IMPROVING THE SELF-EFFICACY OF MIDDLE SCHOOL STUDENTS

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ABSTRACT

This paper explores the implications of improving the self-efficacy of middles school students. Historically, self-efficacy has been applied to a wide variety of contexts. This paper explores the connection to education and educational applications. The paper explores the appropriate forms of feedback, strategy implementation, goal setting, reward implementation, modeling of behavior, and methods of enhancing motivation that are conducive to enhancing self-efficacy. Suggestions for improving self-efficacy include a multi-method approach of specific strategy information combined with positive, progress oriented feedback. Future research should address issues of calibration within learning disabled student populations.

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CHAPTER 1: INTRODUCTION

Introduction

People undergo many changes throughout their lives. Some changes are temporary while others are permanent. Some habits or perceptions acquired in adolescence may stick with a person for the rest of their lives. During this highly impressionable stage of human life, young people begin to form their identities and attitudes that will inform them as they pass from adolescence into adulthood. Because of this, teachers have a burden placed upon them where they are partially responsible for development of the youth with whom they work. Ways in which teachers may positively influence self-efficacy in middle-school student populations is especially compelling. Self-efficacy perceptions are one of many identity components that are rooted in adolescent development. The central focus of this document considers the contextual, individual, and socio-cultural nature of self-efficacy, and an endless number of variables in which self-efficacy may apply. An important question to ask is what is self-efficacy anyway and why should an educator care about it? This paper defines, historically contextualizes, explores the research literature, and finally applies that concept and why it is applicable to the field of education.

Rationale

My own experiences overcoming obstacles and making positive changes in my life have greatly contributed to my interest in the topic of self-efficacy. There have been times when I was immobilized by fear and was afraid to try anything. My own perceptions of failure created a threat that was much too high, creating a situation where it was always too risky for me to take action. I believe the need to control is central in all

of our lives. Having at least the illusion of control provides us with a sense of relief, comfort, or security. When this perceived need dominates or when situations seem well out of control stress, anxiety, and depression can surface and manifest. One of my goals for this document, aside from being informative, is to complexify and deconstruct behaviors many people, including educators, take for granted. I want to show educators that their impact on students goes well beyond the curriculum they teach and that these impacts cause them to bear responsibility for student failures. Since so much of our information is obtained socially and culturally, the burden of success should not be placed squarely on individuals. Finally, I believe that good intentions are a poor substitute for an informed and sincere practice. Though it is not possible to be perfect or to know everything, there exists the potential for improvement if a person remains capable.

Learning about the role of self-efficacy in education is important because of its association with cognitive, social, and identity development. Most teachers want their students to achieve success and to go on to live happy and rewarding lives. Because of the nature of teaching, teachers can impact self-efficacy intimately, in a positive manner. Recognizing that self-efficacy is connected to motivation, perceived competence, goal setting, and task selection would allow a teacher to differentiate instruction and focus support based on efficacy levels. What may help one student may actually inhibit another. Understanding the complexity of self-efficacy and other foundations of identity will help teachers untangle the web and become potentially more effective.

Indeed the burden of the educator is a difficult and sometime unfair one. School is a place where self-efficacy is commonly cultivated or destroyed. A student's

perception of their self-efficacy will in part influence the tasks they choose, the kinds of goals they set, their motivation, their problem solving skills, organizational skills, and applying meta-cognitive skills to evaluate knowledge and strategies. Generally speaking, students with low academic self-efficacy levels have problems with goal setting, motivation, and a negative perception of capability or competence. As a result, a student with low self-efficacy may be less willing to undertake a task that will be difficult or challenging for them. This motivation or lack there of may cause a student to prepare less for a test if they do not feel like it will make a difference. Understanding self-efficacy and the role it plays in student motivation, goal setting, and ability perception would allow teachers to influence the domain of academic achievement in a positive way. This might happen by moving beyond setting demanding standards to actually creating and structuring academic experiences in a way that enhances students' senses of academic efficacy (Zimmerman, Bandura, & Martinez-Pons, 1992). This may involve using more experiential forms of methodology and allowing students opportunities to engage in more self-directed /self-instructional behavior, as well as, by allowing them access to materials in a way that they have been successful with in the past.

Controversies

There exists an expansive body of literature and research that indicates the importance of understanding self-efficacy and applying techniques that will improve student performance and more importantly student well being. However, there are some controversies and limitations surrounding the concept that should be addressed. There has been some outcry over Bandura's use of "reciprocal determinism" as an explanation for human behavior. Phillips and Orton (1983) explored Bandura's use of determinism as

a unidirectional phenomenon that happens without context. They fixated on determinism from a philosophical standpoint where behavior is predetermined and human agency is an illusion. In the end they chastised Bandura more for his language use and encouraged him to avoid paths that might lead him to Neo-Hegelian positions than for his theory which, in the end, they deemed "strong" (1983). In his reply, Bandura (1983) stated that the processes of reciprocal determinism do not operate as a simultaneous holistic interaction but instead causality occurs via an interaction of factors working in different contexts over time. He continued by reminding Phillips and Orton of a cornerstone of social cognitive theory: "Behavior is an interacting determinant, not a detached byproduct that plays no role in the production process" (Bandura, 1983, p. 166).

Another controversy surrounding self-efficacy theory and actually the psychological research community at large revolves around methodology. There has been growing suspicion and dissatisfaction with how self-efficacy is measured and for the lack of multi-method approaches used in research investigating the topic. For example, there is growing concern that questionnaires and methods used to assess perceived self-efficacy are not measuring what they claim to be. These threats to validity have resulted in a growing call for a revision of these methods and for the use of multi-method approaches when researching questions regarding self-efficacy. This would mean using quantitative methods that produce numerical data in conjunction with, implementing more qualitative methodology such as conducting interviews with participants. The usefulness of any research about self-efficacy depends on the reliability of the findings of the research. Some questions in the research community that address this are: Is self-efficacy really what people describe it as? Are the methods used to define and measure

self-efficacy valid and accurate? Are some individuals capable of reporting accurate estimations of their efficacy? Klassen (2002) illustrated this problem while examining students with learning disabilities. Klassen showed that often students with learning disabilities lack the calibration required to accurately report on their self-efficacy perceptions. They gauged their abilities far too high or way too low (according to test results). Ironically, early research supposedly geared toward cognitive behavior tended to focus more on procedural oriented operations such as addition or subtraction ability as opposed to complex problem solving or other process oriented investigations.

Definitions

Albert Bandura defined self-efficacy as "perceived beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). The ways in which these perceived capabilities are exercised and the contexts of those events may vary wildly, however. Bandura went on to state that "Influence may entail regulating one's own motivation, thought processes, affective states, and action, or it may involve changing environmental conditions, depending on what one seeks to manage" (p. 3). People's perceptions of their efficacy can have diverse and sometime unpredictable effects. Those perceptions partially influence actions people choose to pursue, how much effort they expend toward those pursuits, how long they persevere in the face of obstacles and failures, their resiliency to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in coping with taxing environmental demands, and the level of accomplishments they realize (p. 3). To summarize this position, self-efficacy is based in part on the supposition that people have causal capabilities and power to exercise control,

or at least degrees of control, on their physical and social environment. Self-efficacy is just one of many contributing factors to human behavior. The interaction of these causal and influential behavioral factors can be parsimoniously described within social cognitive theory. That simplified explanation is a triadic reciprocal relationship between behavior, internal personal factors, and the external environment. Thus, in this relationship the variables influence and are influenced by each other via reciprocal interaction. According to this triadic relationship, people are contributors to, rather than sole determinates of what happens to them (p. 6).

Before a concerted effort to improve self-efficacy is undertaken, it would be prudent to know how self-efficacy is derived. In his book *Self Efficacy: The Exercise of Control* Bandura (1997) identifies four sources of self-efficacy. They are as follows: Enactive mastery experiences, vicarious experience, verbal persuasion, and physiological and affective states.

The development of self-efficacy beliefs through enactive experience creates the cognitive and self-regulative facility for effective performance (Bandura, 1997, p. 80). They are the most influential source of efficacy information because they provide the most authentic evidence of whether or not a person has what it takes to succeed (p.80). Successes boost self-efficacy and failures undermine it. However, a resilient sense of self-efficacy cannot come with only easy successes, experience must include overcoming obstacles or through persistent effort. On the other hand, individuals who experience a significant pattern of failure are likely to have a crippled sense of self-efficacy. Enactive mastery experiences are those experiences where a person is one on one with the world. The person is actively using skill and ability to accomplish something. Some examples

of enactive mastery experiences might be a person attempting to build a deck, care for a houseplant, ride a bike, or write a thesis paper. All of these tasks have a variety of cognitive and physical skill requirements that a person must engage and apply in order to be successful. Success at these activities implies adequate skill or ability. Failure may indicate a lack of skill, ability, or effort.

Vicarious experience is another source of self-efficacy information. These experiences give people information about their own abilities via social comparison to others or through modeling (p. 86). For many activities there is no clear definition of adequacy. People may therefore, appraise their capabilities in relation to the capabilities and attainments of others (Bandura, 1997, p. 86). Because the definitions of adequacy and success are subjective in nature, interpreting vicarious information can be difficult. In everyday life people most commonly compare themselves to people in settings similar to themselves. Classmates or work associates are common examples of people who may model particular behaviors or that a person may compare themselves to. In these kinds of situations self-efficacy beliefs are heightened when people perceive superior performance over their peers and experience diminished self-efficacy beliefs when they experience lower perceived performance than their peers (p. 87). Modeling that conveys effective attainment strategies, coping strategies, or better ways of doing things can benefit individuals who have experienced repeated confirmations of inefficacy, as well as, highly assured and successful people alike. An example of vicarious experience might be a student who compares their results on a recent biology test with their classmates.

Social persuasion serves as a further means of strengthening people's beliefs that they possess the capabilities to achieve what they seek to accomplish (Bandura, 1977, p.

101). Verbal persuasion alone may be limited in enduring effectiveness but may temporarily bolster efficacy enough to gain practice by completing a task and develop skill. Individuals given encouragement by a significant other may respond by mustering greater effort and sustain that effort more than if they dwell on self doubt or deficiencies (p. 101). The effectiveness of verbal persuasion depends greatly on the perceived credibility of the persuader to the recipient (p. 101). Trust and intimate knowledge are important components in this kind of relationship. Raising unrealistic beliefs will invite failure, discrediting the persuader, and will further undermine the recipient's beliefs in their capabilities. Despite these potential pitfalls, verbal persuasion can be a useful tool for enhancing self-efficacy if administered with caution in mind. An example of social persuasion might be a track coach who tells a runner that they can improve their two-mile time if they open their stride up and push themselves harder.

Physiological and affective states are the fourth kind of information people may use to inform their efficacy perceptions. In judging their capabilities, people rely partly on somatic information conveyed by physiological and emotional states. Somatic indicators of personal efficacy are especially relevant in domains that involve physical accomplishments, health functioning, and coping with stressors (Bandura, 1997, p. 106). Increased awareness or focus on internal processes may increase the salience of these indicators. Perceived vulnerability to psychological stress indicators heightens the level of physiological reactions (p. 107). Physiological and affective states have a reciprocal relationship with how they are perceived making a situation possible where stressors and perception potentially feed off each other to a point of heightened arousal. People who conjure up aversive thoughts and rouse themselves to elevated levels of distress may

actually experience discomfort or dysfunction more than their original object of fear. An example of physiological or affective states information might be a student who gets butterflies in their stomach, sweaty palms, dry mouth, and a pounding heart before they give a speech in front of the class. Those indicators may be perceived by the individual that they are incapable of the task and would actually make the task more difficult.

It should be noted that none of these sources of information are inherently enlightening or will increase or decrease self-efficacy, nor do these sources of information usually operate independently. Self-knowledge and individual meta-cognitive function are important components in self-efficacy function. Self-efficacy is not something that just happens to a person, it requires management and due diligence in order to be maintained or enhanced.

Limitations

As with any construct, SE is confined within the framework built by the imagination and investigation of human thought and cannot definitively describe reality. Cognitive function operates within the brain and body not independent from one another. Limitations in meta-cognitive ability or impairments to biological or physiological function may inhibit accurate self-perception. In research this is often seen in young children who have a difficult time differentiating between effort and ability. The usefulness of self-efficacy is limited by the cognitive development of an individual, the health of an individual, or anything else that would otherwise impact cognitive function in the brain.

Possible limitations to this paper relate to the age of a significant number of articles sited in chapter three and a reoccurrence of one author, Dale Schunk. Many of

the articles sited are from the 1980's. Much research has been conducted on the topic of self-efficacy since then, including studies that incorporate qualitative methodologies or multi-method approaches. The research of Dale Schunk also dominates chapter three. Although Schunk's work has been valuable to the field of educational psychology, he is by no means the only authority on the subject. Many other researchers could have been included in this paper. The work of Schuck was chosen because the ages of the subjects in many of his studies were often close to or within the age demographic that represents middle-school students. This is important for generalizing findings for the purpose of applying them to the classroom. However, Schuck and his partner researcher often used identical or similar research methodologies from one study to the next. This significantly narrows the kinds of variables being investigated and possibly omits a critical contributing variable to behavior in the process. Using the same methodology also limits the kinds of generalizations that can be made. Schunk and his colleagues used quantitative analysis to measure self-efficacy thereby reducing it to variables that are easily measured through a pre/posttest design. This neglected to show some observable behaviors related to self-efficacy such as increased student confidence.

Summary

There is no magic bullet or one piece of advice that can erase perceived deficiencies related to self-efficacy. The combination of time, effort, and effective implementation of strategies are critical components in cultivating a healthy sense of self-efficacy. With awareness and some competence educators have an opportunity to make positive and lasting impacts on the lives of their students. Using effective strategies that foster positive self-efficacy during the middle-school years is especially important

because many students at that time begin to either achieve some comparative amount of academic success or begin their decent through the cracks of society. Providing students with opportunities to exercise degrees of control over their lives is empowering. This empowerment can contribute to long term emotional well-being, productivity, and hopefully a happy and fulfilling life.

The rest of this paper examines self-efficacy from different points of view. Chapter two examines the historical background of self-efficacy and its relation to education, chapter three features reviews and critiques on research related to student self-efficacy, and finally chapter four summarizes the research from chapter three, discusses strategies that may improve student self-efficacy in the classroom environment, and suggests areas of future research.

CHAPTER 2: HISTORICAL BACKGROUND

Introduction

Chapter one described the rationale for exploring self-efficacy and some of its applications within education, specifically with middle school aged students. One of those arguments was that middle school aged students are particularly vulnerable and may begin to achieve or not achieve as the case may be. Fostering self-efficacy within those students may afford them long lasting habits of mind that will aid them throughout the rest of their lives by impacting such things as motivation, perceived competence, goal setting, and task selection. The remainder of this chapter describes the development and progression of self-efficacy theory, its place within educational research, and some opposing schools of thought. The chapter concludes with a summary of the historical background of self-efficacy and its relationship to educational research and application.

Roots in Psychology

The topic of self-efficacy in education is one that is rooted deeply in the relatively new learning theory tradition of American psychology. Ideas explaining the causes of human behavior and ideas about the best forms of education have formed simultaneously and intersect at various points. Thinkers like John Dewey and scientists like James Watson and B.F. Skinner have influenced psychology and education alike. In western civilization psychology has its roots firmly planted in the philosophical observations of many people dating back to well before Descartes' meta-cognitive declaration of "I think therefore I am" to the times of Socrates, Plato and Aristotle. Indeed the history of self-efficacy is a fascinating journey that traces the paths of some of humanity's most enduring questions (Marias, 1967). What is will? Do humans really have agency over

their lives? Is freedom an illusion? What does it mean to exist? These questions have been tackled by nihilists, rationalists, empiricists, relativists, existentialists, and a host of others. Even today in an era that features unprecedented amounts of neurological technology and techniques available for peering into the inner workings of the brain and mind; we are still only marginally closer to knowing the answers to those questions. The debate of cognition vs. behaviorism is a modernized version of the debate between determinism vs. freewill. On one hand you have determinism with its freedom of responsibility for your actions but at the cost of having choice and agency about your actions. On the other hand there is the concept of freewill, where human beings are agents of their own destiny, free to choose the courses of action and direction they take but are burdened with the responsibility of those eventual outcomes. Self-efficacy theory is essentially an attempt at linking causality to behavior and an exercise in the exploration of choice (Bandura, 1997).

John Dewey

John Dewey was an American born philosopher. His work left a lasting impression on education, ethics, social and political theory, and religion. Dewey had a belief that people could change their lives through education. Part of that process meant building on awareness and then using new information to make changes as they see fit. Dewey saw that the freedom for people to pursue purposes related to their own interests and prior experience as a critical component in that process. He wrote “The only freedom that is of enduring importance is the freedom of intelligence, that is to say, freedom of observation and of judgment exercised in behalf of purposes that are intrinsically worth while” (Dewey, 1938, p. 61). Dewey continued by saying that

physical movement is only part of that equation but in addition a person must develop a certain amount of "self-control" (p.64). To Dewey education was s a means of developing awareness of the systems of social control and personal behavior in a person's life. To this Dewey wrote "A person whose behavior was only dictated by whim and impulse had "at most only the illusion of freedom. Actually he is directed by forces over which he has no command" (p. 65). Dewey sums up his philosophy of education with the following:

> There is no point in the philosophy of public education which is sounder than its emphasis upon the importance of the participation of the learner in the formation of the purposes which direct his activities in the learning process, just as there is no defect in traditional education greater than its failure to secure the active co-operation of the pupil in construction of the purposes involved in his studying (p. 67).

As with self-efficacy theory, Dewey suggested that by using experience and interaction with a person's social and physical environment a person gains information, information about themselves that can be used to form appropriate courses of action for the future that are not necessarily tied to the whims of behavior.

The Behaviorists

John Watson's "declaration of behaviorism" ushered in a new approach to psychology that would change that discipline forever (Miller, 2002). Observable characteristics of behavior were all that mattered. The nature of consciousness and introspection had no place in psychology. The exercise of freewill was irrelevant. Everything was to be explained by stimulus and response. Watson's protégé, B.F.

Skinner, continued on when Watson left for a lucrative career in advertising. He shared beliefs that metaphysical information and ideas of freedom were unsatisfactory for explaining human behavior scientifically.

Skinner's ideas about the myth of human agency, a disconcerting as they may have been, were just a small part of his contributions to science. What Skinner would accomplish in the field of psychology should not be underestimated. He provided methodology that allowed behavior to be measured and tested thus giving psychology legitimacy as a science. He showed that behavior is often predictable and that some of those patterns can be extended through a whole culture. He was a passionate champion of humanity and saw his theories as an elixir for all its ills. While Skinner's experiments did show evidence of predictable behavior they were often far too decontextualized with too many real world variables removed for them to be relevant to everyday human life. A bold as his assertions were and as hard as he might have tried, he could not explain the phenomena of language, memory, higher-order problem solving, or even the simple act of common sense with his theories. Interestingly enough, these are the same phenomena that evade those who wish to create a form of artificial intelligence that behaves in a human way. Skinner's (1971) view on autonomy can be summed up thusly:

> Autonomous man is a device used to explain what we cannot explain in any other way. He has been constructed from our ignorance, and as our understanding increases they very stuff of which is composed vanishes. Science does not dehumanize man, but it de-homunculizes him, and it must do so if it is to prevent the abolition of the human species. To man *qua* man we readily say good riddance. Only by dispossessing him can we turn to the real causes of human

> behavior. Only then can we turn from inferred to the observed, from the miraculous to the natural, from the inaccessible to the manipulable (p. 191).

Skinner thought that the idea of autonomous man and agency was a threat to progress and human potential.

Skinner had many views on education and what the most effective forms of teaching were. *The Technology of Teaching* (Skinner, 1968) outlined the obstacles that occur in learning and made suggestions for improving learning. Skinner maintained that barring any physiological or biological disorder all people are capable of learning. He identified five main obstacles that occur in learning. The first being the fear of failure which, ironically, could be interpreted by cognitive learning theorists as an example of physiological or somatic affective states information that would influence self-efficacy. The second and third obstacles are a lack of directions or if directions are available a lack of clarity. The fourth obstacle is that positive reinforcement is not used enough. The fifth obstacle is that often a task is all too often not broken down into small enough steps (Skinner, 1968). He proposed a five principle plan that allowed for any age appropriate skill to be taught. The first principle is to break the task down into small and manageable steps. The second principle is to have students work from the simplest to the most complex tasks. The third principle is to repeat the directions for the tasks as many times as possible or as many times as necessary for them to be understood. The fourth principle is to give immediate feedback or feedback as soon as possible upon completion of the task or through the progression of the task. The fifth principle is give liberal amounts of positive reinforcement. Failure on the part of the students could in his view be attributed to a violation of one or a combination of these principles (Skinner, 1968).

Skinner largely left the responsibility of the learning individual out of the process. In addition to these views on teaching and learning, Skinner also commented on punitive punishment found in schools and suggested that the main thing people learn from being punished is how to avoid punishment (Skinner, 1971). Although pure behaviorism has fallen out of favor within the field of psychology, Skinner's ideas still enjoy wide application in today's educational climate.

Social Cognitive Theory

Behaviorism was scientific; it tested observable behavior and abhorred reliance on reports of feelings, emotions, or other subjective sensations. Its champion, B.F. Skinner described learning as a response to introduced stimuli and that cognition, freewill, and agency were myths. However, behaviorism could not explain everything via pure condition and response behavior. Complex skills such as language acquisition, memory, and application of knowledge could not be explained by behaviorism and as a result, required new techniques to be developed in order to explain behavioral phenomenon. This opened the doors for social learning theory or social cognitive theory as it would later be called.

Social learning theorists developed multiple theories of the self that included ideas such as self-efficacy, self-concept, self-identity, self-esteem, and locus of control to name a few (Miller, 2002). All of these concepts in combination predict the amount of agency person has to determine their own thoughts and behavior. Albert Bandura is one such scientist that contributed heavily to the development of social learning theory and self-efficacy theory. Bandura described self-efficacy as the perceived beliefs in one's capabilities to organize and execute the courses of action required to produce given

attainments (Bandura, 1997). Bandura also developed the triadic reciprocal relationship theory of behavior. This theory maintains that behavior, internal personal factors, and external environmental factors all have an ongoing and reciprocal influence on one another. Behavior then does not happen holistically or via a closed system like an engine. Rather behavior occurs contextually and over time, with determinants coming and going. Some of its earliest applications saw self-efficacy used to explain coping behavior exhibited by people in fearful situations or who had phobias. Bandura and Adams (1977) worked with subjects whose social, recreational, and vocational activities were adversely affected by chronic snake phobias. In this study Bandura and Adams disputed traditional desensitization treatment claims that stated defensive behaviors are controlled by anxiety arousal (1977). Bandura and his social or cognitive learning theory regarded anxiety and defensive behavior as coeffects rather than causally linked (1977). Bandura claimed instead that desensitization works by raising efficacy expectations rather than by eliminating a drive that instigates the defensive behavior (1977). The goal of the study was then to test the theory that desensitization changes behavior through its intervening effects on efficacy expectations (1997). Using various methods of measuring self-efficacy Bandura and Adams monitored the progress of severe snake phobics through a process of desensitization, relaxation techniques, and other coping mechanisms. The results of the study showed following treatment showed that extinction of anxiety arousal through symbolic desensitization significantly enhanced self-efficacy toward similar threats (1977). From this Bandura and Adams concluded that the desensitization processes altered perceptions of consequences so that the new perception of those former threats could be monitored and acted upon calmly and appropriately by

the individual. They had learned control over their fears.

On Education

The clinical application of self-efficacy showed promise and other researchers took notice and began applying it to the field of education. Dale Schunk, conducted studies in the late 1970's and early 1980's that looked at the relationship between self-efficacy, different forms of feedback, and the acquisition of certain mathematical skills in elementary school students. Some of those studies appear in chapter three. Others looked for correlations between self-efficacy and gender, motivation, learning disabilities, strategy use, and goal setting. Schunk and others still continue their work today, contributing to the ever increasing body of research literature. Bandura also used his research to critique the educational establishment declaring that:

> There are a number of school practices that, for the less talented or ill-prepared, tend to convert instructional experiences into education in inefficacy. These include lock-step sequences of instruction, which lose along the way many children who fail to learn at the required pace. Sorting students into ability groupings further diminishes the perceived self-efficacy of those cast into lower academic tracks where little is expected of them, and so they continue to fall further behind academically. Socially competitive grading practices convert educational experiences into ones where many are doomed to failure for the high success of few (Bandura, 1997, p. 175).

This social commentary shows that scientists who conduct research or pioneer radical ideas about human behavior may have an agenda more encompassing than the cold pursuit of knowledge. This view holds that those who seek to understand are bound

to enhance the world around them with the knowledge they uncover.

Summary

Chapter two provided historical context for self-efficacy in relation to education. It highlighted a shift from behaviorist to cognitive explanations for human behavior. Different views on human behavior and education have shaped that landscape for many generations and will continue to change as prevailing attitudes shift and change in accordance to new ideas and information. Chapter three features reviews and critiques on research related to student self-efficacy, and finally chapter four summarizes the research from chapter three, discusses strategies that may improve student self-efficacy in the classroom environment, and suggests areas of future research.

CHAPTER 3: REVIEW OF THE LITERATURE

Introduction

Chapter one described the rationale for exploring self-efficacy and some of its applications within education specifically with middle school aged students. One of those arguments was that middle school aged students are particularly vulnerable and may begin to achieve or not achieve as the as the case may be. Fostering self-efficacy within those students may afford them long lasting habits of the mind that will aid them through out the rest of their lives by impacting such things as motivation, perceived competence, goal setting, and task selection. Chapter two described the development and progression of self-efficacy theory, its place within educational research, and some opposing schools of thought. The rest of this chapter will focus on research related to the four ways in which individuals derive self-efficacy information and how that information influences self-efficacy. The four main sources of self-efficacy information are: Enactive mastery experiences, vicarious experience, verbal persuasion, and physiological and affective states. The studies in this section all explored relationships between individuals or groups and sources of self-efficacy information. The sections of this chapter explore information such as feedback, strategy use, rewards, goal setting, modeling, and motivation. Many of the studies in chapter three may be relevant and indeed overlap into one or more sections.

Feedback

Feedback from teachers comes in many forms and frequently follows enactive mastery experiences. The feedback may be in the form of direct encouragement or critique which would classify it as verbal persuasion or it may be more subtle and

environmentally related such as the way a classroom is organized. It may also come in the form of vicarious experience if the teacher uses information such as examples or models in the feedback. The studies in this section are primarily addressing the differential effects of effort and ability feedback and their affects on self-efficacy.

Rosenholtz and Rosenholtz (1981) conducted a correlational, survey, qualitative study with fifth and sixth graders to investigate if the organization of a classroom shaped student and teacher perceptions of ability by offering or constricting opportunities to construct performance interpretations. The sample consisted of 15 fifth and sixth grade self-contained classrooms from three schools in neighboring districts of the San Francisco Bay area. Two of the schools were located in suburban, middle-class, and white populations. The other school was located in an urban setting that served mostly working class Hispanics. Schools were selected on the basis of interviews conducted with several principals concerning the degree of curricular complexity within their schools. This study was concerned with intra-class effects, each classroom included was composed of mixed ability levels. Data on instructional organization were derived from questionnaires administered to participating teachers. They were asked to describe their curricular materials and instructional practices through Likert fixed-choice responses. Four theoretically identified characteristics were used: Task differentiation, grouping practices, student autonomy, and teacher evaluations. An index for instructional organization was constructed using those four measures. To avoid spurious relationships because of the part-whole phenomenon, each item's value was subtracted from the index score before that item was correlated with the index. Measurements of ability evaluations were based on students' perceptions of reading. The three sources of information for that

measurement were individual students, their classmates, and their teacher. New students were excluded from the sample because they were unlikely to know the reading ability of their classmates. Students with learning disabilities who were being mainstreamed were also eliminated from the sample.

The results from the data showed that individual ability perception was significantly higher in the uni-dimensional classroom vs. the multidimensional classroom. In uni-dimensional instruction, all classroom participants perceived greater ability stratification among students. The data supported the contention that organization of classroom instruction modestly influenced students' self perceptions ($r = .13$, $p<.05$). Uni-dimensional instruction presented fewer choices in performance interpretation and those choices were more highly visible than multidimensional instruction. These factors in uni-demsional instruction contributed to higher distribution rates according to low and high ability vs. that of multidimensional instruction. Although self-efficacy is not explicitly addressed in this study there are clear sources of information present that influenced perception of reading ability. The vicarious experiences in this study came most frequently in the form of social comparison. The tendency for students to compare themselves and others according to ability was more salient in the uni-dimensional instruction group. What is somewhat disappointing is that students with learning disabilities were eliminated from the sample. An opportunity to observe the perceptions that students with learning disabilities have about themselves and their peers was missed. At the same time there is the issue of students with learning disabilities ability to accurately report their perceptions. This would have been a good opportunity to use a more multi-method approach and used some form of qualitative analysis with those

students.

Schunk (1984) conducted two quantitative, pretest/posttest design studies with third graders to investigate if sequence of ability and/or effort attributional feedback will influence student self-efficacy. The participants from study one were 40 third-grade students drawn from four classes in one elementary school. Ages ranged from 8-10 years old. The 21 boys and 19 girls were from a predominately middle-class background. Children were initially selected on the basis that their teacher thought they would have trouble correctly answering 25% of the problems on a subtraction skill test. The participants from study two were 40 students drawn from three classes in one elementary school. The ages ranged from 8-10 years old. The 24 boys and 19 girls were from a predominately middle-class background. Children were initially selected on the basis that their teacher thought they would have trouble correctly answering 25% of the problems on a subtraction skill test. The participants from both studies were assigned to one of four condition groups (n = 10): ability-ability feedback, ability-effort feedback, effort-ability feedback, and effort-effort feedback.

The students in test one were initially administered a pretest series that assessed subtraction efficacy and subtraction skill. The self-efficacy assessment used a scale that went from 10 (not sure) to 100 (real sure) with 40 representing maybe and 70 representing pretty sure. After the subjects were familiarized with the assessment scale, they were shown sample pairs of subtraction problems for two seconds each. This allowed the student to assess the difficulty without actually solving the problem. The student was then asked to privately rate the certainty of their ability to solve the pair of problems by circling one of the 10 scale numbers that matched their certainty. The

subtraction skills test consisted of 25 problems of varying degrees of difficulty. The measure of skill was the amount of problems solved correctly. Following the pretest the subjects were randomly assigned to one of the four treatment groups. Children received 40 minute training sessions over four consecutive school days, during which they worked on a training packet that consisted of seven sets of material. The first page contained written explanations for the subtraction operations required to solve the problems. Those explanations were followed by example problems. The next six pages contained problems to solve. A proctor read the instructions with the students and reread any material as necessary without supplementing the information. For the ability-ability feedback condition the proctor gave feedback five times during each of the four training sessions. The feedback consisted of a "You're good at this," statement. This feedback was given without accompanying social reinforcers. For the ability-effort feedback condition the proctor gave the same feedback and amount for the first two days but switched to an effort linking "You've been working hard," statement the last two days. For the effort-ability condition the information was the same as the ability-effort condition except the sequence was reversed. For the effort-effort feedback condition the effort attributional feedback was extended over the entire four days. Children's attributions for their problem solving progress during training were assessed the day after the final training day. The posttest was administered the day after the attribution assessment. The same self-efficacy and skill assessments were used as in the pretest except a parallel form of the skills test was used to eliminate problem familiarity. The participants from study two followed the same procedures as in study one.

The data from study one showed that each experimental group made significant

pretest-posttest improvements in both self-efficacy and skill ($p<.01$). The two groups that received ability feedback during the first two training session had significantly higher increases in skill and self-efficacy than the groups that received effort feedback over the first two days ($p<.01$). There was no significant difference between the ability-ability and ability-effort in terms of improved self-efficacy. Students in those groups had their self-efficacy increase from 36 pretest to 88 posttest and 35 pretest to 88 posttest respectively. The effort feedback groups saw their self-efficacy increase but at a less drastic rate (effort – ability 32.9 pretest to 65.3 posttest and effort-effort 35.8 pretest and 72.4 posttest). The data from study two showed similar results to study one. The two groups that received ability feedback the first two training session had significantly higher increases in skill and self-efficacy than the groups that received effort feedback over the first two days (ability-ability 34 pretest to 87 posttest and ability-effort 31 pretest to 87 posttest, $p<.01$). The effort groups both saw significant increases in self-efficacy but less than in the ability first groups (effort-ability 35 pretest to 67 posttest and effort-effort 32 pretest to 65 posttest, $p<.01$). The data could be interpreted in many ways. First of all, the sequence of the ability first feedback may diminish the effects of the following effort feedback because the students may have interpreted the task as something they are good at (according to the ability feedback) and thus should not require lots of effort. Although the feedback and sequence of the feedback was significant in this study, it appears to be less significant that the enactive mastery experiences of the students getting opportunities to practice with subtraction material when looking at the differences in data between the experimental conditions. The participants in these two studies were third graders selected on the basis of sub-standard subtraction ability. These populations may

be less likely to view effort as cause of success compared to ability and may explain why the ability first groups had such a higher gain in self-efficacy. Also the age of the participants and their ability to differentiate between effort and ability may have had some impact on the results. Future research may want to address the perception of ability to effort through various stages of development.

Schunk and Swartz (1993) studied fourth graders to see whether or not strategy feedback goals would positively influence self-efficacy and writing skill. The subjects were 33 fourth graders from two classes in one elementary school. There were 19 girls and 14 boys. Ages ranged from 9 to 10 years old. The subjects were predominately middle class. Ethnic composition was 23 White, six Black, two Hispanic American, and two Asian American. Students had been previously classified as gifted in language arts by school district standards and were initially selected on this basis.

The quantitative study used a pretest/posttest group design with no control group. A pretest series was administered to all the subjects that measured self-efficacy, writing skill, strategy use, and goal orientation. Following the pretest, subjects were randomly assigned to one of three experimental conditions (n = 11): Paragraph goal, strategy goal, or strategy goal plus progress feedback. The subjects received 45 minute instructional sessions over 20 days; five days were devoted to one of five different types of paragraph. Students assigned to the same condition met in small groups with a teacher from outside the school. The procedure during the five sessions devoted to each type of paragraph was identical. At the start of the first session a tester administered a self-efficacy for skill improvement measure where the subjects judged their capabilities for improving their skills. Following this the teacher gave goal instructions appropriate to the condition

group and then referred to a writing strategy displayed on a poster board. During the first 10 minutes of each session the teacher verbalized the strategy steps and applied them to sample topics and paragraphs. For the next 15 minutes the students received guided practice where they applied the steps under the guidance of the teacher. The last 20 minutes of each session were devoted to independent practice. During the goal instructions for the strategy goal and the strategy goal plus feedback groups the teacher said, "While you're working, it helps to keep in mind what you're trying to do. You'll be trying to learn how to use these steps to write a descriptive paragraph." These instructions were identical for the other sessions except the teacher substituted the name of the appropriate paragraph type. In addition the subjects in the strategy goal plus progress feedback group received progress feedback three-four times during each session. Examples of progress feedback were: "You're learning to use the steps," or "You're doing well because you followed the steps in order." All students received performance feedback but only the strategy goal plus progress feedback group received progress feedback. Students in the paragraph goal condition were told "While you're working, it helps to keep in mind what you're trying to do. You'll be trying to write a descriptive paragraph." All other instructions were the same as the other groups. The posttest that followed the final session included the same measures as the pretest and also included measures of progress of strategy learning and strategy value. A parallel form of the skill test was used. A maintenance test was administered six weeks after the posttest. The test included the pretest measures except a parallel form of the skill test was used.

The results from the data showed that strategy goal plus feedback students judged self-efficacy significantly higher than the paragraph goal group. The strategy goal plus

feedback group showed higher skill than both the strategy goal and paragraph goal groups (paragraph goal 60.5 pretest to 73.1 posttest; strategy goal 63 pretest to 80.5 posttest; and strategy goal plus feedback 64. 3 pretest to 89.7 posttest, $p<.05$). These results indicate that student may perceive strategy use as a useful way to improve writing skill. Progress feedback may reinforce those perceptions further. The self-efficacy of students in the strategy use plus feedback group sustained their levels of writing efficacy in the maintenance measure where the other two groups saw decreases. However, according to the study, gifted students usually possess higher levels of strategy use and transfer of those skills across domains more than average achieving or lower students. Future research may look at using peers to implement the progress feedback and monitor strategy use.

Schunk and Rice (1987) conducted two quantitative, pretest/posttest design studies with fourth and fifth graders to investigate if providing strategy use for remedial readers will improve self-efficacy and comprehension skills. The subjects in the first study were 40 students (20 fourth and 20 fifth graders) drawn from two elementary schools. The 21 boys and 19 girls were from a predominately lower-middle class background. Ages ranged from 9-13 years old. Ethnic composition was 37% Hispanic, 27% Black, 26% White, and 10% Asian. Subjects were initially selected on the basis that they regularly received remedial reading comprehension instruction. Twenty five percent of the sample students also received some instruction in ESL classes. The subjects in the second study were 15 fourth graders and 15 fifth graders. There were 15 boys and 15 girls. Ages ranged from 9-13 years old. Subjects were initially selected on the basis that they regularly received remedial reading comprehension instruction.

In study one the students were initially given a pretest series that consisted of a self-efficacy assessment and a comprehension skill test. The self-efficacy test assessed the student's perceived capabilities to correctly answer different types of comprehension questions from 20 different passages. The assessment tool consisted of 20 scales that ranged in 10 unit intervals. The comprehension skill test that immediately followed the self-efficacy assessment consisted of eight passages and 20 comprehension based questions. Following the pretest the students were randomly assigned to one of four experimental condition groups (n = 10): specific strategy value information (SSVI), general strategy value information (GSVI), specific plus general strategy value information (SS+GSVI), and no strategy value information (NSVI). All students received 35-minute training sessions over 15 consecutive school days, during which they worked on an instructional packet. Children met in small groups of five or six within their condition and worked with one of two female trainers. At the start of the first training session, the trainer distributed the instructional packet. On a nearby poster was printed a five-step reading comprehension strategy. The instructional material consisted of a training packet that included several reading passages, each of which was followed by one or more multiple choice questions. The passages were ordered from least to most difficult. After distributing the packet, the trainer pointed to the poster board and gave the appropriate treatment instructions. For children in the SSVI condition the trainer started each session by saying "Today we're going to use these steps to answer questions about main ideas." She then delivered the strategy value information as follows, "Using these steps should help you whenever you have to answer questions about main ideas, because most children like you find that using these steps helps them whenever they have

to answer questions about main ideas." At the end of each training session, the trainer would say "Remember that using these steps should help you whenever you have to answer questions about main ideas." For students in the GSVI group the pre and post strategy emphasis information were the same. The strategy value information however was, "Using steps like these should help you whenever you have to answer questions about passages you've read, because most children like you find that using steps like these helps them whenever they have to answer questions about passages they've read." The students in the SS+GSVI group received both sets of strategy value information. At the start and end of each training session the trainer first provided the specific value information, followed by the general value information. The emphasis instructions that preceded and followed the strategy value information was the same as in the previous two conditions. For students in the NSVI group the trainer pointed to the poster with the strategy at the start of each training session and verbalized only the introductory emphasis statement. After the strategy value instructions the trainer modeled the reading comprehension strategy and verbalized the five steps. Following the demonstration she instructed the children to repeat each step aloud after she verbalized it. Following this the trainer would call on different children to read questions and then verbalize the steps. This format was the same for the rest of the first session and rest of the training program except the trainer did not model strategies and children did not verbalize each step before applying it. The students were administered the posttest the day following the last training session. The self-efficacy and skill instruments were the same as the pretest except a parallel form of the skill test was used to avoid familiarity.

The procedures were the same in study two except for the variation of the

treatment conditions and the feedback. The three treatment conditions were (n = 10): specific strategy value information (SSV), strategy effectiveness feedback (SEF), and strategy value plus effectiveness feedback (SS+SEF). The interventions in each treatment group featured strategy value information only, strategy effectiveness feedback only, or a combination of the two. For children in the SSV condition the trainer would at the start of each session say "Today we're going to use these steps to answer questions about main ideas." She then delivered the strategy value information as follows, "Using these steps should help you whenever you have to answer questions about main ideas, because most children like you find that using these steps helps them whenever they have to answer questions about main ideas." At the end of each training session, the trainer would say "Remember that using these steps should help you whenever you have to answer questions about main ideas." The students in this condition also received performance feedback following their answers to the comprehension questions. For students in the SEF group the pre and post strategy emphasis information were the same. These students received strategy effectiveness feedback from the trainer three to four times during each training session. This feedback followed the verbal performance feedback. The students in the SS+SEF group received a combination of strategy value information, performance feedback, and strategy effectiveness feedback from the preceding two conditions. At the start and end of each training session the trainer first provided the specific value information, followed by the general value information. The emphasis on instructions that preceded and followed the strategy value information was the same as in the previous two conditions.

Methodologies in the two studies seem to have produced valid and reliable data.

The data from study one showed that students in the SSVI made a significant improvement in self-efficacy (mean scores 58.2 pretest to 73.9 posttest, $p<.05$). The subjects in the SS+GSVI also showed significant gains in comprehension self-efficacy and skill (mean scores 64 pretest to 90.7 posttest and 4.9 pretest to 11.2 posttest, respectively, $p<.01$). The students in the SS+GSVI judged self-efficacy significantly higher than students in the other three conditions (mean scores GSVI 66.7 pretest to 73.8 posttest; NSVI 69.6 pretest to 71.6 posttest, $p<.05$). The significant gains in self-efficacy of the SS+GSVI group compared to the only marginal gains of self-efficacy in the other two experimental groups show the value of offering a variety of information to students about strategy use. Study two showed that subjects in the SS+SEF group showed significant gains in self-efficacy (64 pretest to 90.7 posttest, $p<.01$). These students showed significantly higher self-efficacy than students in the other two condition groups, which did not differ significantly (SSV 58.2 pretest to 73. 9 posttest; SEF 66.7 pretest to 73.8 posttest, $p<.05$). The results of the study support the idea that providing students with multiple sources of strategy value information can have positive effects on self-efficacy and comprehension skill. Although these two studies show that multiple sources of strategy information enhance readers' self-efficacy and comprehension they do not specify the process by which these effects occur. Additional studies may want to address the use of comprehension strategies over extended periods of time. Knowing the number of ESL students per group would have been useful because the passages the students worked with were in English. This factor could have contributed to the higher numbers in the combined group. Future research may want to compare comprehension skill between groups composed of only ESL students and non ESL but remedial reading class

students. The age of the participants, the circumstances of their initial selection and the small experimental group sizes (n = 10) makes generalizing the results to a wide population difficult. If anything this study shows some value for giving students with reading comprehension difficulties as much strategy information for comprehension as possible.

Yasutake, Bryan, and Dohrn (1996) conducted a quantitative, correlational study with students (K-8) to see if perceptions of self competence would increase in students with learning disabilities or students that were at risk for special education after experiences where they served as tutors for younger students. The subjects were 178 students from three Chicago elementary (K-8) schools. One school was predominately African American (>98%), one school was predominately Hispanic (>98%), and one school was predominately Anglo (>98%). All 178 students participated in a cross-age, peer tutoring program, with only 93 children being assigned to the experimental conditions based on their categories. This helped control for experimental effects due to participation in a "selective program," since this program was introduced as part of their everyday school program with everyone participating. The sample of 93 children included 37 African Americans, 32 Hispanic, and 24 Anglo students. There were 12 students with learning disabilities, 20 boys at risk for referral, 22 girls at risk, 22 average achieving boys, and 17 average achieving girls.

The design combined attribution training in a cross-age, peer tutoring program. The design was a two condition (attribution-plus strategy training (ATT+STR) and strategy only training (STR) three group (at-risk, average achiever, and learning disabled) and two gender factorial. Factors of school and job (tutor, tutee) were analyzed

separately. Students were randomly assigned to dyads that resulted in age differences of at least two years between tutors and tutees. These pairs were randomly assigned to one of the two conditions. Student dyads were changed depending on teachers' observations of the social behaviors and effectiveness of students' interactions. These changes accounted for the uneven number of students who participated in the study. The students were pre-tested prior to the training and tutoring sessions and post-tested after the final tutoring session. Each week tutors were trained on how to use the materials in the peer tutoring sessions and how to respond to the younger children's accurate or inaccurate responses. The tutoring sessions took place immediately following the training sessions. Tutors and tutees were administered pre and post-tests on the following measures: The Perceived Competence Scale for Children for students, the Attribution Circle Scale (ACS), and the Forced Choice Attribution Scale (FCAS) in 3rd-8th grades, 1st and 2nd grades students were administered the Pictorial Scale of Perceived Competence and Acceptance for Young Children, the students were also administered the Smiley Faces scale that represented reading, math, and making friends. During peer tutoring sessions, tutors recorded each time they made an attribution or strategy statement. This was so that tutors could self monitor their use of attribution and strategy statements. Due to scheduling problems, peer tutoring was conducted across a 5-10 week schedule depending on the school. Twice a week the tutors received training on the lessons they would teach until they achieved 100% accuracy. In the ATT+STR condition ability and strategy responses were modeled for the tutors. In the STR condition only the strategy responses were modeled. These training sessions lasted for 20 minutes for the first two weeks each subsequent week requiring only 10 minutes. The tutoring sessions lasted

from 30-45 minutes. Half of the tutors went to the tutees' classroom and half of the tutees went to the tutors' classrooms. The tutors and tutees worked on tasks selected by the teachers. Tutees were required to work on their assigned tasks until they achieved 100% accuracy before a different task was assigned. At the end of each session, the tutors completed a questionnaire about how well the session had gone. In the ATT+STR group the tutors made attributions to ability and effort when the tutee responded accurately. Strategy statements were used when the tutee responded inaccurately. In the STR only group the tutors responded with general reinforcements such as "Good job" or "That's correct" for correct responses. Responses to incorrect answers were the same as the ATT+STR group.

The results from the data show that there were positive effects for effort, ability, and task difficulty for positive outcomes for the FCAS. A main effect indicated that average achievers rated effort as a more important cause of successful outcomes ($M = 5.75$, $SD = 1.69$) than at-risk students ($M = 5.75$, $SD = 1.69$), or students with learning disabilities ($M = 4$, $SD = 1.75$). Students with learning disabilities differed significantly from the average achieving students and the at-risk students after a post hoc analysis ($p<.05$). Males from the ATT+STR and the STR groups did not differ significantly ($M = 4.68, 5.61$, respectively), however the females from the ATT+STR condition rated ability as a more important cause of positive outcomes than did females in the STR only condition ($M = 5.33, 4.26$, respectively, $F = 3.03$, $p<.05$). For negative outcomes there was a main effect for condition on ability, effort, and task difficulty. Students in the ATT+STR condition rated ability and effort as a more important cause of failure than did students in the STR only condition ($M = 2.88, 1.93$ respectively, $p<.035$). Students in the

ATT+STR condition rated task difficulty as less important for failure than did the STR condition students (M = 5.73, 6.54, respectively, p<.008). For the ACS, average achieving students rated effort as more important (M = 14.06, SD = 3.25) than at-risk students (M = 13.88, SD = 2.04), followed by students with learning disabilities (M = 12.25, SD = 3.25). ATT+STR tutors rated effort as less important for positive outcomes (M = 12.8) than did STR tutors (M = 14, p<.05). ATT+STR tutors rated ability as less important for positive outcomes (M = 12.05) than did STR tutors (M = 13.30, p<.05). However, tutees in the ATT+STR condition rated ability as more important for positive outcomes than did the tutees in the STR condition (M = 13.07, 11.70, respectively, p<.05). For ACS negative outcomes tutees in the ATT+STR condition rated task difficulty as more important than did tutees in the STR condition as a reason for negative outcome (M = 11.07, 8.90, respectively, p<.05). Males in the ATT+STR condition rated luck as more important for negative outcomes (M = 8.94, SD = 3.78) than males in the STR condition (M = 6.83, SD = 2.79, p<.05). Females in the ATT+STR condition rated luck as significantly less important for negative outcomes (M = 7.83, SD = 3.22) than females in the STR condition (M = 10. 80, SD = 3.42, p<.05). Correlational analysis between ACS and FCAS indicated significant relationships between effort and positive outcomes (r = .21, p<.03), effort for negative outcomes (r = .2, p<.04), and luck for positive outcomes (r = .3, p<.004). Overwhelmingly, students liked peer tutoring, wanted to do it again, and were willing to do it with the same or another student. The implications of Vygotskian social learning via zone of proximal development type mechanisms and their impact on self-efficacy and learning are significant. The results of the study showed that attribution training and peer tutoring may influence 3rd-8th graders

self-perceptions of competence. Tutors and tutees both perceived themselves more positively in terms of academic skills, behavior, athletic abilities, and physical appearance compared to tutors and tutees in the strategy only condition. In this study positive impacts were shown across gender, race, and academic status when attribution training and peer tutoring was implemented. The results of the study indicate positive gains for students with learning disabilities or are at risk for special education. However, it would be useful to know the criteria for what earns a student the label of at risk for special education. Those criteria may have indicated some other form of cognitive disruption other than a learning disability. As Klassen (2002) discusses, students with learning disabilities or other cognitive problems may not be accurate with their perceptions of competence based on actual performance data. The authors should have included some kind of information that compared the students' new perceptions of competence with performance data.

Schunk (1980) conducted a quantitative, pretest/posttest control group design study with third, fourth, and fifth graders to investigate if providing students with corrective feedback fosters development of skills and self-efficacy. The subjects were 56 students from five elementary schools. There were 33 males and 23 females from a predominately middle class background. The mean age was about 10 years old. Children were initially selected on the basis of low arithmetic achievement, persistence, and self-confidence.

The pretest consisted of measure of division skill, persistence, and self-efficacy. All of the students were given a division skills test with 18 problems. Twelve problems had one or two digit divisors and six problems had three or four digit divisors. A tester

administered the problems to a student one at a time and recorded the amount of time the student spent with each problem. Following the division skill test, students where given a self-efficacy measurement where they gauged their ability to solve division problems that corresponded in difficulty to the problems on the pretest. The scale went from 10 (not sure at all) to 100 (very sure). After the self-efficacy assessment subjects were randomly assigned to one of five treatment groups. The treatment groups had 12 students and the control group had eight students. The treatment groups were: modeling-with attribution feedback, modeling with no attribution feedback, didactic with attribution feedback, didactic with no attribution feedback, and a control group where no treatment was given. The treatment groups then received 55 minute training sessions with three different phases over three consecutive days. The first phase provided instruction on division strategies. The second phase provided opportunities to practice applying the strategies. The third phase had students practice self-directed mastery and had them work alone to solve problems. During the training one trainer worked with one student side-by-side. The instructions differed for each of the four treatment groups. In the cognitive modeling group, children observed an adult solving division problems contained in the explanatory pages of their packet and verbalized aloud the strategies used to figure the correct solution. During the practice phase the trainer used corrective modeling when the student encountered conceptual difficulty and referred to the corresponding page in the practice packet. In the didactic treatment studied the same explanatory pages in the packet after which they worked on the practice problems. When students experienced conceptual difficulty the trainer referred them to the relevant explanatory pages in the packet and told the student to review it. The pages were pilot tested to insure that the vocabulary

was understandable by students with low achievement in arithmetic. For both of the attribution feedback groups the trainer attributed student success to high effort and their difficulties to low effort on the average of once every five minutes during the practice phase of each of the three training sessions. A week after the training the students were given a self-efficacy assessment that mirrored the one they performed earlier in the study. The posttest was administered immediately following the efficacy assessment and was a parallel form of the pretest.

The data from the study revealed that attributing children's successes and difficulties to effort do not influence their self-efficacy as hypothesized, however providing problem solving strategies, opportunities to practice the strategies, corrective feedback, and self-directed mastery were effective in developing skills and enhancing self-efficacy when compared to students in the control group who did not receive treatments (self-efficacy increase, modeling-attribution .2 pretest to 2.1 posttest; modeling-no attribution .3 pretest to 2.2 posttest; didactic-attribution .3 pretest to 1.8 posttest; didactic-no attribution .4 pretest to 2.2 posttest, control .6 pretest to 0.0 posttest, $p<.05$). There seems to be a demand on language ability in order to take advantage of the instruction. Schunk does describe how the explanatory pages used during the instruction were pilot tested to insure that the vocabulary was understandable by children with low arithmetic achievement. This does not completely eliminate the possibility that some students may have had the mathematical literacy required to understand the instructions but not the English language proficiency. More detailed demographic information would certainly be useful here. The 56 subject sample is fairly small but is not too small to draw generalizations from. What is of higher concern is that the treatment groups only

had twelve children and the control group only had eight children. The age and development of the sample subjects are of concern, however since the subjects are dealing with mathematic problems that are generally appropriate for their development level it is reasonable to draw generalizations to older populations.

Schunk (1982) conducted a quantitative, pretest/posttest control group design with seven to ten year olds to determine the effects of effort attributional feedback on self-efficacy and mathematical achievement. The subjects of the study were 40 school aged children ranging in age from seven to 10. There were 26 males and 14 females from seven classes in two elementary schools in a Texas community. The subjects were from a predominately middle-class socioeconomic background. The children were initially selected by teachers who identified them as students who lacked subtractions skills.

The procedures were the same as in Schunk (1980) except for the variation of the treatment groups and interventions. The subjects were randomly assigned to one of four treatment groups (n = 10): Past attribution, future attribution, monitoring, and control groups. During the three treatment sessions the students received the treatment feedback from a proctor around once every eight minutes. In the past attribution group the proctor asked the child "What page are you working on?" After the child showed the proctor the page the proctor would link prior achievement with effort feedback by matter-of-factly remarking "You've been working hard." In the future attribution group the process was the same as the past attribution except when the page was show to the proctor they linked future achievement with effort by remarking "You need to work hard."

The mean self-efficacy scores from the first posttest to the second posttest were as follows: Past attribution – 82.3 posttest 1 to 85.5 posttest 2; future attribution – 52.8

posttest 1 to 55.4 posttest 2; monitoring – 60.5 posttest 1 to 55.8 posttest 2; control – 53.4 posttest 1 to 55.4 posttest 2. The findings from the study showed that only past attribution condition showed a significant increase in self-efficacy ($p<.01$). Schunk cautioned that a larger sample is needed in order to generalize the data from the analysis. From this data it is difficult to definitively say what kind of effect effort attributional feedback has on self-efficacy. The information that past attributional feedback was found to have significantly influenced an increase in self-efficacy is useful. Since all students worked on the same kinds of problems out of the skill packets, increases in self-efficacy cannot be completely attributed to enactive mastery experience because the other treatment groups did not report significant gains in self-efficacy. Significance may have been found but the small sample size weakens any assertions that can be made about exactly how useful past attributional effort feedback can be. Another area of concern is related to the age of the subjects (7-10). In the discussion section, Schunk (1982) pointed out that many children have a difficult time differentiating between effort and ability feedback and often link ability to effort expended. These developmental issues pose limitations problems for the value of the study. It is questionable that this data can be generalized to older students. The progressive difference between a seven year old, a ten year old, and an older student in terms of cognitive function is significant. This problem could be substantially minimized by the instrumentation of more qualitative methods such as interviewing the subjects individually. These issues highlight the need to consider individual meta-cognitive ability in order to accurately report on and measure self-efficacy.

Schunk (1983) conducted a quantitative, pretest/posttest control group design

model study with third graders to investigate whether or not attributional feedback based on effort and/or ability will increase student self-efficacy in relation to mastery of subtraction problems. The subjects of the study included 44 third grade students from four classes at one elementary school from a Texas school district. Ages ranged from eight to 10. The 24 boys and 20 girls were predominantly middle class. The subjects were initially selected by teachers on the basis that they could not correctly answer 25% of the problems on a subtraction skill test.

Schunk followed the same procedures as in Schunk (1980) with the variation of the four treatment groups. The four treatment groups were (n = 11): Ability attributional feedback, effort attributional feedback, ability & effort attributional feedback, and no feedback. In the ability feedback group the proctor would ask what page the subject was working on. Once shown the proctor then remarked, “You’re good at this,” and then departed. In the effort feedback group the proctor asked what page the subject was working on. Once shown the proctor then remarked, “You’ve been working hard,” and then departed. In the effort & ability feedback group the proctor asked what page the subject was working on. Once shown the proctor then remarked, “You’ve been working hard & you’re good at this,” and then departed. In the no feedback control group the proctor asked what page the subject was working on. Once shown the proctor then remarked, “OK,” and then departed. Immediately following the last training session the subjects were administered an effort assessment. The subjects privately judged how hard they thought they worked using a 10 unit scale that went from 10 (not hard) to 100 (really hard). A self-efficacy assessment and a subtraction skill test were administered the day after the final training day. The tests were a parallel form of the ones given for the

pretest.

The findings from the data showed that a significant main effect was obtained for ability feedback ($p<.001$), as well as, significant for ability and effort ($p<.001$). Post hoc comparisons showed that subjects in the ability group judged self-efficacy significantly higher than subjects in the other three groups ($p<.01$). All three treatment groups judged self-efficacy significantly higher than the control group, although the effort and effort plus ability group did not differ (Pretest-posttest measures of self-efficacy for each treatment group: ability only feedback 39.6 pretest to 80.9 posttest; effort only feedback 37.1 pretest to 60.4 posttest; ability plus effort feedback 35.8 pretest to 60.0 posttest; no feedback 36.5 pretest to 43.3 posttest, $p<.05$). There is a small sample size in this study. At face value a sample of 44 total subjects with only 11 subjects per treatment group provides a small amount of generalizable value. It is difficult to definitively say what kind of effect effort or ability attributional feedback has on self-efficacy. However, when comparing these results with other studies there is a clear pattern of self-efficacy progress associated with the intervention of specific kinds of feedback. In this study there is a significant difference between the groups that had the benefit of verbal feedback and the no feedback group that had only the benefit of practicing the problems (mastery experience). Also of importance are the similarities between the effort and ability plus feedback groups. They ability feedback of “you’re good at this” followed by “you’ve been working hard” may have sent a mixed message to the recipient. Some students may perceive that if they are good at something then they should not have to work hard at it to be successful. A future study exploring effort feedback followed by ability feedback may signal to the recipient a progression of skill or ability. There may be some problems

generalizing this data to older students. The progressive difference between a seven year old, a ten year old, and a teen-age student in terms of cognitive function is significant. It would be helpful to see the age break down of the subjects in each treatment group. This problem could be substantially minimized by the instrumentation of more qualitative methods such as interviewing the subjects individually. These issues highlight the need to consider individual meta-cognitive ability in order to accurately report on and measure self-efficacy.

Summary

Based on the assumption these studies by Schunk (1982; 1983) and others are valid and reliable some assumptions can be made. Past attributional effort feedback has been shown to have a significant positive impact on self-efficacy. Ability feedback alone seems to be more effective on self-efficacy than effort feedback alone or effort + ability feedback. Something worth brining attention to is that the past attributional effort feedback phrase from the 1982 study was the same phrase used in the effort and the effort + ability feedback groups in the study of 1983. Bearing the results of these studies in mind it would be wise to be careful with feedback especially with younger students, students with learning disabilities or other cognitive disorders, or with students that have low self-efficacy in a particular domain. This section also highlights the need for more feedback and its effects on self-efficacy research that includes subjects that are farther along in their cognitive development.

Modeling

Modeling can be a valuable form of self-efficacy information. It can take on the form of active mastery experience if a student is modeling strategies for a peer. It can

come in the form of vicarious experience if a student observes another student, a teacher, or any other person modeling skills, strategies, etc. This could even be combined with verbal persuasion if a person of authority speaks of the value of the type of behavior being modeled. In additions to self-efficacy, the following studies explore modeling in relation to persistence, peer influence, and demonstrated procedural examples versus didactic explanations.

Zimmerman and Ringle (1981) conducted a quantitative, pretest/posttest control group design study with first and second graders to investigate if a model's statements of confidence and degree of persistence positively influence student self-efficacy. Subjects were 100 first and second graders from a public school in New York City. The children were from a lower class area and were Black or Hispanic. There were 10 girls and 10 boys randomly assigned to one of five condition groups. A male graduate student served as experimenter-model.

Two different kinds of wire puzzles were used. The puzzle used by the model had interlocking elliptical rings and could be solved. The puzzle used by the participants was slightly bent and could not be solved. The bending was not obvious and no child complained that the puzzle was insolvable. An embedded word puzzle was also constructed. Those puzzles consisted of two square boxes that were divided equally into 36 sections. Beside each puzzle a target word was printed. The first puzzle served as an example. The word *boy* was the target word. The word was found in the second row with each letter circled so that it could be easily identified. The second puzzle served as a test. The target word was *house*. The letters in the puzzle were arranged so that house was never completely spelled in sequence. None of the children complained that the

puzzle was unsolvable. Each child was taken from class to a separate room by the experimenter-model. The experimenter-model then told the student that they were going to play a game using the wire models. The experimenter then asked the child about their feelings to solve their puzzle. The pretest phase that followed used a row of three cards with pictures of faces on them. The picture on the far left was explained to be happy because they were absolutely sure they could solve the puzzle. The picture on the far right had a picture of an unhappy person because they are sure they cannot solve the puzzle. The person in the middle was unsure that they could solve the puzzle. The students were then instructed to point to which face tells how they felt about solving the puzzle. This constituted the pretest 1 self-efficacy judgment. The experimenter then began to attempt solving his puzzle. This action marked the beginning of the modeling phase of the experiment. The four experimental groups were: high persistence-confident modeling, high persistence pessimistic modeling, low persistence-confident modeling, and low persistence-pessimistic modeling. Students in the control group received no modeling and proceeded directly to the posttest 1 phase. In the high persistence groups the model worked with the puzzle for five minutes. For the low persistence group the model quit solving the puzzle after 30 seconds. For the confident groups the model gave positive statements about his ability to solve the puzzle even indicating that he would solve the puzzle next time he tried. For the pessimistic group the model gave negative s statements about his ability to solve the puzzle and indicated that he would not be able to solve the puzzle if he tried again later. Following the modeling phase the students' self-efficacy estimates were measured again using the same method as before with the three pictures of faces. Following that self-efficacy measurement marked the beginning of the

posttest 1 phase. The children were then given their puzzle and were instructed to play with it for as long as they wished. Persistence was measured by how long the student spent solving the puzzle. There was an experimentally imposed time limit of 15 minutes in which two children reached. After the students completed their puzzle solving effort they were asked to estimate their ability to solve the puzzle if it was presented to them again in the future. The following day all of the children returned to the room with the experimenter-model where he showed them the word puzzle boxes. He explained to them the goal of the word puzzle game and then asked them how they felt finding the word house using the same three picture card method as before. This measurement was the estimate for pretest 2. Following pretest to the students were shown the *house* puzzle and were told to keep trying as long as they wished. The duration of that effort was recorded with a stopwatch. No child reached the 15 minute time limit. Following that effort the experimenter asked the students to estimate their ability to solve the puzzle if it were presented again in the future. This was the posttest 2 estimate.

The results from the data showed that children that watched the pessimistic model persist for five minutes significantly decreased their post-modeling efficacy relative to their pretest 1 judgments, $X^2(2) = 12.12$, ($p<.02$). All of the groups except one showed significant declines in their posttest 1 self-efficacy judgments after experiencing failure for themselves, $X^2(2) = 8.72$, ($p<.05$). Only the children in the confident-low persistence group were significantly more optimistic about solving the wire puzzle than the control group, $X^2(2) = 7.16$, ($p<.05$). Children in the low persistence-pessimistic group displayed significantly less self-efficacy across the entire series of pretests and posttests, $X^2(2) = 10.00$, ($p<.02$). During posttest 2 only the self-efficacy judgments of the confident-low

persistence group were unaffected by failure to solve the embedded word puzzle, $X^2(2) = 12.70$, ($p<.02$). While the high persistence-confident group subjects worked the longest on the two puzzles, what is interesting is that the low-persistence-confident group subjects worked the second longest and sustained higher levels of self-efficacy over the duration of the study. The data showed that the confidence variable was seven times more influential than the persistence variable. This could be explained by the fact that the experimenter-model failed to solve the puzzle and that much of the effect of modeled persistence is imbedded in success or failure of a task. Spending more time and failing seems to have more of a negative impact on self-efficacy than spending less time and failing. The study makes some interesting discoveries about self-efficacy in the face of obstacles but it would be equally enlightening to see what the reported judgments of self-efficacy would have been if the model where actually able to solve the puzzle. One of the fundamental ideas in self-efficacy theory is that person has to be able to perceive the ability to change before that person will act (Bandura, 1997). In the case of this study all roads led to failure no matter the effort, attitude, or ability. Data taken from groups that experienced success from the model and then were compared to data from groups that experienced the non-successful model would have provided a more meaningful analysis of data that is line with self-efficacy theory.

Schunk & Hanson (1985) conducted a quantitative, pretest/posttest control group design study with students aged eight to ten years old to investigate if students observing peers learning a cognitive skill will positively influence their self-efficacy and achievement. The subjects were 72 children drawn from eight classes in two schools. Ages ranges from 8-10 years old. There were 36 girls and 36 boys from a predominately

middle class background. Children were initially selected on the basis that their teachers thought they would not be able to correctly solve 25% of the problems on a subtractions skills test.

Students were initially given a pretest series that was composed of measures of subtraction self-efficacy, skill, and persistence. Following the pretest the students were randomly assigned to one of six experimental conditions (n = 12): male mastery model, male coping model, female mastery model, female coping model, teacher model, and no model. Only boys were assigned to the first two groups and only girls were assigned to the second two. This was done because it was thought that children may attend more closely to models of the same sex as themselves. Equal numbers of girls and boys were assigned to the no model and the teacher model group. All children in the five model conditions received two 45 minute training sessions on consecutive school days. During those sessions students watched videos that presented subtraction operations in 15 minute blocks. Videotapes were used rather than live modeling to ensure standardized presentation across groups. One boy served as both the male mastery and coping models in the tapes for the male only groups; the same was true for the female groups. The teachers and models were drawn from a different school district and were unfamiliar to the subjects. All work was conducted at a chalkboard to permit easier viewing. For the male mastery model the proctor told the students they would be watching a boy who was learning to subtract. The first video tape initially portrayed the teacher explaining and demonstrating subtraction operations. Following the demonstration the teacher wrote a problem on the board for the model to solve. The model performed all of the operations correctly. While solving the problems the model verbalized aloud the problem solving

operations, along with some positive achievement beliefs. Examples of this were: “I can do that one,” “I’m good at this,” “That looks easy,” and “I like doing these.” The model then solved problems on the board for the remainder of the time. The model verbalized two different achievement behaviors while solving each problem. After subjects viewed each tape, the proctor asked them to judge how similar to the model they were in mathematics. This 10 unit similarity scale ranged from 0 (not at all) to 100 (a whole lot). After viewing the second videotape, subjects’ perceptions to learn how to do different subtraction efficacy was assessed. This assessment was the same as the pretest except they were judged on their certainty of learning vs. certainty of solving problems. In the male coping model the procedures and videotapes were the same as in the mastery model except for the problem solving behavior and verbalizations of the model. During the first tape the model hesitated and occasionally made errors. The teacher in the video would prompt the model to correct his error. The model also verbalized to achievement belief statements per problem. Initially these statements reflected low self-efficacy: “I’m not sure I can do that one,” “I’m not very good at this,” “That looks tough,” and “This isn’t much fun.” As the tape progressed the model made fewer and fewer mistakes and began to verbalize coping statements. By the end of the second tape the model no longer made errors and made verbalizations that matched the mastery model statements. The female mastery and female coping conditions were the same and their male group counter parts including the perceived similarity and self-efficacy for learning measures. The videotapes in the teacher model condition group showed only the teacher. During those videos the teacher explained the appropriate operations and proceeded to solve the problems. The teacher made no errors and did not make verbalizations about

achievement beliefs. The teacher solved the same amount of problems as in the other condition videos. The similarity judgment for this condition was based on how much the teacher in the video was like the subjects' own teacher. Self-efficacy for learning was assessed the same as the other groups. Subjects in the no model group received the training program but did not view videotapes or judge perceived similarity. Self-efficacy for learning was assessed during a separate session after the pretest. The subtraction training sessions began on the day the subjects viewed the second videotape. For 40 minutes for the next five days all children worked on five sets of instructional material that were ordered from least to most difficult. The children worked on the material on their own after un-supplemented instructions from the proctor. The posttest series was administered the day after the final training session. These were the same instruments as the pretest except a parallel form of the skill test was used to eliminate problem familiarity.

The results from the data showed that the four peer model conditions did not differ, but that subjects in each condition judged self-efficacy significantly higher (male mastery pretest 46.5 to posttest 90.6; male coping pretest 45.6 to posttest 91.6; female mastery pretest 42.3 to posttest 91.6; female coping pretest 42.0 to posttest 91.5) than subjects in the teacher model, pretest 45.8 to posttest 77.2 ($p<.05$) and the no model, pretest 43.9 to posttest 60.9 ($p<.01$) conditions. Children in the teacher model condition made significantly higher self-efficacy judgments than the no model group ($p<.05$). One of the interesting pieces of data from this study was that perceived similarity yielded no significant correlations. Self-efficacy theory suggests that people who observe others with perceived abilities similar to their own will have higher self-efficacy and success

expectations (Bandura, 1997). It was interesting that they were separated by sex into the different model groups. There is a concern for those students who do not identify their gender with their biological sex. It would be helpful to see the same study done with the sexes mixed in the different modeling groups. Equally valuable would be to see a study where students familiar to the subjects were used as models. It is possible that the perception of similarity results may have been different. A possible generalizability issue has to do with the fact that the models in the videos only depicted successful outcomes. In day to day life students are going to come across peers that model both successful and failure behaviors. Also doing research with students with perceived lesser or greater ability in peers may produce some provoking results.

Schunk (1981) conducted a quantitative, pre-test/post-test control group design study with students ages nine to 11 to investigate if modeling cognitive operations via verbalization have a greater effect on self-efficacy than didactic instruction. The subjects were 56 children ages nine to 11. There were 33 boys and 23 girls. There were varied socioeconomic backgrounds represented but the children were predominately middle-class. Children were drawn from five elementary schools from the Unified school district of Palo Alto in California. The children were selected on the basis of low arithmetic achievement, persistence, and self confidence.

There were four treatment groups and one control group in this study. The subjects were assigned to the groups randomly. The student subjects were all administered an arithmetic pre-assessment individually by an adult tester. The test consisted of 18 division problems. The test was composed of 12 training problems and 6 generalization problems. The six generalization problems were more difficult and

contained either three or four digit divisors. The training problems consisted of one or two digit divisors. The problems were interspersed to negate cumulative fatigue of grouping all the more difficult problems together. Each problem was presented on a single page. The tester recorded the time the student spent with each problem. The students' pretest level of efficacy was measured after the division performance test. The scale used went from 10 (not sure) to 100 (real sure) with 40 representing maybe and 70 representing pretty sure. Following a practice application of the efficacy scale children were shown 18 pairs of division problems for two seconds each. The students privately judged their capability to solve that type of problem. The sample pair corresponded in form and difficulty to one problem on the preceding test. They were however not the same problems and required new applications of cognitive skill. Following the treatment pretest the students were randomly assigned to one of four treatment conditions: modeling-attribution, modeling-no attribution, didactic-attribution, and didactic-no attribution and a fifth non-treatment control group. The treatment groups consisted of 12 subjects each and the control group consisted of eight subjects. On separate days the students received 55 minute training sessions each of which contained three phases. The first phase (10 min.) provided instruction on division strategies. The second phase (35 min.) provided children with opportunities to practice the strategies they had learned. The third phase (10 min.) consisted of self directed mastery where students solved problems on their own. The training was administered individually with a trainer seated side by side with the student. Different packets were used during each training session, however the format was identical. The first two pages of each packet explained the solution strategies and provided exemplars that showed application of the strategies step by step.

On each of the next several pages was one division problem and the students worked on these pages one at a time during the practice phase. Children were informed of the correctness of their solution and for small errors trainers asked the children to check their work. Self directed mastery problems appeared on the last two pages. The treatments were distinguished by the mode of instruction during the instructional first phase of the training session, the format of corrective feedback for conceptual errors occurring during the practice phase, and whether effort attribution was provided for successes and difficulties during the practice phase. In the cognitive modeling treatment groups, students observed an adult model solve division problems contained in the explanatory pages of the training packet and verbalized aloud the solution strategies used to arrive at the correct solutions. During the practice phase corrective modeling was provided when children encountered conceptual difficulties. When this occurred, the adult modeled the relevant strategy while referring to the appropriate explanatory page. In the didactic treatment groups children initially studied the same explanatory pages on their own, after which they worked the practice problems. When a student encountered conceptual difficulty the adult trainer referred them to the appropriate section in the training packet and was instructed to review it. If a child was still baffled they were asked to read the section aloud. In the effort attribution groups the trainer attributed student successes to high effort and their difficulties to low effort on the average of once every five to six minutes during the practice phase. Students received the attribution feedback about 20 times covering the three training sessions to make the effort attributions salient. Attributions were given when it seemed most appropriate. Effort attribution was never combined with corrective feedback to avoid confusing the two. The post-treatment

assessment was conducted within a week after the final training session. The procedures were identical to those used in the pre-treatment testing except that self-efficacy was measured before the division skill test. The self-efficacy measures where used for their predictive value on the division skill test. Different problems were also used to eliminate familiarity with the problems. Arithmetic skill, persistence, and self-efficacy were measured before and after the treatment.

The data from the study show that even though the main hypothesis was not supported there was a reliable effect due to pretest self-efficacy, $F(1,42) = 8.77$, ($p<.01$). Self-efficacy, persistence, accuracy pretest, modeling-didactic, and MAT score accounted for only 22% of the total variation. The treatments did not differentially affect self-efficacy. Schunk pointed out that there were some confounding variables that were unaccounted for. Schunk did not adequately account for the pre-study math ability of the subjects. The devices used to measure that ability seem to be partly responsible for some of the unaccounted for variables. The students in the study were all supposed to have low math ability according to their grade level, and yet the data did not reflect that assumption. Again some kind of qualitative device may have been useful form more accurately determining student math ability. Schunk does point out that the students who did have greater math ability coming into the study should have preformed better than lower ability students according to self-efficacy theory.

Summary

The positive impact of modeling on self-efficacy is mixed according to the results of the studies in this section. According to Zimmerman and Ringle (1981) modeled persistence has a greater negative impact on self-efficacy the longer effort is expended on

a task without success. Conversely, spending less time on a task and failing does not significantly reduce self-efficacy. Schunk and Hanson (1985) showed that students had significant gains in self-efficacy when watching peers of perceived similar ability perform a task. This supports the idea that vicarious experience information should enhance self-efficacy in individuals who observe a peer whom they believe possess similar abilities to their own.

Strategy

Effective strategy implementation is another way to enhance self-efficacy. Using sound strategies can maximize the potential for success during enactive mastery experiences. Strategies may also clarify the definition of success for a given task or make the route to success more organized and easier to follow. Strategies are also useful because they are flexible and can be implemented in a seemingly endless number of ways. They can be modeled, verbalized, practiced, and adjusted to fit ability. This section explores strategy use with students with learning disabilities.

Graham and Harris (1989) conducted a quantitative, group design model with 5th and 6th graders and investigated whether or not self-instructional strategy training would positively influence composition skill and self-efficacy. Subjects were 22 students with learning disabilities and 11 average achieving students drawn from three elementary schools. The average achieving students were randomly selected from the schools for the purposes of contrasting the results from the students with learning disabilities groups. For the students with learning disabilities, 17 were Black, five were White. Fourteen of students with learning disabilities were male, only eight were females. Eleven students with learning disabilities were 5th graders and 11 students were 6th graders. Students with

learning disabilities were defined as being two years below grade level ability in one or more academic areas compared to results from an IQ test. Students with learning disabilities were randomly selected from a pool of students that fit the criteria for being defined as learning disabled. Of the average achieving students eight were black, three were white, five were female and six were boys. There were five 5th graders and six 6th graders. All students were from suburban middle-class neighborhoods outside of Washington D.C.

This study used a group design model that compared the abilities of students with learning disabilities before and after a treatment condition with those of average achieving students. There were also pretest and posttest assessments. The students were all initially given a pretest series that consisted of measurements of schematic structures of written stories, a holistic scale to assess the quality of subjects' stories, and a self-efficacy measure designed to measure subjects' perceived abilities to write a story, and finally a writing stimuli. These same measures were used for the posttest as well as for a maintenance probe two weeks after the posttest. Instructors worked with the students from the conditional groups for 45 minutes, two to three days a week, for two to three weeks. At no time during these sessions were subjects provided feedback on their performance. The students with learning disabilities were randomly assigned to one of two condition groups: strategy instruction (SI) or strategy instruction plus self-regulation training (SI+SR). In both conditions, instruction emphasized the student's role as an active collaborator and emphasized interactive learning between teacher and student. Principles of interactional scaffolding and Socratic dialogue were used. Instructors provided individually tailored feedback. Strategies were explicitly modeled in context.

Finally, all instruction was criterion-based rather than time based, with previously taught skills and strategies routinely reviewed. The SI and the SI+SR groups received the same instructional program except the SI+SR group also received practice and instruction in self monitoring their performance and criterion setting. The instructional steps for the program were as follows: Step 1 pre-training, Step 2 review current performance level and training rationale, Step 3 describe the learning strategy, Step 4 model the strategy and self-instructions, Step 5 mastery of strategy steps, Step 6 controlled practice, and Step 7 independent performance.

The results from the data showed that although the main effect for instructional groups and the interaction effect were not significant, the learning disabled students' average self-efficacy scores increased from the pretest to the posttest (pre 75.2 – post 88.8). These unusually high numbers for self-efficacy on the pretest may indicate a calibration issue showing that students with learning disabilities may have problems matching performance capabilities perceptions with actual performance. This supports claims made by Klassen (2002) that some individuals with learning disabilities have problems with calibration. This also supports contentions made by Bandura (1997) that accuracy of self-efficacy perceptions are greatly impacted by self knowledge and meta-cognitive ability. If it is true that at least some students with learning disabilities have problems with self-efficacy perceptions then a new instrument of measuring self-efficacy should be designed with the unique characteristics of those students in mind. The students with learning disabilities condition showed significant improvements in writing skill from pretest to posttest although there were no significant differences between the two condition groups, which itself shows value of practicing with effective strategies.

Nelson and Manset-Williamson (2006) conducted a quantitative, pretest/posttest group design study with students ages 9-14 to investigate if students with learning disabilities that receive explicit, self-regulatory strategy instruction will possess greater reading self-efficacy than a group that received less explicit strategy instruction. Subjects were 20 students who were at least two years below grade level in reading fluency and or reading comprehension. There were 15 boys and five girls. There were 17 White students and three African American students.

Subjects were randomly assigned to one of two intervention groups: explicit comprehension group (n = 9) or the guided reading group (n = 11). The study was conducted at the beginning of the participants' summer break and lasted six weeks. Prior to receiving the treatment training sessions the students were administered a pretest series that consisted of a reading self-efficacy measure, a reading attributions to strategy use measure, and a reading affect measure. Four days were used for the pretesting and posttesting. The interventions were delivered on a one on one basis. Participants received five weeks of one on one instruction, four days per week, for one hour per day. All participants received training in phonological awareness, decoding, and fluency; only the reading comprehension component was manipulated. Overall, the guided reading group received comprehension training in prediction, summarization, and question generation. The explicit comprehension group received comprehension training in goal setting, prior knowledge activation, prediction, main idea identification, summarization, self-monitoring and evaluation, and strategy-value feedback. The posttest series was similar to the one used for the pretest.

The results from the data showed that neither group made significant gains in self-

efficacy from the pretest to the posttest although the guided reading group's reading self-efficacy approached significance. The mean self-efficacy score for the explicit instruction group was pretest 61.17 – posttest 60.94. The mean self-efficacy score for the guided reading group was pretest 60.15 – posttest 69.15. The hypothesis that students with learning disabilities in an explicit instruction group would have higher levels of reading self-efficacy after a posttest analysis compared to students with learning disabilities in a guided reading condition group did not even come close to being observed.

Zimmerman and Martinez-Pons (1990) conducted a correlational study with third, fifth, and eleventh graders to investigate if developmental age in terms of grade level impacts self-efficacy and if there is a relationship between student self-efficacy and the use of self-regulated learning strategies. Equal numbers of boys and girls were chosen randomly from three grades and from one gifted and three regular schools. Thirty fifth grade students, 30 eighth grade students and 30 eleventh grade students were selected from a school for intellectually gifted children in New York City. The school was run on a tuition-free basis and students were selected on an open, competitive basis. Students entered in either elementary school or junior high school. In addition to those ninety students, 30 fifth grade, 30 eighth grade, and 30 eleventh grade students were selected from regular, non-selective schools. The entire general sample population was middle class and included students of White, Black, Hispanic, and Asian ethnicities. No precise figures were available due to restrictions in school policy. The total subject population for the study was 180 participants.

The conclusions were drawn between the ability level of the students (gifted/non-

gifted), the grade level (5^{th}, 8^{th}, and 11^{th}) and the connection between self-regulated learning strategies and academic self-efficacy. The first step in the study was to individually interview each student about their study practices using a self-regulated learning interview schedule. The interview was developed to measure 14 classes of self-regulated learning strategies. The strategies were: self-evaluating; organizing and transforming; goal-setting and planning; seeking information; keeping records and monitoring; environmental structuring; self-consequating; rehearsing and memorizing; seeking peer, teacher, or adult assistance; and reviewing tests, notes and texts. One category of non-self regulated learning responses was also included. Eight different learning contexts were described to the students: in classroom situations, when completing writing assignments, when completing mathematics assignments, when checking science or English homework, when preparing for a test, when taking a test, when poorly motivated to complete homework, and when studying at home. Following the interview two academic efficacy scales were administered. The verbal scale was administered first. The interviewer asked a student to give their best estimate on their ability to provide a correct definition to a word that was shown to them. They were to select a number between 0 (completely unsure) to 100 (completely sure) of their ability to provide a definition that would be judged as correct by a teacher. The students were told that some of the words were very difficult and most students could not define them. They were also told not to guess but to give a realistic estimate. The students had ten second to give their response. The students were presented with 10 words total during the verbal phase. The mathematical efficacy scale was administered last. The instructions were the same as with the verbal section only the students were assessing

their ability to solve math problems that were presented to them. There were 10 math problems in the mathematical efficacy phase. The questioning was designed to prompt students to give realistic estimates of their verbal and mathematical efficacy without actually solving a math problem or defining a word. The interviewer was a female graduate student who had been trained extensively in individual testing.

The findings from the data showed that there were some differences in academic efficacy among the different student groups. A main effect for students' sex was found. Univariate tests revealed that boys (M = 681) surpassed girls (M = 536, $p<.01$), in verbal efficacy but not in mathematical efficacy. Gifted students displayed higher verbal efficacy (M = 734) than regular students (M = 536), as well as greater mathematical efficacy (M = 724) than regular students (M = 638, $p<.01$). Significant grade differences were found in both verbal and mathematical efficacy. Eleventh graders revealed significantly greater verbal efficacy (M = 677) than 8^{th} graders (M = 619) or 5^{th} graders (M = 528, $p<.01$). Regarding mathematical efficacy, 11^{th} graders indicated higher levels (M = 779) than 8^{th} graders (M = 740) or 5^{th} graders (M = 598, $p<.05$). Post hoc testing revealed that gifted children displayed a significant increase in verbal efficacy between the 5^{th} (M = 573) and 8^{th} grades (M = 722, $p<.05$). Regular students showed a significant increase in verbal efficacy between the 8^{th} (M = 525) and 11^{th} grades (M = 608, $p<.05$). Overall, students' perceptions of mathematical efficacy were correlated with their use of self regulated learning strategies, $r = .41$, $p<.01$). Also, students' perceptions of verbal efficacy were correlated with their use of self regulated learning strategies, $r = .42$, $p<.01$). Developmental variables accounted for 35% of the variability in students' perceptions of self efficacy ($r = .59$). These outcomes are interesting because they

contrast to developmental trends in students' self-ratings of academic competence. This evidence contrasts other evidence that indicates a decline in self-perception in competence from elementary school to junior high presumably due to competitive grading and the student perception of ability as an endowed, un-changeable trait. The present study indicated that while self-perceptions of competence were declining, their perceptions of self-efficacy were increasing. Self-competence measures typically involve social comparisons and self-efficacy measures involve estimates of performance success that are unrelated directly to the skills of classmates. These developmental data suggest that instructional procedures that draw on or enhance students' perceptions of self-efficacy, such as participant modeling or mastery learning may hold particular promise for motivating junior and high school students. There seems to be a significant correlation between giftedness, development and self-efficacy. Developmental differences are shown between gifted students and regular students. Gifted students showed a sharp increase of verbal efficacy between 5^{th} and 8^{th} grade where regular students showed the increase between 8^{th} and 11^{th} grades. Caution is in order because these gifted students attended a separate school with a highly accelerated academic program. Boys perceived significantly greater verbal efficacy than girls and comparably to girls in mathematical efficacy. No performance data or standardized measures of achievement were available for the self efficacy perceptions so a determination could not be made about the accuracy of those perceptions. What is interesting about this study is that development can be seen as a tenable influence on self-efficacy. This offers up questions of cognitive ability between older and younger students and between gifted and non gifted students. The testing and instrumentation used in this study were not threats to internal validity. The

efficacy scales seemed to bear the same characteristics of other valid forms of self-efficacy assessment. The authors took steps to ensure validity of their self-efficacy measurements across a developmental continuum. The interviewing method that checked for strategy use across different academic contexts seemed thorough and effective. They both seemed reliable and accurate. The interviewer seemed to be competent, qualified, and received training to administer both the structured interview and the academic efficacy tests. There is no evidence that shows there to be a threat to validity. Overall, this study is strong and useful. It shows variability across gender, development level, and ability level. Interestingly, reliance of adults for assistance tended to be negatively correlated to both verbal and mathematical efficacy whereas, seeking assistance from peers was positively related to verbal and mathematical efficacy. It appears that students' perceptions of academic self-efficacy develop in concurrence with their increasing independence from their parents. Vygotskian and social cognitive researchers view children's development of self-regulation as an achievement of socialization processes. However, gifted students in the 5th grade obtained significantly higher adult assistance from their parents than their regular counterparts. The reasons for this outcome remain unknown. Future research exploring the connections between specific self-regulated learning strategies and self-efficacy, especially the strategies involved in the triadic model of self-regulation which involves regulation of personal process, behavior functioning, and environmental events might be a good idea.

Schunk and Rice (1993) conducted a quantitative, pretest/posttest group design study with fifth graders to determine if the use of a fading verbalization strategy will influence self-efficacy when combined with feedback. The subjects of the study were 52

fifth graders from two elementary schools. The final sample consisted of only 44 students because five were dropped after they had difficulty understanding the experimental instructions. Three more students were randomly dropped to make the condition groups even. Of the 44, 16 were boys and 28 were girls. The ages ranged from 10-11 years old. The children were predominately lower-middle class. Ethnic composition was: 24 Hispanic, 11 White, eight African American, and one Asian. About half of the students were in their first year of a remedial reading program. The rest were in their second or third year. One quarter of the student participants also received some instruction in ESL classes. Students were initially selected on the basis of their enrollment in the remedial reading program.

The four treatment groups in the study were (n = 11): fading only, feedback only, fading plus feedback, and no feedback or fading. The students were administered a pretest series that was composed of measurements for self-efficacy, comprehension skills, and self reported strategy use. Following the pretest the students were randomly assigned to the condition groups. There were some adjustments to balance the groups with students enrolled in ESL classes. All students received 35 minute instructional sessions on twelve days spread over three weeks, during which they work on a packet of material. Students assigned to the same condition met in small groups or two groups per condition and worked with a female teacher from outside the school. Groups met privately in classrooms. The packet consisted of several reading passages, each of which was followed by one or more multiple choice questions. The packet material was carefully sequenced so that the students could complete it. The children initially answered questions based on only a few sentences. The passage length gradually increased to by

the end the students were working with material that was at a fourth grade level. Approximately 90% of the material was at or below the student's reading level. No difficulties with the passages were reported by the teacher. The experimental procedure for the first four instructional sessions was as follows. The teacher distributed the packet at the start of the first session. On a poster was printed a five step reading comprehension strategy. The teacher stated that they were going to use those steps and then modeled the strategies. Following the demonstration the teacher instructed the children to repeat aloud each step after she verbalized it. This was the format for the remainder of each session and the next three sessions except that the teacher did not explicitly model the strategy. Instead the teacher called on children and had them verbalize and perform steps. Students assigned to the feedback only and no-fading-or-feedback conditions continued to receive this instructional procedure for the remainder of the twelve weeks. At the start of week five, students in the fading-plus-feedback and fading only conditions received the instructions to whisper the steps to themselves rather than saying them out loud. The teacher modeled it for the students and then had them do the same for the remainder of that session through session eight. At the start of the ninth session the teacher told the students that rather than whisper the steps to themselves they would begin saying the steps silently. She modeled the sub-vocal behavior and had the students use the procedure with their reading passages. The students used this sub-vocal behavior for the rest of session nine through session 12. At the start of week five students in the fading-plus-feedback and feedback only conditions received strategy value feedback linking their success at answering comprehension questions with their proper application of the five step reading strategy. Each student received feedback three to four times each

session. Strategy-value feedback was not the same feedback concerning the accuracy of students' answers to questions. All students received performance feedback but only to the fading-plus-feedback and feedback only received strategy feedback. The posttest was administered two weeks after the final instructional session. The same series was used as the pretest only a parallel form of the skills test was used to eliminate passage familiarity.

The results from the data showed a significant treatment effect related to self-efficacy ($p<.01$). Fading-plus-feedback, fading only, and feedback only conditions judged efficacy higher than the no-fading or feedback condition ($p<.01$). The mean pretest and posttest self-efficacy scores for each group were: Fading only 58.3 pretest to 81.4 posttest; feedback only 59.5 pretest to 79.2 posttest; fading plus feedback 57. 9 pretest to 85.4 posttest; no fading or feedback 53.8 pretest to 63.2 posttest. The hypothesis that the fading-plus-feedback condition would judge self-efficacy higher than the fading only and feedback only conditions did not receive support. The results of this study rely heavily on the English language capabilities of students some of which were ESL students. The authors did excuse five students based on their inability to understand direction they also did periodic checks of all the students to make sure they were adequately able to decode the material. They claimed that the remaining students had enough of an understanding of English to comprehend the experimental conditions. Since the teacher modeled much of the behavior it's possible that some of the students were able to mimic her without really understanding the instructions. It's questionable that all groups could be engaged with the same material over 12 weeks. This may have impacted the results. Also the sample size of 44 students with 11 students per treatment group is fairly small and creates some generalizability issues. Still the effects of fading

verbalization technique and strategy feedback did significantly influence self-efficacy compared to those students in the no fading or feedback group. However future research may want to address the issue of no significant difference between fading and feedback.

Summary

The results from this section emphasis the importance of strategy use, strategy value information, and feedback related to the use of specific strategies. This section also showed how important it is to provide students with learning disabilities with as much information as possible in order to inform their learning processes. Graham and Harris (1989) showed that students with learning disabilities may have difficulty accurately perceiving the abilities. This can be problematic for selecting appropriately challenging tasks or creating realistic goals.

Rewards

Using rewards as an incentive to perform tasks in a classroom can be a controversial subject. The effect of rewards on self-efficacy is unclear as the negative effects may outweigh the positives over time. This section looks at rewards as a form of self-efficacy information when used in conjunction with other forms of self-efficacy information.

Arnold (1976) conducted a quantitative, correlational study with college students to determine if extrinsic rewards influenced perceived feelings of competence. The subjects were 53 undergraduates at Yale University. One hundred males and 100 females were randomly sent letters telling them about a video game and that the designers needed volunteers to test the game in order to obtain data about game characteristics. The word experiment was not used in the letter. In recruiting subjects, no mention was made of any

type of extrinsic reward for participating.

Subjects met with an experimenter one at a time. At the first session the experimenter gave the subject a five page booklet that explained the game. Once the subject had read the book they were shown a videotape that further described and explained the game. Upon completion of the tape the subject was permitted to ask the experimenter any questions. The subject was then left alone in the room with the game and was told they would not be observed during the session. The experimenter then left the room and the subject played the game. After about 10 minutes the experimenter returned to check on the subject. The experimenter did not offer any advice about strategy. Only questions about the nature of the game and how to operate the terminal were answered directly. The primary measure of intrinsic motivation was the return behavior of the subjects, or rather if they returned to play the game more than once. Subjects were allowed to play the game a total of three times. Subjects were randomly assigned to one of three groups: Group 1 received $2.00 for playing the game during session 1, Group 2 received $2.00 for playing the game during session 2 Group 3 received $2.00 for playing the game during session 3. The $2.00 payment was not contingent upon any specified level of performance. At the conclusion of each game session the subject was asked to fill out a brief questionnaire that consisted of four, 7-point scales in which the subject degree of enjoyment of the game, satisfaction with the game, feelings of competence as a starship captain at the end of the session, and their degree of interest to play the game again. Subjects that showed interest in playing the game again the experimenter immediately scheduled another session. If the subject was not interested the experimenter thanked them for participating and said goodbye. The

procedure for sessions two and three were the same except the preliminary explanations of the game were not gone over and subjects at the end of session three who wanted to return to play the game again were told that computing funds had been exhausted and it would not be possible to schedule another session. For sessions where a subject was paid $2.00, the experimenter informed the participant that they would be paid for their participation before the start of the game session. Those subjects were paid the $2.00 following the game session but prior to filling out the questionnaire. Upon payment the experimenter stressed that due to a limited amount of funds the subject would receive payment in the future if they chose to come back and play the game.

The results from the data showed that 32 of 53 subjects returned for a second session and 15 of 32 subjects who played twice returned for a third session. That means 15 of 53 participants played the game three times. The prediction that feedback from task performance will have a significant impact upon feelings of competence and intrinsic motivation, and that extrinsic rewards will not received support. Five performance measures taken recorded by the game during each session and accounted for 45% of the variance in subjects' reported feelings of competence, while extrinsic reward accounted for less than 1% ($p<.001$). These findings are similar to those of Schunk (1983) and showed that extrinsic rewards not based on performance have no positive impact on self-efficacy. Subjects who indicated higher levels of perceived competence after session one were significantly more likely to return for a next session ($p<.05$). This indicated that perceived feelings of competence are important part of intrinsic motivation to attempt or perform a task again in the future. Knowing the gender breakdown of the initial set of participants would help to see what percentage of women compared to men went to three

game sessions. The novelty interest of playing a videogame at the time when this study was done surely had something to do with whether or not subjects returned to play. However, interest in a task does not necessarily translate into feelings of competence for the task.

Schunk (1983) conducted a quantitative, pretest/posttest control group design study with eight to 11 years olds to determine if performance rewards will increase arithmetic skill and perceptions of self-efficacy. The subjects were 36 children drawn from two elementary schools. The subject's ages ranged from eight to 11 years old. There were 11 boys and 25 girls representing diverse socio-economic backgrounds but were predominately middle class. The children were selected on the basis of their previous low achievement in mathematics.

The subjects were randomly assigned to one of three treatment groups: performance-contingent, task contingent, and unexpected reward. They were administered a self-efficacy judgment and division skills pre-test. They were then administered the treatment during a series of training sessions. Following the trainings the subjects were administered a division skill and self-efficacy post-tests. The subjects were administered a self-efficacy assessment followed by a division skills test. The proctor measured the amount of time the subject spent on each problem. That was used as a persistence measurement. On the following two days the subjects received 40 minute training session where they worked individually on two packets of instructional material. The proctor administered the treatment on the first day of training for two of the three groups. The performance-contingent reward group was told that they would receive points for each problem they completed in the training packet that they could exchange

for prizes at the end of the second day. The task-contingent group was told that since they agreed to participate that they would be allowed to select prizes equal to the monetary value they would pull out of a hat at the end of the second day. The control group was the unexpected reward group. They were told at the end of the second day that they since they agreed to participate in the project they could draw a number from a hat and choose prizes. The subjects in the control group and the task-contingent group all chose $2.00 from the hat.

The findings from the data showed that performance-contingent reward children made significantly higher self-efficacy judgments than children from the other treatment groups ($p<.01$). The mean scores for self-efficacy from the pretest to the two posttests are as follows: Performance contingent - 5.2 pretest to 10.3 posttest[1] and 10.7 posttet[2]; task contingent – 3.9 pretest to 4.3 posttest[1] and 5.3 posttest[2]; unexpected 5 pretest to 6.6 posttest[1] and 6.1 posttest[2]. The value of the rewards seems clearly tied to progress. This study provides evidence that offering performance contingent rewards promotes self-efficacy significantly more than providing rewards for merely participating in a task. The rewards act more as a reinforcement when tied to other information and do not provide much information on ability in and of themselves. Exploring the relationship between rewards and motivation or persistence would be worth investigating in the future due to their connection to self-efficacy.

Schunk (1984) conducted a quantitative, pretest/posttest group design study with students ages nine to 11 to investigate the effects of performance contingent rewards in comparison to proximal goals and self-efficacy. The subjects were 33 students from two elementary schools in a Texas school district. There were 20 girls and 13 boys. Ages

ranged from nine to 11 years old. The subjects were predominately middle class. The subjects were initially selected on the basis of their previous low achievement in mathematics.

There were three groups of students that were measured for self-efficacy and achievement before and after a variable intervention. A pre-assessment measured student efficacy beliefs in their ability to solve division problems correctly, using a scale that went from 10-100. A division skill test was administered to all students immediately following the efficacy assessment. The students were randomly assigned to one of three treatment groups. The students were then assigned to their treatment groups and all of them received two 45 minute training sessions over consecutive school days, during which they worked on two training packets. The students were escorted into a room under the supervision of an adult proctor where they were issued instructions and worked on a practice problem. The proctor then issued the treatment and retired out of the room. The student then went about completing division problems for a 45 minute period. The four groups were: Rewards only, goals only, rewards and goals, and no treatment. The rewards group was told that they would receive points for every correct problem that they could later exchange for prizes. In the goals group the proctor suggested that the students work on at least 20 problems during the first session and a goal of 10 problems during the second session. The goals and rewards group received a combination of the previous treatments. The students were then issued the posttest a day after the second training session. This consisted of the self-efficacy measurement instrument and the division skill assessment. The test was similar but not the same in order to eliminate problem familiarity.

The results from the data showed that rewards plus goals children judged self-efficacy significantly higher than children in the other condition groups. The mean pretest/posttest self-efficacy scores for the groups were: Rewards only – 43.5 pretest to 60.8 posttest; goals only – 41.9 pretest to 62.0 posttest; rewards and goals 43.5 pretest to 80.6 posttest, ($p<.05$). The results support data from Schunk (1993) that performance contingent rewards positively impact self-efficacy. The pre and posttest scores for the rewards plus proximal goals group indicate the enhancive properties that rewards may have when combined with other forms of self-efficacy information. Future research could look at the benefits of rewards combined with more long term goals both as a motivating factor and as positive self-efficacy information.

Summary

Studies from this section provided evidence that rewards contingent on performance were significantly superior to rewards based on participation in relation to positive influence on self-efficacy. Rewards combined with proximal goals were even more effective than either goals or rewards alone. This evidence supports ideas that rewards have a cumulative effect when combined with other self-efficacy information but do not necessarily convey much useful information on their own.

Goals

Goals can appear in many forms within the four main sources of self-efficacy information. They can provide a framework for enactive mastery experiences. Goals set by others followed by subsequent accomplishments can serve as positive examples of vicarious experience. Verbal persuasion may contribute to certain kinds of goals being set or the criteria for the accomplishment of those goals. Even something like feelings of

physical strength or weakness might contribute to goals a person may set for themselves. Goal information can be cyclical. Information from successfully completing a goal or failing at a goal can contribute to future goal or task selection. This section explores goals in conjunction with feedback, participation, implementation strategy, and motivation.

Schunk and Swartz (1993) conducted two quantitative, pretest/posttest control group design studies with fifth graders to explore if process oriented goals and progress feedback positively influence self-efficacy more than product oriented goals or general goals. The subjects in study one were 60 fifth grade students from three classes in two schools. The 33 girls and 27 boys were from a predominately middle-class background. Ages ranged from 10-12 years old. Ethnic composition was 37 Anglo American, 20 African American, two Hispanic American, and one Asian American. Students were initially selected on the basis of receiving language arts instruction in regular classes and experienced no problems comprehending oral instructions. The subjects in study two were 40 fourth grade students from two classes in one school. Ages ranged from 9-11 years old. There were 20 girls and 20 boys. The ethnic composition was 19 Anglo American, 19 African American, one Hispanic American, and one Asian American. Students were initially selected on the basis of receiving language arts instruction in regular classes and experienced no problems comprehending oral instructions.

Students were initially given a pretest series that was composed of a self-efficacy assessment and a writing skill assessment. Following the pretest the students were randomly assigned to one of four experimental condition groups (n = 15): product goal, process goal, process goal plus progress feedback, and general goal (instructional

control). The subjects received 45 minute instructional sessions over 20 day; five days were devoted to one of five different types of paragraph. Students assigned to the same condition met in small groups with a teacher from outside the school. The procedure during the five sessions devoted to each type of paragraph was identical. At the start of the first session a tester administered a self-efficacy for skill improvement measure where the subjects judged their capabilities for improving their skills. Following this the teacher gave goal instructions appropriate to the condition group and then referred to a writing strategy displayed on a poster board. The first 10 minutes of each session the teacher verbalized the strategy steps and applied them to sample topics and paragraphs. The next 15 minutes the student received guided practice where they applied the steps under the guidance of the teacher. The last 20 minutes of each session were devoted to independent practice. In the goal instructions for the strategy goal and the strategy goal plus feedback groups the teacher said at the beginning of the first of the five sessions, “While you’re working, it helps to keep in mind what you’re trying to do. You’ll be trying to learn how to use these steps to write a descriptive paragraph.” These instructions were identical for the other sessions except the teacher substituted the name of the appropriate paragraph type. In addition the subjects in the strategy goal plus progress feedback group received progress feedback three to four times during each session. Examples of progress feedback were: “You’re learning to use the steps,” or “You’re doing well because you followed the steps in order.” All students received performance feedback but only the strategy goal plus progress feedback group received progress feedback. Students in the paragraph goal condition were told “While you’re working, it helps to keep in mind what you’re trying to do. You’ll be trying to write a descriptive paragraph.” All other

instructions were the same as the other groups. The students in the general goal group were told “While you’re working, try to do your best.” The posttest that followed the final session included a measure of progress in strategy, self-efficacy, and writing skill. The self-efficacy and writing skills assessments were the same as the pretest except a parallel form of the skill test was used to eliminate familiarity. The procedures for study two were the same as in study one.

The mean scores for pretest/posttest self-efficacy from study one were as follows: Product goal – 62.5 pretest to 73.4 posttest; process goal 62 pretest to 81.2 posttest; process goal plus feedback 63.7 pretest to 85.6 posttest. This data indicates that process goal plus progress feedback children judged self-efficacy significantly higher than the product and general goal groups ($p<.05$). Process goal children judged self-efficacy significantly higher than the general goal students ($p<.05$). Over the four weeks, process and process goal plus feedback children’s self-efficacy for improvement scores increased; those of product and general goal subjects showed a decline. The children in learning goals plus feedback outperformed the general goals group significantly in efficacy for improvement groups in, posttest self-efficacy, skill, and progress. The effects of strategy implementation on self-efficacy were not measured. The mean scores for pretest/posttest self-efficacy from study two were as follows: Process goal - 59.3 pretest to 77.5 posttest; process goal plus feedback - 63 pretest to 89.1 posttest; control group – 58.7 pretest to 67.7 posttest. The data results from study two showed that process goal plus feedback students judged self-efficacy significantly higher than general goal students ($p<.01$). All groups saw increases in self-efficacy from the pretest to the posttest. Students in the process goal plus feedback groups showed the highest increases in self-efficacy. The

effects of strategy implementation on self-efficacy were not measured. Students seemed more likely to use strategies or adhere to specific goals if they produced positive results. Future research may address the effects of strategy use within goals and their differential effects on self-efficacy.

Schunk (1985) conducted a quantitative, pretest/posttest group design study with sixth graders to investigate if participation in goal setting enhances self-efficacy and skill in learning for students with learning disabilities. The subjects in the study were 30 sixth grade students from two middle schools. Ages ranged from 12-14 years old. There were 15 boys and 15 girls from a predominately middle class background. These students were previously identified as being learning disabled in mathematics according to state guidelines and were selected on the basis of not being able to correctly solve 25% of the problems on a subtraction skills test.

The subjects were all initially given a pretest that assessed self-efficacy for solving subtraction problems and a subtraction skills test. The self-efficacy measurement scale ranged from 10 (completely unsure) to 100 (completely sure). The children were shown 25 sample pairs of problems for two seconds. The children then privately judged their efficacy by circling a value in the scale. The subtraction skills test included 25 subtraction problems ranging in difficulty. Following the pretest the subjects were randomly assigned to one of three treatment groups (n = 10): self-set goals, assigned goals, and no goals. The students received 45 minute training sessions over five consecutive days. During the training sessions the students worked on packets containing seven sets of material. Children worked on the packets individually but sat by one of two female proctors. Initially, the proctor reviewed the first explanation page. Then the

proctor instructed the student to work on the pages in order. Then proctor then gave goal instructions appropriate to the condition, stressed the importance of careful work, and moved out of sight. The student worked alone and at the end of each session they marked their places and resumed there the next day. In the self-set goals group the proctor suggested that the children select a number between four and 10 pages to accomplish a day. These limits were derived from a pilot study. In the assigned goals group the proctor suggested that the students try and finish at least seven pages a day. In the no goals group the students received the subtraction training but no goal instructions. After receiving goal instructions at the start of each session, self-set and assigned goals students judged their expectancy of goal attainment on a scale that was identical to the self-efficacy scale used in the pretest. The post-test was administered the day following the last session. The self-efficacy instruments were the same and a parallel form of the skills test was used to eliminate the possibility of problem familiarity.

The mean pretest/posttest self-efficacy scores were as follows: Self-set goals – 51.4 pretest to 86.7 posttest; assigned goals – 49.1 pretest to 69.3 posttest; no goals – 47.8 pretest to 60.1 posttest. Post hoc analysis showed that self-set goals children judged self-efficacy higher than assigned goals ($p<.05$) and no goals students ($p<.05$). The self-set and assigned goals conditions differed significantly for expectancy of goal attainment. Self-set goals children had higher initial goal attainment expectations. Among the students that were in a goals condition group expectancy of goal attainment was related to training progress ($p<.01$) and post-test self-efficacy ($p<.05$). For all students rapid problem solving was associated with higher post-test self-efficacy ($p<.01$) and skill ($p<.05$). Post-test self-efficacy had a positive relationship with subsequent skill ($p<.01$).

This study clearly showed a connection between proximal goals and subsequent self-efficacy and skill increases in students with learning disabilities. The small sample of only 30 students is a problem considering that all of the students were considered to have learning disabilities. Generalizing these findings to populations other than students with learning disabilities may not be a good idea. Future research may want to address the conditions and environments where students with learning disabilities usually perform their school tasks. A question along that line might be are they segregated from other students or are they mainstreamed in with the general student population? Students in a situation where they are more likely to be labeled as deficient would possibly be more likely to express perceptions of negative self-efficacy.

Zimmerman, Bandura, and Martinez-Pons (1992) conducted a correlational study with ninth and tenth graders to investigate if students' perceived efficacy for self-regulated learning will significantly influence their self-efficacy for academic achievement. The subjects for the study were 102 ninth and tenth graders selected from a large Eastern city. There were 50 boys and 52 girls. The schools represented a large lower middle class population. The racial demographic breakdown was 17% Asian, 34% Black, 23% Hispanic, 24% White, and 2% did not report their ethnicity. Five social studies teachers agreed to include their randomly selected classes in the study. Social studies was chosen because it was a class all students needed to take in order to graduate and was not subject to academic tracking according to ability.

There was no treatment given to the subjects however, there were inferences made based on statistical data. The initial questionnaires provided contrast to previous achievement. Relationships were constructed on basis of achievement, goal setting, and

self-efficacy. A self-efficacy assessment scale and a grade-goal setting scale were given to the students in their social studies classes at the beginning of a school semester. The scales were administered as a questionnaire. The parents' questionnaires were sent home with the students and included instructions. The parents returned their forms in a sealed envelope. At the end of the semester the teachers provided the final grades for social studies. Also each student's grade in social studies from the prior year was acquired because it was the most recent indicator of academic achievement. This recent level of achievement was an experience that could shape students' perceptions of their goal setting and efficacy.

The results from the study showed that students' prior grades in social studies correlated significantly with their perceived academic self efficacy ($r = .22$). As hypothesized, students' perceived efficacy for self-regulated learning correlated significantly with their self efficacy for academic achievement ($r = .51$). Perceived self-efficacy for academic achievement and student goal accounted for 31% of the variance in the students' academic attainment. The children relied on their self-efficacy beliefs, as well as, their parents' aspirations for them when setting their goals. Combined perceived self-efficacy and academic goals seem to influence grades more than previous grades at about a 26% increase. This indicated that prior performance does not need to influence future student achievement in a deterministic way. Obviously prior performance is going to affect self-efficacy but it can be improved. All is not lost for students who struggle or encounter setbacks. The 102 student sample seems to be adequate. The parallel SAT study brought in a useful contextual dimension that featured results similar to the ones in the main study but they did not use measures that directly measured self-efficacy saying

that a time attitude factor used in time management "seems very much like self-efficacy." Language that more explicitly identifies self-efficacy based on the characteristics and definition of self-efficacy is needed. The use of questionnaires alone to measure self-efficacy is somewhat problematic. The authors do address this by calling for future research to include a multi-method approach that might be composed of interviews, different behavioral measures of studying, and survey rating scales. This would likely create a more expansive picture of the self-efficacy and achievement relationship. Also the study could have been affected by the precedent factor of using a questionnaire or survey because it had been used in the past. A more critical examination or explanation of the questionnaire by the authors would have been appreciated. In future research a different measure of student achievement other that grades alone would be useful. While grades may indicate an institutional level of achievement, they are insufficient in regard to measuring areas such as skill mastery, which is very much connected to self-efficacy. The 31% statistical correlation between perceived self-efficacy for academic achievement, student goals and students' academic attainment highlights the importance of self-efficacy and future academic success. Future research should include interviews, behavioral measure of academic studying, as well as, survey rating scales.

Schunk (1996) conducted two quantitative, pretest/posttest group design studies with fourth graders to investigate if performance and learning goals, as well as, self-evaluation will impact perceptions of problem solving capabilities. Subjects from study one were 44 fourth-grade students drawn from two classes in one elementary school. There were 18 girls and 26 boys. The ages ranged from 9-10. The students were from a predominately middle class background. There were 24 White and 20 African American

students. Subjects from study two were 40 fourth-grade students drawn from two classes in one elementary school. There were 20 girls and 20 boys. The ages ranged from 9-11. The students were from a predominately middle class background. There were 21 White and 19 African American students.

A pretest was administered to all the participants. It comprised of measures of goal orientation, self-efficacy, skill, and persistence. Goals orientations were measured to determine if the goal and self-evaluation conditions exerted differential effects on student's propensities toward various classroom goals. The goal inventory consisted of 18 items. The self-efficacy test assessed children's perceived capabilities for solving types of fraction problems. Children were shown a pair of problems for two seconds and then privately marked how then felt using a corresponding scale. The skill test was composed of 31 problems. The tester presented the problems to the students one at a time. The tester then measured how long the student spent on each problem. That time was used as the measure of persistence. Following the pretest children were randomly assigned to one of four condition groups (n=11): learning goal with self-evaluation (LG-SE), learning goal without self-evaluation (LG-NoSE), performance goal with self-evaluation (PG-SE), and performance goal without self-evaluation (PG-NoSE). Students received 45 minute instructional sessions over seven days. Each day had its own instructional packet. At the start of each session a teacher gave the goal instructions appropriate to the student's condition group. The instructional session was composed of a ten minute modeled demonstration where the teacher explained and demonstrated relevant fraction operations. Following that there was a 10 minute guided practice where the students worked with some manipulatives and cutouts and solved some practice

problems, and finally the remainder of the session (25 minutes) was independent practice where children worked on the work packets independently. The posttest followed the final instructional session day and measured goal orientation, self-efficacy, skill, and persistency. A parallel form of the skill test was used to control for problem familiarity.

The procedures were the same in the second study except for the variation of the treatment groups. The children were randomly assigned to one of two treatment groups (n=20): learning goal with self-evaluation (LG-SE) and performance goal with self-evaluation (PG-SE).

The mean self-efficacy pretest/posttest scores from study one were: LG-SE – 44.8 pretest to 85.3 posttest; LG-NoSE – 39.3 pretest to 81 posttest; PG-SE 40.8 pretest to 87.9 posttest; PG-NoSE – 43.1 pretest to 64.6 posttest. The results from the data showed that there was a significant effect on self-efficacy from goal type and self-evaluation. The LG-SE, LG-NoSE, and the PG-SE groups did not differ significantly but scored higher than PG-NoSE on SE and skill. The students in the three former groups saw their self-efficacy jump over 50% where the PG-NoSe group had their self-efficacy increase about 20%. The data from this study highlights the importance of learning goals and or an opportunity to engage in self-evaluation for students. The mean self-efficacy pretest/posttest scores from study two were: Learning goal – 45.8 pretest to 86.3 posttest; performance goal – 46.3 pretest to 65.2 posttest. The results from the data showed that both conditions significantly influenced self-efficacy and skill. The learning goals group scored higher than the performance goals group on both measures. The learning goals group increased saw their self-efficacy increase by close to 50% while the performance goals saw their self-efficacy only increase 20%. The data from these studies highlight the

importance of learning goals and or an opportunity to engage in self-evaluation for students. The small sample size is a concern for generalizability purposes although in study two there were 20 participants for each group as opposed to 11 in study one. Also a combination of factors that appeared in all treatment conditions could have enhanced self-efficacy. The enactive mastery experience of working on fraction problems over seven days most certainly positively impacted self-efficacy. Having fraction problems modeled and having the opportunity to use models and other forms of practice most certainly influenced self-efficacy. Further discussion should include the effects of modeling and mastery experience in the form of practice and their influence on the data in this study. According to Schunk, the results show a difference between learning goals and performance goals but not in goal properties because the goals were similar in proximity, specificity, and difficulty. Further research should look at the frequency of goal instructions.

Locke, Frederick, Buckner, and Bobko (1984) conducted a quantitative study with college students to determine if subjects will set lower goals in a second trial following a trial where they were assigned impossible goals. The subjects were 231 students in an introductory business management course.

The subjects were given a task of listing uses for common objects. There was one practice trial and two experimental trials. The objects chosen were to be of equal difficulty and the order of the objects was counterbalanced within each goal condition for the two experimental trials. The experimental trials consisted of seven different goals that ranged from easy (two uses) to impossible (26 uses). Everyone within a section was assigned the goal, and goals were assigned to each section at random. The N for each

goal group was: two uses (n=28); five uses (n=38); eight uses (n=32); 11 uses (n=38); 14 uses (n=31); 20 uses (n=32); 26 uses (n=32). After the task was explained, the subjects were given a one minute practice trial followed by two one minute experimental trials. For the practice trial, subjects were instructed to list as many uses as they could for a wire hanger in one minute. Before the first experimental trial (T-1) subjects were assigned a goal consisting of a specified number of uses and were instructed to try and reach the goal but not exceed it, during the one minute period. Subjects then rated their expectancy of meeting their goal, the object was announced, and the trial began. After that trial ended, the subjects rated their goal acceptance. Subjects were given a new object and were told they had the same goal as in T-1. They rated their expectancy of meeting the goal. Subjects were then told they could change their goal to a higher or lower level if they were unhappy with the one assigned to them. If they selected a new goal they were to indicate it and their chances of reaching the new goal. Subjects were again told not to exceed the goal. After T-2 subjects answered goal acceptance questions and questions regarding their desire and freedom to change goals on each trial. The goal expectancy was rated on a scale from 0-100. Goal acceptance was rated on a three point scale and were told to indicate their goal acceptance with a 1 (trying to reach the goal), 2 (trying to get as close as possible to the assigned goal), or 3 (not trying to reach the assigned goal or to get as close to it as possible). For questions about freedom and desire to change goals the scale ranged from 1 (no freedom (desire) to change) to 5 (complete freedom (very strong desire) to change). Performance was the total number of uses given for a trial. Repeat answers or irrelevant uses were not counted.

The data from the study showed that the subjects from the extreme goal

conditions in T-1 (20-26) had lower goal acceptance than the easier assigned goals but that acceptance did not affect performance. Those assigned easy goals on T-1 set easier goals on T-2 than those assigned harder goals in T-1. T-1 goal groups for two and five set significantly lower goals than T-1 groups 11, 14, 20, and 26 ($p.<05$). The goal-expectancy interaction found on T-2 was due to expectancy being positively related to performance at the higher but not lower goal levels. The authors of the study likened the goal-expectancy interaction to a "concept of self-perceived ability" or Bandura's (1984) concept of self-efficacy. Failure to reach goals that were unreasonable or unattainable goals in T-1 did not have a negative affect on goal setting, goal acceptance, or performance for subject in T-2 that set goals that were lower but that remained higher than those who had easier goals in T-1. An assumption from this may be that a balance should be sought where goals should be challenging but not too difficult. Goals that are too easy do not promote ability and therefore do not promote growth. A generalizability problem is that these subjects were college students who had a more developed sense of reasonable and unreasonable goals. Younger students may have been become frustrated by the goals if they were unable to discern a reasonable level of difficulty for the task. Another issue is that the tests were very low stakes did not necessarily mimic any real world applications. On the other hand, this study provides evidence supporting the importance of creating a fun, low-stakes testing atmosphere.

Elliot and Dweck (1988) conducted a quantitative study with fifth graders to investigate if performance goals and learning goals will have a differential effect on learned helplessness, mastery-oriented experience, and perceived ability. The subjects in the study were 101 fifth graders from semi-rural schools. There were 57 girls and 44

boys. No other demographic information was provided.

Roughly equal numbers of participants were randomly assigned to one of four condition groups, which were: learning goal-low ability, learning goal – high ability, performance goal – low ability, and performance goal – high ability. The children were first unknowingly assigned to the high ability or low ability feedback group. They were given a pattern recognition task, which was the basis for the ability feedback. All children were told that they had the capacity to acquire knowledge from the tasks that were presented by the experimenter. This was done to ensure that all children had high confidence in their ability to learn. Hence, if children selected the performance task and sacrificed learning it was thought that it did not come from a low confidence in learning. The exact phrases of the high and low ability feedback were not expressed in the study description. Following the initial pattern recognition task and feedback the first experimenter left and was replaced by a second experimenter. The second experimenter was blind to the student's ability conditions and presented all the children with two boxes. One was described as containing the performance task with its three levels of difficulty: moderately easy, moderate, and moderately difficult. The other box was described as containing the learning task. The identical discrimination task had been placed in both boxes. The presentation of the boxes was counterbalanced. All children were given the same descriptions of the tasks in the two boxes. The performance task description was "In this box we have problems of different levels. Some are hard, some are easier. If you pick this box, although you won't learn new things, it will show really show me what kids can do." The learning task description was "If you pick the task in this box, you'll probably learn a lot of new things. But you'll probably make a bunch of

mistakes, get a little confused, maybe feel a little dumb at times-but eventually you'll learn some useful things." In the conditions that highlighted the value of the performance goal, the children were told that their performance was being filmed and that their performance would be evaluated by experts. In the conditions that highlighted the value of the learning goal, no film was mentioned. In addition to the general description of the learning task, children were told that the learning task might be a big help in school, because it would sharpen the mind and learning to do it well could help their studies. Following the manipulation of the two goal types the children made their choice of either learning or performance goals. This was done to mimic real world choices where one goal is sacrificed because of the high value of another goal. In this case learning goals lead individuals to risk performance failure and the performance goals make individuals sacrifice learning opportunities. Three dependent variables were measured after the treatments were administered: task choice, problem solving during the discrimination task, and verbalizations during the discrimination task. Participant's task choice preferences were taken after the manipulation of the goal. After the participants indicated their preferences, all worked on the same task, which were in the learning and performance boxes. Those who chose the learning box were given the instruction for the task immediately. Those who chose the performance task were asked to indicate two preferences of the three available difficulty levels (moderately easy, moderate, moderately hard). All the children who chose the performance task were given the "moderate" task in that is was either one of their choices or the average of their two choices. This process allowed comparisons of the groups because the participants believed they were performing tasks that required different levels of ability when in fact

all children were doing the same task. The discrimination task consisted of four training problems and three test problems. One problem consisted of a deck of cards that featured two figures that varied on a total of six stimulus values. Figures were either red or blue, they were either a square or a triangle, and they either had a dot or star inside of them. The children were told that only one of the stimulus values was correct for each deck. Children pointed to either the left or right figure and were told "correct" if the figure contained the stimulus value that had been chose for the deck. To monitor hypothesis testing children received feedback about their responses on every fourth card in training problems three and four and for all of the test problems. A hypothesis was defined as a consistent selection of a particular stimulus property over four trials prior to feedback. The cards were varied in a systematic fashion so that the child's hypothesis about the correct solution could be inferred unambiguously from his or her own pattern of choices. On the fourth training problem the children were asked to begin thinking out loud when they worked on the problems. One of the goals of the study was to examine the effects of failure feedback on problem solving strategies. The trainer repeated a training problem until the child was able to give six successive correct responses. A hint was provided each time the training deck was repeated. For the test problems the child received feedback every fourth response and was asked to verbalize his or her thoughts. Those decks were only gone through once. The feedback always consisted of "wrong" thus permitting the monitoring of strategy change following continued failure feedback. All of the participants were carefully debriefed at the end to make sure they left the experiment feeling proud of their performance.

The data from the study showed that there were few differences between the low

and high ability children in the learning task group. However there was a significant difference in the behavior of the low-high ability students in the performance task group. Thirty-three percent of the children in the low ability group chose the moderately easy task level and none selected the moderately hard task level. In the high ability feedback group only 9% chose the moderately easy level and 14% chose the moderately difficult task, $X^2(2, N = 42) = 5.91, (p<.05)$. In the performance goal group there was a significant difference between the low and high ability groups in terms of failure attribution and statements of negative affect, where as there were no differences between the learning goals group in those categories. Twenty-six percent of students in the low ability – performance group made statement of failure attribution to less than 4% for the high ability students (Fisher's exact test, $p = .03$). Particularly interesting is that all of the children in the performance goal-low ability perceived ability group attributed failure to an uncontrollable cause. None attributed failure to lack of effort or any other kind of modifiable factor. Of the low ability group who made statements half attributed their failures to themselves in statements such as "I'm not very good at this" or "I'm confused." The other students made statements that fit into various attributional categories such as luck, task difficulty, and experimenter unfairness. Thirty percent of the low-performance students expressed statement of negative affect during the failure trials to only 4% for the low-learning, 0% for the high-learning, and 4% for the high-performance (Fisher's exact test, $p = .01$). If anything else this study reinforces the need to pay attention to student self-efficacy when designing tasks for them. The data from the present study indicates considering using learning based goals as opposed to performance based goals when working with students who feature low self-efficacy towards a given

task. Although this study does not explicitly name self-efficacy as a variable being measured, it is reasonable to draw some conclusions about factors that influence self-efficacy from this study. The experimenters in this study were able to convince the participants of their abilities to perform certain tasks. This low or high perception of ability is very similar to Bandura's (1997) definition of self-efficacy. The ability feedback given to the participants could be classified as verbal persuasion information and would therefore potentially alter self-efficacy perceptions. The fact that these perceptions had no basis in reality and were artificially and arbitrarily applied and yet perceptions based on the internalization of that feedback showed significance when the data were analyzed is provocative. This study also supports a process over product curriculum implementation strategy where the goal for students could be focused on learning despite encountering mistakes or "ability to learn" versus a more product oriented curriculum implementation where students are generating products for the purpose of being evaluated and judged. There are some concerns, however. Elliot and Dweck assumed that just because a student was told that they had the ability to acquire knowledge doesn't mean they actually believe that. Assessing the student's beliefs about their abilities with some quantitative or qualitative form instead of assuming the verbal persuasion would be useful. Not all of the children selected the goal box that they were assigned to. Eighty-two percent chose the learning box when it was emphasized versus 66% choosing the performance box when it was emphasized. There is some significance to the difference in those numbers. Again measuring the students' ability perception in the beginning of the experiment would have provided a clearer picture of what they actually perceived. Elliot and Dweck also assumed that giving all the students the

feedback that they all had the capacity to acquire knowledge from the tasks would automatically give them a high confidence in their ability to learn. This does not take their prior learning successes and failures into account and diminishes the impact that prior experience has on learning behavior.

Schunk (1983) conducted a quantitative, pretest/posttest group design study with 9 to 11 year olds to determine if pursuing more difficult goals during a division competency-development program will enhance student self-efficacy and achievement. The subjects were 40 children drawn from four classes in one elementary school. There were 23 girls and 17 boys from a predominately middle-class background. Children were initially selected on the basis of perceived mathematical deficiencies by their teachers.

The subjects were first given a self-efficacy assessment followed by a division skill test. The self-efficacy scale used went from 10 (not sure) to 100 (completely sure). After the subjects were familiarized with the assessment scale, they were shown sample pairs of division problems for two seconds each. The point of this assessment was for the children to judge their capability solving different types of problems. The students privately judged their level of self-efficacy for each problem by circling a number on the scale. The division skill test was administered immediately following the self-efficacy assessment. The test consisted of 14 division problems ranging in difficulty. Following the pretest the subjects were randomly assigned to one of four treatment groups (n=10). The treatment groups were: High goal difficulty plus comparative attainment information (high-comparative), high goal difficulty plus direct attainment information (high-direct), low goal difficulty plus comparative attainment information (low-comparative), low goal difficulty plus direct attainment information (low-direct). The students received two 45

minute training sessions over consecutive during which they worked on two training packets. Children were led into a room by a proctor where they worked on their packets. The proctor reviewed the packet with the child and then the child worked on a practice problem, after which the proctor gave the treatment instructions appropriate to the child's treatment group. For the high-comparative group the proctor suggested at the start of the first training session that they might consider setting a performance goal for themselves as follows: You might find that you can work these problems best if you try to finish 25 problems today. Of course, if you do more than 25 problems that's even better, but you should try to finish at least 25 problems. Does that sound okay to you? Immediately following these instructions, the proctor gave the comparative goal attainment information by stating, 'I've worked with a lot of other children just like you and what I find is that they can work 25 problems.' Both sets of instructions were repeated at the start of the second day except that the proctor suggested 15 problems. For the high-direct group the children received the same goal difficulty instructions as the high-comparative group but the proctor conveyed direct goal attainment information by saying 'You can work 25 problems." These instructions were repeated the next day except 15 problems were indicated. The low-comparative group the children received the same instructions as the high-comparative group, except 15 problems were suggested for the first day and 10 problems for the second day. The low-direct group received the same information as the high-direct group except the proctor suggested 15 problems for the first day and 10 for the second. The proctor then retired from the room upon delivering the treatment information. The children kept a tally of each problem they completed. The subject's perception of goal difficulty was assessed immediately following the second day. The

subjects privately judged how hard they thought the training session goals were using a 10 unit scale that ranged from 10 (really easy) to100 (really hard). The posttest was administered the day after the second training session. The instruments and procedures were the same as the pretest except parallel form of the skill test was used to eliminate familiarity.

The mean self-efficacy pretest/posttest scores were: High-comparative – 30.2 pretest to 52.7 posttest; high-direct – 35.9 pretest to 78.5 posttest; low-comparative – 33.9 pretest to 53.1 posttest; low-direct – 32.9 pretest to 61.3 posttest. The findings from the data showed that attainment information and goal difficulty significantly impacted and in some cases increased self-efficacy ($p<.05$). Post hoc comparisons showed that children in the high-direct condition judged self-efficacy significantly higher than the high-comparative and low-comparative groups ($p<.05$). Progress was significantly related to impacting self-efficacy ($p<.01$). The results of this study indicate a need to second guess social comparison implementation for purposes of increasing self-efficacy. Also the study draws attention to goal difficulty and setting challenging but attainable goals. In this study, students with a history of failure in mathematics showed significant improvement in just a two day period in both skill and arithmetic self-efficacy. This study also illustrates how effective the power of suggestion can be. An adult proctor suggested a couple of goals and some attainment information and the students seemed to internalize these suggestions. It would be interesting to see if these children were able to sustain their new levels of self-efficacy or even improve upon them. This study showed that a social force can impact students' perceptions about themselves. Hopefully, these students would eventually gain enough of a perception about themselves that they could

start creating their own goals and implementing strategies accordingly. There are a couple of concerns. First, the sample of this was only 40 students meaning only 10 subjects for each treatment group. The potentially exciting results from this study are diminished because of this. It may be difficult to generalize this information to a wide portion of the general student population. Also the relatively young age of the subjects in this study may present problems when trying to generalize this information to older students. The fact that these students were selected on the basis of their struggles with mathematics puts them into a unique category. They possibly came into the study with a much different perception of math ability than other students might. This could potentially create a problem with generalizability.

Bandura & Schunk (1981) conducted a quantitative, pretest/posttest control group design study with seven to 10 year olds to investigate if proximal goal setting will increase precepts of self-efficacy. The subjects were 40 children of predominately middle class socio-economic background. The ages ranged from seven to 10 years old. There were 21 males and 19 females. The children were drawn from six elementary schools based on the results of an initial screening that identified students with gross deficits in arithmetic skill and low interest in associated activities.

Participant subtraction skills and mathematical efficacy were assessed before they were divided into treatment groups. The subjects were randomly assigned to the treatment groups. The four treatment groups were: Proximal goals, distal goals, no goals, and no treatment. All of the subjects worked on subtraction skill packets and given instructions for self directed learning. One of three adult experimenters read the instructions to the students and then the students went to work on the packet for 30

minutes. The importance of working on the material on their own was stressed to the children during the initial reading of the instructions. If the children had questions the experimenter simply reread the relevant section and did not supplement that information in any way. During the 30 minutes one of the experimenters presented a goal to the children based on their treatment group. The proximal group was suggested to complete six pages per session. The distal group was suggested to complete 42 pages of pages by the end of the 7^{th} session. The no-goals group was instructed to complete as many pages as possible as they went along during the training sessions. The treatment group was given the assessment without any intervening exposure to the instruction material. Parallel forms of the efficacy test and subtraction test were administered the day following the fourth day of practice and after the final (7^{th}) practice session day.

The mean strength of self-efficacy pretest and $posttest^1$ – $posttest^2$ scores were: Proximal goals – 33.4 pretest to 74.3 $posttest^1$ and 81.1 $posttest^2$; distal goals – 33.9 pretest to 56.1 $posttest^1$ and 50.7 $posttest^2$; no goals – 34.2 pretest to 49.8 $posttest^1$ and 63.3 $posttest^2$; control group – 36.1 pretest to 36.2 $posttest^1$ and 31 $posttest^2$. The results from the data showed that proximal goals impacted student self-efficacy significantly ($p<.001$). The students in proximal goals group substantially increased their perceived self-efficacy from the beginning to the initial assessment and even further following the final posttest series. Children in the distal goal group saw modest gains of self-efficacy up to day four assessment but saw a small decline after the final posttest series ($p<.01$) All of the treatment groups saw an increase in perceived self-efficacy, the proximal goal group having the highest increase. There was no significance between the distal group and the no-goals group.

Subjects were alleged to have "selected" their form of goal setting by having the adults suggest their potential form of goal setting. This minimizes the role of adults in youth-adult relationships in our culture and society. The power of suggestion from an adult is obviously a contributing factor to the decisions a child is going to make. Self directed practice increased efficacy across the board. When compared to the no-goals group it seems that distal goal setting may have had a hindering effect on self-efficacy. Discrepancies in accuracy might be attributed to the cognitive development of the participants. Cognitive differences between 10 year olds and seven year olds are significant. A breakdown of the participant ages in the breakdown and analysis of the data would be helpful. There were no interviews done with the participants leaving this study as a purely quantitative endeavor. The measurements used for intrinsic motivation were suspect. Given the opportunity to choose between answering subtraction questions or filling out a adapted version of a Wechsler Intelligence Scale for children exercise where they were filling in empty squares in correspondence with digits that appeared above the squares, does not demonstrate interest as much as it does selecting the lesser of two potentially boring tasks. It is one thing to feel efficacious but it is quite another thing for those perceptions to match reality. Ambiguous progress toward competency does not necessarily improve self knowledge. The students in this study may have been more efficacious but they may not have understood the material. Goal progress feedback may have dramatically altered the results of this study.

Summary

Conventional wisdom touts the value of setting goals to guide achievement and success. The evidence in the section supported that wisdom and showed the power that

setting short-term, achievable goals may have on self-efficacy. For the populations in this section proximal goals seemed to have a more profound impact on self-efficacy than distant goals. Additionally, learning goals seemed to influence self-efficacy more positively than performance goals. Specific strategy implementation or feedback combined with proximal goals showed an enhancive affect.

Motivation

Motivation and behavior share a reciprocal relationship and because of this it is not always clear what is influencing what. Self-efficacy also fits into this category. Improved motivation can contribute to individuals undertaking enactive mastery experiences, which can inform self-efficacy. While motivation may not directly influence self-efficacy the experiences of individuals acting under the influence of high motivation may. The value of enhancing motivation in relation to self-efficacy should not be underestimated. The studies in this section explore intrinsic motivation, autonomy, competence, and feedback.

Cordova and Lepper (1996) conducted a correlational study with fourth and fifth graders to determine the effects of contextualization, personalization, and provision of choices may have on intrinsic motivation. The 72 participants (31 male and 41 female) were fourth and fifth graders from two private elementary schools in the San Francisco Bay area. The socio-economic backgrounds ranged from working-class to upper-middle class. The ethnic composition of the participants revealed that 71% were Caucasians, 13% Hispanic, 9% African American, and 7% Asian American. Children at these schools had prior experience working with computers. Two children did not complete all five sessions so their data was not included in the final results.

The participants were randomly assigned, with-in gender, to one of five conditions (n = 14): Generic fantasy-no choice, generic fantasy-choice, personalized fantasy-no choice, personalized fantasy-choice, and the no fantasy control. Three parallel versions of a computer game were designed to teach arithmetical and problem solving skills during the study. The underlying game structure was the same for all three versions. The participants were allowed to select the difficulty level for each game. In all three versions two types of hints were available. At the end of each game, students were shown a summary their performance that included the number of missed problems and the number of problems that were answered correctly. The three games consisted of a basic non-embellished game called "Math Game" and two fantasy embellished games called "Space Quest" and "Treasure Hunt". The fantasy embellished games also featured a title page with associated graphics and icons followed by a brief prologue that added context to the "mission" or objective of the game. Instructionally, the path through each game was identical. There were two manipulated variables within each of the two fantasy games. The first was the extent in which the children had control over instructionally irrelevant materials such as specific icons that represented the child and names of the characters. The second variable was the extent to which the fantasy context had been personalized for each child. A number of generic referents in the program were replaced with replaced with personally relevant information obtained from a personalization questionnaire. The first of five sessions consisted of a pretest. The children's knowledge of order of operations and use of parenthesis in solving arithmetic problems were pretested using computers. The students also completed a personalization questionnaire during this session. In sessions two through four each child was asked to

play with one of the three games they were randomly assigned to. For the fifth session the children were re-tested on order of operations and use of parenthesis in solving arithmetic problems. In addition, the students were asked a series of questions using seven point Likert scales. The were asked how much they liked the games, how likely they were to stay after school to play the games, how useful they thought the games were in helping them learn math, and strongly they would recommend the games to other children. They were also asked questions that rated their perceived competence and their future aspirations in relation to the games.

In general, the children in the control group were less willing to spend free time playing the games in their free time than participants in the fantasy condition, $F(1, 65) = 6.69$, $p<.01$. Students in the generic fantasy were significantly less willing to spend free time playing the game than the personalized fantasy gamers, $F(1, 65) = 3.72$, $p<.05$. Students in the no choice conditions were less likely to spend free time playing the game than students in the choice conditions $F(1, 65) = 9.99$, $p<.005$. The children in the control condition perceived themselves as significantly worse at playing the game than the children in the fantasy conditions, $F(1, 65) = 5.10$, $p<.05$. In addition, students in the conditions where they could exercise control over some of the non-instructional features of the game reported significantly higher levels of perceived competence than those students who had no control over the options, $F(1, 65) = 7.79$, $p<.05$. Intrinsic motivation scores were highest in the personalized fantasy-choice group. The relation of choice and relevant personal information had a significant impact in this study. The measure of perceived competence seemed similar to self-efficacy. Again students that worked with personalized information and had the opportunity to exercise some control over their

game had significantly higher levels of perceived competence. These findings support ideas that it is important to learn about students and to use relevant information as motivational or engagement tools in instruction. A limitation of a study such as this are related to the resources a school may have. The students in this study attended private schools that afforded them the opportunity to work with computers. In reality, not all students have access to computers or other kinds of interactive educational tools. Also the findings in this study may not be applicable to situations that require a higher cognitive demand.

Lavigne, Vallerand, and Miquelson (2007) conducted a correlational study with tenth graders to explore if teachers' support of students' autonomy will positively influence perceptions of autonomy and competence. The participants of the study were 728 tenth graders (349 boys and 367 girls; 12 did not indicate gender) from three Montreal public high schools. The mean age was 15.14 years old.

Students completed a four section, 16 item, questionnaire that addressed various issues related to science, needs, autonomy and demographics. The four sections of the questionnaire were: Needs satisfaction, autonomy support, future intentions, and demographic variables. Needs satisfaction measured science related perceptions of competence. Autonomy support measured students' perceptions of their teachers' autonomy support. Future intentions measured students' intentions to pursue science in their education and a career within the sciences. Demographic variables assessed students' age, gender, nationality, languages spoken at home, birth place, and each parent's working status. The questions were scored using a seven point Likert scale.

Based on data drawn from the questions students were divided into two groups:

High and low science intentions. High science intention students were found to be more intrinsically motivated than low intention students, $F(2.23, 218) = 76.35$, $p<.001$. Low science intentions students had higher levels of introjected ($p<.0001$) regulation and of amotivation ($p<.0001$) than high science students. Students with high intentions to pursue science had higher perceptions of autonomy and competence in science than students with low intentions for a science education, $F(1,475) = 293.22$, $p<.0001$. Boys ($M = 4.56$) perceived themselves as more competent in science than girls ($M = 3.96$) and higher in future science intentions ($M = 4.48$) than girls (3.97). The data from the study support the authors' ideas that autonomy, intrinsic motivation, future science intentions, and perceptions of competence are related. There was a high meta-cognitive demand to answer the questions on the questionnaire. The results on the questionnaire may not represent actual student perceptions if students had not had many opportunities in the past to exercise their meta-cognitive thinking. This is an extremely important detail since all of the data in this study was derived from the questionnaire. Also social desirability may have influenced the way that some of the students answered the questions.

Corpus and Lepper (2007) conducted a correlational study with fourth and fifth graders to investigate the effects of differential forms of praise on motivation and gender. The participants were 93 fourth and fifth graders (44 boys and 49 girls) from elementary schools in the San Francisco Bay area. The students were largely Caucasian, Asian-American, and Latino.

Children were randomly assigned, within sex, to one of four treatment conditions: Person praise ($n = 25$), product praise ($n = 22$), process praise ($n = 24$), or neutral feedback ($n = 22$). Aside from feedback statements, all other aspects of the study were

the same for all participants. Children were given two sets of geometric puzzles to complete. The first set of puzzles were selected to be moderately easy for the children to solve. This created a success experience for them to be praised on according to their assigned condition. The second set of puzzles were selected to be very difficult, in order to produce a failure experience. During the success phase the children were told they had six minutes to complete as many puzzles as possible. Throughout this period they were given praise according to their assigned group. After the six minutes was up an experimenter evaluated student performance using a mock scoring grid and a predetermined score of 90%. The students received additional praise feedback according to their condition group. Children were then asked to complete a self-reported motivation measure. During the failure phase of the study children were asked to work on puzzles for an additional six minutes. As they worked they were given a neutral sounding "OK" upon completion of each completed puzzle. At the end of the six minutes the children were evaluated again using a mock scoring grid and a predetermined score of 60%. Upon receiving the score the students were told "That's not a very good score," by a tester. The tester then asked the students to complete the self-reported motivation measure followed by a measure of attributions of failure. The students were carefully debriefed at the end of the session to ensure they were feeling good about their accomplishments with the puzzles.

Following the success phase, there was a statistically significant main effect for gender on self-reported motivation, $F(1,85) = 7.01$, $p<.05$. Girls ($M = 5.17$, $SD = .55$) reported greater levels of post-success motivation than boys ($M = 4.82$, $SD = .69$). Following the failure phase, there were no significant main effects or interactions. The

results of the study show that praise can have important effects on intrinsic motivation. The study illustrates the importance of gender when attempting to understand the complex effects of praise on children's motivation.

Denissen, Zarrett, and Eccles (2007) conducted a correlational study with 1st through 12th graders to investigate the coupling of academic achievement, interest, and self-concept of ability (SCA) over time. Approximately 1,000 children and two thirds of their parents participated in the study. The participants lived in four cities in southeastern Michigan. The sample was primarily European American with a small minority of African Americans, Asian Americans, Native Americans, and Hispanics. Gender was close to perfectly balanced at 51%, tilted slightly towards the female gender. Ninety percent of the families were two parent intact families. The first wave of data was collected in 1986 from three cohorts of children, their parents, and their teachers, beginning when the children were in kindergarten, first, and second grade. These children were followed for four consecutive years. After a three year gap they were followed again for four more consecutive years.

Data was gathered by assessing interest, SCA, and achievement in three academic domains (English, math, science) and two nonacademic domains (sports and instrumental music). Interest was assessed with two items using a seven point Likert scale. SCA was assessed with a five items for each of the five domains. Academic achievement was assessed by operationalizing average yearly marks in school or from performance feedback from teachers at younger grades. The marks were also correlated with results of standardized achievement tests. Three different coupling groups were established: Achievement and interest (AIC), achievement and SCA (ASC), and interest and SCA

(ISC). Assessment of coupling was accomplished by calculating intraindividual correlations between domain specific SCA, interest, and achievement profiles by using the Pearson correlation. Hierarchical linear modeling (HLM) was used to model the different coupling groups over time.

Within-person and within-grade analysis for each domain and across all 12 grades was correlated. The results showed a moderate association for AIC ($r = .52$, $p <= .09$) and high for ASC ($r = .81$, $p<.01$) and ISC ($r = .92$, $p<.01$). Not surprisingly, the results showed a high correlation between achievement and self-concept of ability. Less expected was the strong correlation between interest and self-concept of ability. A moderate correlation was made between achievement and interest. The results indicate that the level of beliefs a person holds in their abilities within a specific domain can contribute to certain levels of achievement over time. Although it is not necessary for students to be interested in a domain in order to achieve within it, the high correlation between interest and SCA clearly show the value of intrinsic motivation factors and attitude within a specific domain. An issue addressed by the authors was the reliability of the SCA and interest measurements of students in the younger ages. The authors adjusted the scores of those measurements to correspond with the reliability estimate of each grade. The sample was quite homogeneous in regard to race and socioeconomic status and may limit the generalizability. There were also large amounts of parental data missing and bias parental judgments may have confounded the results.

Summary

Studies in this section highlighted motivation in the short term and long term. Intrinsic motivation was shown to be impacted by including intrinsic interest and

personalized information in learning material. Corpus and Lepper (2007) explored the connection between intrinsic motivation, praise and gender. Perceptions of competence and autonomy contributed to motivation within the domain of science. Finally, significant correlations were established between interest and self-concepts of ability and achievement and self-concepts of ability in specific domains.

Chapter Summary

Chapter three was a review of research that connected self-efficacy to feedback, modeling, strategy implementation, rewards, goals, and motivation. The findings of each study were summarized and critiqued. The research was reviewed for the purpose of improving self-efficacy in middle school students. The feedback section highlighted the importance of differentiating feedback to the fit the needs of specific individuals. The modeling section indicated the importance individuals place on the performance of others, especially when they perceive those others to be similar to themselves, when forming perceptions about their own abilities. The strategy section indicated the importance of specific strategy implementation and information for accelerated, average, and struggling learners. The rewards section showed the potential of using rewards to enhance perceptions of self-efficacy. Rewards were most effective when combined with a main source of self-efficacy information. The goals section showed the importance of providing framework for experiences and evaluation from which self-efficacy information can be drawn. The motivation section highlighted the value of promoting intrinsic motivation in relation to self-efficacy. Chapter four summarizes the research from chapter three, discusses strategies that may improve student self-efficacy in the classroom environment, and suggests areas of future research.

CHAPTER 4: CONCLUSIONS

Introduction

Chapter one described the rationale for exploring self-efficacy and some of its applications within education, specifically with middle school aged students. One of those arguments was that middle school aged students are particularly vulnerable and may begin to achieve or not achieve as the case may be. Fostering self-efficacy within those students may afford them long lasting habits of mind that will aid them throughout the rest of their lives by impacting such things as motivation, perceived competence, goal setting, and task selection. Chapter two described the development and progression of self-efficacy theory, its place within educational research, and some opposing schools of thought. Chapter three was a review of the research literature about self-efficacy. The findings of each study were summarized and critiqued. The research was reviewed for the purpose of improving self-efficacy in middle school students. The feedback section highlighted the importance of differentiating feedback to the fit the needs of specific individuals. The modeling section indicated the importance individuals place on the performance of others, especially when they perceive those others to be similar to themselves, when forming perceptions about their own abilities. The strategy section indicated the importance of specific strategy implementation and information for average and struggling learners. The rewards section showed the potential of using rewards to enhance perceptions of self-efficacy. Rewards were most effective when combined with a main source of self-efficacy information. The goals section showed the importance of providing framework for experiences and evaluation from which self-efficacy information can be drawn. The motivation section highlighted the value of promoting

intrinsic motivation in relation to self-efficacy. The remainder of this chapter explores the summary of the findings from chapter three, discusses implications for teaching, and makes suggestions for future research.

Summary of the Findings

Feedback can be a valuable way to inform self-efficacy beliefs. Most of the time feedback given by teachers is going to be more specific than, "You're good at this" (Schunk, 1983). Because this information is a form of vicarious experience and/or verbal persuasion it is particularly important for teachers to accurately know their students abilities. Giving vague feedback or inaccurate feedback can cause confusion which may result in a decrease of self-efficacy. Schunk (1983) discussed how some students may receive a mixed message when they receive feedback that they are good at something but worked hard at it. The higher level of task mastery acquired, the easier the task should be, and the less amount of time it should take to finish the task. If a student is told that they are good at something but had to work hard at it, they may begin to question how good they actually are at something that should be easy and not require much effort. Of course, this is only one example and is contextually based; it nevertheless, illustrates the point that feedback should be sincere and give an accurate portrayal of reality.

Due to the interaction between meta-cognition, self-knowledge, and experience, perceptions of self-efficacy may vary widely from domain to domain. Young people are often at a disadvantage when trying to interpret their skill. Attributional ability or effort feedback is one area when this may become apparent. Elementary aged students often have a difficult time differentiating between effort and ability (Schunk, 1981). Usually, they interpret ability as the amount of effort expended and not as an expression of skill.

This has less to do with chronological age or grade level than it does with biological and physiological brain development. Late elementary and middle school students are also encountering more academic subjects for the first time that calls for them to apply the fundamentals they learned in elementary school. The unfamiliarity often translates into a lack of confidence and surety about ability. There is some debate about whether it is better to use effort or ability feedback with struggling learners. Blackwell, Trzeniewski, and Dweck (2007) for the interpretive reasons mentioned above emphasize using effort feedback. The data from studies by Schunk (1984) indicated that ability feedback may be more appropriate for enhancing self-efficacy. Based on the research in chapter three, ability feedback is more effective with older students and effort encouragement should be given to students who demonstrate ability but underperform.

Yasutake, Bryan, and Dohrn (1996) showed that attribution training combined with peer tutor positively influence the self-perceptions of confidence of third through eight graders. In that study, tutors and tutees exposed to a combination of effort and ability feedback perceived themselves more positively in terms of their academic skills and behavior compared to students who were only exposed to strategy information. However, the lasting impacts of those interventions are not known. Vicarious experience and verbal persuasion have been shown to have a mitigated impact on self-efficacy over time when compared to enactive mastery experiences Bandura (1997).

The research from the modeling section of chapter three highlighted the value of modeled behavior and increases in self-efficacy. Zimmerman and Ringle (1981) described how a researcher who modeled levels of persistence and attitude influenced self-efficacy in children who observed him working with an unsolvable puzzle. The data

from the study indicated that modeled persistence would have a more positive impact on self-efficacy if success is achieved during the modeling. According to Bandura (1997), if there is no hope of success or enacting change then there is little onus to act.

Schunk and Hanson (1985) described the value of peer modeling, especially when the students perceived the models as similar to themselves in ability. Of special importance was that models that showed masterful command of the material and made no mistakes and students that made a few errors but showed coping strategies and persistence to arrive successfully at correct answers both had significant impacts on self-efficacy.

Chapter three featured a few studies that addressed the use of various cognitive strategies and their relationship to self-efficacy. Those studies addressed students with learning disabilities, students who were receiving remedial instruction, and average achieving students. Graham and Harris (1989) described how students working with a specific reading strategy designed to help students with learning disabilities saw increases to their self-efficacy. Students memorized elements of a story, reviewed their performance, were introduced to a five-step learning strategy, had the strategy modeled for them, and then practiced the strategy themselves.

Schunk and Rice (1993) showed similar results with the implementation of a specific strategy implementation called fading. Student in the fading and strategy value information feedback group saw the most dramatic gains in self-efficacy and skill. This study highlighted a potentially effective method of enhancing self-efficacy by using relevant feedback in conjunction with specific strategies within a domain (not that all strategies have to be domain specific).

Zimmerman and Martinez-Pons (1990) explored self-efficacy in relation to giftedness, gender, and development. Academic efficacy was correlated with the use of specific forms of self-regulated strategy use and organizational methods. Overall, efficacy was significantly correlated with strategy use, developmental age, giftedness, and gender. An interesting piece of data showed that boys significantly surpassed girls in verbal efficacy but not mathematical efficacy. Stereotypically speaking, boys possess more confidence and ability in mathematics than girls and girls show more ability and confidence in verbal domains than boys. That was not represented in the data of this study. Also of interest was the negative correlation of student efficacy and asking for help from an adult in both verbal and mathematical domains. However, asking for peer assistance resulted in a positive correlation in the verbal domain.

Nelson and Manset-Williamson (2006) explored the impact of self-regulatory reading strategies on reading specific self-efficacy for students with reading disabilities. Students in the guided reading strategy group had specific comprehension reading strategies modeled for them followed by guided practice using the strategies themselves. This was supplemented with information that highlighted the value of goal setting and self-monitoring. An explicit reading strategy group received direct instruction about the same reading strategy and information about why it is important to comprehend text. They received the same verbal information about goal setting and self-monitoring. Although they only approached significant levels, students in the guided reading had gains in self-efficacy. Part of the attribution to lack of significance in the results was attributed to unusually high pretest self-efficacy scores.

Variables within students with learning disabilities confounded results in other

studies in chapter three. Klassen (2002) described this phenomenon and how some people with learning disabilities display clear calibration issues between perception of ability and actual ability. Even more puzzling is that students with learning disabilities often possess IQ scores on par with or higher than average achieving students without learning disabilities (Graham & Harris, 1989). More often than not these students overestimate their capabilities by a more than significant amount, as was shown by Graham & Harris (1989). The average self-efficacy scores for students with learning disabilities were 75.2 for the pretest and 88.8 for the posttest. Both of those numbers are approaching absolute certainty to complete a writing task. Comparing those measures to pretest and posttest measures of children who had difficulties in math but were not diagnosed as learning disabilities, the dilemma becomes quite evident. A modeling and attributional feedback group in a study by Schunk (1981) had a mean self-efficacy score of 20 for the pretest and 75 for the posttest. One might argue that the reason students with learning disabilities overestimate their abilities is because they have high self confidence and should not be discouraged. While that may be true, students who feel like they are capable and perceive that they are performing at a high level are unlikely to switch academic strategies to something that would actually be more beneficial. What some may interpret as overconfidence others may interpret as a form of self-protection (Alvarez & Adelman, 1986). In addition, individuals who grossly overestimate their abilities often suffer from severe failures (Bandura, 1997).

Rewards were another piece of information that indirectly provided self-efficacy information. Arnold (1976) and Schunk (1983, 1984) provided overwhelming evidence that rewards do not contribute significantly to intrinsic motivation or increases in self-

efficacy for tasks that have a participation only criterion for receiving the reward. However, Schunk did show that rewards contingent on performance based outcomes or accomplishing specific goals reinforced feelings of competence and heightened perceptions of self-efficacy significantly higher than groups that received rewards only or accomplished goals/tasks only. Even though rewards were shown to contribute to enhanced perceptions of self-efficacy in certain contexts, Schunk (1984) cautioned against the irresponsible overuse of rewards as a motivational tool or as a method of increasing efficacy or esteem.

Accomplishing specific goals and self-directed formation of goals or goal selection were shown to enhance self-efficacy in chapter three. More often than not, goal information within condition groups were accompanied by specific strategy implementation or by feedback related to goal progress. Process oriented goals were shown to enhance self-efficacy more than product oriented goals. Schunk and Swartz (1993) showed that process oriented goals combined with feedback specific to progress or strategy use significantly influenced self-efficacy more than product only goals. There was approaching significance from process oriented goals to process goals and feedback, as the latter groups had higher overall mean scores.

Schunk (1985) provided evidence that showed the value of allowing students to self-select goals in relation to self-efficacy. Students that were allowed to set their own goals had significantly higher perceptions of self-efficacy than those that were assigned goals. In addition, the students in the self-selecting groups had significantly higher levels of expectancy to attain their goals than students that were assigned their goals. It should be noted that in the self-selecting goal group, a tester offered a goal suggestion within the

parameters of the task the students were working on.

Zimmerman, Bandura, and Martinez-Pons (1992) showed correlations between prior achievement associated with grades, self-efficacy for self-regulated learning, parental grade goals, and self-efficacy for academic achievement. Several interesting ideas emerged from this study. The first idea being that even though previous achievements or failures do inform self-efficacy perceptions they do so only partially. No one is necessarily doomed to a life of failure in any domain because they have experienced setbacks in the past. The study also discusses why students may not adopt high academic aspirations imposed on them by their parents or teachers. A determinant of student aspirations is their belief in their academic efficacy. The authors wisely pointed out that those who desire to foster academic achievement need to do more than set demanding standards. They also need to intentionally structure academic experiences in a way that will enhance students' perceptions of academic efficacy as well. A prudent piece of advice for today's standards and accountability obsessed society.

Locke, Frederick, Buckner, and Bobko (1984) showed an important relationship between freedom to select goals, goal difficulty, and subsequent goal selection. Subjects assigned impossible goals in one trial unexpectedly selected goals much higher in a second trial than those who had easier goals assigned to them in the first trial. Apparently, those assigned impossible goals during the first trial realized the goals were unreasonable and when presented the opportunity to set their own goals were undeterred by previous failure and set goals that were overall higher than those assigned easier goals in the first trial. Conversely, those who experienced success in the first trial set goals that were only marginally more difficult in the second trial, possibly in an attempt to preserve

positive feelings and perceptions derived from that success.

Schunk (1996) described how effective self-evaluation can be for informing self-efficacy perceptions when combined with goals. Learning goal and performance goal groups had significantly higher levels of posttest self-efficacy when they had opportunities to engage in self-evaluation during the learning process, when compared to other groups. Process goal only groups also showed significantly higher levels of self-efficacy than performance goal only goal groups. Schunk stressed the importance of teaching students proper self-evaluative skills prior to using them. Low self-evaluations, even when students are making progress, can derail motivation and learning. Accuracy of these assessments are critical.

Schunk (1993) showed that even gifted students draw significant benefits from self-efficacy information such as strategy goals and progress feedback. Students in the strategy goal plus progress feedback significantly outperformed their peers in the other groups in regards to skill acquisition and posttest self-efficacy levels. Schunk went on to say that specific progress feedback is valuable in writing because it is not always easy for students to know if they are making progress.

Elliot and Dweck (1988) provided evidence for implementing learning goals as opposed to performance goals. This may prove difficult in a system that necessitates product generation for the purpose of assessment. Elliot and Dweck declared that achievement goals are critical determinants in patterns of how students attribute factors of success or failure. Students who thought they had low ability and were presented with a performance goal were quick to make attributing remarks that indicated lack of ability. Students that had high ability perceptions displayed mastery oriented responses and

persisted in the face of obstacles. However, those same students declined an opportunity to increase their skill on a task that featured the potential of public mistakes. In contrast, students in the learning goal groups displayed more persistent achievement behaviors and sophistication with problem solving strategies, regardless of perceived ability. They all sought to increase their competence. In their conclusion Elliot and Dweck describe goals quite succinctly – "Each goal, in a sense, creates and organizes its own world – each evoking different thoughts and emotions and calling forth different behaviors."

Bandura and Schunk (1981) confirmed the influential role of proximal self-motivators in the cultivation of competence, perceptions of self-efficacy, and intrinsic interest. Children who set reasonable goals showed rapid progress in self-directed learning, achieved substantial mastery of mathematical operations, and increased their perceived self-efficacy. The results represented ideas that judgments of self-efficacy are not simply reflections of past performances. Rather they reflect an ongoing inferential process in which many variables contribute information.

Schunk (1983) provided information that suggesting more difficult goals to children led to a higher rate of problem solving during training when compared to children that were suggested easier goals. The children were all told that their goals were attainable. This information highlights the value of setting challenging but reasonable goals.

Cordova and Lepper (1996) described the process of how students exposed to a learning game that featured personalized fantasy attributes and were allowed to make interactive, non-instructional choices with some functions of the game outperformed their counterparts in every measurable category. Those students attempted to use more

complex operations, had higher levels of perceived competence, scored higher on a skill test, and showed higher levels of intrinsic motivation and task enjoyment. This study highlighted the powerful influence that personalization and choice can have on enhancing intrinsic motivation, perceptions of competence, task engagement, and task performance.

Lavigne, Vallerand, and Miquelson (2007) studied the relationship between perceptions of competence, perceptions of autonomy, and science motivation. High science intention students were found to be more intrinsically motivated than low intention students. Low science intentions students had higher levels of amotivation than high science intention students. Students with high intentions to pursue science had higher perceptions of autonomy and competence in science than students with low intentions for a science education. Boys perceived themselves as more competent in science than girls. This study supports ideas that autonomy, intrinsic motivation, future science intentions, and perceptions of competence are related.

Denissen, Zarrett, and Eccles (2007) showed a high correlation between achievement and self-concept of ability and a less expected correlation between interest and self-concept of ability. The results indicated that the level of beliefs a person holds in their abilities within a specific domain can contribute to certain levels of achievement over time. Although it is not necessary for students to be interested in a domain in order to achieve within it, the high correlation between interest and concept of ability clearly showed the value of intrinsic motivation factors and attitude within a specific domain.

The preceding section was a review of the research literature from chapter three. The section included information about self-efficacy in relation to feedback, modeling, strategy use, rewards, goal setting, and motivation.

Classroom Implications

Given the summary of the research it should be clear that self-efficacy has many important implications in the classroom. Many variables influence how self-efficacy is perceived by an individual. Prior experiences, cognitive functioning, and development are just a few of the possible variables that may influence self-efficacy perceptions. This is important to know since many middle schools start as early as sixth grade and run through ninth grade. The potential developmental differences between a sixth grader and an eighth or ninth grader can be massive. Middle school creates a spectrum where at one end there are students on the cusp of their teenage years and adolescence and at the other end are students that have begun puberty and everything that goes along with it. Of course some individuals start to develop before or after middle school. The maturation and development of individuals does not adhere to any particular schedule. For this reason there is no one size fits all approach to working with students of any age let alone middle school students. Knowing students and their individual schema is perhaps the most critical component of helping them make positive and lasting changes. There are so many important things to know and evaluate when trying to apply methods that will improve self-efficacy in students. Each student comes into the classroom with unique abilities, prior knowledge, life experiences, self-perceptions, goals, levels of motivation, and patterns of successes and failures not to mention different degrees of mental and physical health. The first step to improve self-efficacy in any student should be learning about them as an individual and then make informed decisions based on that information.

The true value of feedback lies in factors such as relevance, specificity, timeliness, and accuracy or congruence with reality. Feedback should match the needs of

the student. Learning about students' previous achievement patterns, learning habits, and prior responses to feedback are useful ways to inform methods of designing and implementing feedback. A student lacking a specific skill set required to accomplish a task successfully will continue to fail no matter how much effort they expend. Telling a student to work harder when they lack skill or ability provides a source of frustration and powerlessness and will not improve self-efficacy. Modest gains in self-efficacy acquired by expending more effort during an enactive mastery experience can quickly deteriorate if the extents of the ability deficiencies are not accurately recognized. Schunk (1980) also warned about using effort attribution feedback to correct cognitive deficiencies. If basic deficits are not recognized and addressed a student may become demoralized especially after they have worked hard but have not been successful. Effort attribution should be left for those students who possess the requisites skills and so that increased effort would likely bring success. That is not to say that students should not be encouraged to work hard or try their best. Students should be worked with to understand the value and role of effort in successful outcomes. Accurate feedback may allow a child to form a more realistic picture of the value and limitations of effort required to successfully complete a task. It is important to have different strategies in mind when dealing with students who have different levels of efficacy. Feedback should come in combination with instruction and opportunities to learn and practice. Feedback should be specific to the task, clear, easy to understand, and free of sarcasm or any other kind of confusing information. Questions about feedback should be met with patient and clarifying answers. Using progress feedback over performance feedback highlights the accomplishments of the learner and provides them with evidence of capability. Peer

conferences, which are commonly used in writing programs, can be an effective way to provide progress feedback. The bottom line is that knowing students' abilities and potential will allow a teacher to give feedback that is more useful to them in the long run.

Modeling behavior can take the form of enactive mastery experience for the model and can act as a form of vicarious experience for the observer. Both are sources of information that inform self-efficacy beliefs. Modeling can be done by anyone that a student observes. Usually, this is a teacher or peers. Encouraging more capable students to work with other students may potentially build the self-efficacy of all students involved in the scenario. Students will typically identify more with peers than with adults. More capable peers can act as master models that flawlessly demonstrate a skill or learning strategy. They may also act as a coping model that demonstrates how to learn a specific skill or strategy and how or when to apply it (Margolis and McCabe, 2006). As obvious as this may seem, teachers should model the behavior they want the students to have and not the opposite. This requires paying attention and building awareness to methodologies, classroom habits, and personal biases. This, of course, is much easier said than done. Being aware of how success and failure are modeled is also important. Modeling persistence is useful but it does not necessarily produce successful outcomes. The point of persistence and perseverance is to overcome obstacles that ultimately lead to success. It may also be beneficial to take the time to explain the value in a variety of outcomes or to reinforce or shift thoughts about success and failure. Times when things don't go according to plan are opportunities for learning. Finally, teachers who model enjoyment, positive attitude, and confidence will influence students infinitely higher in regards to those behaviors than teachers who don't.

Goals are an easy way for a teacher to influence the self-efficacy of their students. Teachers can take the lead for students that lack goal strategies and recommend goals or strategies for them. Goals should be meaningful. Setting several goals in succession that are too easy for students may have a negative affect on their self-efficacy even if they are successful. Not only will the students not develop, but they may interpret the pattern as a signal that they are not capable of performing more difficult tasks. This is more likely to be true for younger students than for older students. Students want to be challenged and will want tasks that push their limits once they gain confidence in themselves and their abilities. They will rise to the occasion if given the opportunity, provided they are capable. When the students understand the usefulness of goals, a gradual shift in goal setting can allow the students to start making their own goals provided they gain an accurate view of their abilities. Allowing students to set goals that are too high or unrealistic are not useful. For this reason, it is important to work with students to develop and set realistic but challenging goals. This would potentially be a good way to develop students' self-efficacy. Proximal goals are a way for students to realize their competence and capabilities in a relatively short amount of time. Students should be involved in their learning goals whenever possible. They should also have the opportunity to evaluate their goal progress: What they did well at and what they could improve on for next time. This will give students practice at taking ownership and responsibility for their education. For students with lower self-efficacy, setting goals based on learning is a great way for them to see their own progress and abilities without the social comparison or judgment that accompanies performance goals. Learning goals may also encourage all students to take risks that they would not normally take with performance goals. Goals that

emphasize learning or process oriented outcomes seem to produce better results on self-efficacy than performance or product goals (Elliot & Dweck, 1988).

Strategy development is a wonderful way to develop task mastery, self-knowledge, and understandings of academic awareness. Working with students to develop specific strategies for learning will not only give them tools they need in order to be successful, it will also illustrate the importance of effort in success. Strategies that have steps or phases may require that certain actions need to be taken in a particular sequence. These steps will all require action or effort in order to get from one step or phase to the next. Along that same line, strategies should match the student. Some students may need steps broken down into simpler or more explicit components until they gain a clear understanding of the process. Strategy information should be repeated and explained as necessary. While specific strategy implementation may be a useful way to organize and focus learning, students should also have the opportunity to understand these values. Simply telling or forcing students to engage in activities or methods without clear explanations will not necessarily lead to desired habits. It is also useful to discuss with students the variety of ways in which strategies can be used, including homework (Margolis and McCabe, 2006). Similar to working with learning goals, strategy use should ideally and eventually include the students and emphasize a more self-guided approach where the student is recognizing what they need to improve on and take the necessary steps to do so. Meta-cognitive development should be cultivated as an important component in this process. Schunk (1993) points out that as students become more capable, they can personally modify strategies to reflect their needs or preferences. Such endeavors should be guided and encouraged.

While using extrinsic rewards has been shown to enhance extrinsic motivation it is worth mentioning that self-efficacy is quite different from motivation. Using extrinsic rewards to enhance self-efficacy should be done when performance is tied to success. Rewards in this case function as a form of performance or progress feedback and reinforce successful outcomes. In most cases giving rewards for merely participating in an activity will not enhance self-efficacy. However, task participation may lead to an enactive mastery experience which itself may enhance self-efficacy. It is important that the reasons for receiving rewards are understood by students, otherwise the desired effects may not be internalized. Using rewards inconsistently or arbitrarily should be avoided. Being fair with rewards is perhaps the most troubling part of using them. All students should have an opportunity to receive an award contingent upon success. Many times this is not the case and students are unfairly excluded.

In U.S. culture, some students value autonomy, exploring their interests, and having options to choose from. Incorporating such things in the classroom will enhance intrinsic motivation. It has been demonstrated by countless individuals that students can achieve success on other peoples' terms. Students will often go through the motions to get where they are "supposed" to go without really learning anything. However, enhancing students' intrinsic motivation has been shown to increase task engagement, which leads to higher levels of skill acquisition, which leads to higher levels of self-efficacy. Implementing curriculum that includes student interests or features issues that strike at personal experiences may be a useful way to increase intrinsic motivation. Also, simple things like allowing students to choose their assignments, books they read, and where they sit may enhance their intrinsic motivation. Additionally, this may signal to

the individual that they are capable of making judgments that are trustworthy and reasonable. Giving students the opportunity to communicate and share their ideas with their peers is another way to provide them with a sense of personal ownership over what goes on in the classroom. These discussions can be monitored and facilitated by the students themselves. Students participating in such leadership roles may build experience, competence, and confidence.

Although the information presented in this section highlighted specific strategies in isolated chunks the reality is that they should be used and incorporated together whenever possible and relevant. Using many of these tools in combination has been shown to have a cumulative, positive effect on self-efficacy. For example, a multi-method approach of providing positive and task specific feedback to students while they are using a specific learning strategy during a task will provide them with clear information they are on the path to success. In this day and age of emphasized standards and performance the true purpose of education often gets lost in the shuffle. The name of the game is learning and having students come to understand themselves as dynamic and competent individuals that have much to offer the rest of society. The job of the teacher is to provide students with opportunities to learn and to see themselves in the best light possible. Enhancing self-efficacy in the classroom is just one of many important components in this equation.

Further Research

Social scientists conduct studies for a wide variety of reasons. They seek the keys that will unlock the driving forces behind phenomenon that is yet to be fully understood by humanity. Many times unlocked answers bring with them more complex questions.

The world of self-efficacy is such a complex entity. So complex that it could not be fit into any one document. There is still much to be discovered about the mechanisms of self-efficacy and of human behavior in general. Studies that incorporate strategies for improving self-efficacy related to physiological and affective states do not appear in this document. Research in other domains has generated plenty of information about dealing with stress and anxiety. Some of that information may be relevant to education, however, there have been significantly less studies conducted related to the specific stresses and anxieties associated with education in the classroom. Providing students with specific tools to understand and overcome those specific stresses and anxieties would most certainly be useful.

The prevalence of rewards in education also deserves a closer look. More often than not rewards are used as a tool to manipulate students into good behavior or some other classroom management purpose. The value of rewards has been addressed in relation to self-efficacy but could be explored in other areas.

Another possible topic of further research might be investigating self-perception and calibration issues within students with learning disabilities. Determining the contributing causes of inaccurate assessment would be helpful for those who work or interact with students with learning disabilities.

Finally, future research may be directed more towards peer influences on self-efficacy. Many studies have looked at the impact adults have on student self-efficacy, but there is still a wealth of information to be discovered about peer to peer interaction. Studies may look closer at the implementation of various forms of feedback, strategy use, and cooperative learning.

Conclusion

In chapter one, Bandura (1997) defined self-efficacy as perceived beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments and identified four main sources of self-efficacy information: Enactive mastery experiences, vicarious experience, verbal persuasion, and physiological and affective states. Frequently occurring in combination, these forms of information partially influence actions people choose to undertake, how much effort they expend toward those pursuits, how long they persevere in the face of obstacles and failures, their resiliency to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in coping with taxing environmental demands, and the level of accomplishments they realize (p. 3). In addition, self-efficacy is associated with motivation, perceived competence, goal setting, and task selection. Although the results of self-efficacy research could be applied to many different age groups, middle-school students were identified as the central population for which this paper focuses on. Individuals in this population face important developmental and educational transitions. During this stage individuals generally move from the relatively unstructured and informal education of elementary school to the more formal and regimented education of high school. This requires that individuals make certain cognitive and social changes in order to transition successfully.

Chapter two contextualized the history of self-efficacy in education within the framework of American psychology and educational theory during the twentieth century. Two main schools of learning theory emerged during this time: Behaviorism and social cognitive theory. Behaviorism was founded on the belief that in order to be considered a

proper science, psychological research had to rely on empirical evidence gained from stimulus/response interactions. Information gained by feelings or intuition had no validity according to this doctrine (Miller, 2002). Behaviorist educational theory largely left the learner out of the equation and broke effective learning into five or six steps that should be followed to in order to maintain maximum efficiency (Skinner, 1968). In contrast, social cognitive theorists insisted that learning and behavior was more complex. Behavior was part of a triadic reciprocal relationship that also included the external environment and internal personal factors (Bandura, 1997). The components of these relationships could not all be isolated and investigated at any given time because they were contextually dynamic and occurred over time. Self-efficacy was just one of many theories that addressed human identity and function within the whole of social cognitive theory.

Chapter three reviewed research literature that investigated studies about self-efficacy in relation to feedback, modeling, strategy, rewards, goals, and motivation. Ability attributional feedback was shown to be more effective than effort attributional feedback. This seemed to be contingent on whether or not the participants could differentiate between effort and ability. It is important for individuals to understand the value of persistence and effort in overcoming obstacles or achieving goals.

Modeling desired behaviors can provide important pieces of self-efficacy information. However, as shown by Zimmerman and Ringle (1981), the effectiveness of modeling persistence to increase self-efficacy seemed strongly tied to the success or failure of the modeler. The longer the model persisted without success, the more negative an impact it seemed to have on perceived self-efficacy in a group of young

subjects. Peer modeling was shown to have a positive impact on self-efficacy when observers watched a peer with perceived abilities that were similar to their own.

Strategy implementation was shown to have significant positive impacts on self-efficacy. The effects were even more positive when specific strategies were combined with strategy value information and feedback specific to the task or strategy being used. Graham and Harris (1989) showed the importance of providing students with learning disabilities with as much information as possible in order to inform their learning processes. That same encouragement to provide plenty of accurate and relevant information could be said for all students.

Studies from the rewards section showed that rewards contingent on performance were significantly superior to rewards based on participation in regards to their positive influence on self-efficacy. Rewards combined with proximal goals were even more effective than either goals or rewards alone. This evidence supports ideas that rewards have a cumulative effect when combined with other self-efficacy information but do not necessarily convey much useful information on their own.

Information from the goals section confirmed the value of setting goals to guide achievement and success. The evidence in the section supported ideas that setting short-term, achievable goals can positively impact self-efficacy. For the populations in this section proximal goals seemed to have a more profound impact on self-efficacy than distant goals. Additionally, learning goals seemed to influence self-efficacy more positively than performance goals. Specific strategy implementation or feedback combined with proximal goals showed an enhancive affect.

Motivation was shown to have indirect but positive impacts on self-efficacy.

Studies in that section highlighted motivation in the short term and long term. Intrinsic motivation was shown to be impacted by including intrinsic interest and personalized information in learning material. Corpus and Lepper (2007) explored the connection between intrinsic motivation, praise, and gender. Perceptions of competence and autonomy contributed to motivation within the domain of science. Finally, significant correlations were established between interest and self-concepts of ability and achievement and self-concepts of ability in specific domains.

Chapter four presented a summary of the research from chapter three, stated implications and strategies for enhancing self-efficacy in the classroom, and made recommendations for future research.

There is much more that remains unsaid about the topic of self-efficacy outside of this document. This paper has highlighted only but a small piece of information related to enhancing the classroom experiences of students and teachers alike. Those who wish to pursue the topic further will find a wealth of information and applications.

Teaching is a noble profession and many that choose to pursue it, do so with noble ideas in their hearts. One of the many goals for this document was for it to serve as a reminder that noble ideas and good intentions, while they are good things to have, should supplement knowledge and informed practice. The power of knowledge lies in its application. For educators this means applying knowledge toward the process of helping other human beings develop. A more noble intention may not exist.

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