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Understanding Self-Regulated Learning and Its Implications for Accounting Educators and Researchers

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ABSTRACT: Recommendations by the AICPA (1998, 2000), AAA (1986), and AECC (1995) have focused on the need for the accounting professional to be a lifelong learner. Attributes and skills connected with lifelong learning may be promoted in accounting classroom instruction by drawing from the work of educational theorists and researchers interested in similar goals. This paper introduces the concept of self-regulated learning and its related attributes and processes that are being studied as a means to promote self-motivated, independent, lifelong learning. Research in education theory and psychology from outside the field of accounting has found that the classroom environment can support the development of self-regulated learning and stimulate active involvement in one's own learning. This paper discusses the major findings of this research and provides guidance to accounting educators for classroom applications, and to accounting education researchers for studying the effectiveness of approaches to promoting self-regulated learning environment in the accounting curriculum.

INTRODUCTION

This paper presents an overview of the research published by researchers in education theory and psychology (outside of accounting education) labeled "self-regulated learning" and highlights its relevance to accounting education. The accounting profession has called for the development of lifelong learning skills so that the accounting professional is someone who uses the independent learning skills of decision making, problem solving, and self-management to

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determine *what* needs to be learned and *how* to learn it (e.g., AAA 1986; *Perspectives* 1989; AICPA 1998, 2000; Albrecht and Sack 2000). Self-regulated learning is fundamental to lifelong learning and is a process in which the learner exercises control over his or her thinking, effect, and behavior as knowledge and skills are acquired (Zimmerman 1986).

In its first position paper, the Accounting Education Change Commission (AECC 1990) stated that because of the rapid pace of change in the profession, it is not possible for educators to fully prepare graduates to *be* accountants. Rather, the AECC maintained that educators must prepare graduates to *become* accounting professionals by equipping students with lifelong learning skills. Subsequently, the AECC and AAA (Francis et al. 1995) focused on the theory of lifelong learning and its applications to accounting education. The intent of that monograph was to present the theory, concepts, and processes of intentional learning¹ to help accounting faculty understand student learning, rather than to provide a discussion or review of the literature (Francis et al. 1995, xi). In contrast, this paper is a review of the research on self-regulated learning, including suggestions for further investigation.

The term “lifelong learning” is a general term seldom used in current educational research.² Several more precise terms are used to better fit the conceptualization of education theorists and researchers interested in goals similar to those of the accounting profession. Two such terms are “self-directed learning” and “self-regulated learning.” The term “self-directed learning” is most often used in the study of adult education outside a formal educational setting. Researchers who are focused on students in formal educational settings most often use the term “self-regulated learning.” While the different contexts shape somewhat differing research agendas, the objectives and goals of these researchers are chiefly the same: to learn about the attributes and skills of those who take control of their own learning, and the conditions that promote learning development (Hiemstra 1996).

While some relevant material may be drawn from the self-directed learning research, this paper is focused on the educational research on self-regulated learning because findings here can be more directly adapted to accounting education. First, self-regulated learning focuses on formal educational settings, the context of collegiate accounting education. Second, the goal of self-regulated learning is updating skills, acquiring new knowledge, and solving new problems throughout life. This is precisely what is expected from today’s accounting professional, who must continually acquire new capabilities to solve complex problems throughout a professional career. Finally, the self-regulated learning model has made specific descriptions of various components of the successful learning process. This model

¹ Intentional learning is the focus of the AECC and the AAA monograph and is defined as learning with self-directed intent and choice of how and what to learn. Self-regulated learning differs from intentional learning in its focus on the learner. Self-regulated learning focuses on the self-regulatory attributes and processes innate in the learner, the choices made by the learner, and the execution of the self-regulatory learning model by the learner.

² To ease readability the term “education research” will be used to refer to research in education theory and psychology outside the field of accounting and “accounting education research” will be used to refer to research within the field of accounting.

provides a framework that can guide classroom instruction and provide researchers with definitions for specific constructs that can aid in research design.

In recent years accounting educators and education researchers have made great efforts to respond to the professional requests for change. Some accounting educators have pursued and even embraced various forms of active learning to increase student participation in the learning process. For example, the motivation behind problem-based learning (Alder and Milne 1997; Johnstone and Biggs 1998), cooperative learning (Cottell and Millis 1992, 1993), use of cases (Barkman 1998; Hassall et al. 1998), minute papers or self-reflection techniques (Almer et al. 1998; Brown and McCartney 1998), role-playing (Beets 1993; Craig and Amernic 1994), and many other action-oriented methods has been to help the student develop lifelong learning skills. It is therefore useful to relate where we are in accounting education research to the goal of self-regulated learning, both because it is aligned with the goal of accounting education and because it is in the direction in which accounting educators are moving.

The rest of this paper is organized as follows. The next section presents a conceptual framework of self-regulated learning, including the underlying definitions, theories, and constructs. This is followed by classroom research on self-regulated learning and examples of how researchers from disciplines outside accounting have created classroom environments that support self-regulated learning. The next two sections provide guidance on the application of these findings in the accounting classroom and implications for accounting education research. Finally, there is a brief summary.

SELF-REGULATED LEARNING

In the late 1980s Zimmerman (1986, 1989) and Zimmerman and Martinez-Pons (1986, 1988) began to examine the learning approaches of elementary and high school students. They were interested in student metacognitive awareness, which is the conscious selection and use of learning and critical-thinking strategies; and student **self-monitoring**, the deliberate self-assessment of learning progress (all terms defined in Table 1 will appear in bold when first used). From these studies, Zimmerman and Martinez-Pons conceptualized what they called **self-regulated learning**. Other aspects of their research, and those of researchers doing parallel studies, included further exploration of metacognition as well as the role of **self-motivation** in determining the strength and direction of the learning effort. They found that the essential qualities that discriminate a self-regulated learner from others is the individual's stronger use of conscious selection and control of critical thinking and learning strategies, and continuous self-assessment of learning effectiveness and progress (Zimmerman and Martinez-Pons 1986, 1988; Zimmerman 1986, 1989).

Self-Regulated Learning Model

When observing the self-regulated learner an instructor would see a student who holds a clearly defined learning goal, determines what needs to be mastered, controls his or her learning environment by eliminating or reducing distractions, puts a learning plan into action, seeks help, monitors progress, and evaluates progress toward the learning goal. This learner then reacts by making adjustments in cognitive and regulatory learning strategies until the learning goal is achieved.

TABLE 1
Definitions of Key Terms

| Term | References | Definition |
|-------------------------------|--|--|
| Attributions | Heider 1958 Weiner 1979 Schunk 1984, 1994 | Views regarding the causes of an outcome Attributions can be internal or external, controllable or uncontrollable. |
| Goals | Hagen and Weinstein 1995 Schwartz and Gredler 1998 | That which guides the learning effort in a particular direction and serves as a standard for performance. |
| Resourcefulness | Zimmerman and Martinez-Pons 1986, 1988 Zimmerman 1989 | Control of physical surroundings to optimize performance, and seeking help from social sources such as persons or other references known to be capable. |
| Self-awareness | Zimmerman and Martinez-Pons 1988 Zimmerman et al. 1992 | The result of using reflection to develop awareness about one's own person, task, and strategy knowledge in a given context (i.e., metacognitive awareness). |
| Self-efficacy | Bandura 1977, 1986, 1993 Schunk 1990, 1991 Shin 1998 | Situation-specific self-confidence in one's abilities to organize and execute a course of action to obtain certain outcomes. Self- efficacy influences: choice, effort, and volition. |
| Self-evaluation | Schunk 1983b, 1983c Bandura 1986 Zimmerman 1989 | The link between metacognitive knowledge and metacognitive regulation: a key component of self-regulation. |
| Self-monitoring | Zimmerman 1989 Zimmerman and Paulson 1995 | Intentional efforts to control the learning process by comparing performance to a standard of performance or a goal. |
| Self-motivation | Zimmerman 1985, 1994 Zimmerman et al. 1992 Reeve 1996 | The self-generated energy that gives behavior direction. Energy is represented by strength, intensity, and persistence; direction by the aim toward a particular purpose or goal. |
| Self-regulated learning | Zimmerman and Martinez-Pons 1986, 1988 | The process in which the learner is cognitively, motivationally, and behaviorally active in his or her learning. |
| Self-regulatory attributes | Zimmerman 1989 Pintrich 1995 | The learner's personal learning characteristics: self-efficacy, self-awareness, and resourcefulness. |
| Self-regulatory processes | Zimmerman 1989 Pintrich 1995 | The learner's personal learning processes: attributions, goals, and monitoring. |

Figure 1 represents the key components of self-regulated learning. At the core of this model is the learner's self-motivation, which is intense determination to learn something specific or to acquire some added level of expertise. The **self-regulatory attributes** and the **self-regulatory processes** that the learner habitually uses influence the strength of the learner's self-motivation. Self-regulatory attributes are constructs that include self-efficacy ("I know I can do this if I try"), self-awareness ("I'm not getting this"), and resourcefulness ("I know where to get a tutor to help me learn this"). Self-regulatory processes include attributions ("I was successful because I put in the extra hours of studying, not because the teacher did it for me"), goals ("I'm determined to be a CPA; therefore it is necessary to master the knowledge and skills that will be tested"), and self-monitoring ("I've finished Chapter 1; just two more chapters and then I'll go back and review the sections I don't understand").

The next level depicts the choices that the self-regulated learner makes in pursuing knowledge. These include the learner's choice to participate in the learning process (e.g., to be in class), choice of learning strategy (e.g., working problems), and choice of learning outcome (e.g., mastery of material). Through these choices the learner sets personal learning objectives independent of those set by outside authority. A self-regulated learner does not wait for someone else to tell him or her what to learn; he or she has a personal learning agenda. Free choice is a necessary condition for self-regulation.

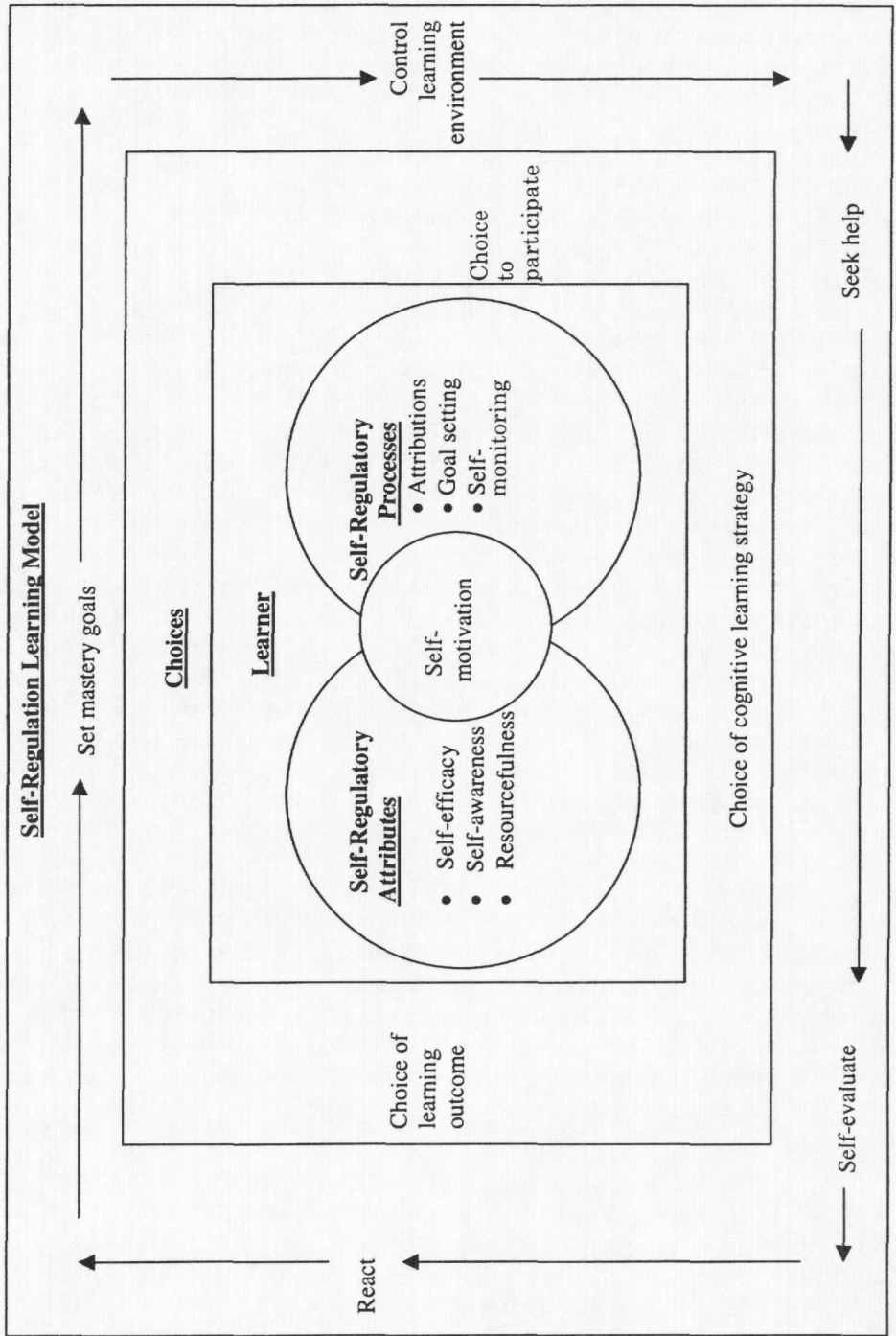
The outside level in Figure 1 depicts the self-regulated learning model, which encompasses the learner's attributes, processes, and self-motivation, as well as the learner's choices. In the self-regulated learning model the learner sets goals to master the material, controls the learning environment, seeks assistance when needed, evaluates progress, and adapts behavior based upon that evaluation.

A brief profile of a self-regulated learner will help facilitate the discussion that follows. The self-regulated learner is motivated to learn and has confidence in his or her ability to learn the specified material. This learner is very much aware of his or her strengths and weaknesses and actively pursues resources that assist in the learning process (e.g., "I know I am not a good speller; therefore, I will always use spellchecker on my papers"). The ability to learn is viewed as something the learner controls; therefore, the self-regulated learner accepts responsibility for the learning outcome. The self-regulated learner, desiring to master the material rather than perform minimum requirements, monitors progress toward mastery, making adjustments to assure goal achievement. It is important to discuss the influences on self-motivation and the choices made by the learner that lead to self-regulated learning, as depicted in Figure 1, because they are critical to the self-regulated learning model.

Self-Motivation

The core of self-regulated learning is self-motivation; without self-motivation many of the choices and processes would not be executed. In contrast to learners who remain passive recipients of instruction determined by an outside authority, the self-motivated learner has an intrinsic or internal goal-directed toward drive self-improvement. Without strong self-motivation, the learner will remain inactive or merely reactive to externally imposed demands (Zimmerman and Martinez-Pons 1986, 1988; Zimmerman 1989; Meece 1994). Therefore, self-motivation is at

FIGURE 1
Self-Regulated Learning



the center of the self-regulatory learning model. The importance of self-motivation is underscored by the emphasis placed on it in the research literature (see for example: Meece 1994; O'Neil and Drillings 1994; Reeve 1996).

Figure 1 shows the integral and dynamic relationship between self-motivation and the learner's self-regulatory attributes and processes. Strengths and weaknesses in any combination of the attributes and processes will affect the strength and focus of self-motivation (Schunk 1991; Pintrich 1995). The individual who will be most strongly self-motivated believes in his or her abilities (**self-efficacy**), believes the ultimate outcome is attributed to controllable forces (**attributions**), and views goals as attainable (**goals**). Conversely, low self-confidence in personal abilities, perceived inability to control the learning outcome, and goals viewed as unrealistic lead to lower self-motivation. Instinct has led education researchers to focus primarily on the role of self-efficacy, attributions, and goals on self-motivation (Hiemstra 1996).

Self-regulatory attributes. In the model of self-regulatory learning, self-regulatory attributes include self-efficacy, **self-awareness**, and **resourcefulness**. Self-efficacy refers to belief or lack of belief in personal capabilities to master situations that may include novel, unpredictable, or stressful elements. The notion stems from social cognitive theory, where the learner develops beliefs in his or her competencies by accumulating successful experiences in a given task (Bandura 1977, 1986, 1989). The belief that one can perform a required behavior to produce a specified outcome increases self-confidence and leads to situation-specific efficacy. Belief in one's abilities is a critical influence on motivation (Schunk 1990, 1991; Bandura 1993; Meece 1994). Self-efficacy affects three behaviors: (1) choice, (2) effort, and (3) volition (including persistence) (Bandura 1977). Belief in one's own efficacy will influence the task choice, the amount of effort made, and persistence at the task. Research suggests that high self-efficacy is positively related to learning outcomes, task persistence, effective study activities, skill acquisition, and academic achievement (Zimmerman 1989; Schunk 1991).

Self-awareness refers to heightened awareness of the outcomes of one's behavior. The learner's ability to self-regulate is closely linked to heightened awareness of his or her abilities. For example, the self-regulated learner is more likely than the non-self-regulated learner to know test performance before the test is graded (Zimmerman and Martinez-Pons 1988). Self-awareness also plays an important role in learning outcomes. For example, Hunter-Blanks et al. (1988) found that students displaying low levels of accuracy in evaluating their performance were less successful at learning relative to those with high levels of self-awareness. It appears that the accuracy of one's self-awareness influences the capability to self-regulate the learning process.

Resourcefulness refers to the ability to control physical surroundings in a way that limits distractions to the learning effort, and to successfully search out and use the references and expertise needed to master what needs to be learned (Zimmerman 1989). The mark of resourcefulness is active pursuit of information. The self-regulated learner is significantly more likely to organize and control the physical learning environment to optimize focus and to minimize distractions (Zimmerman and Martinez-Pons 1986, 1988; Zimmerman 1989). The self-regulated learner is also more likely to seek assistance and will determine which resources should be consulted for expert guidance.

Self-regulatory processes. Self-regulatory processes are the learner's attributions, goals, and monitoring strategies used during the learning process. These processes are critical because it is the learner's active involvement in the process that distinguishes self-regulated learning. Attributions are how one views the causes of an outcome (Heider 1958). The attributed cause of an outcome can be internal or external to the learner and controllable or uncontrollable by the learner (Weiner 1979). For example, the amount of effort expended on a task is viewed as internal and controllable, whereas certain abilities may be viewed as internal and uncontrollable (Schunk 1994). Studies have found that supplying feedback informing subjects that success is attributed to ability rather than attributed to effort enhanced the subjects' belief in their abilities (situation-specific efficacy), motivation to learn, and increased performance on the task (Schunk 1982, 1983b, 1984). The next section will describe these studies in further detail.

Goals guide the learner's efforts to actions in a particular direction and serve as the standard for self-evaluation (Schwartz and Gredler 1998). Mastery goals focus on knowledge and skills; performance goals focus on the task to complete (Schunk 1994). In order to master material the student must be motivated to learn rather than to perform (Hagen and Weinstein 1995; Shin 1998). A mastery goal, therefore, is one that leads to in-depth understanding and comprehension of the subject, whereas a performance goal leads to understanding just enough to perform a minimum requirement. Studies have found mastery-goal orientation to be positively related to self-regulated learning (see Ames [1992] for a review). While there is no doubt that mastery of a learning goal results in an enhanced learning outcome, the challenge is to have the learner view that goal as his or her own. Some believe that transferring the responsibility of learning to the student also transfers the goal of learning and that the student will then take ownership of that goal, leading to self-regulatory behavior (Schunk 1994; Pintrich 1995; Shin 1998).

Self-monitoring by the learner is a process in which systematic observations are often recorded and used to assess progress toward a goal. Self-monitoring is an important self-regulatory process because it focuses the learner on what is being learned and fosters reflective thinking (Zimmerman and Paulson 1995). Deliberate self-monitoring enhances learning by focusing the learner on specific outcomes and a determination of what actions or cognitive processes are responsible for these outcomes (Zimmerman 1989). Extensive evidence exists to show that self-monitoring via self-recording is positively associated with learning, motivation, and skill acquisition (Zimmerman 1989, 1994; Schunk 1991).

Choice

The next level on Figure 1 is "choice." An imperative part of self-regulated learning is that the learner makes a choice that is intrinsically generated, rather than reacting to an external requirement (which would be following, rather than self-initiating [Shin 1998]). A traditional learning model where the teacher prescribes and the student performs does not support self-regulated learning and in fact can deter it (Zimmerman 1989; Boekaerts 1997).

The most fundamental of the choices made by the self-regulated learner is the *choice to participate* in the learning processes. Choosing to attend class and being actively involved in the classroom experience demonstrates that the learner wants to learn. Active involvement is evident in the learner who is eager to ask questions, demonstrates intellectual curiosity, and is not satisfied until he or

she understands. This quest for knowledge is in fact a choice (consciously or unconsciously) made by the learner.

For the learner to self-regulate the method of learning, there must be a *choice of cognitive learning strategy*. Cognitive learning strategies are plans or techniques used by the learner to accomplish the learning objective (researchers often use the term “learning strategies,” which encompasses a wide array of learning approaches). Cognitive learning strategies include approaches such as rehearsing, elaborating, modeling, and organizing.³ A self-regulated learner consciously reflects on what might be the most effective way to master the learning goal and chooses an appropriate strategy to accomplish that goal. Those who are not self-regulated learners tend to do what they are told to do or they use strategies without reflection on their efficiency or effectiveness. The self-regulated learner tends to use strategies that support mastery goals rather than strategies that support performance-oriented (e.g., grades) goals (Meece 1994). Choice of strategy is requisite to self-regulated learning because it emphasizes that the individual chooses and structures his or her achievement experience (Zimmerman 1990).

A self-regulated learner sets personal learning goals, often called “learning outcomes” by researchers. In the self-regulated learning model, the learner *chooses a learning outcome* that leads to mastering the topic (Zimmerman 1994). This learning goal compels the learner to monitor and evaluate progress to assure achievement of that goal.

Summary

The culmination of the learner’s motivation, self-regulatory attributes, self-regulatory processes, and choices is the self-regulated learning model (see Figure 1). This learning model has as its core the learner’s self-motivation, which is influenced by the learner’s self-regulatory attributes and processes. Choice is evidence that the self-regulated learner is actively involved in the learning process and chooses when and how to participate in the attainment of a chosen goal.

In the self-regulated learning model, the learner will set goals to master the material. Mastery goals by definition are learning (rather than performance) goals. To attain those goals the self-regulated learner will control the learning environment by minimizing distractions to stay focused on the goal. When needed, the self-regulated learner will seek help from experts or references believed to be reliable. As the learner progresses toward the goal he or she will self-evaluate progress toward it and adjust actions to assure goal achievement. Whereas self-monitoring (a self-regulatory process) focuses on what one does, **self-evaluation** focuses on how well one does it relative to a standard or goal. Self-evaluation is a systematic comparison of performance to some standard or goal and is considered a critical part of the self-regulated learning model (Zimmerman 1989). Finally, the self-regulated learner will react to the self-evaluation by making adjustments to current cognitive and regulatory strategies in order to align performance with the learning goal.

³ Rehearsal strategies involve reciting items to be learned or highlighting key points. Elaborative strategies include paraphrasing or summarizing the material and creating analogies. Modeling and organizing strategies are discussed in this article in the context of self-regulated learning. See Weinstein and Mayer (1986) for a discussion of learning strategies.

Example Application of Self-Regulated Learning

The following example demonstrates how an accounting professional might apply the self-regulated learning model. Say a new accounting standard is enacted that applies to a major client; therefore the accountant sets the goal to master the new standard (set mastery goal). Assume that after the accountant reads the new standard he or she decides to attend a CPE training session and to study the material in his or her home office, where distractions can be minimized (control the learning environment). The professional will ask questions of the CPE instructor (or others with expertise) and search the literature to clarify areas that are not clearly understood (seek help). As progress is made the professional may complete self-study tests as part of the CPE training or tentatively apply the standard in order to evaluate his or her understanding of the new standard (self-evaluation). Based upon that evaluation the professional will determine if more training is needed to fully master the standard or if an alternative training source should be consulted (reaction).

This example displays how a professional chose to participate (learn the new standard), chose a learning strategy (CPE training), and chose a learning outcome (master the new accounting standard). All of this was possible because the learner was motivated to learn. The professional's self-motivation had direction and purpose because he or she was confident in his or her ability to learn the new material (self-efficacy), was objectively aware of his or her strengths and weaknesses (self-aware), and knew how to seek out CPE course materials and expert guidance (resourceful). The professional attributed the progress and outcome to his or her own abilities and effort (attributions), set achievable goals (goal setting), and monitored progress toward the goal (self-monitoring).

EDUCATION RESEARCH DESIGNED TO FOSTER THE DEVELOPMENT OF SELF-REGULATED LEARNING

The research on education theory and psychology from outside the field of accounting presented in this section focuses on *what* the instructor can do to support self-regulated learning. This research suggests that the classroom environment can support (or suppress) the self-regulatory attributes and processes in the learner (Schunk 1982; Brown and Pressley 1994; Graham and Harris 1994; Garcia and Pintrich 1994; Zimmerman 1994). Research has also substantiated that teaching cognitive learning strategies can enhance academic achievement (Zimmerman et al. 1994; Zimmerman 1989; Schunk 1991).

Collectively, this research concludes that instructors can enhance students' self-motivation and use of learning strategies and that these elements have the greatest impact on the student's ability to self-regulate his or her learning. Therefore, the research selected for discussion in this section is classified into two categories: (1) enhancing self-motivation (i.e., the self-regulatory attributes and self-regulatory processes that influence self-motivation—the center of Figure 1), and (2) developing cognitive learning strategies (a choice in Figure 1).

Education Research on Enhancing Student's Self-Motivation

The ultimate goal is to enhance student learning. As indicated in Figure 1, self-motivation is at the core of the self-regulated learning model. Therefore self-motivation, including the self-regulatory attributes (self-efficacy, self-awareness,

and resourcefulness) and self-regulatory processes (attributions, goals, and self-monitoring), has been the focus of education researchers. Researchers have explored the effect of an attribute or process on motivation or on each other. For example, some researchers have studied the effect of attributions or goals on self-efficacy and then implied or measured the changed effect of self-efficacy on motivation. Therefore, although the discussion below is organized by research on self-regulatory attributes and self-regulatory processes, there is overlap because some research explored the impact of an attribute on a process or a process on an attribute. The studies on enhancing student's self-motivation are presented in Table 2 along with a summary of the instructional objective, references, and major findings.

TABLE 2
Education Research on Enhancing Student Self-Motivation

| Research Area | Instructional Objective | References | Major Findings |
|----------------------------|---|---|--|
| Self-regulatory attributes | To enhance self-efficacy | Schunk 1982, 1983c, 1984, 1990 Wood and Bandura 1989 | <ul style="list-style-type: none"> • Positive feedback on ability leads to enhanced self-efficacy. • Perception that ability can be acquired leads to higher self-efficacy. • An attainable goal increases self-efficacy to the task. |
| | To increase self-awareness | Zimmerman and Martinez-Pons 1988 Schunk 1991 Lindner et al. 1996 Everson et al. 1997 | <ul style="list-style-type: none"> • Self-awareness enhances ability to relate outcome to behavior. • Self-monitoring heightens self-awareness, which is associated with more self-regulated learning strategies and better knowledge representation. • Inventory instruments can increase students' awareness of their learning. |
| | To encourage resourcefulness | Zimmerman and Martinez-Pons 1986, 1988 Newman and Schwager 1991 Newman 1994 Wolters 1998 | <ul style="list-style-type: none"> • High achievers are more likely to control the learning environment and seek help. • Fear of social judgment can reduce students' help seeking. |
| Self-regulatory processes | To attribute outcome to controllable forces | Schunk 1982, 1983b, 1991 Wood and Bandura 1989 | <ul style="list-style-type: none"> • Instructor feedback can influence the view that ability is acquirable. • Feedback that success is attributed to ability is more effective than linking success to effort. |

(Continued on next page)

TABLE 2 (Continued)

| | | |
|----------------------------|--|--|
| To set mastery goals | Schunk 1983c, 1990 Hillcocks 1986 Zimmerman 1989 Bandura 1993 Graham and Harris 1994 Hagen and Weinstein 1995 Talbot 1996, 1997a | <ul style="list-style-type: none"> • Mastery goals lead to self-regulatory behavior. • Self-set goals encourage self-regulatory behavior. • Attainable absolute goals can help develop performance. • Social goal comparisons can de-motivate. |
| To enhance self-monitoring | Arredondo and Rucinski 1994 Brown and Pressley 1994 Zimmerman et al. 1994 Lan 1996 | <ul style="list-style-type: none"> • Self-monitoring via self-recording increases awareness and leads to self-regulatory behaviors. |

Research on How to Support Self-Regulatory Attributes

Self-efficacy. Research has found that feedback intervention related to attributions and goals affect the learner's perceived self-efficacy (Schunk 1982, 1983c, 1984, 1990). For example, Schunk (1984) found that providing children positive feedback on ability ("You're good at this") enhanced self-efficacy and increased motivation for the task, which ultimately led to increased skill. Feedback on effort ("I can see you are trying hard"), however, caused subjects to attribute their performance to inadequate ability, diminishing their efforts and motivation toward the task. Therefore, providing positive feedback on a student's abilities may enhance self-efficacy, skill performance, and, ultimately, motivation.

Wood and Bandura (1989) studied the effect of manipulating graduate business students' perception of ability on the students' self-efficacy, goal setting, and task achievement. One group received feedback that ability is an acquired skill and another group received feedback that ability is a fixed or inherent skill. The acquired-skill group maintained higher self-efficacy, set challenging goals, and used higher-order decision-making skills. The fixed-ability skill group had greater doubts about their abilities the longer they were on the task, set progressively lower goals, and achieved less than the acquired-skill group. These results suggest that instructor feedback that supports the notion that ability is an acquired skill can influence the student's self-efficacy, goal setting, and motivation to learn.

Self-awareness. Studies have supported the idea that increased awareness can enhance the learner's ability to relate learning outcomes with certain behaviors and that objective awareness can lead to effective goal attainment (Zimmerman and Martinez-Pons 1988; Schunk 1991). Therefore, increasing the student's self-awareness can help the student associate behaviors to successful (or unsuccessful) learning outcomes and aid in the achievement of the learning goal. The most common way to increase awareness is through self-recording (self-monitoring). A second way to increase awareness is through standardized tests developed to provide feedback to students on their motivational beliefs and learning strategies. These external measures are designed to provide an objective assessment that is useful for increasing awareness, aiding instruction, and measuring learning attitudes. Table 3 lists these instruments and what they are designed to measure.

TABLE 3
Assessment Instruments Used in Self-Regulated Learning Research^a

| Instrument | Authors | Measurement |
|---|----------------------------|--|
| <i>Learning and Study Strategies Inventory (LASSI)</i> | Weinstein et al. 1987 | The inventory contains 77 items rated on a five-point Likert scale. These items are classified into ten subscales: attitude, motivation, time management, anxiety, concentration, information processing, selecting main ideas, study aids, self-testing, and test strategies. The <i>LASSI</i> is designed to capture not only specific knowledge, but also what the learner thinks about prior to, during, and after the learning. |
| <i>Motivated Strategies for Learning Questionnaire (MSLQ)</i> | Pintrich et al. 1991, 1993 | This questionnaire consists of 81 items grouped into 15 scales: 3 motivation; 2 expectancies; 4 affective; 2 learning strategies; 4 resource management. |
| <i>Knowledge Monitoring Accuracy (KMA)</i> | Everson et al. 1997 | Assessment of knowledge monitoring accuracy by evaluating the difference between the student's estimates of knowledge in a domain (both procedural and declarative) and actual knowledge as determined on a performance test. |
| <i>Self-Regulated Learning Inventory (SRLI)</i> | Lindner et al. 1996 | Assessment of self-regulated learning. Four general areas: executive, cognitive, motivational, and environmental. Each area consists of 20 items for a total of 80 items. All are measured on a five-point Likert scale. |

^a These instruments are commonly used in self-regulated learning research and the *LASSI* and *MSLQ* are reviewed in the *Mental Measurements Yearbook* (Impara and Plake 1998). Researchers should evaluate these reviews in the context of the research objective to determine if the instruments have sufficient validity and reliability for their study.

Lindner et al. (1996) studied undergraduate and graduate students' ability to self-regulate, using the Self-Regulated Learning Inventory (version 3) developed by Lindner and Harris (1992) (see Table 3). They administered the inventory to 219 undergraduates and 62 graduate students. Graduate students outperformed undergraduate students on all five subscales measuring the components of self-regulation, indicating that graduate students exhibit more self-regulated learning strategies than undergraduate students. Using Cronbach's Alpha, the instrument measures were found to be reliable and produced results consistent with expectations. Lindner et al. (1996) propose that the inventory measures can be used to predict the likelihood of degree completion and to increase students' awareness of their own learning strategies.

Everson et al. (1997) explored whether knowledge monitoring and self-regulated learning are domain-specific or generalizable across verbal and mathematical domains. Using 120 undergraduate students, Everson et al. (1997) examined the correlations among measures of metacognition, knowledge monitoring, learning and study strategies, and academic achievement. They measured knowledge-monitoring accuracy using the KMA, an index measuring the difference between students' estimation of their knowledge and their actual knowledge. Everson et al. (1997) measured learning and study strategies using the *Learning Study and Strategy Inventory (LASSI)* developed by Weinstein et al. (1987). Students were briefly shown math problems and vocabulary words (time-constrained) to determine whether they could solve the problems or define the vocabulary words. Students also rated the degree of confidence they had in their decision. Subsequently, they were given the actual math problems and vocabulary words and asked to solve or define them. The results suggest that metacognitive knowledge is generalizable across the verbal and mathematical domains: verbal and math KMA measure correlations were relatively strong ($r = 0.49$) and statistically significant. Everson et al. (1997) noted that an added outcome of this study was students' increased awareness of their knowledge accuracy.

Resourcefulness. High achievers tend to be more resourceful and to use more help-seeking strategies than low achievers (Zimmerman and Martinez-Pons 1986, 1988; Wolters 1998). Zimmerman and Martinez-Pons (1986) identified help-seeking as the most important learning strategy in differentiating low-achieving and high-achieving high school students. Newman (1994, 288) states that "help-seeking is different from other strategies of self-regulated learning because it is a social strategy, involving individuals other than the learner." Therefore, for the learner to be comfortable seeking help there should be no perception of social judgment.

Newman and Schwager (1991) provide evidence that goals that include social effects influence help seeking. Elementary-aged subjects were assigned "task-involved" or "ego-involved" conditions. Task-involved students were told that "Math puzzles like these will help you learn math." Ego-involved students were told, "How you do tells us how smart you are," a social judgment of the subject's intelligence. Task-involved subjects were more likely to confirm their work for correctness. Ego-involved subjects had noninquisitive questions or no questions at all. Task assignments also affected problem-solving performance. Task-involved subjects solved more problems correctly than ego-involved subjects. These results suggest that fear of social judgment reduced help-seeking by the ego-involved subjects. Newman and Schwager (1991) conclude that goal-related expectations that involve social judgments affect classroom interactions and achievement.

Research on How to Support Self-Regulatory Processes

Attributions. Attributing a learning outcome to something that is controllable is fundamental to enhancing motivation. Very few people are motivated to undertake a task if they believe that there is nothing that can be done to change the outcome. Ability to learn can be viewed as fixed (limited or static) or dynamic (can be improved or developed). Therefore, how one views ability is critical to motivation and plays an important and fundamental role in self-regulated learning. Studies support the notion that instructor feedback suggesting that ability is an “acquired skill” increase students’ view that they can develop their own ability to learn.

In a study on decision making, Wood and Bandura (1989) told one group of graduate students studying business that these skills can be developed and another group that these skills were fixed or innate. They found that attributing the skill as acquirable led to higher self-efficacy and motivation for the task. Schunk (1991) reaffirms that persuasory information (e.g., “You can do this”) can influence the student’s view of his or her ability, but cautions that the view is only temporary if the outcome is not successful. Therefore, although the learner may attribute the learning outcome to ability and view ability as acquirable, the learner must successfully execute cognitive and regulatory strategies to achieve that goal. Furthermore, Schunk (1982, 1983b) found that ability feedback on success (e.g., “You’re good at this”) enhanced children’s self-efficacy and skill more effectively than effort feedback (e.g., “You’ve been working hard”) and that linking the prior achievement with effort leads to higher motivation, self-efficacy, and skill than emphasizing the potential benefits of effort (e.g., “You need to work harder”).

Goal setting. The framework for self-regulated learning (Figure 1) acknowledges that goals can also influence motivation. As discussed earlier, the goal of knowledge mastery focuses on learning, whereas performance goals focus on the performance measure (e.g., grade). Performance goals often lead to abandonment of planning and monitoring activities, whereas mastery goals lead to planning and monitoring in order to overcome difficulties (Hagen and Weinstein 1995). Schunk (1983c) demonstrated that the instructor could influence the children’s goals by interjecting goal standards.

Talbot (1997a) provides a frank discussion on how self-regulated learning strategies may be taught to college students. Talbot (1997a) believes the key is to help the student think about learning and his or her personal goals to increase motivation. To begin, students must be challenged to improve themselves by setting learning-oriented goals on their own. Talbot (1997a) provides his practical guide, “working smarter, not harder,” as a means for students to self-assess their cognitive strategies, resource management strategies, and metacognitive strategies. Through the use of this self-study guide the students were encouraged to set learning-oriented goals on their own and develop other self-regulated learning strategies.

To determine if goal setting leads to the use of self-regulated learning strategies, Talbot (1996) studied 100 undergraduate students enrolled in first- or second-year psychology classes to determine whether they were aware of the effort employed in a task, as well as their own learning skills. Talbot (1996) confirmed the findings of earlier studies that learning-oriented students were more aware of their learning attitudes and behaviors than performance-oriented students. Learning-oriented students were more likely to use resources such as peer counselors, workshops, and

“work smarter, not harder” training than students who focused on their grade. These results indicate that learning-oriented students utilized more self-regulated learning strategies than performance-oriented students.

Goals can be absolute (fixed or set) or normative (social, relative to peers or a model). Studies have found that self-evaluation relative to appropriate goals can motivate behavior (Schunk 1990). Therefore, studies typically focus on self-evaluation in the context of goal manipulation. Hillocks (1986) found that when secondary and college-aged students used absolute standards to evaluate writing performance, they internalized the standards as a result of applying them. The activity of evaluating and reacting to the writing standards led to improved writing and understanding of grammatical rules. Advocates of absolute goals argue that knowing the goal and evaluating success toward that goal help develop the cognitive processes necessary for competent performance (Zimmerman 1989; Schunk 1990; Bandura 1993; Graham and Harris 1994). Schunk (1983c) studied the effect of absolute goals on self-efficacy and performance. Elementary-aged subjects were given attainable goal standards (“Complete 20 problems in the given time”) or given the attainable goal in nonabsolute terms (“Try to complete 20 problems in the given time”). The group given absolute standards displayed higher self-efficacy and skill attainment. Schunk’s (1983c) results suggest that the use of attainable absolute goals in the self-regulatory process can increase self-efficacy and ultimately skill attainment.

Hagen and Weinstein (1995) discuss how self-evaluation relative to social standards affects effort and perceived ability. For example, a performance goal (“To be the winner”), emphasizes ability relative to the others. On the other hand, a mastery goal (“To do your best, this information is relevant and useful”), focuses on learning. Hagen and Weinstein (1995) discuss how students at all levels (including college) put forth more effort when the goal is not focused on performance relative to others. Students who focus on relative performance are more likely to attribute unsuccessful attempts to their lack of ability. Perceived lack of ability can reduce self-efficacy, motivation, and willingness to engage in self-monitoring.

Self-monitoring. Self-monitoring stimulates awareness because it forces deliberate attention on some aspect of a student’s behavior and can be actuated through self-recording or self-reflection. Weinstein taught time-management skills by asking college students to monitor the use of their time by keeping a detailed log (Zimmerman et al. 1994). The logs increased the students’ awareness of wasted time and led to better time management. Heightening the students’ awareness of wasted time ultimately enhanced the effectiveness and automation of time-management skills (Zimmerman et al. 1994; Brown and Pressley 1994).

Arredondo and Rucinski (1994) studied the use of reflective journals with both graduate and undergraduate education majors. Reflective journals were used to help students clarify their thinking and to record progress as part of a semester-long project. The student teams and the instructor periodically reviewed the journals together. The reflective journals and peer monitoring resulted in a higher level of involvement in the project, higher motivation, and more accurate monitoring by the students of their progress toward completion.

Lan (1996) performed an experiment using 72 graduate students in a statistics class to determine the relationship between student performance and three levels of monitoring: self-monitoring, instructor monitoring, or no monitoring. Members of the self-monitoring group recorded the frequency and intensity of

their learning activities. For each statistical concept, the students recorded the time and frequency of reading the textbook, the completion of assignments, participation in after-class discussions, the amount of tutoring, and other activities. The instructor-monitoring group evaluated the instructor's teaching and rated the instructor's pace of instruction, sufficiency of examples and assignments, and time allowed for questions. The self-monitoring group performed better than the other two groups on examinations, used more self-regulated learning strategies (e.g., self-evaluation, self-monitoring, seeking assistance, etc.) and developed better knowledge representation of course content (e.g., identified related concepts and organized them in an outline format).

Education Research on Enhancing Cognitive Learning Strategies

Implied in Figure 1 is a premise that learning is enhanced when the student has knowledge of multiple strategies that can be used to aid his or her learning. Cognitive learning strategies include rehearsing, elaborating, modeling, and organizing techniques, as well as many others. Two of these strategies, modeling and organizing, have been studied in the context of self-regulated learning and are summarized here. One objective is to provide examples of how teaching cognitive strategies can help the student become a self-regulated learner. Another objective is to provide examples of alternative cognitive strategies so that the student can make a choice about how to approach his or her learning objective. The studies presented here were selected because they focus on what the instructor can do to help the student learn how to learn. The studies on enhancing cognitive learning strategies are presented in Table 4, along with the instructional tools used, references, and major findings.

TABLE 4
Education Research on Enhancing Cognitive Learning Strategies

| Research Area | Instructional Tools | References | Major Findings |
|-----------------------|--|--|--|
| Modeling | • Instructor | Coppola 1995 Pintrich 1995 Hagen and Weinstein 1995 Trawick and Corno 1995 Zimmerman and Paulson 1995 | • Both instructor and peer modeling are effective ways for students to learn self-regulating strategies. |
| | • Peer | Orange 1999 | |
| Organizing techniques | • Note-taking • Spatial mapping • Graphic organizers | Hartley and Cameron 1967 Alvermann 1981, 1986 Kiewra 1989 Robinson and Kiewra 1995 Robinson 1998 Robinson et al. 1998 Katayama and Robinson 2000 | • Spatial notes are more effective than liner notes. • Graphic organizers are effective spatial maps. • For maximum learning, students should be furnished with partially completed notes and trained to use graphic organizers. |

Modeling

Instructor. Pintrich (1995), Zimmerman and Paulsen (1995), Hagen and Weinstein (1995), Trawick and Corno (1995), and Coppola (1995) all stress the importance of instructors' modeling various learning, thinking, and regulating strategies for students. For example, Pintrich (1995) discusses why the instructor should model his or her thinking so that the student can observe complete thought processes to learn how to think and reason through situations and develop self-regulated learning. Pintrich (1995) encourages the instructor to think about the way he or she solves problems and thereby make explicit the application of knowledge and ways of thinking inherent to problem solving. This is not to say that the instructor's way of thinking is optimal for every student. But it is important for the student to witness various learning approaches. Too often, as an expert in the field, an instructor will lecture and discuss a topic as if the student were familiar with all the underlying theory, vocabulary, and details of the discipline.

Coppola (1995) provides an example of how he used modeling to teach chemistry to undergraduates. Coppola (1995) makes explicit to the students that (1) learning itself is a process, and (2) the learning process is one of the instructional goals of his course. By heightening student awareness that learning is being taught, students are more likely to focus on the learning processes being illustrated. One technique Coppola (1995) discusses is how he uses incorrect responses as a learning tool. Instead of giving the correct answer, the incorrect response is used to show where the thought process may have gone awry. Discussion of incorrect answers provides the opportunity to introduce new material and to link new material with existing knowledge.

Another example discussed by Coppola (1995) is the use of the textbook as a training ground for developing and modeling thought processes. Although reading techniques are fundamental, explicitly stating how to use a textbook is very beneficial. For example, before reading the text the student should: (1) review subsections of a chapter to determine the context and the main areas, (2) skim the summaries or list of objectives, and (3) review the problems first to identify key learning points. This process guides the students how to seek out and organize information. Coppola (1995, 94) quotes a response from a student as testimony to his approach: "Not only is it obvious that you have an instructional plan, but you let us in on it."

Peer. Orange (1999) studied the effectiveness of peer modeling using a peer-advocated action plan. The study was a pretest-posttest control group design that measured college students' (education majors) self-regulatory attitudes and behaviors using a Self-Regulation Inventory developed for the study. The experimental group received training on self-regulation modeled after the Alcoholics Anonymous 12-step program. That is, the training was Academics Anonymous 12-steps to become a self-regulated learner; each of the 12 steps related to self-regulation. Training included videos of students who gave testimonials about how they previously were poor students. Testimonials revealed how the 12-step program helps poor students overcome their weakness and become successful students through self-regulation.

In Orange (1999), the experimental group made commitments to action that reflect self-regulation. Commitments were in the form of statements such as "I will time myself when studying to make sure I have time for each subject" and "I will not

study in places where I am likely to fall asleep” (Orange 1999, 26). The control group was not trained in self-regulation or exposed to the peer testimonials. The experimental group’s posttest measures of self-regulatory attitudes and behaviors increased significantly, confirming that the peer modeling was effective.

Organizing Techniques

In general, students have been found to be poor note takers (Katayama and Robinson 2000). It is not that the notes taken are poor, but often critical information is missing (Hartley and Cameron 1967). This deficiency motivated several studies to examine the benefits of providing students with more complete notes (see Kiewra [1989] for a review). These studies found that simply providing students with complete outlines has not proven to be effective for learning. The most effective notes are based on spatial, rather than linear, formats. Two spatial maps have emerged from this research: knowledge mapping and graphic organizers. Knowledge mapping is a node-link display that communicates relationships using two-dimensional space (Katayama and Robinson 2000, 120). Graphic organizers are similar to knowledge maps, but they do not use links to show relationships among concepts. Several studies have found that students perform better on tests when they are provided with graphic organizers to study along with the text (Alvermann 1981, 1986; Robinson and Kiewra 1995; Robinson 1998; Robinson et al. 1998).

Katayama and Robinson (2000) studied the use of graphic organizers and note taking on college students’ (education majors) factual recall and application abilities. Katayama and Robinson (2000) found recall and application of the material was better for students supplied with partially completed notes with graphic organizers than for students who were furnished completed notes or those who took all their own notes. Katayama and Robinson (2000) provide ideas about how much information should be provided so that maximum learning (encoding) takes place.

Summary

This section presented an overview of the research in education theory and psychology (outside the field of accounting) on how the instructor can promote a self-regulated learning environment. This research indicates that the students’ self-motivation can be enhanced when the instructor supports the students’ belief in themselves, self-awareness of their abilities and actions, and encourages resourcefulness. The research also indicates that the classroom environment can help students attribute outcomes to controllable causes, set challenging yet attainable goals, and self-monitor their behavior toward the achievement of their goals. This environment can be enhanced when the student utilizes cognitive learning strategies such as modeling and organizing techniques. The next section provides guidance on how the accounting instructor can promote self-regulated learning in the accounting classroom.

GUIDANCE ON APPLICATION IN THE ACCOUNTING CLASSROOM

As noted above, education research overwhelmingly supports the idea that instructors can enhance students’ self-motivation and use of cognitive learning strategies and that these have the greatest impact on the learning environment depicted in Figure 1. The guidance, therefore, for application in the accounting

classroom presented in this section focuses on enhancing students' self-motivation (i.e., the self-regulatory attributes and self-regulatory processes that affect self-motivation) and developing cognitive learning strategies (i.e., modeling and organizing strategies). This guidance is based on the collective findings of the research discussed in the previous section. In addition, examples of accounting education research will be integrated into the discussion and are displayed in Table 5 to show how accounting education research fits into the self-regulated learning framework depicted in Figure 1.⁴

This section provides suggestions to stimulate ideas for application of self-regulated learning in the accounting classroom. A critical element of this discussion is that the student *must* buy into the fact that the process of learning is something to be learned. The success of teaching self-regulatory learning begins with an adjustment of the student's attitude toward learning. The student must accept and even embrace the fact that he or she is responsible for *and* capable of learning. This means that the student must attend to the learning process itself.

Guidance for Enhancing Motivation

Since motivation is at the core of self-regulated learning (see Figure 1), it is the logical place to begin. Studies on motivation have focused on the effect of the instructor's motivation on the student and on the effect of the student's own self-efficacy, attributions, and goals on his or her motivation. Table 6 is organized by instructor enthusiasm and student's self-motivation and presents a summary of instructional objectives and guidelines on how to enhance motivation.⁵

Instructor Enthusiasm

Instructor enthusiasm for both course content and self-regulated learning has been shown to have positive effects on teaching and on student learning. Excitement for learning can be conveyed to students through the instructor's words and actions that motivate and reinforce upon students that they are capable of learning. In two studies, Patrick et al. (2000) examined instructor enthusiasm on students' motivation to learn and on their "psychological vitality." In the first study, 93 undergraduate students enrolled in introductory- and intermediate-level psychology courses rated their own motivation and their instructors' classroom behavior. Both zero-order correlations and regression analysis support a positive relationship between instructor enthusiasm and students' intrinsic motivation (self-motivation).

Patrick et al.'s (2000) second study was a controlled experiment with 60 undergraduate students enrolled in an introductory psychology course, in which instructor enthusiasm was manipulated to ascertain its causal influence on students' intrinsic motivation. A one-way ANOVA revealed a statistically significant relationship between instructor enthusiasm and both self-reported and observed intrinsic motivation. These results suggest that enthusiasm expressed by instructors affect the student's motivation to learn.

Perhaps the most fundamental thing the instructor can do is share a love of learning. Three masters of accounting education, Cunningham (1999), Hanno (1999), and Wilson (1999), discuss ways to "energize" teaching. While much of

⁴ See Apostolou et al. (2001) for a recent review of the accounting literature.

⁵ Recommended reading on motivation include Brophy (1987), O'Neil and Drillings (1994), and Reeve (1996).

TABLE 5
Accounting Research Categorized into the
Self-Regulated Learning Framework Depicted in Figure 1

| Area | Instructional Objective | References |
|-------------------------------|---|--|
| Motivation | | |
| Instructor enthusiasm | To provide guidance on how to "energize" teaching | Cunningham 1999 Hanno 1999 Wilson 1999 |
| Student's self-motivation | To enhance self-efficacy | Almer et al. 1998 Brown and McCartney 1998 Chen and Hoshower 1998 |
| | To increase self-awareness | Baird et al. 1998 Esmond-Kiger and Stein 1998 Almer et al. 1998 |
| | To encourage resourcefulness | None noted ^a |
| | To attribute outcome to controllable forces | Fogarty et al. 1998 Philips 1998 |
| | To set mastery goals | None noted ^a |
| | To enhance self-monitoring | Baird et al. 1998 Esmond-Kiger and Stein 1998 Almer et al. 1998 |
| Cognitive learning strategies | To model behaviors and processes | Siegel et al. 1997 Knapp et al. 1998 Krumwiede and Bline 1997 Edmonds et al. 1998 |
| | To learn organizational tools | Groomer and Heintz 1991 Schadewald and Limberg 1992 Greenberg 1996 |

^a A review of the accounting education research indicated that there were no studies that explicitly addressed this instructional objective as a primary focus.

the instructor-generated enthusiasm seems self-evident, it is perhaps the most critical and essential element in motivating students. Indeed, enthusiasm can be contagious. We are educators because we love to learn and want to share the power of knowledge with students. We should make that objective clearly evident in each classroom experience.

Use outside speakers. Aside from enthusiasm, the accounting instructor can enhance student motivation by sharing with the student the exciting and dynamic nature of the accounting profession. Outside speakers from the profession and alumni are potential sources for stimulating student interest in learning and helping them recognize the importance of the material. External speakers are an effective way to show that the topics being taught are important and emphasize that the ability to learn is essential for today's accounting

TABLE 6
Guidance for Enhancing Motivation

| Area | Instructional Objective | Guidelines |
|---------------------------|---|---|
| Instructor enthusiasm | To portray instructor enthusiasm | <ul style="list-style-type: none"> • Be excited about the topic. • Treat the student as if he or she is eager to learn. • Portray material as important to induce interest or appreciation of task. • Use dynamic outside speakers. • Learn the self-regulated learning model and then teach it. |
| Student's self-motivation | To enhance self-efficacy | <ul style="list-style-type: none"> • Establish an appropriate level of challenge/difficulty. • Set meaningful learning objectives. • Permit the student to express opinions. • Provide opportunity for student responses and feedback. • Induce the student to generate his or her own motivation. • Encourage the student to see that errors are part of the learning process rather than evidence of ability. |
| | To increase self-awareness | <ul style="list-style-type: none"> • Encourage self-recording and self-reflection techniques. • Have students complete inventory instruments (see Table 3). |
| | To encourage resourcefulness | <ul style="list-style-type: none"> • Require students to complete cases and assignments requiring research skills. • Require students to complete homework assignments before material is covered. |
| | To attribute outcome to controllable forces | <ul style="list-style-type: none"> • Portray effort as investment rather than a risk. • Link successful performance with successes. • Show the value of learning as a reward. • Provide feedback that encourages further effort. • Attribute failure to insufficient effort, lack of information, or reliance on ineffective strategies rather than ability. |
| | To set mastery goals | <ul style="list-style-type: none"> • Emphasize meaningful aspects of task. • Encourage short-term goals. • Support the use of learning strategies. • Let the student make some choice in assignments. • De-emphasize competition and social comparisons. • Have the student relate course topic to long-term goals. |
| | To enhance self-monitoring | <ul style="list-style-type: none"> • Require self-recording of study habits, intensity, and frequency. • Encourage intentional self-reflection toward goal attainment. |

professional. In short, they can help induce interest and make classroom topics come alive.

Training in self-regulated learning. A final suggestion for accounting instructors is to seek training in self-regulated learning so that they can teach the self-regulated learning model to their students. Once the instructor clearly understands the self-regulated learning model, it can be taught in such a way so as to show the student how to help accomplish learning goals throughout his or her lifetime. Although teaching a learning model may seem rudimentary to the instructor, it is in fact very useful to the student. As educators, we probably already self-regulate our learning but may not be fully aware of every attribute or process that supports our own thinking. If instructors are explicitly trained in a learning model and then explicitly teach it, the model will help their students develop the skills that many of us take for granted.

Instructor training specifically in self-regulation has been advocated by education researchers (Lindner 1993; Karabenick and Collins-Eaglin 1995; Talbot 1997b). Talbot (1997b) suggests that learning about self-regulated learning will help instructors become aware of techniques already in use and learn new ones. Talbot (1997b) believes that learning about self-regulated learning is applying self-regulated learning firsthand, and will therefore enhance the ability to teach this learning process. In addition, Talbot (1997b) suggests participation in motivational skills training as an effective way to learn about motivational strategies and techniques about motivating the student. Such training can help instructors learn that “to motivate” is to convince the student that learning is desirable, rather than that the consequences of not learning are undesirable.

Karabenick and Collins-Eaglin (1995) promote the use of instructor development seminars that include instructors from every discipline to address research on student learning and classroom design. Karabenick and Collins-Eaglin (1995) describe how one university offered a series of seminars in which instructors from many disciplines participated. These seminars focused on how to implement self-regulated learning in the classroom and measure the corresponding outcomes.

Student's Self-Motivation

Self-efficacy. Student motivation is closely related to the student's self-efficacy. Providing an opportunity for a student to participate in the learning process and express an opinion can enhance his or her self-efficacy. “Minute papers” afford an opportunity for the student to participate and express opinions by providing feedback about what was the one most important thing learned that day, and what was the one most important question left unanswered. This technique, when used by accounting educators, has been shown to increase student performance (Almer et al. 1998; Brown and McCartney 1998).

One method enabling the student to see that the instructor values the feedback from the minute papers is for the instructor to summarize the students' comments and questions along with the instructor's responses and begin the next class with that summary. This will provide an opportunity for the students to see that their input is seriously considered and that the instructor will respond to it. Demonstrating the value of student feedback will almost certainly promote student self-efficacy. In addition, these summaries serve as a bridge between each class, helping the students to attribute their feedback to the learning environment and permitting other students to benefit from the questions asked. Chen

and Hoshower (1998) apply expectancy theory to accounting education research, showing that student motivation was related to students' belief that their feedback was useful.

Self-awareness. Intentional self-monitoring can enhance the development of the student's self-awareness. Self-recording is one of the most common methods of increasing student awareness of learning behaviors and enabling students to evaluate progress toward a goal. Self-recording includes various forms of reflective writing. Reflective writing requires that students put into writing their thoughts, ideas, and questions with respect to a certain topic. The reflective-journal method of self-monitoring can be implemented in various ways. It could be used over a short period of time, such as for a specific project, or over an extended period of time, such as an entire academic year. The reflective journal requires students to document what they have learned, what modes of learning they used (reading, study groups, problems, etc.), how much time they spent using these learning strategies, what was critical to learn, and what questions remain. Ideally, a reflective journal is an ongoing document that helps students increase their awareness of what is being learned and how it is being learned.

Baird et al. (1998) required accounting students to complete short, in-class essays that synthesized and/or applied topics and concepts. Student feedback indicated that the writing helped them learn in a variety of ways. Using self-reflective theory, Esmond-Kiger and Stein (1998) required accounting students to write a self-reflective essay about ethics and about themselves in ethics-related papers. Most students believed that writing these essays helped them enhance their ethical awareness of themselves.

Student self-awareness can also be increased through the completion and subsequent discussion of results associated with the *Learning and Study Strategies Inventory (LASSI)*. This instrument (and others) can help students identify and reflect on attitude, motivation, time management, concentration, and other critical components of how they learn. Use of inventory instruments can potentially add value to a student's self-awareness by forcing the student to consider specifically what he or she was thinking about before, during, and after the learning process.

Resourcefulness. Resourcefulness involves knowing when and where to go for assistance as needed. Most accounting coursework requires that the student seek assistance from outside resources such as the authoritative accounting literature, the library, or the Internet. In addition to purposefully teaching what resources are available and how to use them, instructors can help the student recognize what resources to use and when. Some students will inefficiently spend hours on an issue they are trying to resolve while other students will expend much less unproductive effort before they go straight to someone else for help. Knowing when to get assistance is just as important to knowing where to go.

Obviously, cases and assignments that require research provide good ways to develop student resourcefulness. An alternative method for developing resourcefulness (and to practice self-regulated learning) is to require students to complete problems before a lecture—a painful process for students because they prefer a lecture, an example, and then an assignment. The instructor should explain that students are thereby developing learning skills and discuss how this will benefit them in the long run. During class a student might state how a problem was

approached and solved. Inevitably another class member will have made an error or completed the problem in a different way. The instructor can actively direct the discussion and integrate self-regulated learning techniques into the process by encouraging those students who approached the problem differently to share with the class what they did and why. Instructors should also encourage students who were unable to complete the problem to state where and why they got “stuck.” Often the class discovers that other students were stuck in the same place. If instructors discuss various problem-solving techniques and encourage discussion on ways to avoid faulty logic, then students learn from each other through peer modeling.

Attributions. The more students believe that their learning can be attributed to forces that they control, the more likely they will be motivated to learn. Students need to know that errors are part of the learning process and not evidence of inability. Instructors ought to repeatedly emphasize to students that errors inevitably occur while learning, and that the errors themselves are valuable to the learning process. In addition, the instructor can help students understand that they are capable of learning even the most difficult topics. This will help students view knowledge as attainable and not innate. Philips (1998) discovered that accounting students with a more sophisticated view of knowledge (e.g., knowledge is attainable, not inherently fixed or limited) had a positive association with performance on cases.

How the instructor handles the incorrect response is critical to how the student views his or her learning abilities.⁶ The typical accounting student wants to know the “correct” answer and is uncomfortable when he or she does not know it. The instructor can create an environment that dispels the notion that not knowing an answer is okay and not a sign of failure. For example, emphasizing that the student attempt assignments not for accuracy but for effort will reinforce that trying, albeit with mistakes, is part of the learning process. Grading exams and giving credit for correct logic rather than exact answers will reward the student for thinking rather than memorizing. Once the student attributes the learning outcome to the investment made by trying (rather than only by succeeding), he or she is more likely to take the risk needed to master the material. Fogarty et al. (1998) studied accounting student effort and found it to be a significant link to student performance; therefore, as the student makes mistakes and corrects them, instructors should make explicit the link between effort and learning.

Goals. Alignment of teaching and learning goals can be explicitly demonstrated by requiring the student to define his or her course goals at the beginning of the semester. The more clearly students define these goals, the more ownership they will take of them. The instructor has the responsibility to make sure the assignments, projects, and examinations also emphasize the course goals. The instructor should encourage students to set their own personal short-term and long-term goals, not permitting them to think of getting an “A” as a short-term goal or graduating as a long-term goal. Since it is the *students’* education, instructors should ask them to think about what they want to accomplish. Thus they help the students relate individual tasks to long-term goals and support short-term goals by letting them have some choice in learning strategy and in assignments.

⁶ For further information on the effect of questioning techniques see Francis et al. (1995) and Karabenick and Sharma (1994).

To help students see a long-term goal beyond just getting through school, instructors can provide them with a listing of the core competencies identified by the profession (AICPA 1998, 2000), the professionals (*Perspectives* 1989), and academics (AAA 1986; Albrecht and Sack 2000). These sources make clear the argument that in addition to technical competency, accounting professionals need skills that include communication, leadership, logical reasoning, problem solving, and learning to learn.

Self-monitoring. For students to self-monitor progress toward the attainment of a goal, they must have a set goal for comparison. Self-regulated learning supports the use of mastery goals rather than performance goals. First and foremost, students must view the goal as attainable and theirs. To do this, they must believe that mastering the topic is attainable. Accounting instructors can play a crucial role influencing this belief. Students' must *believe* that knowledge is attainable; otherwise the learning effort is defeated before it begins.

Second, to effectively self-monitor performance, the mastery goal should be clearly defined. However, students should realize the impossibility of mastering every aspect of accounting; they must be selective in determining what they should master. Learning is defeated if the perception is that every minute detail must be mastered. Here the accounting instructor can provide guidance about which factors and core concepts are critical. For example, it is more important for the student to master the criteria for revenue recognition and the concepts of earned and realized, than to master details related to a unique industry.

Guidelines for Teaching Cognitive Learning Strategies

The successful student develops a strategy based on the situation and actively revises that strategy through evaluation of his or her progress toward the learning goal. Learning strategies mean how the learner approaches organizing, connecting, practicing, and solving problems related to the learning goal. The learning strategies presented here are only a few that support the development of self-regulated learning.

Modeling

Instructor modeling is perhaps the most accessible and widely available teaching tool.⁷ This method is simply the explanation of the instructor's logic and thought processes as the instructor solves the problem for the students. It is indeed "thinking out loud." While instructor modeling seems clearly obvious and most instructors would profess to be modeling already, exhibiting complete and thorough modeling is painfully slow to most experts. That is, as experts in our field, accounting instructors unwittingly make many assumptions, skip steps, and presume the process being explained is clear. An instructor who is modeling his or her thought process and logical approach must explicitly state each step, even those that have become automatized. Obviously, time will not permit detailed instructor modeling for each problem. However, a few examples of instructor modeling should be sufficient to give the student a general idea of how to approach a problem.

Knapp et al. (1998) display how accounting heroes can be used to model ethical behavior for accounting students. Through example, these accounting heroes

⁷ For further reading on modeling see Gorrell (1993) and Lochhead and Clement (1979).

show students how to conduct themselves in an ethical and professional manner. Siegel et al. (1997) use video simulation of an audit to model audit processes and procedures.

Organizing Techniques

Perhaps the learning strategy most applicable to accounting education is the use of graphic organizers.⁸ Graphic organizers are heavily used in accounting textbooks. In intermediate accounting the “house of GAAP” is illustrated by classifying into categories the levels of authoritative literature (Kieso et al. 2001, 14). In advanced financial accounting the purchase price of an acquired company is decomposed by use of a vertical line to show the differences between investment cost and fair market value and book value (Baker et al. 1999, 179). In this context the graphic organizer presents a visual representation of the material to be learned. Instructors can promote the use of organizers by showing students examples of how the organizers can help them grasp the material and connect what is currently being learned to what has previously been learned.

A final learning strategy is note taking. Education research indicates that instructors should not provide completed notes for the student (Katayama and Robinson 2000). Maximum encoding takes place when the student actively participates in the note-taking process. The student should be encouraged to summarize text materials into his or her own words because when studying the material later, the student will understand and remember better. In-class lecture notes should be partially completed to permit room for the student to fill in interpretations. When homework assignments are covered in class the student should make marginal notes and corrections (preferably in a different color) and not erase the mistakes made on the homework. The notes and corrections serve as a critical learning tool when the student goes back to his or her notes to study.

IMPLICATIONS FOR ACCOUNTING EDUCATION RESEARCH

Self-regulated learning is a professionally desirable skill and plays a crucial role in academic success. However, implementing self-regulated learning in the classroom is only one phase. Accounting education research is needed to determine the effect of changes made in the classroom on learning outcomes in order to evaluate the effect of teaching these strategies. Research that supports the implementation of self-regulation should validate the integration of these learning strategies and help administrators recognize the impact of, and provide support for, teaching self-regulation.

As accounting educators pursue methods that promote self-regulate learning, accompanying research can provide empirical evidence of the outcome of those efforts. Education researchers (outside the field of accounting) have taken two approaches in the examination of self-regulation and learning: (1) descriptive/correlational and (2) intervention/causal. Accounting education researchers can follow this lead and focus on either descriptive/correlational or intervention/causal research. This section and Table 7 present the education research discussed earlier in this paper, classified into one of these two categories.

⁸ For further reading on graphic organizers see Alvermann (1986), Katayama and Crooks (1999), Robinson (1998), and Robinson and Kiewra (1995).

TABLE 7
Classification of Research on Self-Regulated Learning
by Research Design

| Research Design | Reference | Findings |
|---------------------------|---|--|
| Descriptive/Correlational | Zimmerman and Martinez-Pons 1986, 1988 Lindner and Harris 1992 Graham and Harris 1994 Coppola 1995 Hagen and Weinstein 1995 Pintrich 1995 Lindner et al. 1996 Talbot 1996, 1997a Everson et al. 1997 Orange 1999 Katayama and Robinson 2000 | <ul style="list-style-type: none"> • High achievers employ more self-regulated learning strategies. • Completion of the self-regulated inventory increases student awareness. • Increased awareness leads to use of self-regulated strategies. • Instructor modeling of thought processes and reasoning enhances student learning. • Specific goal criteria more effective than general criteria. • Unsuccessful performance related to social goals reduces self-efficacy. • The learning-oriented student is aware of his or her abilities, attitudes, and behaviors and uses more self-regulating strategies. • Peer modeling of self-regulating strategies is effective. • Supplying partially completed notes results in better knowledge retention than supplying completed notes. • Graphic organizers are effective learning aids. • Graduate students are better at self-regulated learning than undergraduates. • Knowledge monitoring is not domain specific. |
| Causal | Schunk 1983a, 1983b, 1983c, 1984 Wood and Bandura 1989 Arredondo and Rucinski 1994 Hagen and Weinstein 1995 Lan 1996 Patrick et al. 2000 | <ul style="list-style-type: none"> • Instructor motivation influences student motivation. • Feedback intervention on attributions affects self-efficacy, motivation, and task performance. • Feedback intervention on ability affects perceived ability, goal setting, and motivation. • Interjected goals influence self-efficacy and motivation. • Self-monitoring increases use of self-regulated learning strategies and performance. |

Descriptive/Correlational Studies

Descriptive/correlational research has identified the attributes of those who naturally engage in self-regulation. Determination of these behaviors has been obtained through verbal protocols, interviews, and inventory assessments. Education researchers have viewed the self-regulated learner as “the expert.” Therefore, the descriptive research thus far is analogous to the novice-expert methodology used to study cognitive learning. In the novice-expert research, the expert is studied to determine skill performance within a particular domain, and then the expert’s actions are compared to those of a novice who has minimal competence within the domain. The ultimate goal is to move the novice toward the expert level as effectively as possible.

Research on the existence and effectiveness of the accounting major’s self-regulated attributes and processes is a fruitful area for accounting education researchers. Using the measurement instruments developed by education researchers, the accounting education researcher can provide a learning profile of the typical accounting major. To the extent that student attributes differ across disciplines, descriptive research on the accounting student would reveal these differences or confirm the similarities. Understanding the learning attributes and processes innate in the accounting major is an essential step in knowing how to design studies that can be used to develop the student’s self-regulated learning skills. Learning how to self-regulate one’s learning requires development over time and, therefore, a commitment from accounting educators. Therefore, studying the effect of teaching self-regulated learning can be captured only over periods of time in longitudinal studies.

To complete descriptive studies, accounting education researchers have the benefit of existing inventory assessment tools (Table 3). Perhaps the first significant research for accounting education researchers is to establish the validity of these instruments for application in a collegiate accounting setting. Once the validity of these instruments is established, collecting data to obtain an accounting student profile can provide information about what skills are already developed and what skills need to be strengthened. Lindner and Harris (1992) advocate such an assessment because academic difficulty may be less a matter of ability than of the student’s failure to know how to take control of the learning process. For example, assume a student has excellent metacognitive strategies (e.g., reflecting and monitoring) and a repertoire of learning strategies. If the student believes that ability to learn is innate rather than acquired, then he or she will not pursue the learning task because the student believes learning ability cannot be acquired. In this example the problem lies in the student’s failure to apply the skills of learning, not the absence of a learning skill. Therefore, accurate assessment of learning attributes and processes is necessary for classroom implementation efforts to achieve the intended objective.

When designing descriptive studies the researcher must keep in mind that the design should allow the student to exercise control over choices. Most classroom structures and even certain research procedures *compel* the student to act, therefore preventing any self-regulating behavior (Zimmerman 1994; Talbot 1997a; Boekaerts 1999). To test for self-regulation, the student must be given alternative choices to approach the learning task. By including choice in the research design the researcher can make inferences about ability to self-

initiate and self-control the learning strategy (i.e., self-regulation) vs. about the use of a learned strategy (i.e., a learning outcome).

Intervention/Causal Studies

Intervention is the experimental approach most often applied in education research on self-regulation. This approach attempts to identify causal relationships between self-regulation and learning variables. Education researchers have manipulated some aspect of the learning processes as an independent variable and examined the self-regulated learning processes and outcomes as dependent variables. From these experiments, the researchers explored how processes affect student learning. These studies employed experimental vs. control groups and pre-experiment vs. post-experiment testing. Quantitative statistical tools were used to measure the changes, usually over a short period of time.

Most intervention/causal studies have focused on one process and held the others constant. This focus is important for experimental control and explaining how changes in self-regulatory behaviors relate to experimental variables. However, it does not capture the dynamic nature of self-regulation and the interaction among processes (see Figure 1). Although the study of interactions may sacrifice some experimental control, this type of research would provide valuable insights into the self-regulatory process as a whole. Therefore, current educational research on the self-regulated process has moved away from exploring the relationship between a student's behavior and what the student learns toward the study of what is going on inside the learner. These researchers are interested in how the learner manages or regulates the learning process, a critical point because it is the learner's active involvement in the process that distinguishes self-regulated learning.

Ridley et al. (1992) tested the interactive influence of two self-regulatory processes on student performance: (1) goal setting, and (2) self-awareness (metacognitive awareness). As hypothesized, the interaction of being asked to set clearly defined goals and a tendency to develop a high degree of metacognitive awareness best facilitated student performance on a decision-making task. Using 89 junior and senior undergraduate students (education majors), the findings support the view that there are interactive components of self-regulation. Ridley et al. (1992) concluded that using goals to enhance motivation might not be enough. Instead, education aimed at developing metacognitive awareness *and* motivation is important to foster self-regulated learning.

More intervention studies need to take place in actual learning settings (Schunk and Zimmerman 1994). For example, there is a need for studies that test how well student perceptions translate into actual activities in the classroom and whether self-reported self-regulatory processes are actually acted upon. This type of research would require a design that uses multiple phases, such as baseline, interim, and ending assessments that could take place over one semester, one year, or four years.

In addition, education researchers have not explored whether changes in learning behaviors are sustained over time and generalizable across settings and tasks. Assessment using longitudinal studies over extended periods of time will help determine the long-range benefits of self-regulation. Indeed, self-regulation is not developed in one course; self-regulating strategies need to be practiced and developed over multiple courses in order to cultivate a self-regulated learning environment. As such,

student portfolios can be a useful measurement tool to monitor self-regulatory development. Student portfolios may contain documentation of short-term and long-term goals, examples of written assignments, logs of study habits, and a self-assessment of the student's own progress toward his or her learning goals.

Although longitudinal studies may be viewed as cumbersome and time-consuming, they promise to hold the greatest insight to understanding the development of self-regulating strategies. Longitudinal studies provide an opportunity for accounting instructors to rally together and study the progress of the student from introductory courses to graduation and beyond. Integrating self-regulation into the accounting curriculum will provide multiple opportunities for the student to practice self-regulation and process course content serially over time. This deliberate and consistent approach can develop expert self-regulating skills (Butler and Winne 1995). Studies that explore student strategy development during the collegiate experience and into the professional career can make great contributions to the literature.

The first phase could be a baseline pretest in the introductory accounting course. Subsequent phases could study training in multiple courses such as intermediate, systems, tax, or managerial. Assessment of self-regulatory skills can thus be measured periodically over the student's academic career and post-tested upon graduation. Again, this recommendation would require increased collaboration among instructors and those involved in a longer research window. However, because accounting education now strives for long-term effects, study of the student progress over long periods of time is germane to assessing the effectiveness of teaching lifelong learning.

SUMMARY

Self-regulatory learning promises to provide accounting graduates with skills that are demanded in today's profession. This paper presents a model of self-regulated learning and describes how the core element is the learner's self-motivation to learn. Self-motivation is influenced by the learner's self-regulatory attributes and self-regulatory processes. Literature outside of accounting is reviewed and examples are presented of how the instructor can create a classroom environment that promotes the self-regulatory attributes and processes that enhance self-motivation. This literature also shows that teaching cognitive learning strategies can help students develop their self-regulated learning. Based on the self-regulated learning model and the findings of education researchers, this paper offers suggestions to accounting educators on how to support self-regulated learning in the accounting classroom and provides ideas for accounting education researchers on how studies can support these classroom efforts.

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