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Self-Efficacy: An Essential Motive to Learn

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During the past two decades, self-efficacy has emerged as a highly effective predictor of students' motivation and learning. As a performance-based measure of perceived capability, self-efficacy differs conceptually and psychometrically from related motivational constructs, such as outcome expectations, self-concept, or locus of control. Researchers have succeeded in verifying its discriminant validity as well as convergent validity in predicting common motivational outcomes, such as students' activity choices, effort, persistence, and emotional reactions. Self-efficacy beliefs have been found to be sensitive to subtle changes in students' performance context, to interact with self-regulated learning processes, and to mediate students' academic achievement.

Educators have long recognized that students' beliefs about their academic capabilities play an essential role in their motivation to achieve, but self-conceptions regarding academic performance initially proved difficult to measure in a scientifically valid way. Initial efforts to study students' self-beliefs gave little attention to the role of environmental influences, such as specific features of performance contexts or domains of academic functioning. In the late 1970s, a number of researchers began to assess self-beliefs in a more task-specific way, and one of the most important of these efforts focused on self-efficacy. In 1977(a) Bandura proposed a theory of the origins, mediating mechanisms, and diverse effects of beliefs of personal efficacy, and he provided guidelines for measurement of self-efficacy beliefs for different domains of functioning. In the present article, I define self-efficacy and distinguish it from related conceptions in the literature, describe its role in academic motivation and learning (with special attention to students' capabilities to regulate their own learning activities), and discuss its susceptibility to instruction and other social-cultural influences. Because of space limitations, I cite only key studies and do not consider other issues such as theoreti-

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cal controversies or gender differences in self-efficacy. For comprehensive reviews of research on academic self-efficacy, I recommend Bandura (1997), Pajares (1996b, 1997), Schunk (1989), and Zimmerman (1995).

SELF-EFFICACY AND ITS DIMENSIONS

Before Bandura (1977a) introduced self-efficacy as a key component in social cognitive theory, he discussed human motivation primarily in terms of outcome expectations. However, during the treatment of phobic individuals with mastery modeling techniques, individual differences in generalization were found regardless of the fact that all subjects could successfully interact with the target of their fear (e.g., touch a snake or dog) without adverse consequences at the end of therapy. Although the subjects developed a strong outcome expectancy that proper techniques (e.g., for handling a snake or dog) would protect them from adverse consequences (such as biting), they still differed in their perceived capabilities to use the techniques outside the therapeutic setting. Bandura labeled this individual difference *self-efficacy* and sought to measure it using task-specific scales. Although self-efficacy and outcome expectations were both hypothesized to affect motivation, he suggested that self-efficacy would play a larger role because ''the types of outcomes people anticipate depend largely on their judgments of how well they will be able to perform in given situations'' (Bandura, 1986, p. 392).

Bandura (1977a, 1997) formally defined perceived self-efficacy as personal judgments of one's capabilities to organize and execute courses of action to attain designated goals, and he sought to assess its level, generality, and strength across activities and contexts. The *level* of self-efficacy refers to its dependence on the difficulty of a particular task, such as spelling words of increasing difficulty; *generality* pertains to the transferability of self-efficacy beliefs across activities, such as from algebra to statistics; *strength* of perceived efficacy is measured by the amount of one's certainty about performing a given task. These properties of self-efficacy judgments are measured using questionnaire items that are task specific, vary in difficulty, and capture degrees of confidence (e.g., from 0 to 100%).

With regard to their content, self-efficacy measures focus on *performance capabilities* rather than on personal qualities, such as one's physical or psychological characteristics. Respondents judge their capabilities to fulfill given task demands, such as solving fraction problems in arithmetic, not who they are personally or how they feel about themselves in general. Self-efficacy beliefs are not a single disposition but rather are *multidimensional* in form and differ on the basis of the domain of functioning. For example, efficacy beliefs about performing on a history test may differ from beliefs about a biology examination. Self-efficacy measures are also designed to be

sensitive to variations in performance *context*, such as learning in a noisy lounge compared to the quietude of the library. In addition, perceptions of efficacy depend on a *mastery criterion* of performance rather than on normative or other criteria. For example, students rate their certainty about solving a crossword puzzle of a particular difficulty level, not how well they expect to do on the puzzle in comparison to other students. Finally, self-efficacy judgments specifically refer to *future* functioning and are assessed before students perform the relevant activities. This antecedent property positions self-efficacy judgments to play a causal role in academic motivation.

SELF-EFFICACY AND RELATED BELIEFS

Self-efficacy beliefs differ conceptually and psychometrically from closely related constructs, such as outcome expectations, self-concept, and perceived control. The conceptual distinction that Bandura (1986) drew between academic self-efficacy and *outcome expectancies* was studied psychometrically in research on reading and writing achievement. Shell, Murphy, and Bruning (1989) measured self-efficacy in terms of perceived capability to perform various reading and writing activities, and they assessed outcome expectancies regarding the value of these activities in attaining various outcomes in employment, social pursuits, family life, education, and citizenship. Efficacy beliefs and outcome expectancies jointly predicted 32% of the variance in reading achievement, with perceived efficacy accounting for virtually all the variance. Only perceived self-efficacy was a significant predictor of writing achievement. These results not only show the discriminant validity of self-efficacy measures, they support Bandura's contention that self-efficacy plays a larger role than outcome expectancies in motivation.

One of closest constructs to self-efficacy is *self-concept*. The latter belief is a more general self-descriptive construct that incorporates many forms of self-knowledge and self-evaluative feelings (Marsh & Shavelson, 1985). Historically, self-concept was defined by phenomenologists (e.g., Rogers, 1951) as a global perception of oneself and one's self-esteem reactions to that self-perception, but this global measure of self-belief was not found to be related consistently to students' academic performance (Hattie, 1992; Wylie, 1968). Perhaps as a result, a number of theorists (e.g., Harter, 1978; Marsh & Shavelson, 1985) reconceptualized self-concept as a hierarchical construct, with a global self-concept at the apex of a self-hierarchy but added subcategories such as academic self-concept in the middle of the hierarchy and academic domain-specific self-concepts at the bottom. The latter self-concept measures emphasize *self-esteem reactions* by posing self-evaluative questions, such as ''How good are you a in English?'' By contrast, self-efficacy items focus exclusively on task-specific *performance expectations*, such as ''How certain are you that you can diagram this sentence?'' Although prior task reactions and future performance expectations are often correlated,

Bandura (1997) notes it is possible conceptually to have high self-efficacy about a capability that one does not particularly esteem as well as the reverse.

There is growing evidence that, although self-efficacy beliefs are correlated with domain-specific self-concepts, self-efficacy measures offer predictive advantages when a task is familiar and can be specified precisely. For example, Pajares and Miller (1994) used path analysis procedures to examine the predictive and mediational roles of these two constructs in mathematical problem solving by college students. Math self-efficacy was more predictive of problem solving than was math self-concept or, for that matter, perceived usefulness of mathematics, prior experience with mathematics, or gender. The effect of prior math experiences on math problem solving was mediated primarily by self-efficacy beliefs, but self-concept played a small but significant role. Thus, when self-concept and self-efficacy beliefs are both included in regression equations, self-efficacy beliefs display discriminant validity by independently predicting future academic achievement. Although self-efficacy questionnaire items should be adapted to specific tasks, the scope of these tasks can vary on the basis of the user's intended purpose, ranging from proficiency in an academic domain (e.g., writing or mathematics) to proficiency in a subskill (e.g., grammar or fractions). This second criterion for developing self-efficacy measures involves their *correspondence* to the performance capability in question. Pajares (1996a) demonstrated that the predictiveness of self-efficacy measures increases as a function of both their specificity and correspondence to a skill. Thus, self-efficacy differs from self-concept in both its specificity and correspondence to varying performance tasks and contexts.

Another closely associated construct to self-efficacy is *perceived control*, which emerged from research on locus of control (Rotter, 1966). Perceived control refers to general expectancies about whether outcomes are controlled by one's behavior or by external forces, and it is theorized that an internal locus of control should support self-directed courses of action, whereas an external locus of control should discourage them. Locus-of-control scales are neither task nor domain specific in their item content but rather refer to general beliefs about the internality or externality of causality. Bandura (1986) has questioned the value of general control beliefs because students may feel anxious about controlling one type of subject matter or performance setting (e.g., solving mathematical problems in a limited time period) but not others. In support of this contention, Smith (1989) found that locus of control measures did not predict improvements in academic performance or reductions in anxiety in highly self-anxious students who underwent an intensive coping skills training program, but self-efficacy scales did predict such improvements.

In summary, measures of self-efficacy are not only conceptually distinctive from closely associated constructs such as outcome expectancies, self-

concept, and perceived control, they have discriminant validity in predicting a variety of academic outcomes.

ROLE OF SELF-EFFICACY IN ACADEMIC MOTIVATION

Self-efficacy beliefs have also shown convergent validity in influencing such key indices of academic motivation as choice of activities, level of effort, persistence, and emotional reactions. There is evidence (Bandura, 1997) that self-efficacious students participate more readily, work harder, persist longer, and have fewer adverse emotional reactions when they encounter difficulties than do those who doubt their capabilities.

In terms of *choice of activities*, self-efficacious students undertake difficult and challenging tasks more readily than do inefficacious students. Bandura and Schunk (1981) found that students' mathematical self-efficacy beliefs were predictive of their choice of engaging in subtraction problems rather than in a different type of task: The higher the children's sense of efficacy, the greater their choice of the arithmetic activity. Zimmerman and Kitsantas (1997; 1999) also found self-efficacy to be highly correlated with students' rated intrinsic interest in a motoric learning task as well as in a writing revision task. Furthermore, measures of self-efficacy correlate significantly with students' choice of majors in college, success in course work, and perseverance (Hackett & Betz, 1989; Lent, Brown, & Larkin, 1984).

Self-efficacy beliefs are predictive of two measures of students' *effort*: rate of performance and expenditure of energy. For example, Schunk and colleagues found that perceived self-efficacy for learning correlates positively with students' rate of solution of arithmetic problems (Schunk & Hanson, 1985; Schunk, Hanson, & Cox, 1987). Salomon (1984) has found that self-efficacy is positively related to self-rated mental effort and achievement during students' learning from text material that was perceived as difficult. Regarding the effects of perceived self-efficacy on *persistence*, path analyses have shown that it influences students' skill acquisition both directly and indirectly by increasing their persistence (Schunk, 1981). The direct effect indicates that perceived self-efficacy influences students' methods of learning as well as their motivational processes. These results validate the mediational role that self-efficacy plays in motivating persistence and academic achievement. In a meta-analytic review of nearly 70 studies of persistence and rate measures of motivation, Multon, Brown, and Lent (1991) found a significant positive effect size of students' self-efficacy beliefs.

Student's beliefs about their efficacy to manage academic task demands can also influence them *emotionally* by decreasing their stress, anxiety, and depression (Bandura, 1997). For example, Pajares and Kranzler (1995) have studied the relationship between self-efficacy and students' anxiety reactions regarding mathematics. Although the two measures were negatively correlated, only self-efficacy was predictive of mathematics performance when

compared in a joint path analysis. There is also evidence that students' performance in academically threatening situations depends more on efficacy beliefs than on anxiety arousal. Siegel, Galassi, and Ware (1985) found that self-efficacy beliefs are more predictive of math performance than is math anxiety. The strength of efficacy beliefs accounted for more than 13% of the variance in their final math grades, whereas math anxiety did not prove to be a significant predictor. These studies provide clear evidence of the discriminant and predictive validity of self-efficacy measures, and they suggest particular benefit if educators focus on fostering a positive sense of personal efficacy rather than merely diminishing scholastic anxiety.

SELF-EFFICACY AND SELF-REGULATION OF LEARNING

Self-efficacy beliefs also provide students with a sense of agency to motivate their learning through use of such self-regulatory processes as goal setting, self-monitoring, self-evaluation, and strategy use. For example, there is evidence (Zimmerman, Bandura, & Martinez-Pons, 1992) that the more capable students judge themselves to be, the more challenging the *goals* they embrace. When self-efficacy and personal goal setting from the beginning of a school term were used jointly to predict final course grades in high school social studies, they increased prediction by 31% over a measure of prior grades in social studies. Similarly, when self-efficacy and personal goal setting were compared with the verbal subscale of the Scholastic Aptitude Test, there was an increase of 35% in predicting college students' final grades in a writing course (Zimmerman & Bandura, 1994). Although prior course grades and general measures of ability are considered exemplary predictors of achievement, these studies demonstrated that self-efficacy beliefs and goal setting add significantly to the predictiveness of these measures.

The effects of efficacy beliefs on students' *self-monitoring* was studied during concept learning (Bouffard-Bouchard, Parent, & Larivee, 1991). Efficacious students were better at monitoring their working time, more persistent, less likely to reject correct hypotheses prematurely, and better at solving conceptual problems than inefficacious students of equal ability. Self-efficacy beliefs also affect the *self-evaluation* standards students use to judge the outcomes of their self-monitoring. In a path analytic study (Zimmerman & Bandura, 1994), self-efficacy for writing beliefs significantly predicted college students' personal standards for the quality of writing considered self-satisfying as well as their goal setting and writing proficiency. Self-efficacy beliefs also motivate students' use of *learning strategies*. With fifth, eighth, and eleventh grade students, there were developmental increases in perceived verbal and mathematical efficacy as well as strategy use, and there was a substantial relation (16 to 18% shared variance) between efficacy beliefs and strategy use across the three grade levels of schooling (Zimmerman & Martinez-Pons, 1990).

The greater motivation and self-regulation of learning of self-efficacious students produces higher *academic achievement* according to a range of measures. Multon, Brown, and Lent (1991) found an overall effect size of .38, indicating that self-efficacy accounted for approximately 14% of the variance in students' academic performance across a variety of student samples, experimental designs, and criterion measures. This represents further evidence of the convergent validity of self-efficacy beliefs.

INSTRUCTIONAL AND SOCIAL INFLUENCES ON SELF-EFFICACY BELIEFS

In contrast to trait measures of self-perceptions, self-efficacy indices focus on cognitive beliefs that are readily influenced by four types of experience: enactive attainment, vicarious experience, verbal persuasion, and physiological states. *Enactive* experiences are the most influential source of efficacy belief because they are predicated on the outcomes of personal experiences, whereas *vicarious* influences depend on an observer's self-comparison with as well as outcomes attained by a model. If a model is viewed as more able or talented, observers will discount the relevance of the model's performance outcomes for themselves. *Verbal persuasion* has an even more limited impact on students' self-efficacy because outcomes are described, not directly witnessed, and thus depend on the credibility of the persuader. Finally, students base their self-efficacy judgments on their perceived *physiological reactions*, such as fatigue, stress, and other emotions that are often interpreted as indicators of physical incapability. Unlike self-beliefs assumed to have trait-like stability across time and setting, self-efficacy is assumed to be responsive to changes in personal context and outcomes, whether experienced directly, vicariously, verbally, or physiologically. As a result of this sensitivity, self-efficacy beliefs are studied as indicators of change during instructional interventions as well as indicators of initial individual differences.

To facilitate improvements in perceived efficacy, researchers have trained students with learning and motivational deficiencies by modeling specific self-regulatory techniques, describing their form, and providing enactive feedback regarding their impact. For example, youngsters who observed an adult model the use a cognitive strategy had significantly higher levels of perceived efficacy and academic skills than youngsters who received didactic instruction (Schunk, 1981). Asking students to set proximal goals enhanced self-efficacy and skill development more effectively than asking them to set distal goals because the proximal attainments provide evidence of growing capability (Bandura & Schunk, 1981). Verbally encouraging students to set their own goals improved not only their efficacy beliefs and achievement but also their commitment to attaining the goals (Schunk, 1985). The frequency and immediacy of enactive feedback also created higher perceptions of personal efficacy (Schunk, 1983). When students were taught to attribute

their enactive feedback to effort, they perceived greater progress, maintained higher motivation, and reported greater efficacy for further learning (Schunk, 1987). In these investigations, Schunk and his colleagues not only demonstrated the sensitivity of efficacy beliefs to instructional interventions, but also the mediational role of these beliefs in explaining changes in learners' self-regulation and achievement outcomes (Berry, 1987; Schunk, 1981). Self-efficacy beliefs increased prediction of academic outcomes as much as 25% of the variance above instructional influences. Clearly, students' self-efficacy beliefs are responsive to changes in instructional experience and play a causal role in students' development and use of academic competencies.

CONCLUSION

Students' self-perceptions of efficacy are distinctive from related motivational constructs because of their specificity and close correspondence to performance tasks. These cognitive beliefs differ conceptually and psychometrically from trait self-belief measures due to their sensitivity to variations in experience and task and situational context. Two decades of research have clearly established the validity of self-efficacy as a predictor of students' motivation and learning. Although self-efficacy correlates with other related constructs, it has also shown discriminant validity by its unique predictiveness of these outcomes when included in multiple regression analyses. It has shown convergent validity in predicting diverse forms of motivation, such as students' activity choices, effort, persistence, and emotional reactions. Finally, when studied as a mediating variable in training studies, self-efficacy has proven to be responsive to improvements in students' methods of learning (especially those involving greater self-regulation) and predictive of achievement outcomes. This empirical evidence of its role as a potent mediator of students' learning and motivation confirms the historic wisdom of educators that students' self-beliefs about academic capabilities do play an essential role in their motivation to achieve.

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