefore, students may take into account the cues made salient by educational practices. To the extent that these cues convey information to students about their learning efficacy, they can influence efficacy appraisals beyond the effects of performance outcomes.

The actual cognitive processing involved in appraising self-efficacy may be very similar to how students cognitively process instructional information. Winne (in press) advances the view that efficacy expectations are represented in memory as propositions, much the same as factual information and procedural knowledge. In appraising self-efficacy, therefore, students may attend to cues from educational practices, code this efficacy information in a form compatible with preexisting efficacy representations, and so on.

Efficacy Cues

Performance outcomes exert an important influence on self-efficacy. In general, successes raise and failures lower self-efficacy; however, an occasional failure after many successes may not have great impact. Similarly, one success after many failures may not raise self-efficacy much. A large body of research indicates that self-efficacy is not a mere reflection of one's prior performances (Schunk, 1984). The effects of performance outcomes on self-efficacy can be tempered by the cues derived from educational practices.

Students' *attributions* are hypothesized to exert important effects on self-efficacy (Bandura, 1982b; Schunk, 1984). Attributional theories of behavior postulate that individuals make causal ascriptions for the outcomes of their actions (Heider, 1958; Kelley, 1967). In achievement contexts, outcomes often are attributed to ability, effort, task difficulty, and luck (Frieze, 1980; Weiner, 1979; Weiner, et al., 1971). Future performance expectancies (i.e., self-efficacy) depend heavily on causal ascriptions (Weiner, 1979). For example, if one believes that the task circumstances will remain much the same, attributing prior successes to relatively stable causes such as high ability or low task difficulty should result in higher expectancies of future success than attributions to the more unstable causes of great effort or good luck (McMahan, 1973; Weiner, Nierenberg, & Goldstein, 1976).

Children often attribute outcomes to ability and effort (Frieze, 1980; Harari & Covington, 1981). As Nicholls (1978) has shown, however, important developmental changes occur in children's attributions. Very young children view effort as the prime cause of outcomes and ability-related terms as closely associated. With development, a distinct conception of ability begins to emerge. Ability attributions become increasingly important influences on performance expectancies, whereas effort as a causal factor declines in importance (Harari & Covington, 1981; Nicholls, 1978).

The amount of effort necessary to succeed at a task also should affect efficacy appraisals (Bundura, 1981). Assuming that a task is perceived as intermediate in difficulty, success achieved with great effort should raise self-efficacy less than if minimal effort were required, because the former implies that skills are not as well developed. Failure despite high effort should be more likely to convey that capabilities are lacking than failure following minimal effort.

The effects of performance outcomes on self-efficacy can be moderated by the perceived difficulty of the task. Success at a task thought to be easy ought to convey less information about one's level of skill and knowledge than success at a more difficult task. In the same vein, failure at a task viewed as difficult is less informative of skill level than failure at a task considered easy.

Another theoretically important influence on self-efficacy is how students view the *situational circumstances* surrounding the learning activity. Many efforts aimed at skill improvement initially are aided by teacher corrective feedback or assistance from other students. Such supports are helpful in initiating skill development, but they do little to promote self-efficacy if students attribute their improvement to external factors. Students who master tasks with little or no aid may be more likely to form ability attributions and develop higher self-efficacy than those given greater assistance. In addition to external aid, other situational factors that may affect self-efficacy are students' perceptions of the working conditions (including distractions), fatigue, and physical illness.

The *outcome patterns* that students observe are hypothesized to affect self-efficacy. Learning often is fraught with early failures and setbacks, but the perception of progress can promote students' sense of efficacy for further improvement (Schunk, 1984). Self-efficacy may not be aided much if students sense that they are making little progress.

Vicariously conveyed efficacy information also must be cognitively processed. *Perceived similarity to models* is one factor that influences the impact of social comparative information. Seeing similar others improving their skills can convey a vicarious sense of self-efficacy that students can learn as well, whereas observed failures cast doubt on students' own capability to succeed (Bandura, 1981). In addition to perceived similarity in competence, model similarity can be based on personal attributes (Bandura, 1971). The accomplishments of students who are similar in attributes such as sex, ethnic background, and socioeconomic level often are viewed as indicators of one's capabilities, even when the attributes have little bearing on the modeled behaviors (Rosenthal & Bandura, 1978).

When efficacy information is acquired through persuasion, students' perceptions of the *credibility of the persuader* can influence self-efficacy. Students may experience a heightened sense of learning efficacy if they are persuaded that they are capable by a trustworthy source (e.g., the teacher), whereas they may readily discount the advice of less credible sources. Although credibility depends on perceived expertise and trustworthiness of the persuader, students may discount the advice of an otherwise credible source if they believe that the source does not fully understand the nature of the task demands (e.g., difficult for students to comprehend) or the situational circumstances (e.g., too many distractions).

Reciprocal Influence

Self-efficacy is hypothesized to be continually influenced during classroom learning of cognitive skills by students' perceptions of their outcomes and other cues. In turn, changes in self-efficacy affect task engagement variables (e.g., motivation, skill improvement). This reciprocal influence is relevant to Winne's (in press) contention that instructional events bear a reciprocal relationship to students' cognitive processing, which includes processing of efficacy information. In short, motivated learning is characterized by an interactive relationship between self-efficacy and learning experiences.

EDUCATIONAL PRACTICES

Instructional Presentation

How instruction is presented can affect students' learning self-efficacy (Winne, in press). Students who readily comprehend the teacher's instructions and explanations are apt to feel more efficacious for learning than those who experience less understanding.

Teachers often model the application of cognitive skills or utilize symbolic models (e.g., films, videotapes) during classroom instruction. Combining explanations with cognitive modeling can promote skill development better than explanations alone (Rosenthal & Zimmerman, 1978). Modeling also is a vicarious source of efficacy information (Bandura, 1977a, 1981, 1982b). We might expect that observing a teacher perform cognitive skill operations could increase students' learning self-efficacy, because modeling implicitly conveys that they possess the capabilities to succeed and will do so if they perform the same sequence of actions (Schunk, 1984).

In a recent study (Schunk, 1981), children deficient in division skills received either cognitive modeling of division operations or didactic instruction, after which they solved problems. During cognitive modeling, children observed an adult model verbalize aloud division operations while simultaneously applying them to problems; the didactic treatment consisted of children reviewing instructional pages that explained and portrayed the same division operations applied to problems step by step. Although both treatments promoted division self-efficacy equally well, cognitive modeling led to higher skill development. These results suggest that didactic children were overly swayed by their modest training successes while not fully understanding the nature of the division process.

The issue of perceived model similarity raises the question of whether a teacher flawlessly demonstrating cognitive skills has much effect on students' self-efficacy, especially among low achievers who may view the teacher as vastly superior in competence. Peer models and modeling coping procedures may exert more beneficial effect on students' self-efficacy. Peer models may be more effective than teacher modeling, due to their greater perceived similarity in age and competence (Bandura, 1981). To portray coping procedures, teachers could have students observe peer coping models rather than mastery models, or could themselves model procedures for coping with difficulties. Mastery models exhibit faultless performance from the outset, whereas coping models begin by demonstrating the typical deficiencies and fears experienced by observers, but gradually improve their performance and gain self-confidence (Rosenthal & Bandura, 1978). Coping models illustrate how determined effort and positive self-thoughts can overcome difficulties (Bandura, 1977b). These qualities may be quite important, because students often encounter difficulties while acquiring skills. Coping models can enhance subsequent performance by observers better than can mastery models (Meichenbaum, 1971), and modeled self-confidence can promote self-efficacy (Zimmerman & Ringle, 1981).

These considerations do not imply that low initial self-efficacy for learning will stifle task motivation and skill development. Bandura (1982b) argues that some initial self-doubts can lead persons to expend more effort than if they approach the task feeling highly efficacious. Salomon (1983) found that instructional presentations influenced students' perceptions of task difficulty and self-efficacy, which in turn affected effort expenditure. More intelligent students perceived learning from television to be less difficult than learning from text and felt more efficacious about learning from TV; yet their effort expenditure and actual learning from a demanding TV program were lower than from comparable text. In short, students who possess some initial self-doubts about learning, but who feel efficacious enough to overcome difficulties, should develop heightened self-efficacy during task engagement.

Strategy Training

Much classroom learning involves the comprehension and application of strategies. In mathematics, for example, students learn successive steps in an algorithm. An algorithm is a type of cognitive *plan*, or set of sequenced operations that students apply to information during task engagement (Winne, in press). Unfortunately, many students fail to acquire algorithmic knowledge or an understanding of its application through nor-mal instructional procedures.

Research has shown that explicit training in the use of strategies fosters their acquisition and utilization and helps to develop self-efficacy. In a recent study (Schunk & Rice, in press), children in grades two through four with language deficiencies participated in a listening comprehension training program over several sessions that included teacher modeling of comprehension strategies and student practice. Half of the children in each grade verbalized each strategy aloud prior to applying it to a question. It was felt that strategy self-verbalization, as a form of rehearsal, might help focus the attention of these remedial students on the strategies and thereby aid strategy coding and retention. Self-verbalization also was expected to help convey a sense of control over learning, which should enhance self-efficacy (Bandura, 1982a). Strategy verbalization led to greater increases in self-efficacy across all grades, and promoted performance among third and fourth graders, but not among second graders. These results suggest that the demands of self-verbalization, along with those of the comprehension task itself, may have been too complex for the second graders. These children may have focused their efforts primarily on the comprehension task, which would have interfered with strategy encoding and retention. Future research needs to address ways of incorporating self-verbalization into instructional procedures.

Performance Feedback

To develop self-efficacy, students need clear information that they are acquiring knowledge and skills, mastering the material, and so on. Self-acquisition of such information becomes problematic when progress is slow, such as during complex skill learning, where students may master some component skills readily, but fail to grasp others. Teacher feedback that points out correct operations and remedies troublesome task aspects provides valid capability information (Schunk, 1981).

Performance feedback is hypothesized to influence self-efficacy by highlighting performance outcomes and patterns. Feedback that students are making progress (e.g., "That's correct" and, "You're doing much better") informs them that they are acquiring skills and knowledge, which can sustain motivation and enhance learning self-efficacy. Students also can gain capability information through charts and grades.

That explicit performance feedback enhances self-efficacy was recently shown during a subtraction training program (Schunk, 1983d). Elementary school children who lacked subtraction skills received instruction and individually solved problems in a training packet over several sessions. At the end of each session, some children recorded the number of pages of problems they completed; others had their pages recorded by an adult proctor; and children in a third condition worked on the packet, but did not receive explicit feedback. Both forms of feedback were equally effective and led to higher self-efficacy and skillful performance compared with the no-feedback condition. The three treatments did not differ in the number of problems solved during the training program, which supports the idea that, although self-efficacy is influenced by prior performances, it is not merely a reflection of them (Bandura, 1982b; Schunk, 1984).

Attributional Feedback

Unlike ability, task difficulty, and luck, effort presumably is under volitional control and amenable to change (Weiner, 1979; Weiner et al., 1971). Ascribing past failures to insufficient effort is hypothesized to exert motivational effects. When people believe that increased effort will produce success, they should persist longer. Telling students that their past failures were due to insufficient effort can promote effort attributions and persistence (Andrews & Debus, 1978; Dweck, 1975).

Effort attributional feedback is a persuasive source of efficacy information. To be told that one can achieve better results through harder work can motivate one to do so and can convey that one possesses the necessary capability to succeed. Similarly, providing effort feedback for prior success can support students' perceptions of their progress in acquiring skills, which should sustain motivation and increase self-efficacy for continued learning (Schunk, 1982).

At the same time, attributional feedback may convey markedly different efficacy in-formation, depending on how it is linked to outcomes. Telling students that effort is responsible for past successes should support their perceptions of progress and convey that they can continue to perform well with hard work. Conversely, linking effort to future success could convey that they are not doing well. They might conclude that they are not very capable at the task and might wonder whether more effort will produce better results.

These predictions were supported during a subtraction training program in which children who lacked subtraction skills received instruction and solved problems individually over several sessions (Schunk, 1982). During the problem solving, children were periodically monitored by an adult proctor. Some children received effort attributional feedback for prior achievement ("You've been working hard"), whereas others received effort feedback for future achievement ("You need to work hard"). Children in a third group were monitored, but received no attributional feedback, and those in a fourth group were not monitored. Attributing prior achievement to effort led to the highest self-efficacy and skills; stressing future effort led to no benefits, compared with those due to receiving training.

Success achieved with less perceived effort is hypothesized to raise self-efficacy more than when greater effort is required (Bandura, 1981). Once children begin to differentiate the concepts of ability and effort, we might expect that feedback linking prior achievement with ability would increase self-efficacy more than effort feedback. Ability feedback ought to make perceived ability a salient cue for assessing self-efficacy, and ability attributions increase performance expectancies (McMahan, 1973; Weiner et al., 1976). Because effort feedback ought to highlight effort expenditure it should not raise self-efficacy as well.

In a follow-up study, children periodically received either ability attributional feed-back for their prior achievement ("You're good at this"), effort feedback ("You've been working hard"), both forms of feedback simultaneously, or no attributional feedback (Schunk, I983a). Although the three forms of feedback led to equally high task motivation during training, as measured by rate of problem solving, children who received only ability feedback developed the highest self-efficacy and subtraction skill. The effort-only and ability-plus-effort conditions did not differ on any measure, but each outperformed the no-feedback group. The ability-only condition also judged their effort expenditure during training lower than the other conditions. These results suggest that ability-plus-effort subjects discounted the ability feedback; they might have wondered how able they were because they had to work hard to succeed.

Goal Setting

Goal setting involves comparing one's present performance (quantity, quality, rate) to some desired standard (Bandura, I977b). When students are given or select a goal, they are apt to feel motivated and experience a sense of self-efficacy for attaining it. These effects result in more on-task behavior. Students' initial sense of self-efficacy is substantiated as they work at the task and observe their goal progress. A heightened sense of learning self-efficacy helps sustain task motivation.

Goals exert their effects through their properties: specificity, difficulty level, and proximity (Bandura, 1977b; Locke, 1968; Locke, Shaw, Saari, & Latham, 1981; Schunk, in press). Goals that incorporate specific performance standards are more likely to in-crease motivation and activate self-evaluative reactions than are general goals such as, "Do your best" (Locke, 1968; Locke, et al., 1981). Specific goals boost task performance through their greater specification of the amount of effort required for success and through the self-satisfaction anticipated when accomplished (Bandura, 1977b). Specific goals raise self-efficacy more than do general goals, because progress toward an explicit goal is easier to gauge (Schunk, in press).

Goal difficulty refers to the level of task proficiency required as assessed against a standard (Locke, et al., 1981). How much effort students expend to attain a goal depends on the level at which it is set. Assuming requisite ability, there is a positive relationship between difficulty level and task performance (Locke, et al., 1981). Although students initially may doubt their capabilities to attain goals they believe are difficult, working toward difficult goals can build a strong sense of efficacy, because difficult goals offer much more information about one's capability to acquire knowledge and skills than do easier goals.

In a recent study (Schunk, I983c), children who lacked division skills received instruction and individually solved problems over two sessions, and received goals of completing a given number of problems each session. Half of the children received difficult, but attainable goals, whereas the other half were given easier goals. To preclude children believing that the goals were too difficult—which would have stifled motivation—half of the subjects in each goal condition were told directly by an adult proctor that they could attain the goal ("You can work 25 problems"), whereas the other half received social comparative information indicating that other similar children had been able to complete that many problems. As expected, difficult goals enhanced children's rate of problem solving during training and led to significantly higher division skill; however, a significant effect for direct attainment information on self-efficacy was obtained. This latter finding is discussed in the next section.

Goals also can be distinguished by how far they project into the future. Proximal goals, which are close at hand, are hypothesized to result in greater motivation than more distant goals (Bandura, 1977b). Pursuing proximal goals also conveys more reliable in-formation about one's knowledge and skills. As students observe their progress toward a proximal goal, they are apt to develop an enhanced sense of learning self-efficacy (Schunk, 1984). Because progress toward a distant goal is more difficult to gauge, students receive less clear information about their skills.

During a subtraction skill-development program (Bandura & Schunk, 1981), children individually worked on a training packet consisting of seven sets of material. Each set included instruction and problems to solve, and children were told they would work on the packet over seven sessions. Some children pursued a proximal goal of completing one set each session; a second group was given a distal goal of completing the entire packet by the end of the last session; and a third group was given only a general goal of working productively. The results showed that proximal goals heightened task motivation, and led to the highest self-efficacy and subtraction skill. The distal goal resulted in no benefits over those obtained from receiving training.

Social Comparison

Social comparison refers to comparing oneself with others (Festinger, 1954; Suls & Sanders, 1982). Use of social comparison for self-evaluation depends on higher levels of cognitive development and experience in making comparative evaluations (Veroff, 1969). Children show increasing interest in social comparison in the early elementary school years, and by the fourth grade utilize comparative information to help form self-evaluations of competence (Ruble, Boggiano, Feldman, & Loebl, 1980; Ruble, Feldman, & Boggiano, 1976).

Social comparison provides vicarious efficacy information because people learn something about their own capabilities from observing others (Bandura, 1981). Similar others, rather than those perceived as much higher or lower in ability, offer the best information for judging one's own performance capabilities (Bandura, 1981; Suls & Sanders, 1982). Teachers often provide social comparative information (e.g., "Kevin, see how well

Shawn is doing"). Such information should help promote a sense of efficacy for learning if students believe that they can learn as well as their peers (Schunk, in press).

During a division training program in which children with low division skills received instruction and individually solved problems over sessions (Schunk, 1983b), children were given either an intermediate-difficulty goal each session of completing a given number of problems, comparative information indicating that similar children had completed that many problems, both goals and comparative information, or neither goals nor comparative information. Providing comparative information promoted task motivation; however, goals significantly enhanced self-efficacy.

These results, combined with those of the Schunk (1983c) study, suggest that comparative information indicating average achievement enhances motivation, but does not foster high self-efficacy. Social comparative information that leads students to focus on the accomplishments of similar (and average) others may make salient to students that they too are average and therefore have no reason to feel overly competent. Because direct attainment information conveys nothing about others' accomplishments, students are more likely to focus on how their present performances surpass their prior attainments (Schunk, in press). The perception that one is improving is hypothesized to build a strong sense of efficacy. Comparative information might better enhance self-efficacy if students attain a difficult standard, although such attainment may be unlikely.

Rewards

Rewarding consequences inform and motivate (Bandura, 1977b). As students work at a task, they learn which behaviors lead to desirable outcomes and which result in un-desirable ones. Such information guides future behavior. Further, the anticipation of attaining desirable outcomes can motivate students to engage in a task and persevere. There is much evidence showing that offering rewards promotes performance (Lepper & Greene, 1978).

Reward contingencies are hypothesized to be an important contextual influence on students' efficacy appraisals. Rewards are likely to enhance self-efficacy when they are tied to students' actual accomplishments. Telling students that they can earn rewards based on what they accomplish can instill a sense of self-efficacy for learning (Schunk, 1984). As students then work at a task and note their progress, this sense of efficacy is validated. Receipt of the reward further validates self-efficacy, because it symbolizes progress. In contrast, when rewards are offered merely for participating in a task, students may not experience a comparable sense of learning self-efficacy. Such rewards actually may convey negative efficacy information; students might infer that they are not expected to learn much because they do not possess the requisite capability.

During a division training program (Schunk, 1983e), children received instruction and individually solved problems over sessions. One group of children (performance-contingent reward) were told that they would earn points for each division problem solved during training and that they would exchange their points for prizes equal in monetary value to the points. A second group (task-contingent reward) were told that they would receive prizes for participating in the program. To disentangle the effects of reward anticipation from reward receipt, a third group (unexpected reward) were unexpectedly allowed to choose prizes at the end of training. Results showed that performance-contingent rewards led to the most rapid problem solving during training, as well as the highest division skill and self-efficacy. Offering rewards for participation led to no benefits, compared with merely providing training.

How rewards are distributed in classrooms can affect students' social comparisons and self-evaluations (Ames, 1981, in press); Competitive reward structures, in which the possibility of a student receiving a reward is reduced when others are successful, emphasize social comparisons (Ames, 1981). Observing others' successes and failures results in differential ability attributions and levels of student motivation (Ames, 1981).

In contrast, cooperative reward structures are characterized by group members sharing rewards based on their collective group performance (Ames, in press). Research shows that successful cooperative groups reduce social comparisons and do not negatively affect motivation or self-evaluations of low group performers, which suggests that the group success may be a highly salient cue to use in assessing self-efficacy. In an individualistic reward structure, students' achievements are independent of one another, and the opportunity for reward is equal across students. This structure ought to highlight progress in skill development as a cue to assess self-efficacy. At the same time, cooperative groups that fail may stifle motivation and increase differences in self-evaluations, and the perception of no progress under individualistic conditions will not promote self-efficacy (Ames, in press; Schunk, 1984). It becomes important, therefore, that activities be structured so that students can experience some success under these conditions.

FUTURE DIRECTIONS

Research that utilizes a wider range of subjects, tasks, and experimental treatments will further our understanding of the interactive relationship between self-efficacy and learning experiences. Within this context, the following areas seem particularly fruitful to explore.

Integration of Efficacy Information

Research is needed on how students weight and combine efficacy information from diverse sources. This situation occurs often during classroom learning of cognitive skills, because students may work at a task (performance), observe peers (social comparison), and receive teacher feedback (persuasion). Although performances are hypothesized to provide the most reliable efficacy information (Bandura, 1977a, 1982b), an important question is how students integrate performance cues with those derived from nonperformance (i.e., vicarious, persuasory) sources. We might ask, for example, how efficacy appraisals are affected when students repeatedly fail, but observe peers succeed and receive positive persuasory feedback from the teacher.

This situation is further compounded because a single educational practice may generate multiple cues. For example, attributional feedback may simultaneously highlight cues such as task success, performance improvement, and effort expenditure. It seems likely that some cues would be heavily weighted, whereas others might be discounted altogether. Knowing how students weight cues would be beneficial in designing instruction to promote students' motivation, skill development, and learning self-efficacy.

Cognitive Processing During Learning

A related concern is to specify in finer detail students' cognitive processing during learning activities. Given Bandura's (1982b) contention that efficacy appraisals occur more often when people encounter new task demands, we should expect much cognitive processing of efficacy information, along with instructional information, during a learning endeavor. For example, Peterson, et al. (1982) showed that an important part of students' cognitive processing during instruction involved attempts at understanding content. If instructional events and cognitive processes interact with one another during learning (Winne, in press), then we might ask how the cues that students derive from attempts at understanding content influence preexisting self-efficacy and, in turn, how self-efficacy reappraisals affect cognitive processes aimed at understanding (e.g., attending, rehearsing).

Within this context, research is needed using tasks that presumably require different kinds of cognitive processing. Doyle (1983) distinguishes four types of academic task demands: memory, procedural, comprehension, and opinion. Cognitive processing should vary according to the task demands. For example, the cognitive coding involved in a procedural task (e.g., learning to divide) likely will be quite different from what occurs during a comprehension task (e.g., learning to draw inferences from narrative). Greater specification of how self-efficacy interacts with other cognitive processes as students engage in different types of tasks would help to extend the generality of the role of self-efficacy in motivated learning.

REFERENCES

AMES, C. (1981). Competitive versus cooperative reward structures: The influence of individual and group performance factors on achievement attributions and affect. *American Educational Research Journal, 18,* 273-287.

AMES, C. (in press). Competitive, cooperative, and individualistic goal structures: A cognitive-motivational analysis. In R. Ames & C. Ames (Eds.), *Research on motivation in education: Student motivation (Vol.* 1). New York: Academic Press.
ANDREWS, G. R., & DEBUS, R. L. (1978). Persistence and the causal perception of failure: Modifying cognitive attributions. *Journal of Educational Psychology, 70,* 154-166.
BANDURA, A. (197i). Analysis of modeling processes. In A. Bandura (Ed.), *Psychological modeling* (pp.1-62). Chicago: Aldine-Atherton.
BANDURA, A. (1977a). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84,* 191-215.
BANDURA, A. (1977b). *Social learning theory.* Englewood Cliffs, NJ: Prentice-Hall.
BANDURA, A. (1981). Self-referent thought: A developmental analysis of self-efficacy. In J. H. Flavell & L. Ross (Eds.), *Social cognitive development: Frontiers and possible futures* (pp.200-239). Cambridge, England: Cambridge University Press.
BANDURA, A. (1982a). The self and mechanisms of agency. In J. Suls (Ed.), *Psychological perspectives on the self (Vol.* 1, pp.3-39). Hillsdale, NJ: Erlbaum.
BANDURA, A. (1982b). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122-147.
BANDURA, A., & SCHUNK, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 41,* 586-598.
BROPHY, J. (1983). Conceptualizing student motivation. *Educational Psychologist, 18,* 200-215.
BROWN, I., JR., & INOUYE, D. K. (1978). Learned helplessness through modeling: The role of perceived similarity in competence. *Journal of Personality and Social Psychology, 36,* 900-908.
COWNs, J. (1982, March). *Self-efficacy and ability in achievement behavior.* Paper presented at the meeting of the American Educational Research Association, New York.
CORNO, L., & MANDINACH, E. B. (1983). The role of cognitive engagement in classroom learning and motivation. *Educational Psychologist, 18,* 88-108.
COVINGTON, M. V., & GMELICH, C. L. (1979). Are causal attributions causal? A path analysis of the cognitive model of achievement motivation. *Journal of Personality and Social Psychology, 37,* 1487-1504.
CRONBACH, L. J., & SNOW, R. E. (1977). *Aptitudes and instructional methods.* New York: Irvington/Naiburg.
DECHARMS, R. (1968). *Personal causation: The internal affective determinants of behavior.* New York: Academic Press.
DOYLE, W. (1983). Academic work. *Review of Educational Research,* 53, 159-199.
DWECK, C. S. (1975). The role of expectations and attributions in the alleviation of learned helplessness. *Journal of Personality and Social Psychology, 31,* 674-685.
FESTINGER, L. (1954). A theory of social comparison. *Human Relations, 7,* 117-140.
FRIEZE, I. H. (1980). Beliefs about success and failure in the classroom. In J. H. McMillan (Ed.), *The social psychology of school learning* (pp.39-78). New York: Academic Press.
HARARI, G., & COVINGTON, M. V. (1981). Reactions to achievement behavior from a teacher and student perspective: A developmental analysis. *American Educational Research Journal, 18,* 15-28.
HEIDER, F. (1958). *The psychology of interpersonal relations.* New York: Wiley.
KAHNEMAN, D., & TVERSKY, A. (1972). Subjective probability: A judgment of representativeness. *Cognitive Psychology, 3,* 430-454.
KELLEY, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska symposium on motivation* (Vol. 15, pp.I92-238). Lincoln: University of Nebraska Press.
KUKLA, A. (1972). Foundations of an attributional theory of performance. *Psychological Review, 79,* 454-470.
LEPPER, M. R., & GREENE, D. (1978). *The hidden costs of reward: New perspectives on the psychology of human motivation.* Hillsdale, NJ: Erlbaum.
LOCKE, E. A. (1968). Toward a theory of task motivation and incentives. *Organizational Behavior and Human Performance, 3,* 157-189.
LOCKE, E. A., SHAW, K. N., SAARI, L. M., & LATHAM, G. P. (1981). Goal setting and task performance: 1969-1980. *Psychological Bulletin, 90,* 125-152.

MCMAHAN, I. D. (1973). Relationships between causal attributions and expectancy of success. *Journal of Personality and Social Psychology, 18*, 108-114.
MEICHENBAUM, D. H. (1971). Examination of model characteristics in reducing avoidance behavior. *Journal of Personality and Social Psychology, 17,* 298-307.
NICHOLLS, J. G. (1978). The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability. *Child Development, 49,* 800-814.
NISSERR, R., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment.* Englewood Cliffs, NJ: Prentice-Hall.
PETERSON, P. L., SWING, S. R., BRAVERMAN, M. T., & Buss, R. (1982). Students' aptitudes and their reports of cognitive processes during direct instruction. *Journal of Educational Psychology*, 74, 535-547.
RESNICK, L. B. (1981). Instructional psychology. *Annual Review of Psychology, 32,* 659-704.
ROSENTHAL, T. L., & BANDURA, A. (1978). Psychological modeling: Theory and practice. In S. L. Garfield
& A. E. Bergin (Eds.), *Handbook of psychotherapy and behavior change: An empirical analysis* (2nd ed., pp.621-658). New York: Wiley.
ROSENTHAL, T. L., & ZIMMERMAN, B. *J.* (1978). *Social learning and cognition.* New York: Academic Press.
RORRER, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80* (1, Whole No. 609).
RUBLE, D. N., BOGGIANO, A. K., FELDMAN, N. S., & LOEBL, J. H. (1980). Developmental analysis of the role of social comparison in self-evaluation. *Developmental Psychology, 16,* 105-115.
RUBLE, D. N., FELDMAN, N. S., & BOGGIANO, A. K. (1976). Social comparison between young children in achievement situations. *Developmental Psychology, 12,* 191-197.
SALOMON, G. (1983). The differential investment of mental effort in learning from different sources. *Educational Psychologist, 18,* 42-50.
SCHUTOC, D. H. (1981). Modeling and attributional effects on children's achievement: A self-efficacy analysis. *Journal of Educational Psychology,* 73, 93-105.
SCHUNK, D. H. (1982). Effects of effort attributional feedback on children's perceived self-efficacy and achievement. *Journal of Educational Psychology, 74,* 548-556.
SCHUNK, D. H. (1983a). Ability versus effort attributional feedback: Differential effects on self-efficacy and achievement. *Journal of Educational Psychology, 75,* 848-856.
SCHUNK, D. H. (1983b). Developing children's self-efficacy and skills: The roles of social comparative information and goal setting. *Contemporary Educational Psychology, 8,* 76-86.
SCHUNK, D. H. (1983c). Goal difficulty and attainment information: Effects on children's achievement behaviors. *Human Learning, 2,* 107-117.
SCHUNK, D. H. (1983d). Progress self-monitoring: Effects on children's self-efficacy and achievement. *Journal of Experimental Education, 51,* 89-93.
SCHUNK, D. H. (1983e). Reward contingencies and the development of children's skills and self-efficacy. *Journal of Educational Psychology, 75,* 511-518.
SCHUNK, D. H. (1984). Self-efficacy perspective on achievement behavior. *Educational Psychologist, 19,* 48-58.
SCHUNK, D. H. (in press). Children's social comparison and goal setting in achievement contexts. In L. G. Katz (Ed.), *Current topics in early childhood education* (Vol. 6). Norwood, NJ: Ablex.
SCHUNK, D. H., & RICE, J. M. (in press). Strategy self-verbalization during remedial listening comprehension instruction. *Journal of Experimental Education.*
SUITS, J., & SANDERS, G. S. (1982). Self-evaluation through social comparison: A developmental analysis. In L. Wheeler (Ed.), *Review of personality and social psychology* (Vol. 3, pp.171-197). Beverly Hills, CA: Sage Publications.
TVERSKY, A., & KAHNEMAN, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology, 5,* 207-232.
VEROFF, *J.* (1969). Social comparison and the development of achievement motivation. In C. P. Smith (Ed.), *Achievement-related motives in children* (pp.46-101). New York: Russell Sage Foundation.

WEINER, B. (1979). A theory of motivation for some classroom experiences. *Journal of Educational Psychology, 71,* 3-25.
WEINER, B., FRIEZE, I., KUKLA, A., REED, L., REST, S., & ROSENBAUM, R. M. (1971). Perceiving the causes of success and failure. In E. E. Jones, D. E. Kanouse, H. H. Kelley, R. E., Nisbett, S. Valins, & B. Weiner (Eds.), *Attribution: Perceiving the causes of behavior* (pp.95-120). Morristown, NJ: General Learning Press.
WEINER, B., NIERENBERG, R., & GOLDSTEIN, M. (1976). Social learning (locus of control) versus attributional (causal stability) interpretations of expectancy of success. *Journal of Personality, 44,* 52-68.
WINNE, P. H. (in press). Cognitive processing in the classroom. In T. Husen & T. N. Postlethwaite (Eds.), *The international encyclopedia of education.* Oxford: Pergamon.
ZIMMERMAN, B. J., & RINGLE, J. (1981). Effects of model persistence and statements of confidence on children's self-efficacy and problem solving. *Journal of Educational Psychology,* 73, 485-493.