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Self-Regulated Learning in an Introductory Undergraduate Accounting Course

A dissertation

presented to

the faculty of the Department of Educational Leadership and Policy Analysis

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Doctor of Education in Educational Leadership

by

Lana Lowe Becker

August 2011

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Keywords: accounting education, self-regulated learning, lifelong learning,
learning strategies, novice learners, metacognition

ABSTRACT

Self-Regulated Learning in an Introductory Undergraduate Accounting Course

by

Lana Lowe Becker

Self-regulated learning skills have been shown to positively impact academic achievement in educational settings. This same set of skills becomes critically important as graduates enter today's dynamic work environment. That environment increasingly requires accountants and other professionals to be lifelong learners. This study is a response to the call of the Accounting Education Change Commission (AECC) to make "learning to learn" a priority in the accounting classroom. This study used a quantitative, quasi-experimental design within the context of a beginning accounting course. The course is characterized by high failure rates, highly conceptual content, and a population of novice learners.

Study participants were stratified according to ACT level, prior GPA level, and academic major. The control group received instruction based on course content only. The treatment group received an intervention in which instruction focused on the *process* of learning as well as on regular course content. The purpose of the study was to determine whether academic performance differed between the 2 groups. The study further examined whether differences in the means on exam scores varied as a function of ACT level, prior GPA level, or academic major.

A MANOVA indicated a significant difference in exam scores between the control and treatment groups with the treatment group outperforming the control group on 4 of the 5 exams. Follow-up ANOVAS were used to determine on which exams statistical significance was found. Two-way ANOVAS revealed no significant interaction between classroom method and prior GPA or academic major. Although statistical significance was not found in the interaction between classroom method and ACT level, descriptive statistics revealed that the greatest differences (between the mean exam scores of the control and treatment groups) occurred among the high-ACT group.

The researcher did not attempt to trace causal paths, or changes in the mediating variables that may have linked changes in the learning environment to changes in academic performance. This study provided evidence that instruction related to the *process* of learning did not diminish academic performance on content-based exams and for most groups of students who received such instruction performance on exams was enhanced. This study casts doubt on the presence of a “ceiling effect,” which is often associated with high-ACT students.

DEDICATION

I dedicate this work to the loving memory of Annie Lowe Hunt (my sister), Gentry W. Lowe (my father), and Margaret Homfeldt Lowe (my mother).

My sister's wise and loving words provided the encouragement I needed to set out on this rewarding journey. Memories of my mother's wonderful sense of humor reminded me to keep all things in perspective so that I could truly enjoy the journey. My father's legacy as a dedicated and distinguished educator led me to the profession of teaching and provided the inspiration I needed to make it to this final destination.

ACKNOWLEDGEMENTS

I extend my sincere gratitude to the members of my dissertation committee:

Dr. Terry Tollefson (Chair)

Dr. James Lampley

Dr. Pamela Scott

Dr. Karen Tarnoff

I especially wish to thank Dr. Tollefson for his consistent words of encouragement and kindness. His calm, professional, and insightful approach truly transformed problems into challenges and allowed me to continue on the path to completion of this dissertation with optimism and confidence.

I also wish to express my appreciation to the faculty, staff, administrators, and students of the ETSU College of Business & Technology who have supported my efforts. I am especially grateful to Dr. Paul Bayes, Dr. Gary Burkette, and Dean Linda Garceau for encouraging and supporting my professional development through this doctoral program.

The completion of this dissertation would not have been possible without the love and encouragement of my wonderful family: my husband Ben and sons Edward and Bennett.

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CHAPTER 1

INTRODUCTION

The dynamic nature and complexity of the business world and American society in general have made it increasingly important for institutions of higher education to graduate students who possess a proficient set of learning skills as well as content knowledge (Cassidy, 2007; Knapper & Cropley, 2000; Moser, Hasanbegovic, & Metzger, 2008;). Business graduates especially will be confronted with a workplace characterized by globalization, emerging technologies, novel problems, increasing uncertainty, and a rapidly changing knowledge base (Albrecht & Sack, 2000). Because the content knowledge students acquire during the college years is likely to become outdated quickly, it is imperative that institutions of higher education, and business schools in particular, respond to this environmental change by taking deliberate steps to develop lifelong learners so that graduates can “maintain competency” (Leauby & Brazina, 1998, p.123) in their professions.

Lifelong learning is not a new educational phenomenon but one that has received substantial attention in higher education in recent years. As early as the 1960s and before the term “lifelong learning” emerged in education, the educational theorist, John Dewey, suggested that education could be evaluated in terms of how well it developed the desire for “continuous learning” and how well it provided the means to carry out such learning (Smith, 1982). Two decades ago Weinstein and Mayer (1986) and Smith (1982) anticipated the increasingly important development of lifelong learning skills when they advocated a dualistic teaching focus. They recommended that college teachers adopt teaching goals concerning the “products of learning” (content knowledge) as well as teaching goals concerning the “process of learning.” The process of learning includes making the connection between learning and real life and appreciating the

necessity for lifelong learning. Furthermore, the process of learning involves the possession of a set of learning skills that are efficacious in responding to novelty and change, referred to as skills with transfer potential in the literature (Marini & Genereux, 1995). Such skills are not innate but generally must be acquired in an academic setting according to Knapper and Cropley (2000). As higher education institutions disseminate content knowledge in the college classroom through academicians who are experts in their fields, it is in this same classroom where higher education institutions must demonstrate their commitment to lifelong learning by helping students develop the necessary set of skills (Caprara et al., 2008; Pintrich, 1995; Schraw & Moshman, 1995).

Leaders of accounting education programs, in particular, have consistently been encouraged by the professional community to adopt a dual focus. An emphasis on “learning-to-learn” has been a salient theme in a series of studies and reports that were initiated by the American Accounting Association (Eide, 2000). Beginning with the Bedford Committee appointed in 1986 accounting professionals determined that the traditional rule-based, textbook-bound, and mechanical approach to accounting education was inadequate for preparing young professionals for a highly dynamic work environment. Subsequent calls for changes in accounting education were embodied in the widely supported Accounting Education Change Commission (AECC), which has been described as an important catalyst for change in accounting education (Nelson, 1995). The AECC (1990) explicitly stated that “The overriding objective of accounting programs should be to teach students to learn on their own” (p. 09). Consistent with the opinions of leading educational psychologists, the AECC attributed the need for movement toward a lifelong learning focus to the “...dynamic, complex, expanding, and constantly changing profession for which students are being educated” (p. 307). The Albrecht and Sack report (2000) continued to argue that the overemphasis on technical knowledge or

content in accounting classrooms was at the expense of the development of learning skills that were crucial in the profession.

The fusion of the accounting education and educational psychology disciplines offers promise and provides direction for accounting educators who are summoned to make changes in the way that accounting is taught (Paris & Paris, 2001; Svinicki, 1994). Research related to the learning construct of self-regulated learning (SRL) is particularly relevant to accounting educators as they consider how to develop students' lifelong learning skills in accounting classrooms. The goal of self-regulated learning is "updating skills, acquiring new knowledge, and solving new problems throughout life" (Smith, 2001, p.664), which interestingly parallels the AECC's recommended goal for accounting education. As higher education institutions, business schools, and accounting programs respond to the "learning-to-learn" imperatives from the external environment, educational research related to the construct of self-regulated learning provides a plethora of empirical evidence about how students approach learning (i.e., attitudes, epistemological beliefs, goals), how they apply strategies for learning (i.e., how to assimilate complex material), and how they evaluate the effectiveness of such strategies. These three phases of the academic learning cycle have been referred to as forethought, performance, and self-reflection (Zimmerman, 1998). The learning cycle is completed when self-evaluations affect forethought related to subsequent learning tasks.

Self-regulated learning is closely aligned with the educational philosophy of constructivism. From the constructivist perspective, learners are active in their learning and construct meaning internally rather than passively receive knowledge from external sources (Pintrich, 2000). Self-regulated learning focuses on the "how-to-learn" skills necessary for lifelong learning and simultaneously offers the potential for increased academic performance by

students who develop such skills (Zimmerman, 1989b). Students' acceptance of responsibility for their own learning is the nucleus of self-regulated learning (Masui & De Corte, 1999). In other words, "learning is not something that happens *to* students; it is something that happens *by* students" (Zimmerman, 1989b, p.22). Knowledge is not passively received by students but instead meaning is constructed in the minds of students (Eide, 2000). The theory of self-regulated learning views students as "...metacognitively, motivationally, and behaviorally active participants in their own learning process" (Zimmerman, 1986, p.308).

Although self-regulated learning is complex, multifaceted and resides at the "junction of several fields," according to Boekarts (1997, p. 62) it is equally practical because self-regulatory knowledge, skills, and attitudes can be transferred from one learning context to another as well as to workplace and leisure settings (Marini & Genereux, 1995). Furthermore, self-regulated learning skills are best developed in authentic classroom settings (Hattie, Biggs, & Purdie, 1996), where powerful learning environments (Boekarts, 1997) can provide opportunities for students to develop, practice, and increase their level of self-regulation and move toward lifelong learning.

As accounting educators and other educators consider pedagogical shifts toward designing classrooms and instructional plans that develop lifelong learning skills, it is helpful to consider how self-regulated learning intersects with theories related to goal setting, students' approaches to learning, and epistemological beliefs. Because self-regulated learning involves both "will and skill" (Paris & Winograd, 1990), consideration must be given to motivational factors as well as to the development of metacognitive skills (Kinzie, 1990). Each student brings a unique set of intellectual abilities, prior educational experiences, attitudes, and beliefs about knowledge to college classrooms. Students' epistemological beliefs have been identified as a component that needs to be added to the traditional self-regulatory models in the most recent

literature (Hofer & Pintrich, 1997; Muis, 2007; Schommer, 1990). Beliefs about knowledge affect goal setting, choice of strategies and, ultimately, academic achievement (Muis & Franco, 2009).

The learning environment plays a crucial role in the development of self-regulatory skills in terms of both student confidence and competence (Pajares, 2002). “While educators cannot influence the orientation to learning that students bring to their studies, they are able to manipulate the learning context, providing a window of opportunity to influence the approach students adopt, and therefore the quality of student learning” (English, Luckett, & Mladenovic, 2004, p.463). Paris and Paris (2001) suggested that a classroom focus on “how to” offered minimal opportunity for developing lifelong learning skills. In contrast, a classroom in which the question “Why?” was often heard was considered to move students beyond remembering to understanding and, perhaps more importantly, to know the difference between the two (Moran, 2005). Accordingly, courses that were considered more difficult and conceptual were deemed to offer greater potential for the development of the skills related to self-regulated learning and lifelong learning (Paris & Paris, 2001; Pressley, Yokoi, Van Meter, Van Etten, & Freebern, 1997) than did courses where unsophisticated strategies requiring memorization were used by students to learn the subject matter. Conceptually oriented courses were deemed to challenge the students’ self-defeating epistemological beliefs (i.e., remembering equates to understanding) (Moran, 2005) which can limit the students’ use of appropriate strategies (Hofer, 2000).

Interestingly, the self-regulatory skills that were considered essential to lifelong learning and future professional success were likewise viewed as fundamental to students’ academic success in college classrooms (Cassidy, 2007). As suggested by Smith (1982), “... [A]cademic difficulty may be less a matter of ability than of the student’s ability to know how to take control

of the learning process” (p.691). Paris and Paris (2001) summoned educators to share with students what was known about self-regulated learning in terms of its relationship to their academic performance and their future professional success. Knowing that performance hinges on more than intellectual ability should increase motivation as should understanding the relevancy of self-regulated learning to their future professions (Garner, 1990). Beyond this mandate for full disclosure, educators should incorporate instructional activities within college classroom settings that foster and develop self-regulation, providing positive models of learning strategies (Paris & Paris, 2001).

A beginning accounting course is offered at most colleges and universities and is a required course for students in business programs as well as in many majors across campuses. Therefore, many of these students are considered novice learners in the accounting discipline (Froman, 2001). Students in such courses are generally in their second year of academic study and have completed most of their general education coursework. From the perspective of accounting faculty members and administrators, this course is highly influential in whether students choose an accounting major (Deberg, Adams, & Lea, 1998). The course should provide students with a strong foundation for future accounting studies and insight into the nature of the subject of accounting and its related profession. For the 80%-90% of the student population who are not accounting majors, the course provides a foundation for understanding how organizations measure the results of their operations. Such understanding is relevant to a wide array of disciplines because accounting information intersects with many fields of study within and outside colleges of business.

Unfortunately, beginning accounting courses at most colleges and universities have been plagued by high failure rates (Froman, 2001; Kealey, Holland, & Watson, 2005). Anecdotal

evidence and evidence-based inquiry suggest that both the nature of such courses and characteristics of students who take these courses make them “high-risk” courses on many college campuses. Specifically, the courses are often characterized by content that is highly comprehensive and developed from conceptual foundations with many interrelationships to be understood. In response to such inherent challenges that are associated with the courses, introductory accounting educators continue to experiment with alternative methods of teaching the subject, various types of homework, including online systems, and various approaches to the subject (e.g., case approach, “user” approach) to increase student learning and to ultimately improve comprehension and the passing rates (Froman, 2001). Recognition that the field of educational psychology might hold some of the solutions was expressed by Brazelton (2000) as he applied Bloom’s *Taxonomy of Educational Objectives* to the accounting curriculum. Unfortunately, approaches that focus on teaching rather than on learning have had only limited success. Assuming that learning outcomes depend only on what the instructor does limits the chances of improving academic performance. Instead, learning outcomes should be viewed as contingent upon both what the instructor does and how the student goes about processing the information and attempting the academic tasks (Eide, 2000).

A highly diverse group of students often enters a beginning accounting course with little exposure to the subject of accounting but often with anxiety. Feelings of academic hopelessness and a lack of self-efficacy have been found to be common for novice learners in courses that had reputations for high failure rates (Brown 1988; Sharma, 1997). Highly anxious students have relied on rote memorization and rehearsal strategies instead of relying on more effective strategies such as elaboration or organizing strategies for learning (McKeachie, Pintrich, & Lin, 1985).

In many cases students have entered the introductory accounting course with incorrect preconceptions about the subject and, more importantly, about knowledge in general (Mayer-Sommer, 1990; Paris & Winnograd, 1990; Winne, 1996). For example, students might mistakenly believe that the subject consists of unrelated facts and that an accumulation of these facts constitutes knowledge of the subject (Moser et al., 2008). Students' prior educational and other experiences have been found to influence their knowledge or epistemological beliefs, which, in turn, have affected their levels of motivation, the goals they set, and how they approached and organized difficult course content (Moran, 2005; Van Rossum, Deijkers, & Hamer, 1985). In a highly conceptual course such as a beginning accounting course, these tacit and often incorrect assumptions may lead students to set surface-level or performance goals, to employ simplistic strategies such as memorization for learning complex material, and to poorly assess their learning progress. Furthermore, because of limited knowledge of the subject, students are less able to discern critically important content from less important content (Mayer-Sommer, 1990) and they are less capable of "seeing the big picture" that emerges only when relationships are understood and connections are made. Students who have limited knowledge of a subject often do not recognize the complexity of course material and consequently are unable to accurately assess whether they have learned the content (Stone, 2000). Described as low calibration, this inability to self-evaluate or "know what you know" hinders academic efforts and ultimately academic performance.

The nature of the beginning accounting course and the students who enroll in the course suggest that the opportunity exists to help students "learn how to learn" while simultaneously providing the support that is needed to improve their chances for academic success in the course. It must be clarified that self-regulation of learning is not an "all-or-nothing" concept but rather it

is a matter of degree according to Boekarts (1997). The goal within the college classroom is to move students toward a higher degree of self-regulation. Just as it is illogical to think that most students can move to higher-level mathematics without assistance, it is equally incongruous to believe that students will move to higher levels of self-regulation without intervention and support. Consistent with the learning of math, students who are “learning how to learn” benefit from similar instructional interventions including modeling (Zimmerman, 2000) and scaffolding or slowly removing instructional support as students develop skills and move to higher levels of metacognitive functioning (Winnips, 2000).

Because of the multifaceted nature of self-regulated learning and the interrelatedness of its components, instructional design and support must encompass all three phases of the academic learning cycle described by Zimmerman (1998). The phases of forethought, performance, and self-reflection describe the notion that learning is a function of what happens before, during, and after academic tasks are attempted. An intervention must address students’ general epistemological beliefs and their self-efficacy about the course as these attitudes affect the goals students set and the amount of effort and persistence they bring to the course (Bandura, 1986). To address these forethought aspects of the academic learning cycle steps must be taken to raise students’ awareness of the role of self-regulation in academic achievement and, more importantly, awareness of their own level of self-regulation (Eide, 2000).

Furthermore, beginning accounting courses must include strategies to be used during instruction. Accounting classrooms should be designed to help students distinguish between critical content and less important content, help students see the “big picture,” and provide modeling of structural aids and other strategies for processing complex course material. Finally, course activities must provide the opportunity for students to reflect and evaluate their progress

toward learning the material. Self-reflective activities that prompt students to consider why they were successful or unsuccessful in course tasks can move students toward higher levels of self-regulation. Specifically, self-regulated learning provides an opportunity to “bridge the gap between teaching students disciplinary knowledge and allowing them to acquire strategic knowledge” (Boekaerts, 1997, p.161).

Purpose of the Study

It has been established that lifelong learning is not only desirable but necessary for college graduates entering their professions. Lifelong learning requires that students accept personal responsibility for their learning and possess the skills associated with self-regulated learning. Self-regulated learning research further indicates that learning skills are best developed within an authentic learning context or regular classrooms where discipline-specific content is taught (Hartman, 2001; Hattie et al., 1996; Paris & Winograd, 1990). Furthermore, effective self-regulated learning has been determined to be a strong predictor of academic achievement (Zimmerman & Martinez-Pons, 1986). Although prior research has solidly established this association between self-regulatory skills and academic achievement, higher education continues to struggle with the most effective ways to develop higher levels of self-regulation in students (Ragosta, 2010).

As accounting programs address the “learning-to-learn” imperatives of the professional community, the introductory accounting course possesses characteristics that make it a logical course in which to embed the development of students’ learning skills. However, a meta-analysis conducted by Ragosta (2010) indicated that business educators generally, and accounting educators specifically, had not significantly engaged in research to investigate how to

move college students toward higher levels of self-regulation. Using eligibility criteria to capture the most robust studies, Ragosta's meta-analysis involved 55 self-regulated learning intervention studies between 1983 and 2008 in various disciplines. Only one of the 55 studies took place in a business discipline (accounting) where the intervention occurred in a computer-mediated training environment.

The purpose of this study was to address this apparent gap in accounting education research. Specifically, the purpose of this study was to determine whether a beginning accounting classroom designed to focus on "learning-to-learn" (i.e., the process of learning, self-regulation) as well as content could move beginning accounting students toward higher academic achievement in the course. Ames and Archer (1988) found that students who perceived that the learning environment prioritized mastery goals in which emphasis was placed on learning and developing new skills were more likely to use learning strategies that positively contributed to academic success and lifelong learning. Because of the multidimensional design of this study, conclusions about specific "causes-and-effects" such as which element in the intervention affected or did not affect academic performance could not be drawn. Instead, a broader question of whether a multidimensional intervention was associated with higher levels of academic performance of students in the course was addressed in this study. Furthermore, this study examined whether particular subgroups of students (groupings based on ACT score, prior GPA, and academic major) responded differently to the self-regulated learning intervention.

Recognizing that self-regulated learning is multidimensional with interrelated components, it is logical that a classroom intervention should also be multifaceted if it is to be successful (Hattie et al., 1996; Ley & Young, 1998; Paris & Paris, 2001). Specifically, the accounting classroom intervention associated with this study encompassed the forethought,

performance, and self-reflective phases of the academic learning cycle while attempting to raise students' awareness of their own level of self-regulation and its importance to their academic achievement and professional success. Although moving students towards becoming lifelong learners was an important auxiliary goal for the intervention, it was the effect of the classroom intervention on academic performance that was the purpose of this study.

Research Questions

This study is designed to investigate the following research questions:

1. Do the mean scores on Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam differ between the control and treatment groups?
2. Do the differences in means on TOTAL exam scores between the control and treatment groups vary as a function of ACT level?
3. Do the differences in means on TOTAL exam scores between the control and treatment groups vary as a function of prior GPA level?
4. Do the differences in means on TOTAL exam scores between the control and treatment groups vary as a function of major?

Significance of the Study

Predictors of the academic performance of college students have been found to include factors that were fixed as well as factors that were amenable to change through interventions (Kitsantas, Winsler, & Huie, 2008). Although the ACT scores and prior GPAs of beginning accounting students are fixed, the self-regulatory skills of students are developmental. It is clearly established in the literature that students who possess high levels of self-regulated learning skills achieve higher levels of academic success in the classroom (Garavalia & Gredler,

1992; Kitsantas et al., 2008; Ley & Young, 1998). Furthermore, extensive research on self-regulated learning has resulted in numerous models of this important learning construct and identified its significant components and closely related fields. Knowing that a higher level of self-regulation influences both academic performance in the classroom and lifelong learning in future contexts, researchers continue to develop effective interventions to move students toward higher levels of self regulation.

The purpose of this study was to determine whether beginning accounting students achieved higher levels of academic performance when a focus on the development of self-regulated or lifelong learning skills was embedded within the technical content of the course. Was academic performance higher for students who received instruction related to the process of learning as well as course content than for those students who received content instruction only? Albrecht and Sack (2000) argued that accounting education too often focused solely on technical knowledge and that singular focus was at the expense of the development of learning skills. It is understandable that the vast amount of technical content in the beginning accounting course causes accounting educators to be skeptical about taking limited class time away from the teaching of technical knowledge to accommodate learning skills instruction. From this perspective educators may question whether classroom time devoted to the development of learning skills comes at the expense of the attainment of content knowledge. A primary purpose of this pioneer study was to address this legitimate concern of accounting educators.

Although interventions designed to move students to higher levels of self-regulated learning are relatively common in the educational literature, those interventions have largely focused on single elements or phases of self-regulation. However, a ubiquitous theme in the self-regulated learning literature is the importance of the interdependencies that exist among the

components and phases of self-regulation. The intervention associated with this study was designed to exploit any synergies that might accrue from a robust, multidimensional intervention.

The multidimensional attribute of self-regulated learning was clearly supported in the research of Garavalia and Gredler (2002) in which regression analysis was used to determine the significant predictors of academic achievement. In an attempt to identify the features of an intervention that would most likely lead to successful outcomes Hattie et al. (1996) determined through a meta-analysis representing 51 interventional studies between 1982 and 1992 that multicomponent interventions had produced greater results than had single-component interventions. In a statistical sense interventions that focused on a single learning deficiency have resulted in lower effect sizes than have interventions that embraced a combined set of self-regulatory elements. For example, an intervention may be designed to help students learn to monitor their progress (self-reflective phase). Although this is an important self-regulatory skill, it may be limited in its effect on academic performance if the student determines that current strategies are ineffective but lacks the ability to employ alternative, more effective strategies (performance phase). Interventions involving the use of organizational aids as a learning strategy for complex course material (performance phase) may not produce improvements in academic performance if students' hold epistemological beliefs (forethought phase) that knowledge is simply an accumulation of facts (Van Rossum et al., 1985).

In a qualitative study conducted at an urban community college and a rural residential university in the southeastern United States, Ley and Young (1998) used discriminant function analysis to determine that the number of strategies students employed in academic tasks was the best predictor for the classification of students as regular admission students or developmental students. That finding was consistent with the notion that multidimensional interventions may

produce better results than single-component interventions. Based upon these and other findings from prior research, the intervention used in this study was comprehensively designed to incorporate all three phases of self-regulated learning: forethought, performance, and self-reflection.

Based upon the literature, which clearly establishes the importance of the interrelationships that have existed between the components of self-regulated learning, this study provides an example of a comprehensively designed semester-long intervention. Although Ramdass and Zimmerman (2008) incorporated the three-phase cyclical perspective of self-regulated learning into an intervention with middle school math students, the study was limited by a small sample size and a brief duration of the intervention. In another study conducted by Krank and Moon (2001) results indicated that a more robust intervention resulted in greater improvement in academic achievement than did a less comprehensively designed intervention. In a meta-analysis of self-regulated learning interventions at primary and secondary schools, Dignath and Büttner (2008) found that interventions longer in duration were more effective than interventions of shorter durations at the primary and secondary level.

The intervention in this study took place in an authentic setting, an introductory accounting course. Studies that have promoted self-regulated learning comprehensively have often used a context other than an authentic setting (regular classroom). Some studies have involved the addition of a supplemental study skills module to a regular college course. Although the meta-analysis conducted by Hattie et al. (1996) indicated that stand-alone courses were less effective in developing self-regulatory skills, those types of interventions were relatively common. In the same meta-analysis, higher effect sizes were found for interventions conducted with primary and secondary school students than with older students in higher education. This

study makes a unique contribution to the extant accounting education literature in that it examined potential interaction between specific subgroups (groups formed using ACT level, prior GPA level, and academic major) and the intervention. In other words, the researcher examined whether differences between the control group (no intervention) and the treatment group varied as a function of ACT level, GPA level, and academic major. Did some groups of students respond differently to the intervention than others?

In essence, this study was a response to the call of the accounting professional community to help accounting students “learn how to learn” in preparation for an anticipated lifetime of learning in professional and leisure settings. It was also a response to the call of Zimmerman (2008) and other self-regulated learning researchers who have identified the emergent question of how classrooms can be modified to promote self-regulated learning. Because of the conceptual nature of the subject, the difficulty level of the course, and the abundance of novice learners in the course, the beginning accounting course provides a fertile setting for the development of self-regulatory skills (Paris & Paris, 2001). Capitalizing on what researchers in the educational psychology field have already learned about self-regulated learning and its related interventions, this study should contribute to the ongoing efforts of accounting and other college educators who seek to develop students’ awareness of their own learning processes and the ability to effectively control those processes.

Delimitations and Limitations of the Study

This study is delimited to one regional university in the southeastern United States. It involved only students enrolled in six sections of a beginning accounting course taught by one instructor. Therefore, the results of this study are not generalizable to other populations. Because the researcher was also the instructor of the six sections of the beginning accounting course used in the study, the researcher had a vested interest in the pedagogical success of the intervention. Therefore, it was the researcher's responsibility to ensure that the study was designed and carried out as objectively as possible and that any personal biases and desired outcomes were not reflected in the results of this study.

Acknowledging that changes in mediating variables link changes in the learning environment to potential changes in the academic performance of students who are exposed to that environment (see Figure 1), the researcher did not attempt to measure changes in these mediating variables. Although well-established instruments are available to measure such mediating variables as self-efficacy, epistemological beliefs, and others, the scope of this study did not include such measurements. The multifaceted design of the intervention related to this study made it impractical to gather such data and could have potentially distracted from the central purpose of this study. Therefore, this study took a "wide brush" approach that specifically focused on whether it was possible to improve the academic performance of students by adding a "learning-to-learn" dimension without sacrificing course content.

This study explored whether students in a beginning accounting course who received a self-regulated learning intervention differed in academic performance from those students who did not receive such an intervention. Although a dual-focus classroom (focus on both course content and the process of learning) was created for the treatment group, it cannot be concluded

that differences in the academic performance of the two groups were a result of the intervention. In a meta-analysis of learning skills interventions Hattie et al. (1996) also acknowledged that “it is not possible to trace causal paths” but it is reasonable, based upon the metacognitive literature, to expect that “the intervention creates effective strategy deployment and monitoring, which in turn produces satisfactory cognitive and affective outcomes” (p. 121). In the context of this particular study it can be reasonably inferred that changes in the learning environment

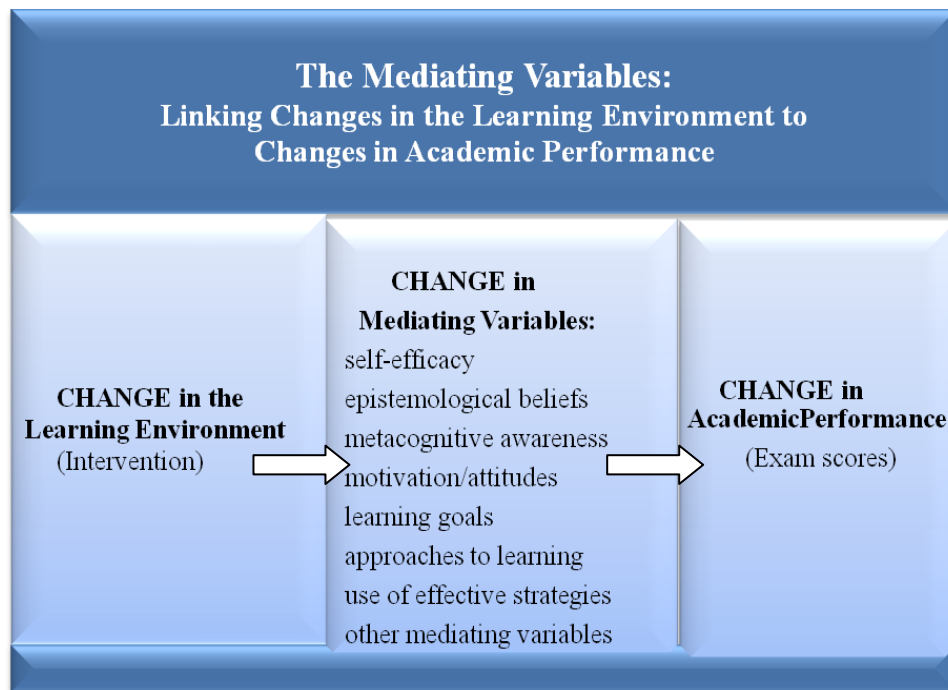


Figure 1. The Mediating Variables (adapted from Hattie et al., 1996)

may have induced changes in the mediating variables and that these mediating variables, in turn, impacted academic performance. Measurement of the changes in these mediating variables was beyond the scope of this study and, thus, the results of this study cannot explain “why” changes occurred in academic performance.

Definitions of Key Terms

1. Calibration: the accuracy of students' self-perceptions, or the ability of students to know "...what they do and do not know" (Stone, 2000, p. 437).
2. Constructivism: an educational philosophy that views learners as active participants in the learning process; knowledge is constructed internally by the learner rather than "deposited" into a passive recipient by an expert or instructor (Pintrich, 2000; Silverman & Casazza, 2000).
3. Elaboration: a learning strategy that uses additions, constructions, generalizations, and other tactics to enhance the meaning of new information. Paraphrasing, summarizing, analogies, examples, and other devices are used to help students initially learn new material and later remember what was learned (Levin, 1988; Weinstein & Mayer, 1986).
4. Epistemological beliefs: beliefs about the nature of knowledge and learning. This set of beliefs' relates to whether knowledge is simple or complex, fixed or developed, certain or evolving, and whether knowledge is acquired quickly or less quickly. Naïve and sophisticated beliefs are terms used to describe the range of epistemological beliefs (Muis, 2007; Phillips, 1998; Schommer, 1990).
5. Learning strategies: cognitive plans directed toward successful completion of academic tasks. Learning strategies include elaboration, organization, rehearsal, self-monitoring, and other strategies (Schunk, 2004; Weinstein & Mayer, 1986).
6. Mastery goal: a goal set by a student that focuses on the intrinsic value of learning. A mastery goal involves an orientation toward gaining new skills and knowledge, trying to understand and not just remember the new material, and a desire to improve competencies using self-imposed standards (Ames, 1992a)

7. Metacognition: a learner's knowledge of his or her own cognitive processes and how to regulate these processes (Derry & Murphy, 1986).
8. Modeling: a "...process whereby observers pattern their thoughts, beliefs, strategies, and actions, after those displayed by one or more models" (Schunk, 1998, p. 142)
9. Novice learner: a learner who has little or no knowledge or experience about a particular field or discipline, often making learning more challenging (Mayer-Sommer, 1990; Naveh-Benjamin & Lin, 1994; Paris & Winograd, 1990).
10. Performance goal: a goal set by a student that focuses on one's sense of self-worth and abilities. Performance goals focus on achievement and normatively defined success and often include making a certain grade in a course or performing better than other students (Ames, 1992a).
11. Powerful learning environment: a classroom context that is designed to promote students' acquisition of conceptual understanding, complex skills, and self-regulated learning behaviors (De Corte, Verschaffel, Entwistle, & Van Merriënboer, 2003; Gerjets & Hesse, 2004).
12. Scaffolding: support provided to learners to help them "...do things they couldn't do without that support" (Winnips, 2000, p. 298).
13. Schema (natural): a cognitive framework or mental configuration that helps learners organize and interpret information. It is naturally derived by repeated experiences with a subject and facilitated by the use of organizing strategies. The term, "knowledge structures," is also used to describe this phenomenon. (Ausubel, 1968; Dansereau, 1995)
14. Self-efficacy: the extent to which a student believes he or she is capable of accomplishing an academic task in a context-specific situation (Bandura, 1986; Kitsantas et al., (2008).

15. Structural (derived) schema: a schema that is "...consciously derived and labeled by experts" (Dansereau, 1995, p. 97) to emulate natural schemas as described above for the purpose of enhancing student learning.
16. Students' Approaches to Learning (SAL): learning constructs that contrast a deep approach (which focuses on understanding) to learning with a surface approach (which focuses on performance) to learning. Learning that focuses on concepts and relationships characterizes the deep approach, whereas memorization of information needed for assessments describes a surface approach to learning. (Duff & McKinstry, 2007).

Summary

It has become increasingly important for students in higher education to develop lifelong learning skills in today's dynamic environment. Professionals in the discipline have called for changes in accounting education whereby less classroom attention is given to technical content and teaching students the "process of learning" becomes a priority. The educational psychology field has provided extensive research related to the construct of self-regulated learning that requires learners to accept responsibility for their own learning as well as to develop effective learning strategies.

The introductory accounting course is characterized by highly conceptual content and is often accompanied by a high failure rate. Many beginning accounting students are novice learners, which makes the course even more challenging. If successfully designed to promote self-regulated learning, the accounting classroom may provide an opportunity for students to improve their academic performance while developing the skills necessary for lifelong learning.

Overview of the Study

Chapter 1 provides an introduction to the study and articulates a statement of the problem and the related research questions. Delimitations and limitations of the study are stated and definitions of key terms are provided at the conclusion of Chapter 1. Chapter 2 provides a comprehensive review of the literature related to this study. It specifically includes a review of the history, definitions, components, and models related to self-regulated learning. The transfer potential of self-regulated learning skills is discussed as also are other closely related theories including metacognition and students' approaches to learning.

The attributes and processes related to self-regulated learning are presented in Chapter 2 and are organized using a structure representing the three phases of self-regulated learning. The characteristics and vulnerabilities of novice learners are then discussed, followed by the important role of context in self-regulated learning. Chapter 2 concludes with a discussion of measurement tools that are germane to this study. Chapter 3 describes the design of the study, the research population, data collection procedures, the research questions and hypotheses, and analysis of the data. The chapter also includes a detailed description of the intervention to be used in the study. Chapter 4 presents statistical analysis of the data collected in the study. Chapter 5 includes an analysis and discussion of the research findings and conclusions drawn from the study. The chapter concludes with recommendations for further practice and research.

CHAPTER 2

REVIEW OF THE LITERATURE

Although there has been an ongoing call for accounting educators to devote more attention to the process of learning and the development of lifelong learning skills (Eide, 2000; Mayer-Sommer, 1990; Nelson, 1995), the accounting education literature is scant in regard to classroom interventions designed to help beginning accounting students “learn how to learn.” The one exception is the abundance of studies related to students’ approaches to learning that have appeared in the international accounting education journals. The relevance of self-regulated learning, students’ approaches to learning, and other learning constructs to accounting education is clearly established in the literature. The educational psychology literature provides a plethora of information about how students go about learning, what “roadblocks” impair this process, and how classrooms can be designed to enhance students’ learning skills.. This body of knowledge is a valuable resource for accounting educators who are committed to the development of lifelong learning skills in their accounting classrooms (Duff & McKinstry, 2007; Eide, 2000; Smith, 2001).

The review of the relevant literature first considers the historical development of the construct of self-regulated learning. General characteristics of self-regulation and diverse models of this construct are presented, followed by research concerning the transfer potential of self-regulatory skills. Because of theoretical commonalities and overlap with self-regulated learning, research related to metacognition and students’ approaches to learning is reviewed. The three phases of self-regulated learning then provide the framework for reviewing research focused on specific elements and processes within self-regulated learning. Because beginning accounting students often have little or no experience in the discipline of accounting, research

related to novice learners and their academic challenges is reviewed. A review of the literature related to the role of context in self-regulated learning is presented, focusing particularly on classroom goals, students' awareness of self-regulation, and the use of modeling and scaffolding. A review of the literature related to measurement tools concludes this literature review.

Self-Regulated Learning

History and Definition

The construct of self-regulated learning began to appear in the educational psychology literature in the 1980s. Researchers such as Brown, Levin, Pressley, and Schunk had already established the importance of several components of self-regulated learning even before a comprehensive model of this construct was formulated (Zimmerman, 2008). A symposium at the 1986 annual meeting of the American Educational Research Association resulted in a comprehensive definition of self-regulated learning in order to assimilate the multiple components identified through the extant research. Starting with a special issue of *Contemporary Educational Psychology* (1986) that was devoted to the symposium discussions, self-regulated learning has continued to be prominent in the literature. Self-regulated learning was inclusively defined at the symposium as "...the degree to which students are metacognitively, motivationally, and behaviorally active participants in their own learning process" (Zimmerman, 1986, p.308). In the special issue of *Contemporary Educational Psychology* in 1986, Zimmerman provided the distinguishing features of this new construct, articulating that "self-regulation is not an idiosyncratic product of a child's own discovery experiences, but rather, it is a culturally transmitted method for optimizing and controlling

learning events” (p. 311). Even at this early stage of self-regulated learning research, the responsibility of educators to promote development of students’ self-regulation was established.

Zimmerman (1994) later described two paths related to self-regulated learning research..One research path explored the attributes, components, and phases of self-regulated learning, whereas the second path examined processes to enhance self-regulated-learning. As an example of the first path, Winne (1995) studied how individuals went about learning by themselves for the purpose of gaining a better understanding of self-regulated learning. The research of Schmitz and Wiese (2006), which involved using online diaries and time series data to determine the effectiveness of training sessions, would exemplify the second path described by Schunk and Zimmerman.

In the same year in which self-regulated learning was formally introduced as a learning theory, a seminal study was conducted by Zimmerman and Martinez-Pons (1986). Using the Self-Regulated Learning Interview Schedule and high and low achievement groups, this study identified 14 categories of self-regulated learning strategies. For 13 of the 14 strategies, high achievers indicated greater use and, of equal importance, Zimmerman and Martinez-Pons found that 93% of students could be classified into the correct achievement group on the basis of their strategy usage. This study was the first of many studies that confirmed the relationship between self-regulated learning and academic performance. Because of this important correlation, the topic of self-regulated learning continues to be salient in the educational literature.

Zimmerman and Martinez-Pons (1988) conducted a follow-up study to establish construct validation of the structured interview used in the prior study and the self-regulated learning model. Construct validity was established by studying the relationships between the structured interview results and teacher observations of the students’ use of self-regulated

learning strategies in the actual classroom. A significant finding of this study was that both perspectives revealed a mutual underlying construct.

The role of social cognitive theory (Bandura, 1986) in the construct of self-regulated learning was addressed by Zimmerman (1989b). The reciprocal causation among behavior, the self, and the environment, referred to as triadic reciprocity by Bandura, was found to be especially relevant to self-regulated learning. Zimmerman advanced Bandura's conviction that behavior was a function of both self and the environment. Zimmerman identified self-efficacy (self) and strategies (behavior) as common key processes in social cognitive theory and self-regulated learning.

The development of motor and athletic skills has been a common focus for self-regulated learning research. Zimmerman and Kitsantas (1997) used dart-throwing to explore the subject of process and outcome goals. Process goals represent a focus on *how* to do something, whereas outcome goals focus on performance. For example in a writing context, using multiple steps to write an essay represents a process goal but a related outcome goal might be to write clearly. For this study Zimmerman and Kitsantas established four phases of learning: observation of models, imitation of models, independent practice using modeled performance standards, and, finally, self-regulation in a dynamic environment. Of significant relevance to college classrooms, the results of this study indicated that self-efficacy, motivation, and skill levels were enhanced when process goals were set during the first two phases of learning and then switched to outcome goals after fundamental techniques had been mastered.

Assuming that homework practices impacted academic performance, Zimmerman and Kitsantas (2005) examined the impact of homework on self-regulated learning. Using the Self-Efficacy for Learning Form (SELF), which was developed for the study, and path analysis, the

results indicated that students' homework practices had predicted self-efficacy beliefs which, in turn, predicted GPA. Because the self-efficacy of students can be enhanced by the completion of quality homework assignments, these findings are considered particularly relevant for accounting educators.

Boekarts (1999) contended that self-regulated learning represented the intersection where several different research fields converged and, thus, the literature often contains a wide array of terminology to describe a common element of self-regulation. Furthermore, Boekarts (1999) suggested that the review of theories associated with those divergent fields, which are considered in this literature review, was necessary to fully understand the essence of self-regulated learning. Despite inconsistencies in terminology Boekarts (1997) acknowledged that there was a consistent belief among both educators and policy makers that teaching self-regulatory skills must be a fundamental goal of education. While encouraging efforts to move students toward higher levels of self-regulation, Pressley (1995) maintained that the development of self-regulatory learning behaviors was a complex and long-term process.

Self-regulated learning is not an "all-or-nothing" concept according to Boekarts (2006). Instead, it is the degree to which a learner is aware of "...strategic relations between regulatory processes and learning outcomes and their use of specific strategies to achieve their academic goals" (Zimmerman & Martinez-Pons, 1992, p. 187). This description of self-regulated learning implies that learners are actively involved in learning, which is consistent with the educational philosophy of constructivism (Pintrich, 2004; Roehler & Cantlon, 1997; Silverman & Casazza, 2000).

Schunk (1992, 2004) contrasted the constructivist view of the self-regulated learner with the behavioristic view whereby learners passively received information from external sources.

Making a significant contribution to the self-regulated learning literature, Schunk explored the role of student perceptions as they actively engage in learning. After establishing that students had the potential to affect the classroom as well as be affected by the classroom, Schunk asserted that students' motivation was affected by self-perception, social perceptions, and perceptions of the classroom. Those perceptions significantly affected how students' anticipated consequences of their actions, their degree of self-efficacy necessary to perform these actions, and their use of self-evaluation of their progress toward goals. Although the subject of motivation consistently has been included in self-regulated learning literature, Smith (2001) considered motivation to be the centerpiece of self-regulated learning.

According to Zimmerman and Paulsen (1995) classroom teachers recognized highly self-regulated learners when they encountered them because of particular behaviors exhibited. Approaching academic tasks with deliberate and appropriate strategies, seeking understanding in academic tasks, asking questions when they did not understand, monitoring their own progress carefully, and often knowing how well they did on tests even before they were graded were typical behaviors of a self-regulated learner. Such highly visible behaviors were products of both internal and external factors. Related research about epistemological beliefs, students' approaches to learning, and self-efficacy revealed that, even before the self-regulated learner exhibited such behaviors, internal and less visible elements of self-regulated learning were driving such behaviors. In essence, self-regulated learning behaviors were associated with the learner's beliefs about knowledge, the learner's goals and intentions, and the learner's beliefs that academic tasks would be successfully accomplished. Each of these related theories and elements is addressed in this literature review. Furthermore, the research shows that the context

in which learning takes place may also be associated with the self-regulated behaviors of students and is examined as well.

Components and Models of Self-Regulated Learning

Several different models of self-regulated learning have emerged in the literature.

According to Pintrich (2004) the various models generally share the following assumptions related to self-regulated learning:

1. Learning is a constructive process and is influenced by internal and external factors.
2. Learners have the potential to regulate or control some aspects of motivation, cognition, and behavior as these relate to learning.
3. Learners set goals or standards for their learning.
4. Self-regulated learning strategies serve as the intermediary between internal and contextual characteristics and academic achievement.
5. Self-regulated learning encompasses various phases and components. (pp. 452-453)

Another important aspect of theories and models of self-regulated learning is that, regardless of how self-regulated learning is broken down into processes, components, or phases, complex interdependencies exist between the various elements of this construct (Zimmerman, 1990). As an example, Zimmerman stated that the learner's perception of self-efficacy was "...both a motive to learn and a subsequent outcome of attempts to learn" (p. 6). Similarly, it is argued that a reciprocal relationship exists between self-efficacy and goal setting. Even as early as 1990 Zimmerman contended that interventions that focused only on one or two processes were unlikely to produce desired results and advocated for multifaceted interventions that capitalized on the interrelationships that are intrinsic to self-regulated learning.

Zimmerman (1989a) directly applied Bandura's (1986) social cognitive theory and the related concept of triadic reciprocity to create a preliminary model of self-regulated learning. Personal influences (i.e., goals, self-efficacy, metacognition), behavioral influences (i.e., self-

reflection), and environmental influences (i.e., academic outcomes) described Zimmerman's Self-Regulated Learning Strategy System. Highly self-regulated students reportedly capitalized on the reciprocity that existed between these three influences to achieve academic success.

Zimmerman (1998) later developed another model that depicted the academic learning cycle (see Figure 2). The key aspects of that model include self-regulation as an open-ended process and a self-fulfilling cyclical activity across three phases: forethought, performance, and self-reflection. The forethought phase represents beliefs held by learners that precede and influence learning efforts. Zimmerman described the performance phase as "...processes that occur during learning efforts and affect concentration and performance" (p.2). The self-reflection phase depicts the processes that occur after learning efforts. This final phase involves the assessment of recent learning efforts and influences future learning endeavors. This particular model provides a framework for organizing various self-regulated learning elements and processes in a later section of this literature review.

In addition to providing a thorough review of self-regulated learning literature, Smith (2001) developed a pragmatic model of self-regulated learning for accounting educators. The components of that model included self-motivation, intrinsically generated choices, self-regulated learning attributes, and self-regulated learning processes. Smith (2001) depicted motivation as the centerpiece of the model, asserting that learners became inactive and responsive only to externally induced demands when motivation was lacking. Self-regulating attributes included self-efficacy (belief that the task can be accomplished), self-awareness (assessment as to what degree learning has occurred), and resourcefulness (seeking help when learning has been insufficient). In the Smith model, attributions, goals, and self-monitoring were defined as key processes in self-regulated learning. Smith further illustrated how the model

could be applied to an accounting professional and also how the model could be used to promote self-regulated learning in the classroom.

A most recent self-regulated learning model offered by Muis (2007) broadened other self-regulated learning models by including the student's set of epistemological beliefs as a component of self-regulated learning. Muis described how epistemological beliefs interacted with the more traditional elements of self-regulated learning and further justified the inclusion of such knowledge beliefs in the model. A review of the literature related to epistemological beliefs appears in a later section of this literature review.

Transfer of Self-Regulated Learning Skills

The ability to use previous knowledge to solve novel problems refers to the transfer of knowledge (Marini & Genereux, 1995). Particularly desirable is "high road" transfer in which principles and concepts are not tied to a particular context but can be applied in new situations (VanderStoep & Seifert, 1994). Marini and Genereux (1995) argued that the importance of such transfer accelerates in a rapidly changing world. Although consistently viewed by educators as a fundamental goal of education, they recognized that it was too often taken for granted. They contended that transfer of learning was not automatic but required deliberate efforts by educators to facilitate it. De Corte (1999) asserted that transferable knowledge and skills could be viewed from an economic perspective because contemporary business and industrial organizations invest substantially in employee training and retraining.

According to Bereiter (1995) the failure to teach conceptual knowledge predicted failure to transfer. Studies related to the transfer of knowledge suggest that transfer could be improved when instruction included multiple examples of a concept. Transfer of learning has also been

considered a function of the quality of the schema, the cognitive framework or concept that learners use to organize and interpret new information (VanderStoep & Seifert, 1994).

Dansereau (1995) offered specific instructions about how educators could develop structural schemas to enrich classrooms. Those classroom aids captured the important elements of a knowledge domain and increased students' potential for knowledge transfer.

For the sake of transfer, VanderStoep and Seifert (1994) encouraged a full disclosure approach to the teaching of learning strategies. This sentiment was echoed by Marini and Generaux (1995) and Paris and Paris (2001), who specifically maintained that a “how, when, and why” approach should be taken when teaching learning strategies to students. In other words, conditional knowledge is as important as learning how to use the strategy, or procedural knowledge (Garner, 1990).

Research related to the generality or transfer of self-regulated learning skills has produced mixed results (De Corte et al., 2003). Pressley (1995) cautioned that newly learned strategies and concepts competed with highly engrained existing ones that often required more effort to employ the newly learned, yet more effective strategies. This reality can create a significant roadblock to the transfer of recently learned self-regulated learning strategies to new situations.

Constructs Closely Related to Self-Regulated Learning

Metacognition

Even before self-regulated learning was formally identified as an educational construct in 1986, metacognitive theory was a subject of interest for such educational psychologists as Flavell, Garner, Lawson, among others. (Brown, 1987; Derry & Murphy, 1986; Lawson, 1984;

Schraw, 2001). As has been the case with self-regulated learning, metacognitive theorists have been inconsistent in their use of labels and even in their definitions of metacognition. Those inconsistencies, as is frequently the case in the development of theoretical research streams, often led to conflicting results in the early research (Lawson, 1984). Derry and Murphy (1986), early leaders in metacognitive research, defined metacognition as the "...learners' awareness and knowledge of their own learning processes, as well as their abilities and tendencies to control those processes during learning" (p. 9). More recently Hartman (2001) described metacognition as "thinking about your thinking *processes* and the *products* of your thinking" (p.34). Metacognitive theory was one of several theories that were integrated into the construct of self-regulated learning (Boekarts, 1999). Although the literature clearly supports the notion that metacognition is embedded in the larger construct of self-regulated learning, it is often addressed as a separate construct in the literature and will be addressed in the same manner in this literature review.

Schraw (2001) asserted that metacognition could be dichotomized into knowledge of cognition and regulation of cognition. Knowledge of cognition, also referred to as metacognitive awareness, represents what students know about their own learning processes or about learning in a generic sense. Schraw conjectured that metacognitive awareness involved declarative, procedural, and conditional knowledge. Students' awareness about themselves as learners and the factors that influence their academic performance represents declarative knowledge. Procedural knowledge represents the execution of learning strategies such as how to organize complex information. Classroom activities should purposely broaden students' repertoires of strategies or their procedural knowledge (Schraw, 2001). Conditional knowledge requires

students to adjust to changing task demands as it represents knowing when and why to use particular strategies (Garner, 1990; Schraw, 2001).

Knowledge of cognition is a prerequisite to successful regulation of cognition, the second component of the metacognition dichotomy. Regulation of cognition involves a student's ability to plan the use of strategies, monitor and self-access comprehension, and then to evaluate learning results (Schraw & Moshman, 1995). In the earlier literature Lawson (1984) referred to this summation of skills as "executive processes" which were generally considered to be higher-level processes. Brown (1987) metaphorically compared this "self-awareness or explicit knowledge of its own workings" (p. 78) to the central processor of a computer. Schraw (2001) further asserted that metacognitive skills, including both knowledge of cognition and regulation of cognition, were "...domain general in nature" (p. 5). Even though different domains require different types of strategies (Garner, 1990), the student's broad metacognitive ability cuts across domains (Schraw, 1995, 2001). Wolters and Pintrich (2001) found a high positive correlation among students' metacognitive skills across three different domains. Studies related to the role of a student's Intelligence Quotient (IQ) in the development of skills indicate that IQ is associated with the initial acquisition of skills but is generally unrelated to performance of these skills at later stages of learning. Schraw (2001) further argued that "Well-organized instruction or the use of effective learning strategies may in large part compensate for differences in IQ" (p. 7).

A recent study by Schleifer and Dull (2009) involving over 1,200 participants examined the relationship between metacognition and academic performance in accounting classrooms. This study confirmed the results of other studies that have suggested that higher levels of metacognition were associated with higher academic performance. As expected, results of this

study showed a higher level of metacognition for upper-level accounting students as compared to beginning accounting students. However, an unexpected finding from the regression analysis was that metaknowledge (i.e., metacognitive awareness) was more strongly associated with high academic performance than was metaregulation. In response to this finding Schleifer and Dull encouraged instructors to administer a metacognitive questionnaire or to create other classroom opportunities whereby students would gain a better understanding of their own metacognition. Hattie et al. (1996) determined through meta-analysis that classroom interventions that emphasized metacognitive awareness were more effective. The importance of students' awareness appears frequently in the literature and research related to this topic and is described later in this literature review.

Because these metacognitive skills, which constitute a large part of self-regulated learning, can and should be developed in authentic classroom settings (Hartman, 2001; Hattie et al., 1996; Paris & Winograd, 1990), the literature provides a plethora of recommendations for doing so. The development of metacognitive skills begins around age 5 to 7 and continues throughout schooling (Garner, 1990; Hartman, 2001). Hartman (2001) and Paris and Winograd (1990) provided numerous examples of pedagogical techniques and classroom activities that promoted metacognitive skills. These techniques particularly involved efforts to help learners become more aware of their personal use of learning strategies and understand the value of strategy usage when attempting academic tasks. As the role of context in self-regulated learning is discussed in a later section of this literature review, examples of how metacognitive awareness can be encouraged in the classroom are provided.

Students' Approaches to Learning (SAL)

Although the construct of self-regulated learning has been a salient research topic in the educational journals in the United States, the construct of students' approaches to learning (SAL) has been equally prominent in Europe and Australia. A discussion of this related topic is warranted in this literature review due to the considerable overlap that exists between these two theories. The construct of students' approaches to learning is viewed as a logical subset of the much broader construct of self-regulated learning for the purpose of this study. SAL studies published in both international and U.S. accounting education journals offer much insight into designing "learning-to-learn" classrooms. Four distinct groups of researchers led efforts to theorize the construct of student approaches to learning through extensive research (Beattie et al., 1997).

SAL research has focused on the differences between surface and deep approaches to learning and the association between the learner's approach and academic achievement. A deep approach to learning prioritizes the understanding of concepts and more permanent learning. It is fueled by an intrinsic desire for meaningful learning. A surface approach to learning focuses on reproduction of information, resulting in only temporary learning. The surface approach is based on memorization and is fueled by external assessments (Beattie et al., 1997). Trigwell and Prosser (1999) further differentiated between deep and surface approaches in terms of whether students approached learning with or without reflection about purpose or strategy. This SAL attribute of deep or surface approaches to learning parallels attributes associated with SRL, especially mastery or performance-goal orientations.

Furthermore, SAL literature contains valuable research about students' perceptions, especially perceptions of learning. The importance of student perceptions is evident in the SRL

literature as well. Early SAL research by Säljö (as cited in Trigwell and Prosser, 1999) revealed five qualitatively different perceptions of learning including perceptions that learning is: a quantitative increase in knowledge, memorizing, the acquisition of facts and methods, the abstraction of meaning, and an interpretive process to understand reality. These perceptions of learning are closely related to epistemological beliefs, a newly added component of the SRL model (Muis 2007).

Pintrich (2004) contrasted the construct of self-regulatory learning (SRL) with the students' approaches to learning (SAL) theory. The most significant distinction between these two constructs related to the "grain size" or level of analysis of those learning constructs and their related studies. Studies about the specific phases and strategies of self-regulated learning described the complexity of SRL, whereas a larger grain size or a more global research approach described SAL's simplicity. This simplicity has often made SAL more attractive for faculty members who have minimal training in educational psychology. Pintrich asserted that proponents of both perspectives view learners as active participants and constructors of knowledge. Likewise, both the SAL and SRL perspectives viewed strategies as mediators between personal characteristics and achievement. According to Pintrich fewer consensus existed about the role of goals in learning, students' potential to regulate their learning, and research methodologies. Whereas SRL research has largely taken a "top-down" approach using quantitative methodology to apply established cognitive and psychological theories, SAL research has preferred a "bottom-up" approach and qualitative methodology. For example, Lucas (2001) conducted a phenomenographic study to examine how beginning accounting students in the United Kingdom approached learning. Differences in the design of SAL and SRL

measurement tools were cited by Pintrich (2004), including the contrast between the SRL focus at the course level and the more holistic focus found in SAL instruments.

Seminal SAL research conducted in Australia in 1985 revealed that a surface approach to learning resulted in lower levels of motivation and weaker academic performance but produced better recall of factual information. The deep approach to learning was related to higher motivation and academic performance (Biggs, 1985). Since that preliminary study the subject of SAL has been much more prominent in the international accounting education journals than in similar journals published in the United States. Beattie et al. (1997) contended that U.S. accounting programs generally had been less focused on theory and conceptual learning than was the case for international accounting programs. They further explained that the responsibility for preparing students for professional exams fell on the university in the United States. In such locations as Australia, Canada, and United Kingdom, that responsibility rested with professional institutes, allowing accounting classrooms in those countries to focus less on procedural knowledge and more on conceptual knowledge.

A review of international accounting education journals revealed a stream of SAL studies conducted in the accounting discipline. Booth, Lockett, and Mladenovic (1999) found that Australian accounting students used more surface approaches to learning than did students majoring in the arts, science, and education. English et al. (2004) successfully used a classroom intervention to encourage a deeper approach to learning for beginning Australian accounting students. Duff and McKinstry (2004, 2007) used regression analysis to confirm that prior academic achievement was the strongest predictor of performance of first year accounting and business students and that effective Scottish learners employed a deep approach to learning. Hall, Ramsay, and Raven (2004) changed the learning environment in a first-year accounting

class in Australia by the introduction of group learning activities. The results of this study showed a statistically significant increase in students' use of a deep approach to learning and a statistically significant decrease in the surface approach. Ballantine, Duff, and Larres (2008) initiated a case study intervention to move accounting students in the United Kingdom toward a deeper approach to learning. The ANOVA results of this quantitative study indicated an increase in the deep approach subscales for "relating ideas" and "use of evidence," both requirements for case studies.

Although the SAL construct has received less attention in U.S. accounting education journals, the following relevant and noteworthy studies and others have been published in U.S. journals in recent years. A study by Gow, Kember, and Cooper (1994) in Hong Kong examined the role of the teaching context as it related to how students approached learning. Davidson (2002) found that a deep approach to learning was positively related to superior performance on complex questions embedded in accounting examinations at three Canadian universities. Another quantitative study conducted by Hall et al. (2004) in Australia examined the association between the learning environment and students' approaches to learning. Although it cannot be concluded that a change in the learning environment caused the 158 study participants to move toward deeper approaches to learning, the MANOVA results indicated that there was a change in students' approaches to learning during the period in which the learning environment involved group problem-solving activities. A robust SAL literature review by Duff and McKinstry (2007) provided an opportunity for U.S. accounting educators to become more knowledgeable about the importance of how students' approach learning tasks.

The Academic Learning Cycle: The Phases of Self-Regulated Learning

Zimmerman (1998) described self-regulated learning in terms of the academic learning cycle, which is composed of three phases: forethought, performance, and self-reflection (see Figure 2).

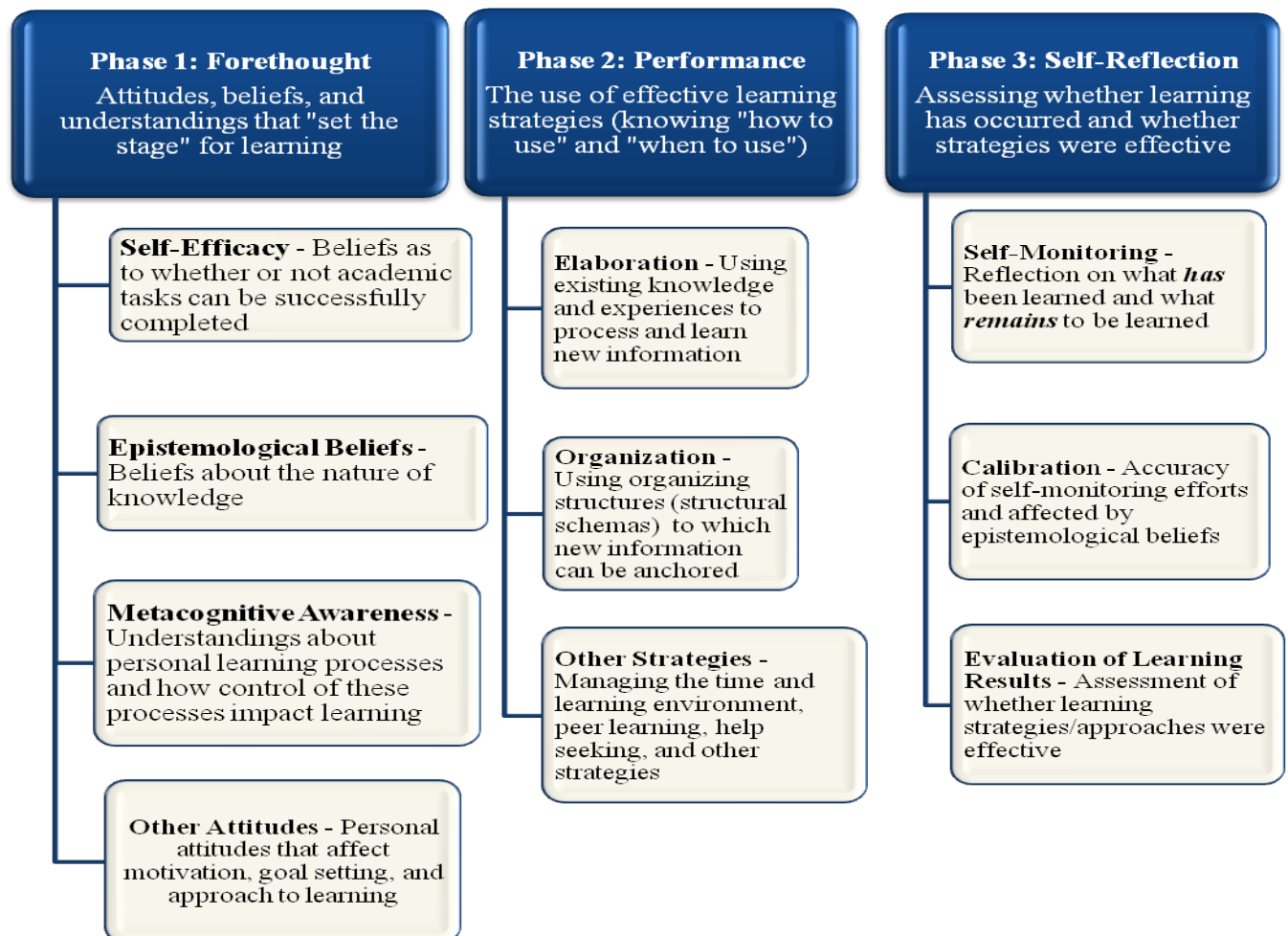


Figure 2. Phases of the Academic Learning Cycle (adapted from Zimmerman, 1998)

The Forethought Phase

The initial or forethought phase of the academic learning cycle describes the influential beliefs and processes that are present before the student attempts learning tasks (Zimmerman, 1998). These beliefs strongly impact the subsequent phases of learning and exemplify the self-fulfilling nature of the academic learning cycle. According to Zimmerman (1998) self-efficacy and epistemological beliefs along with goal setting, goal orientation, and strategic planning “set the stage” for learning.

Self-Efficacy. Early self-efficacy research was conducted by Bandura. It involved the building of self-efficacy to help overcome individuals’ phobias. The studies treated increased self-efficacy both as the result of intervention and as a precursor to changes in behavior (Bandura, 1986; Schunk, 1989). Consistent with his postulated social cognitive theory, Bandura’s work rested on the assumption that behavior was influenced by forethought and was not simply a response to the external environment. Referred to as forethought capability in the literature, this ability to set internal standards and anticipate consequences of behavior is implicit in the larger construct of self-regulated learning. Bandura (1986) theorized that self-referent thought, particularly one’s self-efficacy beliefs, functioned as “...one set of proximal determinants” (p.393) of how individuals behaved and how they persisted in difficult situations.

In the academic setting, self-efficacy refers to students’ beliefs about their ability to successfully accomplish academic tasks prior to actually performing these tasks (Pajares, 1996). Recognizing the importance of motivation in education, Zimmerman (2000) explained that this antecedent property “...positions self-efficacy judgments to play a causal role in academic motivation” (p. 84). It was important for educators to distinguish self-efficacy from self-concept

according to Zimmerman. Self-concept is a general descriptor, but self-efficacy is domain-specific and relates to a task-specific performance.

Self-efficacy was described by Reeve (1996) as the antithesis of self-doubt. Self-efficacy serves as the mediator between knowledge and action because students may know what to do but lack the self-confidence to follow through. In the context of education, academic proficiency requires skills *and* the belief that these skills can be used efficaciously. Schunk (1989) found that high self-efficacy had to be accompanied by requisite skills if desired outcomes were to be realized. According to Zimmerman and Martinez-Pons (1992) the triadic reciprocity among personal, behavioral, and environmental influences allowed self-efficacy to be "...both a proactive determinant of academic achievement as well as a reactive outcome of them" (p.189).

Although designated as one of the key components of self-regulated learning, self-efficacy intersects with theories related to epistemological or knowledge beliefs. For example, struggling students who believe that the ability to learn is inherent rather than acquirable tend to possess a low degree of self-efficacy while students who believe the ability to learn is an acquirable skill are highly resilient when facing academic struggles (Bandura, 1993). In response to findings in their prior studies in 1986 and 1988, Zimmerman and Martinez-Pons (1990) used a structured interview in a study that compared gifted with regular students to investigate the function of student perceptions of self-efficacy in self-regulated learning. Results of this landmark study established that a close relationship existed between high levels of self-efficacy and superior academic performance. Pintrich and De Groot (1990) further established that students with high degrees of self-efficacy used more self-regulated learning strategies than did students with low self-efficacy. This finding provided the missing link between self-efficacy

and academic performance. Increases in self-efficacy induced an increased usage of learning strategies that predicted academic performance.

In a seminal study conducted by Zimmerman, Bandura, and Martinez-Pons (1992) path analysis revealed that students' efficacy for self-regulated learning had a domino effect. Efficacy for self-regulated learning was associated with efficacy for academic achievement. This led to the setting of higher academic goals that predicted academic achievement. Further analysis revealed that efficacy for academic achievement and academic goals together accounted for 31% of the variance in students' academic achievement.

A reciprocal relationship between self-efficacy and the use of learning strategies was hypothesized by Zimmerman and Martinez-Pons (1992). Based upon research findings related to self-regulated learning, classroom interventions to develop students' usage of learning strategies may reciprocally increase the self-efficacy of students. For example, in a study by Schunk and Rice (1985) elementary students who were taught reading comprehension strategies demonstrated higher levels of both self-efficacy and reading comprehension than did students in the control group. Zimmerman (2000) maintained that fostering self-efficacy could lead to a reduced level of anxiety. Furthermore, self-efficacy was found to be responsive to context changes whether the source of the influence was a direct experience, a vicarious experience, or even verbal persuasion.

Schunk and Ertmer (2000) contended that self-efficacy was associated with all three phases of self-regulated learning: forethought, performance, and self-reflection. The student's level of self-efficacy predicted the student's choice of activities, amount of effort exerted, and the degree of persistence (Reeve, 1996; Schunk, 1989). Self-efficacy research has consistently revealed that students with higher degrees of self-efficacy tend to set more challenging goals for

themselves (Zimmerman et al., 1992). Such findings highlighted the importance of the role of parents and teachers in helping to build students' self-efficacy. "Efforts to foster academic achievement need to do more than simply set demanding standards for students. They need to structure academic experiences in a way that enhances students' sense of academic efficacy as well" (p. 673). Otherwise, they said students would detrimentally view these lofty standards as personal threats rather than as challenges.

Self-efficacy influences the level of goals individuals set for themselves and the amount of effort they expend on academic tasks (Zimmerman, 1992). Self-efficacy is strongly associated with motivation and is often described as the factor that provides "staying power." During the performance phase of self-regulated learning a strong sense of self-efficacy is what drives students to engage their personal arsenal of learning strategies and allows them to persist as they face academic difficulties and stressors (Bandura, 1986, 1993; Pintrich & De Groot, 1990). Lent, Brown, and Larkin (1984) studied science and engineering majors and found that students with higher levels of self-efficacy received higher grades and exhibited greater persistence. Wolters (1998) examined the different strategies that self-regulated learners used to regulate their motivation and to keep persisting in the face of academic adversity. In the self-reflective or final phase of self-regulated learning, students with higher self-efficacy employed more self-monitoring strategies (Schunk & Ertmer, 2000). Self-monitoring strategies include evaluation of the strategies used to complete academic tasks and an assessment of progress toward goal achievement, completing the final phase of self-regulated learning.

Bandura (1993) later proclaimed that the foremost goal of education was to prepare students to educate themselves for the rest of their lives. Because self-efficacy plays such a vital role in self-regulated learning and lifelong learning, the literature contains a plethora of studies

that examined the strong relationships between self-efficacy and academic performance. Studies of this nature empirically support the notion that academic achievement requires skills *and* the sense of efficacy that using those skills would elicit academic success. A noteworthy study by Multon, Brown and Lent (1991) examined self-efficacy and academic performance through meta-analysis, integrating over 10 years of data. Results of this meta-analysis indicated that self-efficacy accounted for 14% of the variance in academic performance and 12 % of the variance in persistence. Analysis revealed a .38 effect size in regard to academic performance and a .34 effect size as related to persistence. Statistical tests revealed that the strongest effect size occurred with the low achievers. This finding provides valuable insight for those designing classroom interventions. Specifically, efforts to teach learning strategies and develop academic skills must be accompanied by efforts to simultaneously build students' self-efficacy. Kitsantas et al. (2008) called for domain-specific interventions that "...focus on instilling a healthy sense of self-efficacy..." (p. 63) in students. Providing introductory-level students with successful peer role models and explaining how the use of learning strategies relates to academic success were among the suggested interventions.

Because educational researchers continue to search for the academic performance predictors in various disciplines within higher education, the subject of self-efficacy is prolific in the literature. Using multiple regression in his analysis Klomegah (2007) found self-efficacy to be a significant predictor of academic performance with a beta coefficient of .37. Kitsantas et al. (2008) found time management and self-efficacy to be collectively more powerful in predicting second-semester college GPA than were high school GPA and SAT scores. In the context of a study involving college intermediate French courses at three different institutions, Mills, Pajares, and Herron (2007) found that students' self-efficacy for self-regulation was the strongest

predictor of achievement in the French language. Wolters (2003), Klassen, Krawchuk, and Rajani (2007) and Tan et al. (2008) examined the relationship between self-efficacy and procrastination, a common barrier to academic achievement. As hypothesized, the studies consistently confirmed that low-efficacy was related to increased procrastination tendencies. Although prior performance was associated with self-efficacy, Caprara et al. (2008) established that self-efficacy made an independent contribution to academic performance and it was not merely an "...epiphenomenal reflection of prior performance" (p. 532).

Epistemological Beliefs. As educators consider how classrooms can be designed to encourage self-regulated learning and move students toward becoming lifelong learners, it must be acknowledged that students bring their personal theories and beliefs about knowledge to the classroom. Epistemology was defined by Hofer and Pintrich (1997) as "...an area of philosophy concerned with the nature and justification of human knowledge" (p. 88). Personal epistemological beliefs are relevant to the educational process because they influence the way students view new information as well as how and to what degree students apply particular learning strategies. Both of these factors are associated with how much students learn (Schommer, 1990).

Hofer and Pintrich (1997) traced the history of epistemological research back to the 1950s when William Perry pioneered research on this subject. Perry (1970) found that epistemological development rather than personality predicted how students made meaning out of academic experiences through studies of college students. Similar to Piaget's developmental stages, Perry described four "positions" of epistemological beliefs in his model. Also referred to as "ways of knowing," these positions ranged from the dualist position (i.e., only right and wrong answers and experts have the right answers) to positions of relativism where knowledge is

viewed as contextual and personal. Perry's model later became the catalyst for the reflective judgment model of Kitchener and King (1994), which focused on the ways students approached ill-structured problems. The same epistemological beliefs that deterred the critical thinking required for such problems may also have created impermeable barriers for students in their everyday learning tasks within the classroom (Hofer & Pintrich, 1997; Mayer-Sommer, 1990).

Although Perry did not specifically address how epistemological development and beliefs affected student learning, he did consider the possibility that such beliefs could impact how students approached the learning process when he posed the question: "...[W]hen students radically revise their notions of knowledge, would they not be likely to change their ways of going about getting it?" (Perry, 1981, p.102). This same question was raised again in a later study by Boulton-Lewis and Wilss (2003).

In order for students to evolve in an epistemological sense, disequilibrium or "dissonance" is deemed to be required. Disequilibrium occurs when a discrepancy exists between new information and what an individual already knows or believes (Flavell, 1963; Flavell, Miller, & Miller, 2002). Muis (2007) asserted that epistemology and educational psychology are connected by this developmental theory of Piaget. This Piagetian notion of growth has also been associated with the moral development of students (Mintchik & Farmer, 2009). Although development of epistemological beliefs and moral reasoning both reportedly required a state of disequilibrium, Mintchik and Farmer did not find associations between moral reasoning and epistemological beliefs. The results of their study suggested that these two cognitive dimensions developed independently and likely at a different pace.

According to Boulton-Lewis and Wilss (2003) dissonance occurred when students' knowledge beliefs prevented them from meeting the demands of academic tasks. For example,

Van Rossum et al. (1985) contended that first-year college students often mistakenly believed learning was the memorization of facts rather than the acquisition of knowledge that requires the understanding of concepts and key relationships. Those students likely experienced dissonance in academic contexts that were highly conceptual. Dissonance was successfully resolved if and when students recognized that such academic demands would not allow them to continue to support their “status quo” epistemological beliefs and that subsequently changes occurred in those beliefs. Bendixen (2002) further related Piaget’s theory of development through accommodation to the literature on conceptual change. Individuals must first determine that their current beliefs are not adequately working in the situation and then must gain an understanding of the new belief. The next condition required for change is the opportunity to apply the new belief and finally to witness the fruitfulness of the belief when it is challenged.

On the other hand, students who were unable to appropriately reconcile their epistemological beliefs with the academic context were found to be academically at risk according to Boulton-Lewis and Wilss (2003). Schommer (1990) contended that when students encountered academic content that was inconsistent with their knowledge beliefs students may inappropriately have reconciled the dissonance by distorting the new information rather than by altering their beliefs. For example, the student who believed that learning was linear may have ineffectively employed memorization strategies and oversimplified the content when attempting to fulfill highly conceptual academic tasks. If, however, knowledge beliefs were modified, students should then have recognized the need to adopt a different set of strategies in their pursuit of learning that were better matched to the task demands (Borkowski, Carr, Rellinger, & Pressley, 1990). An appropriate matching of strategies to the demands of the academic task

reportedly contributed to improved academic success (Borkowski et al., 1990; Schommer, 1990).

The association of epistemological beliefs with learning was specifically and quantitatively addressed by Schommer (1990) in a study that used regression analysis to link epistemological beliefs with comprehension. This seminal study was the catalyst that spurred tremendous growth in the interest and research related to epistemological beliefs (Muis, 2007). In contrast to Perry and others, Schommer refuted the notion that epistemological beliefs were unidimensional and developed through stages. Schommer proposed that epistemology was highly complex and was better described through multiple dimensions of knowledge including: structure, certainty, source, control, and speed of knowledge. These dimensions were influenced by the work of Perry in 1970 and the later work of Dweck and Leggett (as cited in Schommer, 1990). In an earlier study in 1988 Schommer developed a questionnaire to assess epistemological beliefs of students. This questionnaire was modified for Schommer's 1990 study but continued to use the five aforementioned dimensions. Using factor analysis the first experiment resulted in the identification of following four factors that comprise naïve epistemological beliefs (Schommer, 1990, p. 500):

1. The ability to learn is innate (fixed ability).
2. Knowledge is discrete and unambiguous (simple rather than complex).
3. Learning is quick or not at all.
4. Knowledge is certain.

Schommer also explored the factors that predicted student's knowledge beliefs and found that the student's background (home and educational) was the strongest predictor of epistemological beliefs. Schommer's second experiment examined the relationship between epistemological beliefs and comprehension. In this experiment, designed to offer insight into how knowledge beliefs may affect classroom tasks, Schommer found that students who believed

in “quick or not at all” learning were likely to perform poorly on academic tasks. Schommer’s study further revealed that “quick or not at all” knowledge beliefs were a predictor of students’ overestimation of their level of understanding. This finding established the close relationship between epistemological beliefs and self-regulated learning especially in regard to self-assessment skills. “When one encounters complex information, belief in quick, all-or-none learning appears to affect the degree to which students integrated knowledge. This same belief affects students’ accuracy in assessing their own comprehension” (Schommer, 1990, p. 503). Schommer (1990) postulated that “...[E]ducation may be the key to the prevention and intervention of self-defeating epistemological beliefs” (p. 503) and that college students may benefit from classroom activities that raise their consciousness about how epistemological beliefs affect their own learning.

Schommer continued to make contributions to the understanding of how and why epistemological beliefs were associated with learning throughout the 1990s. In a study of secondary students Schommer (1993) found that epistemological beliefs predicted students’ GPA, after controlling for general intelligence. In another study Schommer (1993) compared the epistemological beliefs of junior college students and university students. Although this study contained many relevant findings, it indicated that a negative relationship may have existed between the education level of students’ parents and students’ beliefs in simple knowledge. In a study that included the domains of mathematics and the social sciences, Schommer (1995) determined that epistemological beliefs were similar across domains or domain independent. In a later study Schommer (1998) found that both age and higher degrees of education promoted the movement from naïve to more sophisticated epistemological beliefs.

The important role that epistemological beliefs play in self-regulation and learning is becoming widely accepted in the educational psychology literature. Hofer and Pintrich (1997) called for research to empirically investigate this connection. To move forward research in this area Hofer (2000) developed the Discipline-Focused Epistemological Beliefs Questionnaire to measure students' epistemological beliefs. Hofer (2000) described epistemological beliefs as a dichotomy consisting of beliefs related to the nature of knowledge and beliefs related to the nature of knowing. Beliefs related to the nature of knowledge, specifically the certainty of knowledge and the simplicity of knowledge, are particularly relevant to the current study because these beliefs are typical of novice learners such as those in a beginning accounting course. Certainty of knowledge was further described by Hofer as a continuum from beliefs that knowledge consists of absolute truths to beliefs that knowledge is constantly evolving. Hofer described the simplicity of knowledge dimension as a continuum ranging from beliefs that knowledge is an accumulation of facts to beliefs that knowledge represents highly interconnected concepts.

Muis (2007) greatly contributed to the extant literature when she added epistemological beliefs to the established self-regulated learning models and identified four ways in which knowledge beliefs played a role in self-regulated learning. As hypothesized by Hofer and Pintrich (1997), the research of Muis and Franco (2009) revealed that epistemological beliefs predicted the kind of academic achievement goals students set for themselves. Specifically, students who possessed the belief that knowledge was certain and simple were likely to adopt performance goals rather than mastery or learning goals. Likewise, students who believed that knowledge was certain tended to focus their learning on "proving," because knowledge was viewed as a finite target. Students who believed that knowledge was tentative and always

evolving tended to focus on “improving” and would more likely adopt mastery goals. Muis (2009) theorized that achievement goals provided the linkage between epistemological beliefs and strategies students used and that learning strategies provided the linkage between goals and academic performance.

Moran (2005) addressed the common epistemological misconception that “remembering information” was synonymous with “understanding information.” The epistemological belief that a set of accumulated and isolated facts equates to knowledge may prevent students from integrating knowledge and seeing critical relationships (Moser, Hasanbegovic, & Metzger, 2008). Dahl, Bals, and Turi (2005) addressed the relationship between knowledge beliefs and strategy use. The findings of this study confirmed the widely hypothesized notion that naïve epistemological beliefs were associated with the use of rehearsal strategies, a memorization approach to learning. As expected, more sophisticated epistemological beliefs were associated with such self-regulated learning strategies as elaboration and organizational strategies. Other meaningful associations between the beliefs that knowledge was simple and/or fixed and the use of learning strategies emerged from the study.

The relationship of knowledge beliefs to academic performance was addressed in accounting education research conducted by Phillips (1998). The study was designed to determine what epistemological beliefs accounting students held and whether those beliefs were related to academic performance. Using the four aforementioned factors that comprised naïve epistemological beliefs as identified by Schommer (1990), Phillips postulated that those factors may have held answers about why accounting students often struggled. Using a shortened version of Schommer’s questionnaire and factor analysis, Phillips ascertained that more sophisticated knowledge beliefs were related to higher performance in case studies that were

unstructured and ambiguous. Phillips (2001) replicated those findings in a later study that considered whether study strategies mediated the relationship between epistemological beliefs and student performance when preparing solutions to unstructured problems.

As expressed by Winne (1996) less sophisticated beliefs may “color metacognitive monitoring and control” (p. 338) and, in effect, cause students to provide simple answers to complex problems. Because the subject of accounting is inherently conceptual and accounting professionals deal with complexity and uncertainty on a regular basis, studies that have examined the association between knowledge beliefs and academic achievement are particularly relevant in accounting education. As a result of multiple studies Schommer (1994) determined that the belief in fixed or quickly acquired knowledge was negatively associated with persistence, an academic necessity for many beginning accounting students. In other words, it can be reasonably hypothesized that beginning accounting students may hold epistemological beliefs that are inconsistent with the epistemic nature of the discipline of accounting. Phillips (1998) challenged accounting educators to design instructional activities that would increase the sophistication of students’ epistemological beliefs. Schommer (1994) implored teachers to design learning environments that would encourage students to actively construct knowledge and to make connections as new information was learned. Schommer stressed the importance of students’ understanding that academic struggles were necessary when moving to higher-level thinking.

As a prelude to the presentation of a process model of epistemic belief change, Bendixen (2002) provided a review of significant researchers and studies related to epistemological beliefs and concluded that there were still many unanswered questions about how epistemological development and change occurs. It is generally accepted, however, that students’

epistemological beliefs are closely related to students' attitudes towards learning. Smith (2001) contended that in order for classroom efforts to successfully promote self-regulated learning "...the student *must* buy into the fact that the process of learning is something to be learned" (p. 682). Other relationships were studied by Phan (2008), specifically the relationship among epistemological beliefs (simple, fixed, certain, and quick knowledge), SAL (deep and surface approaches), and various elements of self-regulated learning (self-efficacy, mastery goal orientation, and learning strategies). The results of this study confirmed that naïve epistemological beliefs were negatively related to the use of self-regulated learning strategies. This finding was not surprising, because negative relationships were also found to exist between naïve epistemological beliefs and self-efficacy as well as mastery goal orientation. Using the results of this study as justification, Phan concurred with Muis (2007) that epistemological beliefs are central to models of self-regulated learning.

In a recent study, Mihlon (2010) found that self-theories of intelligence (whether intelligence is fixed or malleable) directly impacted the help-seeking behavior of first-year college students. Furthermore, help-seeking behavior was also influenced by students' self-efficacy. The belief that knowledge is fixed and/or the presence of low self-efficacy resulted in students being less inclined to pursue help resources, which in turn negatively affected learning and academic performance. This particular study exemplifies the importance of the forethought stage in the learning cycle.

Metacognitive Awareness. According to Schraw (2001) students' awareness about themselves as learners and the factors that influence their academic performance is another important aspect of self-regulation that relates to the forethought phase. It is critical that students be well informed of the controllable nature of self-regulated learning and the role it plays in their

own academic achievement (Borkowski et al., 1990). This is particularly pertinent to the self-efficacy of academically weaker students who may view their chances for academic success to be uncontrollable and predetermined by fixed levels of intelligence (Zimmerman, 2000).

It is equally important for students to “think about thinking” or reflect on their own use of self-regulatory strategies as they confront academic tasks. According to Weinstein and Meyer (1991) “students must be aware of characteristics about themselves as learners” (p. 17) before they can select the most appropriate learning strategies. This aspect of metacognition was referred to as metacognitive awareness earlier in this literature review (Schraw, 2001)

The Performance Phase

Weinstein and Mayer (1986) argued that classroom goals should include goals relating to the “products of learning” and goals related to the “process of learning.” They contended that helping students “learn how to learn” involved making appropriate strategies available to learners that would influence the encoding process and facilitate learning. Such learning strategies are essentially the tools that made learning goals achievable according to Weinstein (1994). Derry and Murphy (1986) defined learning strategies as “...the collection of mental tactics employed by an individual in a particular learning situation to facilitate acquisition of knowledge or skill” (p.2). Eide (2000) advocated integrating learning strategies into the accounting classroom for the purposes of facilitating student learning and “...empowering students, through strategy use, to become independent learners” (p.37). Cole, Goetz, and Willson (2000) argued that efforts to teach students self-regulated learning strategies could also dispel naïve epistemological beliefs that often were barriers to learning. Schunk (1989) contended that learners’ felt more in control of academic outcomes when they believed that

strategies learned in the classroom could improve their own learning. In essence, such beliefs raised students' self-efficacy beliefs, which, in turn, impacted academic performance.

Weinstein and Mayer (1986) developed a nomenclature of learning strategies that included rehearsal, elaboration, organizational, monitoring, and also affective strategies that relate to the emotional aspect of learning (i.e., controlling test anxiety). Garcia and Pintrich (1994) articulated the ineffectiveness of rehearsal strategies that focused only on the ability to recall information. In contrast, organizational and elaboration strategies were found to be highly effective in helping students establish critical connections between new information and existing knowledge. Applying what is known about the dual components of metacognition (Schraw, 2001), students' must not only possess the knowledge of elaboration and organizational strategies, but they must also be able to regulate these strategies if academic performance is to be enhanced.

Elaboration, organizational, and monitoring strategies are most relevant to this study because they can be explicitly incorporated into classroom activities, whereas rehearsal and affective strategies are only obliquely related to classroom activities. Elaboration and organizational strategies relate to the performance phase of self-regulation, whereas monitoring strategies represent the self-reflective phase.

Elaboration Strategies. Weinstein and Mayer (1986) contended that the purpose of an elaboration strategy was to help students initially acquire new knowledge and then be able later to use that knowledge. Both learning and retention benefits of elaboration extend to students who were diverse in terms of age, academic achievement, intelligence, and ethnicity (Levin, 1988). Weinstein & Mayer (1986) defined an elaboration as the construction of "...internal associations between two items (or among several items)" (p. 319). According to Eide (2000)

elaboration occurs when learners "...use existing knowledge or experiences to make what they are trying to learn more meaningful and memorable" (p.42). Examples of elaboration strategies for complex academic tasks would include analogies, examples, continuations, paraphrasing, summarizing, comparing and contrasting, or simply fitting new information into preexisting models (Derry, 1990; Weinstein, 1982; Weinstein & Mayer, 1986). New ideas can be more easily recalled and used when they are stored with links or connections to a contextual network (Derry, 1990).

More specifically, learning is viewed as an integrative process in which new information is related to existing knowledge structures or schemata. As discussed earlier, the benefits of elaboration generally may not accrue to novice learners until they establish a knowledge foundation or schemata. Piaget first recognized this process of integrating new knowledge with existing knowledge, referring to it as "assimilation" (Flavell, 1963; Flavell et al., 2002). Piaget used the term "accommodation" to describe situations in which new information was inconsistent with schemata, requiring that schemata be altered or adjusted. Pressley et al. (1997) maintained that instructors' and students' use of the "Why?" question was especially effective in helping students connect old and new knowledge. Schunk (2004) advocated the use of synthesis and application questions when encountering complex learning tasks.

Levin (1988) defined elaboration in learning as the generation of "...meaning-enhanced additions, constructions, or generations" (p.191) that improved one's memory for what was being learned. Elaboration uses meaningful connectors to relate new information to familiar information. Levin summarized the general principles and requirements related to strategic elaborations; elaborations must be meaningful to the learner, provide logical connections, and be compatible with prior knowledge. Although elaborations can be internally generated by the

student or externally generated by the instructor, Levin (1988) ascertained that externally-generated elaborations, which could be modeled by instructors, were more appropriate for inefficient or novice learners. However, Levin found that self-questioning and imagery were basic forms of elaboration that even novice learners could incorporate into their academic work.

Although many of the existing studies related to elaboration strategies have taken place in the reading field (Levin, 1988), the accounting education literature also contains elaboration studies. Almer, Jones, & Moeckel (1998) used the elaboration strategy of “one-minute papers” to improve learning in a beginning accounting course. Choo and Tan (1995) studied the association between the use of an elaboration strategy and accounting students’ acquisition of auditing expertise. Like Levin (1988), Choo and Tan found that students were better able to learn new course content when they related it to other course information or other prior knowledge they possessed. Although Schadewald and Limberg (cited in Choo & Tan, 1995) used elaboration strategies to help accounting students learn tax rules, Choo and Tan employed the strategy to help students develop higher-order thinking processes relevant to auditing. Because auditing students were upper-level accounting students who possessed a strong base of foundational knowledge, it was not surprising that student-generated elaborations made the largest contribution to learning in auditing courses.

Organizing Strategies. Teaching course content in such a way that helps students see relationships should be a pedagogical goal in higher education according to Naveh-Benjamin and Lin (1994). Ausubel (1968) earlier described this type of learning as “meaningful learning” and contended that organizing strategies were efficacious in promoting such learning. Knowledge or cognitive structures, organized mental pictures of knowledge stored in memory, were said to be crucial for meaningful learning. Naveh-Benjamin (1994) explained the benefits of providing a

visual representation of such structures for students at the beginning of a course of study and then providing the opportunity for students to use such structural aids more independently over time.

The educational literature provides numerous examples of organizing strategies for complex tasks including the use of outlines, mnemonics, hierarchies, and diagrams (Schunk, 2004; Weinstein & Mayer, 1986). Lowman (1996) argued that lecture outlines, because of their linear nature, are organizationally deficient in helping students see key relationships and understand major concepts. Other organizing strategies include advance organizers that are initially used to introduce new content by providing cognitive structures (Edmonds, Edmonds, & Olds, 1998) and concept maps that visually depict the key concepts and relationships of a specific subject (Leauby & Brazina, 1998). The “House of GAAP” is an example of a hierarchy that is depicted in most financial accounting textbooks (Smith, 2001). According to Svinicki (1991) there are a variety of organizational motifs that can be used to effectively organize course content in the classroom *if* they are made explicit to students.

Ausubel (1968) attributed the success of advance organizers in students’ learning of new material to a fundamental concept referred to as anchoring ideas. These anchoring ideas are part of the learner’s knowledge base. As new, potentially meaningful content is presented, meaningful learning occurs if the learner’s knowledge base contains relevant anchoring ideas. However, if no relevant anchoring ideas are present, the learner must resort to rote memorization. Togo (2002) portrayed an advance organizer to be a “...bridge between what the learner already knows and the knowledge needed before a task can be performed” (p. 206). Ausubel further maintained that advance organizers were particularly important for novice learners who had insufficient anchoring ideas on their own. The advance organizer, in effect,

provided a knowledge structure or schema to which new information can be anchored to create meaning for the learner. The advance organizer should reduce reliance on rote memorization for students studying in a novel discipline.

Of particular relevance to this study, Dansereau (1995) contended that structural schemas provided and modeled by instructors were especially effective in filling the schema void for novice learners. Specifically, Dansereau advocated the construction and use of derived or structural schemas that had been consciously developed by experts. Those derived schemas, which could be the focal point of classroom learning, visually depicted the "...relatively abstract categories or placeholders, and their interrelations" (p. 97) that were characteristic of natural schemas of expert learners in a domain. The novice learner was thus equipped with schema to which new information could be anchored, as described by Ausubel (1968). Beyond facilitating initial learning, this highly strategic organizational strategy was found to help students determine what they needed to know, to detect gaps in their learning, and to help them organize and remember complex information for examinations. Furthermore, those structural schemas if properly designed increased the likelihood that knowledge would be transferred to other settings.

The literature indicates that studies related to the benefits of advance organizers have produced mixed results. Measurement problems and other limitations are endemic to studies using organizational aids such as advance organizers (Edmonds, Edmonds, & Olds, 1998). As is common in other types of studies, long-term benefits are difficult to measure but are likely to be associated with organizational strategies. After analyzing the extant studies related to the use of advance organizers, Grippin and Peters (as cited in Edmonds, Edmonds, & Olds, 1998) concluded that advance organizers, more often than not, had benefited student learning. Organizational aids are particularly valuable in contexts where content is conceptual and

understanding relationships is crucial. Because these characteristics are particularly inherent in the accounting discipline, the accounting education literature is replete with studies using organizational aids.

An Italian study by Nota, Soresi, and Zimmerman (2004) considered 15 different self-regulated learning variables as they related to students' course grades in high school and their subsequent academic performance at the university. The organizing and transforming variable, one of the 15 variables, represented the students' "...self-initiated overt or covert rearrangement of instructional materials to improve learning" (p.209). Using regression analysis the study revealed that the organizing and transforming variable accounted for 23% of the variance in the mathematics grade, 73% in the Italian Language grade, and 83% of the technical subjects' variance. This same strategy was highly predictive of students' academic performance at the university level with the organizing and transforming strategy predicting more than 80% of the variance. Although the study was limited by its highly selective sample, it nevertheless sent a message to educators that students' ability to organize and transform new content was crucial to their academic success. As is true with other self-regulatory skills, it may be necessary for educators to model the use of this strategy so that students can learn to employ this skill independently. Beyond the academic setting, the ability to organize and transform new content is crucial to the lifelong learning required of professionals in a dynamic workplace (Knapper & Cropley, 2000).

Often classroom interventions have involved elaborative and organizing strategies simultaneously. The relationship between elaboration and organizing strategies is demonstrated in an intervention designed by Edmonds, Edmonds, and Olds (1998). Financial statement models were used in a beginning accounting course as advance organizers to provide a knowledge

structure while concurrently allowing students to “...anchor new material into existing knowledge” (p 118). Anecdotal evidence indicated that the “Why?” question was voiced more often when the organizational aid was used. Although grades were higher and drop rates lower, another perceived result of using the models was the struggling students’ improved self-assessment and calibration. Based upon experiential information related to the use of financial statement models, Edmonds, Edmonds, and Olds determined that struggling students had become more capable of recognizing when they were *not* comprehending the accounting concepts.

Greenberg (1997) used an organizational aid, referred to as a systems model, in a cost accounting course to help students see the relationships in accounting information systems. The systems model was further used for student-generated elaborations. Although limitations also accompanied this study, Greenberg concluded that using the model for organizing and elaborating purposes led to higher-order thinking skills and long-term learning of concepts related to accounting systems. Park (1989) used a three-dimensional graph to help students grasp the relationship between profit-volume analysis and product costing methods. A study conducted by Togo (2002) incorporated practical organizational aids suitable for an introductory management accounting course, including t-accounts to depict the flow of manufacturing costs, graphs to illustrate cost behaviors, and time diagrams associated with present value concepts. Duffy (1990) implemented a graphical approach for the study of interest capitalization to help students visualize complex material in an intermediate-level accounting course. Simon (2007) used concept mapping in a financial accounting theory course to enhance student learning.

Leauby and Brazina (1998) demonstrated how concept mapping, another type of organizational aid used to visually depict relationships among concepts, could be used in a

beginning accounting course as a road map to introduce new subjects and as a schematic summary of what had been learned. By providing a visual representation, concept maps enabled students to "...learn about the structure of knowledge and about the process by which knowledge is produced" (p. 125). Hadwin and Winne (1996) reviewed four different studies of concept mapping and concluded that this organizational strategy was particularly useful in courses that required "deep thinking" such as accounting.

Research by Naveh-Benjamin and Lin (1994) was especially pertinent to accounting educators and the beginning accounting course. This study considered the effectiveness of providing an organization scheme (hierarchical tree relating major concepts) at the beginning of each unit of study. Because prior knowledge may have been minimal, the instructor explicitly explained the structure of the hierarchical tree and the significant concepts and relationships. Using a control-and-treatment group methodology, the study found that students in the treatment group were better able to organize unit content at the conclusion of the unit and that these students also initiated organization of materials in a different unit. More importantly, this short study provided an example of how teaching students about learning did not have to be at the expense of time devoted to content. In essence, this study and others established that it was possible to focus on both the "product" and the "process" of learning through tactical instructional design and using pedagogical techniques such as instructor modeling (Ausubel, 1968; Weinstein & Mayer, 1986; Zimmerman & Kitsantas, 1997).

Elaboration and organizing learning strategies may provide a path that leads students to the understanding of "threshold concepts" identified by Meyer and Land (as cited in Duff & McKinstry, 2007). Until a threshold concept is understood, the student cannot progress. This concept is particularly relevant to accounting courses and other conceptually difficult subjects

because it is characterized by three highly crucial aspects of student learning. When a threshold concept is ultimately understood by the learner, it facilitates a significant change in how the learner views and understands the particular subject. Secondly, the student who learns a threshold concept usually does not forget it. Finally, the threshold concept provides a lens through which the student is then able to see interrelationships that were previously imperceptible.

The Self-Reflective Phase

The third phase of the academic learning cycle proposed by Zimmerman (1998) describes processes that occur after learning tasks are attempted. It involves self-evaluation, whereby progress in learning is assessed using monitoring strategies. Learners reflect on their experiences related to the completed learning task and make judgments about the success of their learning efforts. Completing the academic learning cycle, this self-evaluation influences the forethought phase in the subsequent learning cycle (Zimmerman, 1998).

Monitoring Strategies. The ability to judge one's own work and progress in learning is critical in the workplace and fundamental to lifelong learning. Because professionals face the challenge of learning new knowledge throughout their careers, it is imperative that they be able to assess and monitor their learning progress (Cassidy, 2007). Professionals must also be able to assess the quality of their work as compared to peers and widely accepted professional standards (Kirby & Downs, 2007). In academic settings monitoring strategies serve the purpose of helping students recognize failures in understanding or in the assimilation of new information (Weinstein & Mayer, 1986). Often referred to as self-assessment or self-evaluation, monitoring activities

are crucial to effective learning because they can highlight gaps that exist between what is currently known and what still remains to be learned (Boud, 1995).

Wlodkowski (2008) challenged educators to design classroom activities that would provide students the opportunity to check their understanding of newly learned course content. Svinicki (1991) provided multiple examples of how classrooms could be designed to foster such student self-evaluation. Ambrose, Bridges, DiPietro, Lovett, and Norman (2010) recommended “exam wrappers” or short classroom activities that are planned when exams are returned to students. These activities encourage students to reflect on how they prepared for the exam, the nature of the errors made on the exam, and how they can better prepare for future exams.

Cassidy (2007) found that students who possessed strong self-assessment skills also had achieved higher academic performance. Knowing what “you don’t know” is an important realization and should prompt the learner to make adjustments in the strategies being used (Schunk, 1998). When such a gap had not been detected by examination time, students were genuinely surprised to learn that they had performed poorly on an exam (Glenberg, Wilkinson, & Epstein, 1982).

Reflection has clearly been established as a key element in all self-regulated learning models. However, it is the ability of students to *accurately* assess what has been learned and what still needs to be learned that often inhibits learning (Bembenutty, 2009; Boud, 1995; Stone, 2000). Boud (1995) postulated that the ability of the learner to self-assess was not general across domains, but varied among different disciplines, interest domains, and areas of students’ academic strengths or weaknesses. After consolidating the results of multiple self-evaluation studies, Boud found that academically strong students in new subjects tended to either be realistic or underestimated their learning achievements. Boud theorized that awareness of their

learning deficiencies may have been associated with these findings. In general, weaker students tended to overestimate their abilities, which may have been due to ignorance of their “unknowingness.” Experienced students (students in the later courses) tended to be more accurate than inexperienced students. Learners who were outside their domains of interest may have failed to “recognize the inadequacy of their comprehension” (Brown, 1988, p.316).

Calibration. Stone (2000) used the term “calibration” to describe students’ ability to gauge what they knew and what they didn’t know. Stone’s findings were consistent with those of Boud (1995). She maintained that a learner’s level of calibration was associated with multiple factors including the difficulty level of course material and the level of the learner’s expertise in the subject. Stone ascertained that learners tended to be overly confident (thus poorly calibrated) when facing difficult academic tasks as well as in contexts where they had low levels of expertise, such as in a beginning accounting course. The combination of those two characteristics demonstrated the influential link that existed between epistemological beliefs and calibration. For example, if a student epistemologically believed that “being familiar” with course material equated to “knowing” the material, the student tended to be overly confident and poorly calibrated (Stone, 2000). As hypothesized, Stone found a positive correlation between self-regulated learning processes and calibration.

There have been a plethora of studies related to monitoring skills as they apply to reading comprehension (Glenberg et al., 1982; Hartman, 2001). Glenberg et al. referred to self-assessments in which learners overestimated their degree of knowing as the “illusion of knowing” (p. 597). In other words, learners erroneously believed that comprehension or learning had occurred when, in reality, it had not. In response to their reading comprehension study using text contradictions, Glenberg et al. postulated that the default position of readers was to assume

comprehension was occurring, at least until they received a “red flag” that comprehension had failed. This “...ability to detect ignorance...” (p.602) is particularly deficient when reading is done in unfamiliar domains.

Other domains have their own “red flags” that helped learners informally monitor their comprehension. However, informal monitoring cues may not be perceptible to learners who are unaware of the difficult nature of an academic task they are undertaking due to a lack of expertise. Bembenutty (2009) distinguished between this “ease of learning judgment” and accuracy in predicting one’s level of knowledge, referred to as “feeling-of-knowing” judgment. Zimmerman and Paulsen (1995) asserted that self-monitoring skills were not innate but instead were acquired. Classrooms that provided “red flags” through the teaching of explicit monitoring strategies and/or providing formal monitoring instruments could be of greatest benefit to novice learners (Pintrich, 1995).

Lan (1998) provided an excellent exemplar of how self-monitoring skills could be developed in a classroom and could simultaneously improve academic performance in an introductory statistics course. That course, like a beginning accounting course, was characterized by difficult material and highly anxious students. Recognizing that the course was commonly difficult for students, Lan provided a self-monitoring and gridlike protocol that vertically established the significant concepts of the course, called “knowledge elements.” Horizontally, the protocol provided studying activities that would move students toward understanding these critical elements of the course. For each knowledge element, students recorded the time spent using each of the suggested activities. The protocol clearly established focus on the elements essential to academic success and provided the strategies that could be used to better understand these elements. In addition to providing an organizational structure

and establishing content priorities, this instrument allowed students to successfully engage in self-monitoring. In essence, the protocol provided the “red flags” that novice learners may not have been able to perceive on their own. Of particular importance to self-monitoring, the protocol required students to self-assess their levels of efficacy for each knowledge element. This study demonstrated that self-monitoring could be embedded in regular classroom instruction and reaffirmed the notion that the elements of self-regulated learning were highly interdependent.

Even though substantial attention has been given to the importance of monitoring activities in the literature, Cassidy (2007) conjectured that self-assessment “...still eludes full integration in higher education” (p. 316). Consistent with Zimmerman and Paulsen (1995), he argued that self-assessment activities must be embedded in classroom activities to raise students’ awareness of the value of such activities. By including self-assessment in regular classroom activities using modeling and other instructional designs, students had the opportunity to practice and develop this valuable skill. Ironically, the student’s ability to detect a cognitive failure was described by Garner (1990) as “a metacognitive success” (p.518).

Paris and Paris (2001) noted that self-assessment was associated with both internal factors (metacognitive skills) and external factors including instructional design within the classroom and assessment. Classroom activities that promote student thinking and engagement also create opportunities for self-assessment. Brown (1988) contended that group problem-solving activities required students to assess their own comprehension before they could “...explain, elaborate, or defend their positions to others” (p. 316). The commonly used “one-minute paper” required reflection by the student in terms of what was and was not learned in the classroom that day (Almer et al., 1998). Although the status quo purpose of assessment is to

evaluate the “products of learning” (content), Paris and Paris (2001) affirmed that a classroom assessment could serve as a point of departure for students to personally evaluate the “process of learning.” Hartman (2001) proposed using an error analysis activity when examinations were returned to students, making the examination a learning device as well as an assessment tool. Examination scores only provided feedback related to students’ mastery of the content. Using the error analysis activity, students became the assessors (rather than “the assessed”) of their own metacognition as well. Students reflectively determined what they did right or wrong in preparing for the examination as well as ascertaining which content areas were least understood.

Chen (2003) used path analysis to relate the self-efficacy beliefs of seventh graders to their ability to ability to self-assess and found students with both high and low self-efficacy overestimated their academic performance. This study yet again highlights the interdependencies that exist between elements of self-regulated learning. While self-efficacy is an important factor in academic performance, this element must be accompanied by the ability to self-evaluate if academic performance is to improve. Ramdass and Zimmerman (2008) used self-correction strategy training as an intervention with middle school math students. Using a MANCOVA for statistical analysis, the results indicated that the training improved calibration as well as math performance. Mansui and De Corte (1999) demonstrated that a powerful learning environment could be created by incorporating “orienting” and self-judging activities in a university business economics course in a Flemish university. These activities were described as classroom opportunities in which a student could assess his or her personal “characteristics and competencies as a learner or problem solver” (Mansui & De Corte, 1999, p.522). Using a treatment group and two control groups, Masui and De Corte found a positive correlation between knowledge of orienting and self-judging and academic performance. When orienting

and self-judging variables were added to other predictor variables in a regression equation, an additional 7% of the change in the dependent variable, academic performance, was explained by these two variables.

Novice Learners and Self-Regulated Learning

Many students in a beginning accounting course enter the classroom with minimal exposure to the discipline of accounting. Although they may be in their second year of college, many students are “novice learners” in an accounting classroom. In addition to being especially vulnerable to the debilitating effects of unsophisticated epistemological beliefs (Paris & Winograd, 1990), students who lack basic knowledge of a subject face many academic challenges. Consistent with constructivist theory, Cross and Steadman (1996) described the student’s existing knowledge base as “...the Velcro of the mind to which new information sticks” (p.41). The novice learner is deficient in existing knowledge structures called “schemata.” A schema was further described by Cross and Steadman (1996) as a network of “...facts, ideas, and associations formed around related concepts” (p.38). According to Derry and Murphy (1986) schema knowledge enabled students to connect new information to existing knowledge and to identify significant ideas that must be learned.

Pressley et al. (1997) addressed the difficulties students encountered as they prepared for examinations and offered suggestions for both students and instructors to make this process easier. As the authors contemplated the reasons why students may have encountered problems preparing for exams, deficiencies in background knowledge provided some possible answers. Specifically, novice learners lacked the selectivity (distinguishing between important versus superficial information) that is necessary for effective note taking, text reading, and exam

preparation. Without background knowledge, students were less perceptive to clues that helped delineate what was important. Because of this inability to recognize important features of problems, Naveh-Benjamin and Lin (1994) maintained that novice learners relied and focused on the more “accessible” features that may have been trivial and not relevant to finding solutions.

In an effort to address the prevailing calls for change in accounting education, Mayer-Sommer (1990) found it beneficial to contrast novice accounting learners with accounting experts in the field. In contrast to novice learners, one with expert knowledge was easily able to separate more important from less important information. Experts possessed “conceptual fluency” that allowed them to make inferences and see the connectedness of information. In contrast, novice learners relied on “...literal interpretations and explicit problem statements...” (Mayer-Sommer, 1990, p. 133). Because of classroom experiences in teaching chemistry to novice learners, Coppola (1995) said that novice learners “...lack the sophistication that allows experts to make judgments based on information that is only implied...” (p.88).

Novice learners may take an overly simplistic approach to a highly complex subject because they are deficient in ease-of-learning judgment. This metacognitive skill describes the student’s awareness of the degree of difficulty of a task or subject (Bembenuddy, 2009). Successful students, like experts, recognized when the difficulty level was increased and reacted by modifying their efforts and the strategies they used (Wang & Peverly, 1986).

Ausubel (1968) provided a clear distinction between rote and meaningful learning. Meaningful learning occurs when the learner relates the learning to something the learner already knows, whereas rote learning represents “...purely arbitrary associations...” (p.24). Without prior knowledge, novice learners are inclined to engage in rote learning until they establish baseline knowledge in a particular subject. Although students tend to invoke “shallow-processing”

strategies when they are novice learners, they also tend to develop “deeper-processing” strategies as a course progresses and as a knowledge base or schema is built (Muis & Franco, 2009).

In addressing the reasons why learners had failed to engage in strategic learning behaviors, Garner (1990) contended that when background knowledge in a subject was minimal students compensated by using general learning strategies that may not have been effective in certain domains. Garner portrayed adept learners as possessing repertoires of strategies, knowing how to use those strategies, and knowing when to use them. In a prior section of this literature review, these three dimensions were described as declarative, procedural, and conditional knowledge about learning strategies (Paris, Lipson, & Wixson, 1983).

In her studies of calibration or the student’s awareness of what they knew and didn’t know, Stone (2000) concluded that novice learners tended to overestimate what they knew, especially when the academic material was difficult. This conclusion was later confirmed by Chen (2003). Such overestimation could be attributed to the novice learners’ inability to link new content to prior knowledge, the inability to discriminate between relevant and irrelevant material, or the unawareness of the difficulty level of academic subjects and tasks.

It may be concluded that many academic threats exist for students who are studying in new domains. General self-regulated learning skills are both critical and compensatory when students are faced with academic tasks in domains in which they have little or no background knowledge. Garner (1990) further articulated that students who were more experienced and knowledgeable in a domain did not possess the same level of need for effective learning strategies. The strategies used by experts offered valuable insights into how to help students “learn how to learn” in novel settings. Smith (2001) charged accounting educators with the responsibility of helping students discern between core accounting concepts and less important

details until students possessed the background knowledge to make such distinctions independently. Providing more specific direction for educators, Kinzie (1990) insisted that novice learners required assistance in developing schemas or structures to which linkages could then be made. Dansereau (1995) specifically advocated the use of structural schemas to be constructed and applied in classrooms by educators who are experts in the domain. “Schemas should be sufficiently detailed and precise to validly capture a knowledge domain, but simple and coherent enough to be manageable by a novice” (p. 96). Structured schemas were previously discussed in this literature as an organizing strategy to enhance learning. Dansereau (1995) contended that the benefits associated with structured schemas were extended to improvements in the transfer of knowledge.

The Role of Context in Self-Regulated Learning

Unlike domain-specific knowledge that can be directly transmitted to students, helping students develop the skills of a self-regulated learner may require a less direct approach. Randi and Corno (2000) asserted that curricular content was often “...rich with self-regulatory possibilities” and that the curriculum-embedded approach for developing the self-regulatory skills of students held great potential. Describing self-regulated learning as “contextually responsive behavior,” Hadwin, Winne, Stockley, Nesbit, and Woszczyna (2001) contended that the context or environment in which “learning-to-learn” goals were to be achieved had a powerful influence on whether or not students developed learning strategies. Wang and Peverly (1986) were the first to explore how classroom context was associated with the self-regulation of students. Although the significance of the role of context to students’ learning is clearly articulated in the literature, Garner (1990) argued that context was too often “...treated as a

footnote...” (p. 523) in strategy research studies. In early SAL research, Trigwell and Prosser (1991) examined the association between the learning context and how students approached learning tasks. Through a self-reporting study that included the diverse contexts of reading to learn, studying for exam, and preparing to write a think paper, Hadwin et al. (2001) also concluded that students’ choice and use of learning strategies were often in response to variations in context.

Boekarts (1997) asserted that “powerful learning environments” were essential for the development of self-regulated learning skills. Gerjets and Hesse (2004) described powerful learning environments as academic settings that promoted the understanding of concepts and seeing relationships rather than “...digesting and memorizing decontextualized and fragmented knowledge...” (p.447). Powerful learning environments are based upon the notion that knowledge is constructed by students rather than unilaterally transmitted by instructors, indicating that students are active rather than passive in the learning process. Learning environments, therefore, must include opportunities for students to practice newly acquired learning strategies (Boekarts, 1997).

In her synthesis of studies related to epistemological beliefs and mathematics, Muis (2004) determined that such beliefs could be changed to higher levels of sophistication by changes in context. Although quasi-experimental studies cannot generally support cause-and-effect claims, these studies suggest that changes in the classroom structure have the potential to alter students’ beliefs. Considering the preponderance of evidence supporting how knowledge beliefs impact the use of learning strategies (Dahl, Bals, & Turi, 2005; Phillips, 2001), Muis further proposed that classrooms designed to teach and promote the use of effective learning strategies could positively influence these knowledge beliefs.

Paris and Paris (2001) identified three specific classroom components they deemed to be essential to the development of self-regulated learners. Teachers must explain self-regulated learning to students, provide multiple opportunities through classroom activities to practice self-regulated learning skills, and serve as effective and positive models of self-regulated learning. Using both quantitative and qualitative methods to examine interactions between teachers and students that attempted to foster self-regulated learning, Perry, Vandekamp, Mercer, and Nordby (2002) ascertained that “A hallmark of high [*sic*] self-regulated learning environments is that they challenge students without threatening their self-efficacy” (p.12).

Classroom Goals

Achievement motivation has been established as a central element in self-regulated learning (Smith, 2001). Ames (1992b) explained that the motivation literature had migrated toward a broadened framework referred to as a “theory of achievement goals.” This framework embraces both the cognitive and affective components of motivation, unlike the traditional motivation framework that was limited to goal-directed behavior. Using this broader motivation framework, Ames and Archer (1988) found that the design of classroom structures had affected achievement motivation. Specifically, the classroom environment affects how students’ approach learning and whether students select mastery or performance goals. Mastery goals, also referred to as learning goals in the literature, represent an orientation toward understanding and skill development using self-referenced standards. On the contrary, performance goals focus on achieving success using normative standards such as grades (Ames, 1992a). Ames and Archer (1988) found that students who possessed a mastery-goal orientation toward learning reported a

higher usage of effective learning strategies and were more likely to see the connection between effort and academic success than were students without a mastery goal orientation.

Ames (1992a) identified tasks, authority, and evaluation as three influential classroom structures and emphasized the interdependency of these structures. When classroom tasks emphasized personal relevance and understanding of the content, students were more likely to engage in learning in order to develop their skills or learn new skills. Contexts became conducive to a mastery-goal orientation when students perceive that "...value is placed on the process of learning through emphasis on meaningful learning, self-referenced standards, and opportunities for self-directed learning" (Ames, 1992a, p.266). Students were more inclined to engage in learning at the understanding level when teachers were less autonomous and encouraged students to be independent thinkers as well as masters of the course content. Classroom evaluations that focused on self-improvement rather than normative success encouraged mastery goals. Iterating the interdependencies of these structures, Ames asserted that successful classroom interventions must be comprehensively designed to include multiple structures.

Building on the work of Ames but using different terminology to describe mastery or performance orientations, Jagacinski (1992) provided classroom examples of how a "task orientation" (i.e., mastery goal orientation) could be encouraged in authentic classroom settings. Meese (1994) addressed the powerful role of motivation in self-regulated learning and maintained that the development of a mastery goal orientation was fundamental to motivation. Meese expressed concerns about self-regulated learning interventions (modification of attributions, development of learning strategies, etc.) that failed to simultaneously promote a classroom environment that encouraged and supported a mastery-goal orientation. Students who

lacked skills or had motivational deficiencies were only minimally influenced by interventions unless mastery goals were promoted in the classroom whereby such students were "... expected to understand, apply, and make sense of what they are learning" (p.39).

Raising Students' Awareness of Self-Regulated Learning

According to Pintrich (1995) "...the idea of self-regulated learning offered an optimistic perspective on college learning and teaching" (p. 7). The ability to self-regulate one's learning is developed through experience. It should also be encouraging to college students to know that self-regulatory skills are not dependent upon genetics and are not necessarily developed in childhood. Regardless of age, gender, intellectual ability, prior knowledge, and other factors, college students can become self-regulated learners in the authentic setting of the college classroom according to Pintrich (1995). Trigwell and Prosser (1999) advocated classroom activities that made students aware of the limitations of their understanding of course content and learning in general. When Orange (1999) found that peer modeling had resulted in increased academic performance, he speculated that students had become more aware of their own lack of strategies and were motivated to make changes, thereby causing an increase in scores. Peer modeling is only one of many ways to make students aware of the repertoire of strategies that can move them to greater academic success.

McMillan (2006) suggested that questionnaires could be useful in raising awareness about relevant issues. Simply by reading the set of questions, a questionnaire can stimulate thought and produce this desired effect. Mills et al. (2007) suggested that instructors use self-regulation surveys in the classroom for dual purposes. Such an activity can help instructors better understand the self-regulatory behaviors of the students they teach and students have the

opportunity to gain awareness about their own level of self-regulation. Duff (2004) specifically recommended the use of the Revised Approaches to Studying Inventory (RASI) at the start of an accounting program to introduce and raise awareness of the concepts associated with effective studying. Pintrich and DeGroot (1990) noted that questionnaires had been used by faculty in diverse disciplines to better understand the self-regulatory practices of their students and to provide feedback to the students. In a prior section of this literature review devoted to metacognition, the students' understanding of themselves as learners was referred to as "declarative knowledge" (Schraw, 2001). This initial awareness of one's personal learning habits and beliefs serves as a critical first step to future recognition of how self-regulation can impact learning and academic achievement.

Van Overwalle and Metsenare (1990) ascertained that it was advantageous for students to compare newly learned strategies to their then-current strategies. Awareness of current strategy use is the first step in making that possible. In his study of elaboration strategies, Levin (1988) cautioned that metacognitive awareness was absolutely essential if newly-learned elaboration strategies were to be transferred to new contexts. Because knowledge of cognition (which includes awareness) had such a profound impact on academic performance in accounting classrooms, Schleifer and Dull (2009) emphasized the significance of knowing oneself in a metacognitive sense. In her study of the role of epistemological beliefs in self-regulated learning, Muis (2004, 2007) contended that raising awareness of one's knowledge beliefs was an important mechanism in fostering students' development of more sophisticated epistemological beliefs. Consequently, classrooms should be designed to include activities that augment students' awareness of their personal knowledge beliefs, their use of learning strategies, and, most importantly, how self-regulation allows them to take control of their own learning.

Use of Modeling and Scaffolding

It has been established that learning strategies associated with self-regulated learning are not innate for most students and must be developed in the academic setting (Knapper & Copley, 2000). Pressley et al. (1997) stressed that appropriate strategies must be explained, and a support system must be provided until students have acquired enough expertise to use these strategies on their own. Modeling is defined as a "...process whereby observers pattern their thoughts, beliefs, strategies, and actions after those displayed by one or more models" (Schunk, 1998, p. 142). The idea that learning can only occur through one's own actions has been rejected by social cognitive theorists (Bandura, 1986). Vicarious learning or learning by observing others is both an efficient and effective alternative. Having conducted extensive modeling and self-efficacy studies, Bandura recognized the strong relationship that exists between modeling and self-efficacy. The powerful role that self-efficacy plays in self-regulation is a salient theme in the literature (Pajares, 2002; Pintrich & De Groot, 1990; Schunk, 2004).

In terms of students with a history of academic failures or novice learners, Bandura (1986) purported that the self-efficacy and motivation of those individuals could be boosted by the modeling of helpful learning strategies. For more confident students, "...models that teach them better ways of doing things" (p.400) elevate the self-efficacy of these students. Rosenthal and Zimmerman (as cited in Zimmerman & Schunk, 2003) traced modeling back to ancient Greece whereas Zimmerman and Schunk (2003) pointed out that the root meaning of the word "teach" was "to show." Despite its long history modeling had been given minimal attention in the educational psychology field until Bandura's research.

Although modeling and observational learning reportedly occurred in many ways in everyday life (Bandura 1986), modeling in the classroom can involve cognitive and metacognitive skills. Schraw (2001) also differentiated between these two types of instructor modeling. Modeling of cognitive skills focuses on “how to perform a task,” whereas the modeling of metacognitive skills involves the sharing of the instructor’s own thought processes and monitoring strategies used when learning how to perform the task. For the purpose of the current study modeling of metacognitive or self-regulatory skills is the focus. Schunk (2004) emphasized that effective modeling went beyond explanations and demonstrations to include verbalization of the model’s thought processes and justifications for using certain learning strategies. This particularly effective type of modeling is referred to as “cognitive modeling” or “thinking out loud” (Hagen & Weinstein, 1995, p.89). Coppola (1995) used this type of modeling to improve classroom instruction in the chemistry discipline.

Pajares (2002) expressed the idea that teachers were specifically responsible for modeling practices within their classrooms to promote development of self-regulatory skills. Specifically, exemplary models were said to “...exhibit novel patterns of thought or behavior which observers did not already possess but which, following observation, they can produce in similar form” (Bandura, 1986, p.49). In essence the value of models extends beyond the present learning task and can contribute to the development of lifelong learning skills.

Peers as well as teachers can serve as effective models in academic settings. Bandura (1986) ascertained that diversified modeling (i.e., instructor and peer) was more convincing and was more likely to raise learners’ levels of self-efficacy. Schunk (2004) ascertained that learners would try to emulate actions of competent models if they believed such actions would improve their own academic performance, creating the opportunity for increasing students’ self-efficacy.

Using confirmatory factor analysis and the Self-Regulation Inventory to measure participants' self-regulatory attitudes and behaviors, Orange (1999) confirmed earlier findings of Bandura (1986) that peer modeling was highly effective in increasing students' degree of self-regulation.

Pintrich further suggested the need for the modeling of such elaboration strategies as paraphrasing, comparing and contrasting, and using analogies. Further, he advocated explicitly telling students that such devices helped make new information more meaningful. As experts in their subjects who routinely addressed the complexities of the subject, instructors too seldom let "...students hear what goes on in an expert's head..." (Hartman, 2001, p.55). However, verbalizing the thought processes used when he (she) initially approached the difficult academic task as a novice learner is extremely beneficial to students. "By modeling our thoughts about disciplinary content knowledge, our own strategies for learning, and how we think and reason, we can help students become aware of what is required in our courses and help them become self-regulating learners" (Pintrich, 1995, p. 10-11). Furthermore, modeling of learning strategies was found to elevate the self-efficacy of learners, even those that have experienced academic failures (Schunk, 2004).

Because a major function of modeling is to demonstrate how subskills can be synthesized, modeling has the most potential to enhance student learning in complex learning situations (Bandura, 1986). When complexity is high and learners have little background knowledge or experience, learning by direct experience (trial-and-error) is extremely tedious and equally inefficient. "Direct experience is better used to refine and perfect skills than to build them from the outset" (p. 303). The use of pictorial models rather than verbal instructions and decomposing complex tasks into smaller subtasks are effective modeling practices when high levels of complexity are present. Of particular relevance to a discipline such as accounting that

is built on a strong conceptual base, Zimmerman and Schunk (2003) emphasized the importance of multiple demonstrations of a conceptual rule across an assortment of tasks or settings.

Multiple applications enable students to better process the abstraction and they will more likely be able to transfer it later. According to Brown, Collins, and Duguid (1989) concepts are continually “under construction” as they are used in new situations and conceptual knowledge should be viewed as a “set of tools” to be used rather than just something to be acquired.

Randi and Corno (2000) reviewed multiple studies in diverse domains that incorporated modeling in the classroom to “...make all students aware of the kinds of learning strategies that some students have acquired in the absence of explicit instruction and to promote their use” (p.654). Classrooms that used modeling to provide external support for novice learners created cognitive apprenticeships (Randi & Corno, 2000; Winnips, 2000). Identified initially in the athletic context of learning motor skills (Zimmerman & Kitsantas, 1997), skill development phases also applied to students who benefited from instructor modeling. The learner personally executed the learning strategy with assistance after observing the teacher-model. Learners practiced the newly learned strategy on their own during the next phase. The final phase took place when the learner used the learning strategy in a new context.

“Scaffolding” describes this process of gradually removing supports as students are able to accept more responsibility for their own learning. Until students become independent learners, instructor scaffolding includes illustrative examples, clues, reminders, assistance, and even encouragement (Reeve, 1996). Consistent with social constructivism, the zone of proximal development, introduced by Vgotsky (1978), describes the distance between what students can do on their own and what they can do with assistance. Boekarts (1997) simply described this zone as the areas between students’ “...actual and potential development” (p.171). This

construct has special significance to classrooms populated with novice learners. With appropriate scaffolding novice learners engaged in challenging subjects have been able to perform tasks that that could not have been done without such assistance (Roehler & Cantlon, 1997). The zone of proximal development has traditionally been associated with the development of cognitive skills but also has been found to be applicable to the development of metacognitive skills as well (Boekarts, 2006; Tudge & Scrimsher, 2003). Paris and Paris (2001) supported the relevance of Vgotsky's work as they theorized that self-regulation was something to be "shaped" within students rather than something to be "acquired" by students.

Roehler and Cantlon (1997) described students' developmental progression in response to instructor scaffolding as internalization, independence, and generalization. To promote internalization and then independence, they contended that instructors should make students aware of "intrinsic signals" within the context that provide cues that a particular strategy is appropriate. This prevents students from relying on the instructor for "...extrinsic signals for what to do next" (p. 83) and moves students toward ownership. Scaffolding can be used to show students how to transfer skills and knowledge to a novel setting so that they can eventually generalize themselves. Hogan and Pressley (1997) strongly advocated transparency to students through explicit instructor explanations of how and why scaffolding was being used.

Scaffolding may take many forms including the use of software tools. As articulated by Winnips (2000, p. 302), "The challenge is to map the delicate interaction that may occur in a classroom setting to a computer-based (tele) learning environment." Though in its infancy stage, research related to electronic scaffolding tools is becoming increasingly prominent in the literature and offers increasing promise as students approach learning environments with greater electronic savvy. Winnips contended that scaffolding in an electronic environment should

include the elements of modeling, support, and fading so that students can move toward independence. Using a computer programming course as the setting, the results of Winnips' study were somewhat confounded by the unintended collaboration of students working in that environment.

Hadwin and Winne (2001) used a computer-based learning environment to promote self-regulated learning through the use of tacit scaffolding. As students electronically accessed the text of a new chapter, cues for the use of elaboration and other strategies were provided. An organizer window consolidated, organized, and displayed all strategic work initiated by the student. Hadwin and Winne demonstrated how the innovative merging of learning theory and technological innovation can encourage self-regulation. Johnson, Phillips, and Chase (2009) used artificial intelligence to scaffold student learning in a beginning accounting course. The study concluded that the use of artificial intelligence to scaffold the learning of the accounting cycle was associated with higher academic achievement. Although the support was constantly available, fading or the diminishing of support occurred in response to the increase in students' expertise.

Measuring Self-Regulated Learning

The extensive educational research related to the process of learning has been facilitated by a wide array of highly developed measurement instruments. Various self-reporting questionnaires have been developed for the purpose of measuring or describing the student's level of self-regulation, approach to learning, and other student traits related to self-regulated learning. In light of the strong evidence that self-regulatory skills can be developed, scores

determined by such measurement tools have frequently been used as the dependent variable in intervention studies to determine whether such efforts have been successful.

In the current study the Motivated Strategies for Learning Questionnaire (MSLQ) is used to raise students' awareness of their own level of self-regulated and the role of self-regulation in learning. The purpose of the questionnaire is to stimulate self-reflection and an awareness of personal learning behaviors that can serve as a prerequisite to the development of more effective learning strategies (Borkowski et al., 1990, Schraw, 2001; Zimmerman, 2000).

The MSLQ contains 81 questions that comprehensively address the motivational orientation and use of learning strategies as reported by college students (Garcia & Pintrich, 1995). The questions relate to students' actual learning behaviors and strategies rather than to abstract cognitive operations. For example, the MSLQ would not be useful in determining the idiosyncratic elements of planning, monitoring, and regulating used by students. However, the MSLQ does reveal that students who are highly self-regulated do use all three of these.

The questionnaire, which has become the most widely used instrument to measure self-regulation, was developed at the National Center for Research on Improving Postsecondary Teaching and Learning at the University of Michigan. An instrument designed to measure the benefits of a "learning-to-learn" course at the university was the predecessor to the MSLQ. The MSLQ takes 20-30 minutes to administer and the questions are intended to be answered in reference to a specific college course. Because the student's use of strategies and motivation varies between courses, the MSLQ was designed to evaluate motivational and learning strategies at the course level. The questionnaire was based on the learning model developed by Weinstein and Mayer (1986). Weinstein and Mayer's model and this questionnaire represent cognitive strategies (rehearsal, elaboration, and critical thinking), metacognitive control strategies

(planning, monitoring, and regulating), and resource management strategies (time and study environment, persistence, peer learning, and help-seeking).

Extensive statistical procedures were used to establish the reliability and validity of the MSLQ (Garcia & Pintrich, 1995). The authors specifically examined the predictive validity of the instrument. For students in the computer and natural sciences, the 15 subscales of the MSLB accounted for 39% of the variance in the final course grade. For students in the social sciences, humanities, and foreign language courses, 17% of the variance in final course grade was attributed to the 15 MSLQ subscales. Although participants' MSLQ specific scores are not relevant to this study, it is relevant that the instrument requires participants to reflect on aspects of their own learning that have been determined to be predictors of academic performance.

In addressing general criticisms of self-reporting instruments, Garcia and Pintrich (1995) deliberately included questions about actual behaviors rather than abstract cognitive operations. The authors further acknowledged that better construct validity would be established through actual observations. Because such an approach generally was not considered pragmatic, a more global approach to self-regulated learning was taken in developing the MSLQ. Because of its soundness and practicality, the use of the MSLQ is particularly salient in the self-regulated literature that applies to postsecondary students.

Hadwin et al. (2001) shared concerns with other researchers about the limitations of using self-reporting questionnaires (Butler & Cartier, 2005; Garcia & Pintrich, 1995; Pintrich, 1995; Pintrich & De Groot, 1990). Recognizing that self-reporting did provide valuable information about how students participated in self-regulatory activities, Butler and Cartier (2005) recommended supplementing self-reporting questionnaires such as the MSLQ with other types of assessment strategies to get a more complete and accurate picture of self-regulated learning.

Beyond the concern about the accuracy of students in self-reporting, most self-regulated learning questionnaires have described static actions that did not appropriately indicate that self-regulated learning was a dynamic process and was developed over time (Butler & Cartier, 2005; Hadwin et al., 2001). The particular weakness noted by Hadwin and his research team was the omission of the effects of context upon the measurement instruments. A new questionnaire using components from existing instruments rectified this problem by incorporating three contexts (reading to learn, studying for an exam, and preparing to write a “think paper”) in which students reported their self-regulatory activities. The findings revealed that students employed considerable diversity in their uses of self-regulated learning when considering the three contexts used in this study (Hadwin et al., 2001).

CHAPTER 3

RESEARCH METHODOLOGY

The purpose of this study was to determine whether a beginning accounting course designed to improve the process of learning as well as increase content knowledge moved students to higher academic achievement (exam scores) in the course. In addition, this study examined whether a self-regulated learning intervention affected specific subgroups of students differently. This chapter describes the design of the study, the research population, data collection procedures, the research questions and hypotheses, and provides an analysis of the data.

Research Design

This study used a quantitative, quasi-experimental design with a control group and a treatment group of approximately the same number of participants. As is often true in educational research, the research design used a nonequivalent control group design with intact groups. Because group selection was determined by registration of students in the beginning accounting course in 2 consecutive semesters, it was not possible to conduct pure experimental research, which would have involved the random assignment of participants to the control and treatment groups.

In order to control extraneous variability, direct experimental control was established in the design of this study to maximize the uniformity of conditions for the control and treatment groups. Three sections of the beginning accounting course in the Spring 2010 semester comprised the control group. The treatment group consisted of three sections of the beginning

accounting course in the Fall 2010 semester. All six sections of the course were taught by the principal investigator in this study. The control group and the treatment sections each met two times per week for 80-minute sessions, using a Monday and Wednesday schedule. The class meeting times for the three sections of the treatment group in the Fall 2010 semester were identical to the class times for the control group in the Spring 2010 semester. The control and treatment groups shared the same number of class sessions, with exams given at the same points in the semester. The same textbook, online homework system, and examinations were used in the control and treatment groups.

The semester-long intervention was conducted one semester after the control group finished the course. This design eliminated the problem of leakage of the intervention to the control group. The intervention was embedded into the natural context of the beginning accounting course. The study was designed to determine if students who received a classroom intervention (a course designed with a focus on both the process of learning and course content) exhibited higher academic performance than students who did not receive the intervention. The scores on four regular course examinations and a comprehensive exam were used to measure academic performance in the course. All five exams (four regular exams and a comprehensive) were equally weighted for the purpose of this study. The regular exams were developed by the instructor and they included both accounting problems and conceptual questions. The proportions of problems and conceptual questions were comparable on the first three exams. The fourth examination consisted of a slightly larger proportion of conceptual questions than the first three examinations due to the nature of the content. The comprehensive exam was developed by a committee of instructors who frequently teach the beginning accounting course. This committee initially developed learning outcomes for the course and the questions selected

for the comprehensive exam were aligned with these outcomes. The comprehensive exam is intended to assess whether students have learned the major concepts of the beginning accounting course and does not include problems requiring mathematical computations.

The study also examined whether subgroups based on ACT level, prior GPA (GPA prior to taking the beginning accounting course), and major (business or nonbusiness) responded differently to the intervention. According to Noble and Salyer (2004) ACT scores represent cognitive ability while high school and college GPA tend to also reflect noncognitive or personal characteristics such as effort, motivation, attendance, and other factors. Although ACT scores have consistently been found to be strong predictors of academic performance (Garavalia & Gredler, 2002; Kealy, Holland, & Watson, 2005), this study examined whether the students at four levels of the ACT score responded differently to the self-regulated learning intervention.

Noble and Salyer (2004) further concluded that high school GPA was limited as a predictor of academic success at the college level. Because of these limitations GPA prior to the beginning accounting course was selected instead as the variable to represent the student's cognitive and noncognitive dimensions. Currently more and more academic disciplines outside the business discipline are including a beginning accounting course in their curriculums. Consequently, it was worthwhile to also examine whether business majors or nonbusiness majors responded differently to the intervention. In general there appears to be a void in the accounting education literature of research related to differences between business and nonbusiness majors in the beginning accounting course.

The intervention designed for this study included a focus on the development of learning skills as well as on course content. Specifically, the intervention incorporated elements from the three phases of self-regulated learning theory (forethought, performance, and self-reflection)

identified by Zimmerman (1989b) and others. The intervention was designed to encompass and exploit the interrelationships of the various components of self-regulated learning and its related fields for the purpose of creating a powerful learning environment (classroom designed to promote students' acquisition of self-regulated learning behaviors) and consequently improving students' academic performance. Furthermore, the design of this intervention was highly influenced by the findings of a meta-analysis conducted by Hattie et al. (1996). After considering 51 studies using learning skills interventions, these researchers found that interventions were most effective when they incorporated into the regular classroom context, encouraged a high level of student activity, and provided opportunities for students to raise their level of metacognitive awareness.

The following components, each of which was related to a particular self-regulated learning phase, were embedded in the experimental beginning accounting course (see Figure 3):

1. Two additional course objectives were added to the course learning objectives that were presented in the course syllabus (see Appendix A). The purpose of explicitly stating these course objectives was to communicate to students that the course would focus on the process of learning as well as regular course content. A thorough explanation of these additional learning objectives was provided by the instructor during the first day of class for the purpose of encouraging students to set learning goals and possibly enhancing students' self-efficacy in regard to the course. (forethought phase)
2. The Learning Strategies section of the Motivated Strategies for Learning Questionnaire (MSLQ) was administered early in the semester to raise students' awareness of the controllable factors that impact learning as well as awareness of their own learning processes and habits through self-reflective questions (see Appendix B). Permission for

the use of the MSLQ was given by Marie Bien, a representative of the Combined Program in Education and Psychology (CPEP) at the University of Michigan. The

Components of the Self-Regulated Learning Intervention			
ACTIVITY/COMPONENT	PHASE	WHEN USED IN COURSE	PURPOSE
Addition of a “Learning to Learn” Objective to Course Syllabus (see Appendix A)	Forethought	Explained first day of class and emphasized throughout course	To build students’ self-efficacy, to encourage learning goals, and to emphasize the dual focus of the course
Administration of MSLQ with feedback -Learning Strategies Section (see Appendix B, C)	Forethought	Prior to first term	To raise students’ awareness of (1) the controllable factors that affect learning and (2) their own degree of regulation of these factors
Use of Structural Schema (Organizational Aid)	Forethought Performance	Each lecture	To challenge students’ existing epistemological beliefs that knowledge is simply “an accumulation of facts” To (1) compensate for schema void associated with novice learners; (2) help students organize complex, new information; (3) visually demonstrate the “big picture” and key relationships; (4) help students connect previously learned material to new material
In-Class Assignments with a “Why” (Versus “How To”) Emphasis	Performance	Throughout the course	To encourage an “understanding” (versus memorization) approach to learning new content
Student Preparation of Structural Schema	Performance	4 th examination period	To provide an opportunity for students to independently organize new and complex information in a logical manner
One-Minute Papers	Self-Reflection	Throughout the course	To help students assess their degree of understanding of newly introduced concepts
Self-Evaluations	Self-Reflection	In preparation of each exam	To help students (1) monitor their learning progress; (2) identify areas of strength/weakness (3) better allocate studying time
Post-Exam Reflective Activity	Self-Reflection	After exams 1, 2, 3	To encourage students to (1) identify areas of weakness detected in exam; (2) reflect on effectiveness of strategies used; (3) identify strategies for improving performance on subsequent exams

Figure 3. Components of the Self-Regulated Learning Intervention (adapted from Zimmerman, 1998)

Learning Strategies portion of the MSLQ consists of the following nine subscales: rehearsal, elaboration, organization, critical thinking, metacognition, time and study environment, effort regulation, peer learning, and help seeking. The students were informed that : (1) the questionnaire results would not affect their grade in their course (2) the questionnaire was being administered to provide personal insight about their individual learning characteristics and habits (3) a better of understanding of personal learning characteristics and habits would be valuable to them as they approached the first course in accounting. The questionnaires were scored and the MSLQ results were returned to students early in the course. An interpretation of their results was provided to students (see Appendix C). To further increase students' awareness of their own learning processes and habits, the instructor provided a thorough explanation and example of each of the nine learning strategies on which example students were scored. Although participants' MSLQ specific scores were not relevant to this study, it was relevant that the instrument required participants to reflect on aspects of their own learning that had been determined to be predictors of academic performance. (forethought phase)

3. A structural schema (organizational aid) was developed by the instructor for the course and adapted to each chapter covered in the course (see Appendix D). For each chapter, the structural schema contained the same organizational structure but also included prior content that applied to the new chapter. New content was inserted into the structure as appropriate throughout course lectures. The structural schema was designed to serve the following multiple purposes related to "learning how to learn":

- Visually demonstrate the complexity of accounting and its multiple and interrelated dimensions, thus challenging students' naïve beliefs that knowledge is simply “an accumulation of facts.”(forethought phase)
 - Compensate for the schema void that is associated with novice learners (performance phase)
 - Provide a structure for course lectures as textbook content is organized into the various dimensions of the organizational aid (performance phase)
 - Provide students with a visual representation of the relationships among the various dimensions of the course content (performance phase)
 - Help students connect previously learned material to new material.
(performance phase)
 - Help students monitor their progress as they prepare for examinations by making evident the various dimensions of the content as well as relationships that must be understood (self-reflective phase)
 - Help students assess their performance on exams and identify areas of weakness in their learning (self-reflective phase)
4. In-class assignments were designed with a focus on “why” rather than “how to,” emphasizing application and synthesis of knowledge (see Appendix E). These assignments were designed to encourage an “understanding” approach rather than a “memorization” approach as students encountered new course content. (performance stage)

5. “One-minute papers” were used at the end of several class periods to encourage self-reflection as students were asked to assess their understanding of key course concepts that were covered during that class period. (see Appendix F) (Self-reflective phase)
6. Self-reflection activities were conducted before regular course examinations in the course. During the exam preparation stage for the first three exams, students completed and submitted a self-evaluation that was organized in the same format as the structural schema used in course lectures (see Appendix G). Students were required to identify areas where they felt least proficient as they began preparation for exams (self-assessment). The format of this activity was changed somewhat for the fourth exam in order to reduce the likelihood that repetitiveness of the same activity would diminish student interest and engagement in the activity (see Appendix H).
7. Self-reflection activities were also conducted after regular course examinations (see Appendix I). As each graded exam was returned, each student was given the opportunity to reflect on his or her performance. Specifically, this self-reflection activity required students to identify weaknesses in understanding of course material as detected on the exam, and/or reflect on strategies used to prepare for the exam and strategies used during the exam, and/or consider additional or alternative strategies that might be more effective for the next examination. In other words, students were given the opportunity to “think about the factors that influenced the process and the outcome” (Masui & De Corte, 1999, p. 521). (self-reflective phase)
8. Throughout the course and using the instructional technique of modeling, the instructor organized new material into the derived structural schema during class lectures. Because relevant, previously learned material was incorporated into subsequent schemas, the

instructor visually demonstrated how previous knowledge and new information were connected. Later in the course (Week 11) students were given the assignment of incorporating the new course content (obtained through reading a new chapter in the textbook) into the structural schema independently of the instructor. This required students to look for the “big picture” as they encountered new material in the text and then organized this new information in a logical way. (performance stage)

9. Using instructor modeling, students’ suggestions of specific learning strategies that they had used successfully (suggestions were made through participation in the self-reflection activity when exams were returned –See #6) were presented to the class. As these strategies were discussed and examples were provided by the instructor, students were given another opportunity to become more aware of their own use of learning strategies as well as alternative strategies that might be more academically effective.

Participation in the aforementioned activities was encouraged in two ways. The course syllabus allocated approximately 6% of the student’s overall grade in the course to in-class activities (in both control and treatment groups). Bonus points for the course were awarded to those who participated (no direct impact on exam scores) to encourage participation in the completion of the MSLQ and self-reflection activities.

Population

The participants in this study included students enrolled in six sections of a beginning accounting course (ACCT 2010 Principles of Accounting I) at a regional university. The control group consisted of 165 students enrolled in three sections of the beginning accounting course in the Spring 2010 semester. After removing students who officially dropped or unofficially

withdrew from the course, students who did not take all course exams, and students who were enrolled but never attended, there were 132 final participants in the control group. The treatment group began with 181 total students enrolled in three sections of the beginning accounting course in the Fall 2010 semester. After removing students who officially dropped or unofficially withdrew from the course, students who did not take all course exams, students who were enrolled but never attended, students who were repeating the course (six students were repeaters from the Spring 10 control group) and three students who were absent >50% of the class meetings, there were 134 final participants in the treatment group. The two groups experienced comparable drop rates with the drop rate being 10.3% for the control group and 10.4% for the treatment group. The percentage of students who did not finish the course (unofficially withdrew) was 8.7% in the control group and 8.0% in the treatment group.

Data Collection Procedures

Permission to access students' ACT scores, prior GPA, college major, and examination scores from institutional records was obtained from the university's Institutional Review Board (IRB). A signed Informed Consent Form was obtained from all participants in the study. Student data used in the study were de-identified to maintain the confidentiality of all participants.

Research Questions and Hypotheses

The following research questions and null hypotheses are presented for this study:

1. Do the mean scores on each of the five exams (Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam) differ between the control group and the treatment group?

Ho1: The mean scores for Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam are the same for the control group and the treatment group.

2. Do the differences in means on TOTAL (the sum of Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam) exam scores between the control and treatment group vary as a function of ACT level?

Ho2: The differences between the means on TOTAL exam scores between the control and treatment groups do not vary as a function of ACT level.

3. Do the differences in means on TOTAL exam scores between the control and treatment group vary as a function of prior GPA level?

Ho3: The differences between the means on TOTAL exam scores between the control and treatment groups do not vary as a function of prior GPA level.

4. Do the differences in means on TOTAL exam scores between the control and treatment group vary as a function of major?

Ho4: The differences between the means on TOTAL exam scores between the control and treatment groups do not vary as a function of major.

Data Analysis

Descriptive statistics were obtained prior to conducting the statistical tests that specifically addressed the research questions and hypotheses associated with this study. As discussed earlier in Chapter 3, this study involved nonequivalent groups. Therefore, the equivalency of the control and treatment groups was tested prior to addressing the research questions related to this study. Statistical tests were conducted to determine the equivalency of the control and treatment groups. Specifically, independent-samples t tests were conducted to test

whether the two groups were equivalent in terms of mean ACT scores and mean prior GPA. The non-parametric test, chi-square, was used to test the equivalency of the proportion of business and nonbusiness majors in the control and treatment groups. All statistical tests related to this study were run using SPSS®, Version 18 and used a significance level of .05.

The first research questions considered whether the mean scores on Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam differed between the control and treatment groups. A one-way multivariate analysis of variance test (MANOVA) was conducted with follow-up ANOVAS. Two-factor ANOVAs were conducted to test research questions 2, 3, and 4. Because the equivalency t tests and chi-square failed to reject the hypothesis that the control and treatment groups were equal, it was not necessary to use co-variants (ANCOVA) in the analysis of the data. The ANOVAS tested the interaction between the levels of the subgroups (ACT, prior GPA, major). Specifically, the ANOVAS tested whether levels of the subgroups responded differently to the intervention.

For the purpose of this study ACT composite scores were classified as low, medium low, medium high, and high and were based on quartile information derived from the 2009-2010 Common Data Set for the university associated with this study. Likewise, study participants were grouped according to their prior GPA (GPA prior to taking the beginning accounting course). Low, medium low, medium high, and high groups were formed using quartile information derived from the university's Spring 2010 enrollment file of degree-seeking undergraduates. Participants were also grouped according to major using the two categories of Business and Nonbusiness. Students who had an undeclared major were grouped as Nonbusiness.

Summary

Chapter 3 described the methodology and research design used in this study and presented both the research questions and the related hypotheses. The chapter also described the population, data collection procedures, and data analysis that were employed in this study. Chapter 4 describes the findings of the study. Chapter 5 summarizes the findings, presents the conclusions of the study, and provides recommendations for practice and future research.

CHAPTER 4

DATA ANALYSIS

The purpose of this study was to investigate whether the academic performance of students who received a self-regulated learning intervention in a beginning accounting course differed from the academic performance of students who did not receive such an intervention. Furthermore, this study examined whether different subgroups of students within the treatment group responded differently (in terms of academic performance) to the intervention.

Equivalency of Groups

The design of this study did not allow for random assignment into control and treatment groups. Conversely, this study used intact groups formed as a result of the registration of students into particular course sections. Therefore, statistical tests were conducted to establish the equivalency of the control and treatment groups used in this study.

An independent-samples t test was conducted to evaluate whether the mean ACT score differed between the control and treatment groups. The Levene's test for equality of variances, $t(242) = .51, p = .614$ indicated equal variances. The null hypothesis for mean GPAs prior to taking the accounting course was retained with $t(264) = .06, p = .956$. Prior GPAs of the two groups were almost identical. The beginning accounting course contains a mixture of business and nonbusiness majors. The non-parametric test, chi-square, was conducted to test the equivalency of the proportion of business to nonbusiness majors in the control and treatment groups. The results of the Pearson test, $\chi^2(1, N = 266) = .95, p = .330$, suggested that the proportion of business to nonbusiness majors between the control and treatment group was

essentially the same between the groups. Table 1 provides descriptive statistics about the control group, treatment group, and total participants in the study.

Table 1

Descriptive Statistics for the Control and Treatment Groups

Group	N	*Mean ACT	Mean GPA	Major	%
Control	132	22.58	3.07	Business Nonbusiness	52.3 47.7
Treatment	134	22.34	3.08	Business Nonbusiness	58.2 41.8
Total	266	22.46	3.08	Business Nonbusiness	55.3 44.7

*based on N=121,123, and 244 as ACT scores were not available for 22 participants

To determine whether certain groups of students responded differently to the intervention, participants in this study were stratified according to ACT score, prior GPA, and academic major. The beginning accounting course was populated by a wide range of ACT and prior GPA levels. Participants were organized into low, medium low, medium high, and high groups based on ACT scores and prior GPA as presented in Table 2.

Table 2

ACT and Prior GPA levels (based on the university's quartile data for 2009-2010)

Level	ACT	Prior GPA
Low	Below 20	Below 2.58
Medium Low	21-22	2.58 – 3.07
Medium High	23-24	3.07 – 3.44
High	25 and above	3.45 and above

The beginning accounting course sections were represented by a wide range of ACT scores and prior GPAs as illustrated in Table 3.

Table 3

Range of ACT Scores and Prior GPAs of Study Participants

Group	ACT	Prior GPA
Control	15 - 34	1.43 - 4.00
Treatment	15 - 31	1.91 - 4.00
Range for all	15 - 34	1.43 - 4.00

Research Questions

Research Question 1

Students in the treatment group received a self-regulated learning intervention while students in the control group did not receive the treatment. This study primarily focused on whether a classroom with a dual focus on both content and the process of learning would result in improved academic performance in the course as determined by exam scores. In other words, were the mean scores for Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam (or linear combinations of these exam scores) the same or different between students in the control and treatment groups? The following hypothesis was formulated from this research question and tested using multivariate analysis of variance (MANOVA):

Ho1: The mean scores for Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam are the same for the control group and the treatment group.

A one-way multivariate analysis of variance test (MANOVA) was conducted to determine the effect of the two types of classroom methods (control and treatment) on the five

dependent variables, Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam.

Significant differences were found between the two classroom methods on the dependent measures, Wilks' $\Lambda = .94$, $F(5, 260) = 3.32$, $p = .006$, $\eta^2 = .06$. Table 4 contains the means and the standard deviations on the dependent variables for the two groups.

Analyses of variances (ANOVA) on each dependent variable were conducted as follow-up tests to the MANOVA. Each ANOVA was tested at the .01 level (.05/5) using the Bonferroni method. The ANOVA on Exam 1 was nonsignificant, $F(1, 264) = .77$, $p = .379$, $\eta^2 = .01$. The ANOVA on Exam 2 was nonsignificant, $F(1, 264) = .02$, $p = .892$, $\eta^2 < .01$. The ANOVA on Exam 3 was nonsignificant, $F(1, 264) = .15$, $p = .70$, $\eta^2 < .01$. The ANOVA on Exam 4 was significant, $F(1, 264) = 6.86$, $p < .01$, $\eta^2 = .03$. The ANOVA on the Comprehensive was nonsignificant, $F(1, 264) = 1.62$, $p = .204$, $\eta^2 < .01$.

As presented in Table 4 and Figure 4, the mean scores of the treatment group were higher than those of the control group on all exams except Exam 3. Furthermore, the difference in means between the control and treatment groups on Exam 4 was found to be statistically significant. Students in the treatment group scored 8.4% higher on Exam 4 than did the students in the control group. As reflected in Table 4 and Figure 4, the mean score for Exam 4 is considerably lower than the mean scores of the other exams. Experiential evidence indicates that Exam 4 has historically resulted in lower exam means. Therefore, the resulting lower mean on Exam 4 for this population is consistent with this established pattern. Thus, it appears that students in the treatment group made the most gain (in terms of exam scores) on the exam that historically has been the most difficult exam.

Table 4

Means and Standard Deviations for the Control and Treatment groups

Exam	Group	N	M	SD
Exam 1	Control	132	83.70	13.93
	Treatment	134	85.18	13.58
Exam 2	Control	132	75.53	16.50
	Treatment	134	75.79	15.24
Exam 3	Control	132	79.35	12.38
	Treatment	134	78.73	13.66
*Exam 4	Control	132	66.67	17.89
	Treatment	134	72.30	17.19
Comp	Control	132	72.30	13.17
	Treatment	134	74.30	12.40

*significant at the .05 level

Although not statistically significant, the mean score for the treatment group on the Comprehensive Exam was 2.8% higher than the mean score for the control group. The Comprehensive Exam was designed to capture the most important concepts associated with the beginning accounting course. An improvement in the mean score on the comprehensive exam suggests that students are exiting the beginning accounting course with a better understanding of the fundamental concepts of accounting.

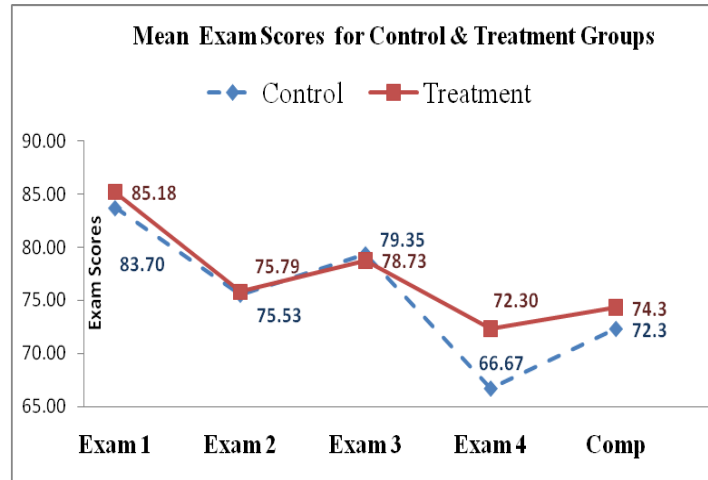


Figure 4. Mean Exam Scores for Control and Treatment Groups

Research Question 2

Do the differences in means on total exam scores (total of five exams) between the control and treatment group vary as a function of ACT level (Low, Medium Low, Medium High, and High)? The following hypothesis was formulated from this research question and tested using a 2-factor ANOVA:

Ho2: The differences between the means on TOTAL exam scores between the control and treatment groups do not vary as a function of ACT level.

A 4 X 2 ANOVA was conducted to evaluate the relationship of four ACT levels and two classroom methods to TOTAL exam scores (Exam 1, Exam 2, Exam 3, Exam 4, and Comprehensive Exam). The means and standard deviations for TOTAL exam scores as a function of the two factors are presented in Table 5. The ANOVA indicated no significant interaction between classroom method and ACT level, $F(3, 243) = .51$, $p = .677$, partial $\eta^2 = .01$, a significant main effect for ACT level, $F(3, 243) = 20.79$, $p < .001$, partial $\eta^2 = .21$, and a nonsignificant main effect for classroom method, $F(1,243) = 1.46$, $p = .228$, partial $\eta^2 = .01$.

Table 5

Descriptive Statistics- Total and Average Exam Scores by ACT Level for Both Groups

Group	N	ACT Level	Total Points*		All Exams	
			M	SD	M	SD
Control	24	Low	352.96	55.99	70.59	11.20
	26	Medium Low	350.02	57.49	70.00	11.50
	37	Medium High	385.54	59.34	77.11	11.87
	34	High	408.97	44.27	81.79	8.85
	121	Total	378.03	58.89	75.61	11.78
Treatment	29	Low	354.79	73.97	70.96	14.79
	23	Medium Low	350.61	62.69	70.12	12.54
	40	Medium High	395.11	45.80	79.02	9.17
	31	High	431.98	44.66	86.40	8.93
	123	Total	386.58	64.48	77.32	12.90
Total	53	Low	353.96	65.83	70.79	13.17
	49	Medium Low	350.30	59.35	70.06	11.87
	77	Medium High	390.51	52.61	78.10	10.52
	65	High	419.95	45.60	83.99	9.12
	244	Total	382.34	61.79	76.47	12.36

* the total of Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam

Follow-up analysis to the mean effect for ACT level was conducted and consisted of pairwise comparisons among the four ACT levels. The Tukey HSD procedure was used to control for Type 1 error across the pairwise comparisons (see Table 6).

Table 6

95% Confidence Intervals of Pairwise Differences in Mean Total Points

ACT Level	M	SD	Low	Medium Low	Medium High
Low	353.96	7.62			
Medium Low	350.30	7.92	[-32.09, 24.76]		
Medium High	390.51	6.32	[10.95, 62.15]*	[14.00, 66.43]*	
High	419.95	6.88	[39.44, 92.53]*	[42.51, 96.79]*	[5.27, 53.59]*

*significant at the .05 level using the Tukey HSD procedure.

The results of the ANOVA indicated no statistically significant difference in how students at various levels of ACT scores responded to the intervention. However, as can be observed in Table 5, the total scores for the treatment group (with intervention) were higher than the control group at every ACT level.

Although the amount of increase from control to treatment group varied between ACT levels, no statistical significant interaction was found. However, the high ACT group showed the greatest increase in exam scores. Overall, the treatment group (representing all four ACT levels) scored 2.3% higher than the control group for mean exam scores. The high ACT group within the treatment group showed a 5.6% improvement on this same measure (see Table 7).

Table 7

Mean Scores and Percent Differences between Control and Treatment Groups for High ACT Level and All ACT Levels

Exam	High ACT Control	High ACT Treatment	% Difference	ALL Levels Control	ALL Levels Treatment	% Difference
Exam 1	88.16	92.48	+ 4.9%	83.70	85.18	+1.8%
Exam 2	84.91	86.16	+ 1.5%	75.53	75.79	.3%
Exam 3	83.25	88.24	+ 6.0%	79.35	78.73	-.8%
Exam 4	75.06	83.10	+10.7%	66.67	72.30	+8.4%
Comp	77.59	82.00	+5.7%	72.30	74.30	+2.8%
All Exams	81.79	86.40	+5.6%	75.61	77.32	+2.3%

As represented in Figure 5, the high ACT treatment group outperformed the high ACT control group on all five exams. The largest difference occurred on Exam 4 where there was a 10.7% difference between the mean exam scores.

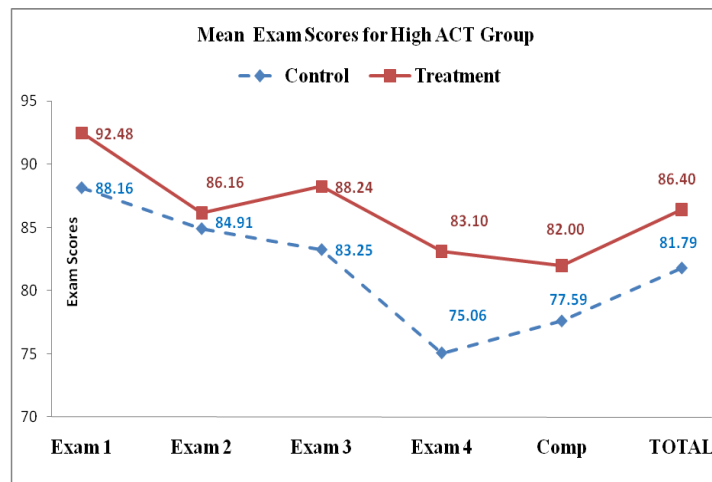


Figure 5. Mean Exam Scores for High ACT Group

Research Question 3

Students enter the beginning accounting course with an established GPA earned in their previous courses at the university level. The third research question considers whether an interaction is present between classroom method and students' prior GPA level and is specifically articulated as: Do the differences in means on total exam scores between the control and treatment group vary as a function of prior GPA level (Low, Medium Low, Medium High, and High)? The following hypothesis was formulated from this research question and tested using a 2-factor ANOVA:

Ho3: The differences between the means on TOTAL exam scores between the control and treatment groups do not vary as a function of prior GPA level.

A 4 X 2 ANOVA was conducted to evaluate the relationship of four GPA levels and two classroom methods to TOTAL exam scores. The means and standard deviations for TOTAL exam scores as a function of the two factors are presented in Table 6. The ANOVA indicated no significant interaction between classroom method and GPA level, $F(3, 265) = .44$, $p = .725$, partial $\eta^2 < .01$, a significant main effect for GPA level, $F(3, 265) = 55.10$, $p < .001$, partial $\eta^2 = .391$, and a nonsignificant main effect for classroom method, $F(1, 265) = 1.18$, $p = .278$, partial $\eta^2 < .01$.

Follow-up analysis to the mean effect for GPA level was conducted and consisted of pairwise comparisons among the four GPA levels. The Tukey HSD procedure was used to control for Type 1 error across the pairwise comparisons (see Table 8).

Table 8

95% Confidence Intervals of Pairwise Differences in Mean Total Points

GPA Level	M	SD	Low	Medium Low	Medium High
Low	321.89	7.17			
Medium Low	361.11	5.40	[16.01, -62.42]*		
Medium High	394.35	6.63	[47.20, 97.70]*	[11.13, 55.34]*	
High	429.75	5.46	[84.55, 131.17]*	[48.79, 88.50]*	[13.19, 57.62]*

*significant at the .05 level using the Tukey HSD procedure

Based upon the results of the 4 X 2 ANOVA, there was no statistical difference in how students at four different GPA levels responded to the classroom intervention. However, Table 9 suggests that all levels, except the lowest GPA level, of treatment group students performed at a higher academic level (expressed as total exam scores) than did the control group. Research participants at this lowest GPA level came to the beginning accounting course with a college GPA between 1.43 and 2.58. Students at this level often are characterized by academic helplessness that can result in a lower degree of responsiveness to classroom interventions.

Table 9

Descriptive Statistics- Total and Average Exam Scores by Prior GPA Level for Both Groups

Group	N	GPA Level	Total Points*		All Exams	
			M	SD	M	SD
Control	27	Low	324.63	70.81	64.93	14.16
	34	Medium Low	353.47	40.79	70.69	8.16
	31	Medium High	390.47	47.03	78.09	9.41
	40	High	423.71	42.48	84.74	8.50
	132	Total	377.54	62.25	75.51	12.45
Treatment	20	Low	318.20	66.90	63.64	13.38
	49	Medium Low	366.41	55.07	73.28	11.01
	24	Medium High	399.35	36.65	79.87	7.33
	41	High	435.65	32.44	87.13	6.49
	134	Total	386.30	62.51	77.26	12.50
Total	47	Low	321.89	68.50	64.38	13.70
	83	Medium Low	361.11	49.86	72.22	9.97
	55	Medium High	394.35	42.67	78.87	8.53
	81	High	429.75	37.98	85.95	7.60
	266	Total	381.96	62.42	76.39	12.48

* the total of Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam

Research Question 4

The beginning accounting course is populated by both business and nonbusiness majors. It would be expected that students of different majors would enter the beginning accounting course with significant diversity in terms of previous learning experiences. Therefore, it is reasonable to consider that students of different majors (business and nonbusiness) might respond differently to the classroom intervention. The fourth research question considers whether an interaction is present between classroom method and students' academic major and is specifically articulated as: Do the differences in means on total exam scores between the control and treatment group vary as a function of academic major? The following hypothesis was formulated from this research question and tested using a 2-factor ANOVA:

Ho4: The differences between the means on TOTAL exam scores (Exam 1, 2, 3, 4, and the Comprehensive Exam) between the control and treatment groups do not vary as a function of major.

A 2 X 2 ANOVA was conducted to evaluate the relationship of two classroom methods and two college majors (business and nonbusiness) to total exam scores. The means and standard deviations for TOTAL exam scores as a function of the two factors are presented in Table 7. The ANOVA indicated no significant interaction between classroom method and major, $F(3, 265) = .03$, $p = .868$, partial $\eta^2 < .01$, a nonsignificant main effect for major level, $F(3, 265) = .23$, $p = .630$, partial $\eta^2 < .01$, and a nonsignificant main effect for classroom method, $F(1, 265) = 1.26$, $p = .263$, partial $\eta^2 < .01$.

Descriptive statistics in Table 10 indicate that business students outperformed nonbusiness students across both the control and treatment groups. The reasons for this difference are speculative but differences could be reasonably attributed to students' level of interest in the subject, background experiences related to accounting, motivation, or other possible factors. The ANOVA did not indicate that differences in TOTAL exam scores between the control and treatment groups varied as a function of major. In other words, the effect of the intervention was not statistically different between business and nonbusiness majors.

Table 10

Descriptive Statistics- Total and Average Exam Scores by Major for Both Groups

Group	N	Major	Total points M*	Total points SD	All Exams M	All Exams SD
Control	69	Business	379.94	61.22	75.99	12.24
	63	Nonbusiness	374.92	63.75	74.98	12.75
	132	Total	377.54	62.25	75.51	12.45
Treatment	78	Business	387.32	64.56	77.46	12.91
	56	Nonbusiness	384.88	60.08	76.98	12.02
	134	Total	386.30	62.51	77.26	12.50
Total	147	Business	383.86	62.91	76.77	12.58
	119	Nonbusiness	379.61	61.99	75.92	12.40
	266	Total	381.96	52.61	76.39	12.48

* the total points for Exam 1, Exam 2, Exam 3, Exam 4, and the Comprehensive Exam

Summary

Chapter 4 presented statistical analyses of the data collected in the study. Chapter 5 includes a summary of the research findings and conclusions of the study. The chapter concludes with recommendations for practice and future research.

CHAPTER 5
FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This study of self-regulated learning in an introductory accounting course was a response to a recommendation proposed by the Accounting Education Change Commission (AECC) in 1990. The AECC argued that the ultimate priority in accounting education should be the development of lifelong learning skills that would prepare emerging professionals for a workplace characterized by rapid change and uncertainty. Such a dynamic environment shortens the “shelf life” of knowledge learned in college classrooms and requires professionals to possess the ability to learn new information efficiently, effectively, and often on their own. As is evident in the accounting education literature, there have been a minimal number of studies in response to the call of the AECC. Yet, the accounting profession has become even more dynamic and complex since the AECC issued its report in 1990 and maintaining one’s competency in that profession has become increasingly challenging.

Secondly, this study addressed the problem that the beginning accounting course is often a “high risk” course on university campuses, characterized by a high failure rate. The beginning accounting course is highly conceptual and academic success requires the understanding of fundamental accounting concepts as well as the underlying relationships that exist within the accounting discipline. The extant literature supports the notion that, as students improve their learning skills, academic performance is increased. This relationship between learning skills and academic performance creates the opportunity to concurrently respond to the academic

challenges that many students encounter in the accounting classrooms as well as respond to the professional challenges they will later encounter in a highly dynamic work environment.

The educational construct of self-regulated learning is closely aligned with lifelong learning and the skill set that prepares professionals for the contemporary workplace. Self-regulated learning is based on the educational philosophy of constructivism. Learners must take responsibility for their learning, be actively involved in their own learning, and be aware of their own learning behaviors and how changes in those behaviors can enhance learning. Weinstein proposed that classrooms could and should be designed with a dual focus on both the “process of learning” and the “products of learning.” Zimmerman described self-regulated learning in terms of a three-phase learning cycle: forethought, performance, and self-reflection. Learning is affected by the attitudes and beliefs the student brings to an academic task (forethought), the strategies that the student employs as academic tasks are attempted (performance), and the student’s ability to use reflective thoughts and practices after completion of academic tasks to enhance success with future academic tasks (self-reflection). Although lifelong learning is clearly impacted by the development of self-regulated learning skills, the extant literature further supports the notion that self-regulated learning skills also positively affect academic performance in the classroom.

The intervention designed for this study encapsulated the three phases of self-regulation described by Zimmerman. The dual-purpose classroom was designed to encourage the learning of fundamental accounting knowledge as well to encourage students to become better equipped as lifelong learners. Activities were designed to help students better understand their own learning behaviors and to convey the message that academic success depends on students’ ability to take control of their learning as well as intellectual ability. Attempts to directly measure

whether or not students' lifelong learning skills were enhanced by the intervention was not the focus of this study. Although self-regulated learning skills can be measured using widely supported questionnaires, changes in learning skills are still quite difficult to quantify using these self-reporting instruments. If measurements take place at the conclusion of the intervention, the measurement fails to capture whether the impact of the intervention transfers to future academic tasks. In other words, the true determination of whether benefits of the intervention have accrued depends on whether students use learning strategies adopted in the beginning accounting course to attempt future academic tasks and later in their professional lives. The existing literature related to transfer of knowledge confirms that this is a viable expectation (Bereiter, 1995; Dansereau, 1995; De Corte, 1999; Marini & Genereux, 1995). Relational interventions (those that focus on the development of metacognitive skills within a specific context such as in this study) can reasonably be expected to afford some degree of far transfer (i.e., transfer of knowledge to entirely dissimilar situations) if students acquire knowledge of when and how to use learning strategies as a result of the intervention (Hattie et al., 1996). However, such benefits are difficult to measure and require longitudinal studies. Because of the time and scope limitations, the focus of this study has instead been on determining if the academic performance of students who were subject to a self-regulated learning intervention was different than those students in the control group who did not receive such an intervention.

Findings

Research Question 1

The first research question addressed whether there was a difference in the exam scores for the beginning accounting course between the control and treatment groups. The MANOVA indicated a significant difference. The follow-up ANOVAS revealed that statistically significant gains occurred (treatment group over the control group) on Exam 4, the last of four regular exams, with the treatment group scoring 8.4% higher than the control group. This finding raises important questions that are beyond the scope of this study. The first issue relates to the fact that the largest difference between the two groups occurred on the examination that historically (as well as in this study) has resulted in the lowest mean score of all the regular exams.

Historically, the average on this exam has been approximately 68%. The group receiving the intervention had a mean score of 72.3% on this examination while the mean score of the control group was 66.7%, a typical mean score for this exam. Does a self-regulated learning intervention have a greater impact when students are faced with more difficult academic tasks? As mentioned in Chapter 3, the fourth examination contained a higher percentage of conceptual questions (versus mathematical computations) than the other three exams due to the conceptual nature of the content covered on this exam.

A second issue to consider is the relationship between the amount of time students have been exposed to a learning skills intervention and the impact the intervention has on academic performance. In other words, one could reasonably hypothesize that students did significantly better on Exam 4 because by this point in the semester they had received more training in self-regulated learning. According to the meta-analyses conducted by Dignath and Büttner (2008) and Ragosta (2010) longer interventions do have a greater impact than shorter interventions.

This finding would support a plausible explanation that by the fourth and last regular exam the effects of the intervention may have begun to have more significantly impacted students' academic performance. Furthermore, according to Ragosta (2010) students are more likely to use effective learning strategies once they have become cognizant of and personally experience the benefits of using effective strategies.

It is also relevant to consider whether the particular design of the intervention associated with this study could have contributed to the significant gains in academic performance that were made on Exam 4. The purpose of the pre-exam, self-reflection activity was to encourage students to evaluate their level of competency in regard to subjects related to the upcoming exam. The self-reflection activity related to Exam 4 preparation was purposefully designed differently than the self-reflection activities related to each of the first three exams. As explained in Chapter 3, the format of this activity was changed for this last regular exam to reduce the likelihood that repetitiveness of the same activity would diminish student interest and engagement in the activity. The self-reflection activities for Exam 1, 2, and 3 prompted students to identify six subjects (areas) in which they felt most confident and least confident (where they needed to devote more study time). The students completed these reflections using the framework design that had been used in course lectures (see Appendix G). The gridlike design of the Exam 4 self-reflection activity required a response (minimal understanding, fair understanding, and good understanding) for *each* individual subject covered on Exam 4(see Appendix H). This design could have diminished the potential for students to merely “ go through the motions” of completing the task, while avoiding any careful self-assessment of their understanding of each subject. It is interesting to consider a prior study conducted by Lan (1998)

in which a similar gridlike protocol was used successfully in an introductory statistics course to improve students' self-monitoring skills and ultimately academic performance in that course.

Although statistical significance was not found in the difference in the mean scores of the Comprehensive Exam between the two groups, the fact that the treatment group scored 3% higher than the control group is still an important finding. The performance of the treatment group (mean of 74.3%) exceeded the 6-year historical average on this examination of 73.5%. The examination was methodically designed by a departmental committee and questions were carefully aligned with the learning objectives of the course. The examination reflects the key concepts (no mathematical calculations or problems) of the beginning accounting course. An increase in the mean score of this type of exam is encouraging because such upward movement in the average score suggests that more of the learning objectives of the beginning accounting course may have been met. An increased understanding of fundamental accounting concepts could positively impact subsequent courses for business majors.

Finally, the 2.3% increase in total performance on exams scores (from control to treatment group) has both practical and economic implications. Each student in the business college is required to make a C or better in the beginning accounting course in order to move to the next required accounting course in the business curriculum. The beginning course in accounting has been identified as a "high risk" course by the university because of its high failure rate. If the addition of a "learning-to-learn" dimension to the course can result in higher exam scores, this may be at least a partial solution to addressing the problem of a high failure rate. Further, a reduced failure rate has positive economic implications for students and also positive implications in regard to the administrative challenge of maintaining reasonable class sizes.

Research Question 2

The second research question considered whether mean differences in TOTAL exams scores between the control and treatment groups were a function of ACT level. The research question considered whether an interaction was present between the classroom method (control and treatment group) and four levels of ACT scores. The 2-way ANOVA indicated a nonsignificant interaction but, as expected, revealed a strong main effect for ACT level. These results suggest that the effect of the intervention was generally equivalent between the various levels of ACT. The significant main effect found for ACT level is consistent with many prior studies that have shown ACT to be a strong predictor of academic performance at the college level (Garavalia & Gredler, 2002; Kealy et al., 2005). However, the predictive ability of ACT scores as related to academic performance was not the focus of this study.

An examination of the descriptive statistics interestingly reveals that among the ACT levels the high ACT level subgroup experienced the greatest increase in academic performance (treatment group compared to control group) as measured by examination scores. Interestingly, this finding is contrary to the findings of a meta-analysis conducted by Hattie et al. (1996). Specifically considering university student populations, their findings suggested the presence of a “ceiling effect” whereby it was difficult to move high performers to even higher levels of performance. In other words, high ability students were less responsive and more resistant to intervention than other students. That was not the conclusion drawn from this study. The fact that high ability students showed the greatest increase in exam scores has important implications and raises questions that are pertinent to accounting and other disciplinary programs at the university level.

The descriptive statistics related to the exam scores of the high ACT group in this study suggest that students of high academic ability may be responsive to “learning to learn” interventions and may be able to make great strides in their academic performance when exposed to such interventions. Again, it is important to note that the causal path leading to such gains cannot be determined by the results of the study. However, pertinent questions can be raised in response to these unanticipated results. Did the intervention challenge students’ epistemological beliefs? Did these high ability students adopt more strategic approaches to learning? Was their motivation increased by the intervention? Did they become more aware of their own learning pathologies and, in response, adopted more effective learning behaviors? These answers are not found in this study but are important questions for future research. All that can be confirmed is that the group of high ACT students who received the intervention performed 5.6% higher than did the high ACT group within the control group on TOTAL exams. In fact, the high ACT subgroup within the treatment group consistently (on all five exams) outperformed the high ACT subgroup within the control group. On Exam 4 where statistical significance was found in the differences between the treatment and control groups, the mean score for the high ACT treatment subgroup was 10.7% higher than that of high ACT students within the control group. Again, this fourth exam historically, and in this study as well, appears to be the most difficult of the regular exams for students, as reflected in its lower mean score.

An opportunity to increase the academic performance of academically strong students in the introductory accounting course has significant relevance for accounting departments. Accounting majors can often emerge from this highest performing group of students in the beginning accounting course. Movement of this top group of students to an even higher level of performance in the beginning accounting course suggests that these students may arrive at the

next level of the accounting program with an even stronger accounting foundation. This creates the potential for a domino effect whereby students are then able to further their development of accounting knowledge as they progress through the higher-level courses in the accounting curriculum. This, in turn, could potentially impact the CPA pass rate which is a significant determinant of the success of an accounting program. From a broader perspective, it is a fundamental goal of higher education to create an environment in which students can reach their academic potential. Moving the most academically capable students to an even higher level of academic performance is consistent with this fundamental goal of higher education.

Research Questions 3

The third research question considered whether mean differences in academic performance on TOTAL exams between the control and treatment groups varied as a function of prior GPA level. The GPA is reflective of both cognitive and noncognitive dimensions of students including effort, motivation, attendance, and other factors (Noble and Salyer, 2004). Therefore, GPA distinguishes students using a wider scope because it reflects these noncognitive dimensions as well as the cognitive dimension captured by the ACT score. It is feasible that students of various levels of prior GPA may respond differently to a classroom intervention.

An ANOVA did not find that differences in means between the control and treatment groups were a function of GPA level. As discussed in Chapter 4, the only notable observation related to prior GPA was that the low GPA group appeared to be generally unresponsive to the intervention in terms of improvement in academic performance. Again, this finding is consistent with prior studies involving learning skills interventions (Hattie et al., 1996). The low GPA

subgroup within the treatment group scored 2% lower on TOTAL exam scores than did the control group and 4% lower on the Comprehensive Exam. Because GPA is reflective of both cognitive and noncognitive factors, it is not possible to determine whether the unresponsiveness to intervention was due to a lack of ability or a lack of interest, motivation, or other noncognitive factors.

Although results of this study indicate that the examination scores of the academically weakest students who received the intervention were about the same as this same subgroup within the control group, it is important to acknowledge that low performing and low ability students can potentially improve performance in the course if they use help resources that are beyond and external to regular classroom activities. However, in a recent study of self-theories of intelligence, Mihlon (2010) found that the presence of low self-efficacy and beliefs that intelligence is fixed prevented such students from pursuing help resources. Even though help resources were identified and their use encouraged in the intervention related to this study, the decision to pursue help resources was ultimately made by the student. Help resources included acquiring a personal tutor, regularly attending the departmental tutoring lab, seeking help from the instructor outside of regular class meetings, studying with peers, and other resources.

Research Question 4

The final research question focused on whether differences in TOTAL exam scores between the control and treatment groups varied as a function of academic major. As discussed in Chapter 4, an ANOVA found that differences in the mean scores between the control and treatment were not a function of major. Although statistical significance was not found,

descriptive statistics indicated that nonbusiness majors in the treatment group as well as business majors outperformed their counterparts in the control group on total exam scores.

Even though the results of this study indicated that business and nonbusiness majors generally may have responded similarly to the intervention in terms of changes in academic performance, it is still important that educators recognize that these two groups of students may bring very different experiences, background knowledge, and attitudes to the beginning accounting course. As classroom environments are designed and attempts are made to move students to higher levels of academic performance in this course, it is important to consider the attributes of a novice learner (Coppola, 1995; Naveh-Benjamin, 1994; Paris & Winograd, 1990) and how these attributes may affect academic performance. This is especially relevant to courses such as the beginning accounting course that are characterized as highly conceptual and in which the understanding of key relationships is essential for academic success. It should be expected that most students taking courses outside their major field of study are likely to be novice learners in terms of the new context. It is reasonable to consider that nonbusiness majors may have less background knowledge and experiences related to business in general, and to accounting specifically, than those students who have chosen business as their major. Furthermore, students in the beginning accounting course whose majors are outside business may also experience lower levels of self-efficacy (Bandura, 1986; Schunk, 1989) and generally less interest in the subject, both adversely affecting motivation.

Conclusions

A secondary goal of the intervention related to this study was clearly to minimize students' learning pathologies and enhance the development of lifelong learning skills, although

the scope of the study did not include measurement of such development but instead measured differences in academic performance. Based on research conducted in 1982 by Kirschenbaum and Perrie (as cited in Hattie et al., 1996, p. 100), interventional studies that used academic performance as the criterion variable were found to have a success rate of only 33%, whereas studies using affective criterion variables (such as attitudes towards learning, self-efficacy, reduction of anxiety, and others) were found to have a 50% success rate. Hattie et al. (1996) found a mean effect size of .27 when academic performance was used as the outcome measure with university students. However, a mean effect size of .68 was associated with affective outcome measures of similar students. Also using meta-analysis but focusing only on the university setting, Ragosta (2010) found an effect size of .373 when the affective variable of self-efficacy was used as the criterion variable. The MANOVA conducted in this study to determine whether there was a collective difference in mean scores between the control and treatment group on five exams resulted in a small effect size of $\eta^2 = .06$. In a meta-analysis of college-level learning skills interventions, Ragosta (2010) found an average effect size of .27 when academic achievement was defined as the criterion variable in studies conducted at the university level. However, only one study among the 55 studies included in this meta-analysis took place within the business discipline and this particular study resulted in a negative effect size (Harris, 1998). Thus, the existing literature fails to provide a reliable benchmark for effect size in regard to learning skills interventions conducted in the business context at a university setting.

Hattie et al. (1996) further acknowledged that positive attitudinal or affective changes did not automatically translate into performance outcomes in the short run. Students can potentially develop a more positive and/or confident attitude toward learning in general as a result of an intervention and yet these improved attitudes may not necessarily translate into improved

academic performance in the course under study. In relation to this particular study and the intervention that was conducted in the introductory accounting course, affective benefits from the intervention may have accrued that may impact performance on future academic tasks even though affective variables were not measured in this study. Concerning the potential for transfer of newly learned strategies (encouraged through the intervention) to new contexts, students must have learned how the strategy works, when it is appropriate to use the strategy, and what the strategy requires of the learner. If students obtained these learning skills and understandings from the intervention, it is reasonable to expect that transfer to new contexts is likely (Hattie et al., 1996).

The impact of learning skills intervention has been analyzed from various perspectives by researchers conducting meta-analysis (Dignath & Butler, 2008, Hattie et al., 1996; Ragosta, 2010). However, none of these analyses has explored the relationship between class size and the degree of impact made by an intervention. In this study, the intervention was carried out in a class size of 60 students. Acknowledging that “large” class size is a relative term, a class size of 60 students in a beginning accounting course at this particular university is considered to be an especially large class size for a beginning accounting course. All activities related to the forethought, performance, and self-reflective phases of self-regulated learning were conducted collectively or with the entire group of students. In other words, the excessively large number of students in each section precluded individualized instruction in terms of the development of self-regulated learning skills. Interventions that can be individualized and carried out on a more personalized basis may result in larger effect sizes. It is conceivable that the large class sizes associated with this study may have negated some of the potential effects of the intervention. Class size was not considered in the meta-analyses related to learning skills interventions

(Dignath & Butler, 2008; Hattie et al., 1996; Ragosta, 2010). Therefore, the literature is void of empirical evidence as to whether or how class size impacts the effect of learning skills interventions. As future classrooms are designed to encourage self-regulated learning and empirical studies are conducted to assess outcomes, class size may need to be one of the considerations.

Closely related to the individualization of the intervention is the recognition that students' perceptions of the learning environment may not be equivalent to "the learning environment envisioned by the instructor" (Hall et al., 2004, p. 495). Even though it may be the intention of the instructor to move each *individual* student to a higher level of self-regulation, this may not be the perception of a student who receives an intervention in a classroom of 60 students. Although they may have participated in the intervention activities, it cannot be assumed that students approached these activities with the intention of self-improvement. Unfortunately, in a large class particularly it is likely that a certain percentage of students mechanically participated in intervention activities but with a lack of interest and engagement. Merely "going through the motions" in reference to activities designed to improve learning skills will not likely move students to higher levels of academic performance.

It may be the student's perception of the classroom environment, the workload required in the course, or the assessment instruments that ultimately influence whether the student is positively affected by an intervention such as the one designed for this study. As an example, Trigwell and Prosser (1991) stressed that the "perception of high workload and assessment aimed at rote could cause surface approach is associated with students adopting a surface approach" (p.260). As a result of interviews with accounting students, Gow et al. (1994) determined that the perception of a heavy workload in a course can detrimentally encourage

students to adopt a surface approach to learning. When students take a surface approach to learning, they are focused on exam performance rather than learning and understanding and often default to ineffective rehearsal or memorization strategies rather than using more effective strategies encouraged in the intervention. Such behaviors are contradictory to the purpose of the intervention. In the SAL literature, English et al. (2004) stressed the importance of curricular design when interventions are used to encourage a deep or understanding approach to learning. Thus, it is necessary to conduct a careful examination of the workload associated with the course as well as the assessment instruments used in the course to ascertain that they support the goals of the intervention. If such a misalignment was present in this particular study, it could have negated some of the benefits of the intervention.

The results of meta-analysis conducted by Dignath and Buttner (2008) indicated that primary and secondary students were more receptive to learning skills intervention (as determined by affective changes, changes in strategy usage, and changes in academic performance), evidenced by the effect sizes associated with interventions conducted at these levels. Likewise, Hall et al. (2004) and others have expressed the difficulty associated with learning skills interventions conducted with students in higher education. These students have deeply “entrenched notions of learning and studying” (p.495) and are somewhat resistant to changing those notions. Ragosta (2010) refuted the notion of a “ceiling effect,” which suggests that students at the university level have already acquired high levels of self-regulation. Conversely, Ragosta suggested that university students are less responsive to learning skills interventions simply because age and experience are often accompanied by an unwillingness to change.

Furthermore, Muis and Franco (2009) argued that novice learners tend to default to rote or memorization strategies rather than approaching these tasks using newly learned strategies when they face particularly difficult academic tasks.. This argument may apply to the findings of this study whereby academically weaker students (low ACT/GPA) showed little evidence of benefitting from the intervention. Although these students received instruction on effective strategies for approaching academic tasks, these students may have experienced strong feelings of academic helplessness (Brown, 1988; Sharma, 1997) and resorted to rehearsal strategies (less effective for the conceptual content of accounting courses) by default. In other words, this academically deficient group may have been particularly resistant to change. This finding is consistent with that of Hattie et al. (1996), who found through meta-analysis that lower-ability students were generally unable to benefit from interventions designed to improve learning skills.

In summary, the scope of this study involving a multifaceted intervention in a beginning accounting course was limited by the use of a single criterion variable, academic performance. Analysis of the data related to this study only provided results related to students' performance on course examinations. The underlying reasons for differences in academic performance between the control and treatment groups and subgroups could not be identified. It is important to recognize that students may have accrued other benefits (affective, study skills, etc.) that were not measured due to the limited scope of this study but that could potentially affect future academic tasks undertaken by the student in a positive manner. It is also reasonable to consider that the age of the participants in this study, the large size of the classes receiving the intervention, potential student perceptions of a heavy workload in the course, and a substantial presence of novice learners may have influenced the effect size of the intervention.

Recommendations

Recommendations for Practice

Although this study was limited to the examination of the differences in the academic performance between students receiving a self-regulated learning intervention and students who did not receive such as intervention, there are broader and perhaps even more important implications that emerge from this study. Although accounting professionals in general and the AECC in particular have implored accounting educators to make “learning to learn” a classroom priority, there has generally been resistance to doing so. It is conceivable that accounting educators hesitate to devote limited class time to the development of lifelong learning skills based upon experiential evidence. It is common knowledge that accounting courses contain a large body of high technical content that requires instructors to strategically allocate class time to coverage of this substantial amount of content. The results of this study suggest that students can be exposed to instruction related to “learning to learn” *without* compromising the acquisition of course content knowledge. Furthermore, students who received the intervention outperformed those students who did not receive “learning-to-learn” instruction. Albrecht and Sack (2000) argued that accounting classrooms’ focus on technical knowledge had come at the expense of the development of lifelong learning skills. This study suggests that the following addendum to this statement may be applicable: Students in a beginning accounting course can be provided instruction related to lifelong learning skills at no expense to their attainment of accounting content knowledge.

Although accounting educators are experts in their discipline, they may require additional training in order to possess the pedagogical skills needed to help students develop lifelong learning skills within the context of accounting classrooms. According to Weinstein and Meyer

(1991) educators must possess cognitive strategies for teaching. Specifically, accounting educators' knowledge "must include not only instructional strategies for teaching content but also strategies for teaching students how to learn content" (p.21). Furthermore, it is imperative that accounting educators consider the possibility that sometimes "the less we teach, the more they learn." In other words, content prioritizations must be made as accounting courses are designed. For example, those who design the beginning accounting course should carefully determine what content is necessary to provide students with a strong foundation in accounting. More technical content does not necessarily equate to a stronger foundation. The intervention designed for this study was carried out during regular class time with no difference in amount of content as compared to the control group that received no intervention. Although classroom time was allocated between accounting content and learning skills, this did not negatively impact students' acquisition of the important concepts of the course as reflected in the scores on the Comprehensive Exam.

It was not within the scope of this study to measure improvement in self-regulated learning skills (as through use of the MSLQ), but it can be reasonably inferred that some aspect or aspects of the "learning to learn" training may impact students in subsequent academic courses and/or later in their professional careers. It is important to consider that it is likely that some transfer of benefits occurs as a result of a learning skills intervention whether or not these benefits were measured

Another assumption that may be dispelled by the results of this study relates to *who* benefits from learning skills interventions. It is often argued that the instruction of learning skills is inappropriate in higher education because academically strong students (high ACT scores) already possess appropriate learning skills and that an intervention to teach learning skills would

largely benefit only the academically weaker students. This study does not support such an argument. Instead, the results of this study indicate that the academically strongest students (those in the high ACT group) made the greatest gains as measured by total exam scores. Although these results are limited to this particular study and cannot be generalized to other populations, this is a critically important and interesting finding with significant implications for accounting education.

Recommendations for Future Research

The results of this study suggest that the adoption of a dual focus on both content and the process of learning in a beginning accounting course can be accomplished without impairing the amount of content knowledge students acquire in the course. In fact, the findings indicate that overall the students in the dual-focus classroom scored higher on total exams than students whose classroom singularly focused on content, with statistical significance emerging on the fourth exam. Additional research is necessary to determine *why* this outcome occurred.

Prior research has established that the link between changes in the learning environment and changes in academic performance is the presence of mediating variables that also represent the multiple facets of the self-regulated learning construct. The significant mediating variables include, but are not necessarily limited to, self-efficacy, epistemological beliefs, metacognitive awareness, motivation, learning goals, approach to learning, and use of learning strategies. Well-established measurement instruments are available to measure many of these mediating variables. If academic performance improves, it can reasonably be inferred that there has been a change in one or more of these mediating variables. Future research should attempt to determine how these mediating variables change in response to changes in the learning environment within

the context of a beginning accounting course. Although the current study looked broadly at whether academic performance was or was not affected by a learning skills intervention, it is critical that the next level of inquiry must focus on and measure the changes in these mediating variables that are the prerequisites to changes that occur in academic performance.

It is also important that educators continue to determine which types of classroom activities most effectively and positively affect the mediating variables previously discussed. In order to effectively design powerful learning environments, it will be necessary to determine how particular activities affect these mediating variables and, subsequently, the learning behaviors of university students. This particular issue was addressed in a meta-analysis conducted by Hattie et al. (1996) but was only minimally addressed in the meta-analysis recently conducted by Ragosta (2010). For example, the 1996 meta-analysis indicated that interventions involving structural or organizational aids appeared to produce the largest effect sizes. As first recommended by Ragosta (2010), future research should consider the possibility that certain types of intervention may impact low-ability and high-ability students differently. Furthermore, future research should address the issue of how class size affects the impact of learning skills interventions.

According to the meta-analysis of Ragosta (2010) 65% of learning skills interventions incorporated multiple strategy instruction, producing a more comprehensive level of training. In the current study, the intervention was comprehensively designed to address all three phases of self-regulation (forethought, performance, and self-reflection). Due to the complex design of many interventions, future research must draw upon qualitative research methods to truly discover *why* learning skills interventions are effective and, more specifically, what types of activities are most effective. Qualitative studies involving feedback from students in the form of

surveys and/or interviews could provide invaluable information in the quest to better understand which intervention activities are most effective. Data gathered using qualitative methodology could provide insight that may not be available by the exclusive use of quantitative methodology and could enrich what has already been learned about learning skills interventions through quantitative approaches. Answers to the following qualitative questions would provide valuable insight in regard to this study and other similar studies:

What aspects of the intervention did students find to be particularly beneficial? What strategies have students added to their repertoire of learning strategies? Likewise, which activities were less meaningful and perhaps were completed with a lack of personal interest and engagement? Which newly adopted strategies will the student purposefully transfer to future academic endeavors because they have experienced the benefits of using these strategies? Which activities helped them better understand their own learning pathologies and how to replace those pathologies with effective learning strategies? Was the message received that effective learning is more than a function of intellectual ability and, if so, did that message enhance their self-efficacy in respect to the course? Did any aspects of the intervention challenge their beliefs about what knowledge is and did that impact how they approached learning tasks? Did novice learners find the use of the structural schema beneficial and did it help them organize course content and see relationships? Which activities most effectively raised students' awareness of their personal learning and studying behaviors? Did a focus on "learning to learn" as well as course content influence students' level of self-efficacy and perhaps reduce anxiety about the course? Did the self-reflective activities implemented prior to each exam help students more effectively use study time to focus on subject areas in which students felt less prepared? Was it helpful to spend time reviewing exams after they were graded and returned?

Did this self-assessment activity help them detect areas of weakness in their understanding? Was it helpful to plan strategies for improving learning approaches for subsequent exams? Which activities helped students recognize the limitations of rehearsal (memorization) strategies?

In summary, future research should attempt to better understand the merits of individual activities or components of an intervention in order to determine the optimal combination of activities. This understanding may be possible when answers to the preceding questions are forthcoming. Ultimately, changes need to be made in the learning environment that will impact the mediating variables that elicit the development of lifelong learning skills and improve academic performance. Answers to the preceding questions would provide invaluable direction in making the most appropriate changes.

Additional studies should attempt to determine the most effective allocation of classroom time and activities between content and the development of learning skills. For example, would a more robust intervention in the current study have moved students to higher academic performance? On the other hand, was the intervention too complex and would the students have performed at an even higher academic level if the intervention had been downsized? In order to move students toward higher academic performance while simultaneously improving their lifelong learning skills, it will be necessary that future studies attempt to find that optimal blend of focus on content and focus on the process of learning. It can reasonably expect that this optimal blend would vary between contexts and between types of students. Therefore, future research is needed specifically in accounting education in order to find the ideal balance between the focus on content and the process of learning within a beginning accounting course.

Furthermore, due to the finding that the high ACT group made the most significant gains in academic performance as measured on five examinations, future research should be devoted to

the investigation of which component or components of the intervention led to these gains of high ability students. The potential to move high-ability university students to even higher levels of performance has great significance to institutions of higher education and to academic departments, such as departments of accountancy, in particular. The findings of this study contradict what has been found in prior meta-analyses in terms of the degree of responsiveness of high ability students to learning skills interventions. This study should be replicated to determine if similar results occur. According to Hattie et al. (1996) it is generally middle ability students and underachievers who reap the greatest benefits from learning skills interventions. Because this study captured both the ACT and prior GPA of all students, it would be beneficial to further classify certain students as “underachievers.” This classification of students would describe those students who are in the highest ability group but who fall into a lower subgroup based on prior GPA. The following questions are particularly relevant as researchers try to understand the responsiveness of high ability students to learning skills interventions: Do underachievers respond to the intervention differently from those high ACT students in the treatment group who also classified in the high prior GPA group (not “underachievers’)? Does the ceiling effect apply to only high achieving students from the high ACT group but not to those high ACT students who are considered to be “underachievers.

A primary goal of higher education is to provide an environment in which students can reach their academic potential. This study suggests that efforts to develop learning skills may allow high ability students to achieve even greater academic success and to move closer to reaching their academic potential. It may be a serious mistake to overlook high ability students and to automatically assume that they are already performing at their maximum ability. Creating this opportunity to enhance the academic performance of our highest ability students through a

learning skills intervention is in keeping with this foundational goal of institutions of higher education.

Many studies have been conducted that involved “learning-to-learn” interventions and the results of many of these studies have been included in meta-analyses conducted by various researchers. Dignath and Buttner (2008) conducted analyses at the primary and secondary levels, Hattie et al. (1996) conducted an analysis of all educational levels, and recently Ragosta (2010) analyzed only college-level interventions for his dissertational study with Barry Zimmerman at the City University of New York. The fact that only one of the 55 college-level studies included in the meta-analysis took place in a business program is indicative of the lack of research related to the development of lifelong learning skills taking place in business programs. Using a wide array of computerized data bases to find appropriate studies for inclusion in the meta-analysis, the only study in a business context that met the criteria for inclusion in the study involved computer-mediated instruction in a beginning accounting course. The learning skills intervention was also computer-mediated and resulted in a negative effect size as the control group’s academic performance exceeded that of the control group that received a computer-mediated intervention (Harris, 1998).

This observed scarcity of studies related to the development of learning skills for the purposes of lifelong learning and enhanced academic performance in the business and accounting disciplines suggests that future research in this area is warranted. Other disciplines such as reading and writing have accumulated a solid research base related to self-regulated learning, providing benchmark effect sizes for interventions and other valuable information. It appears that there has been a resistance in the business disciplines to devote research efforts to better understanding how lifelong learning skills can be developed in a college classroom

without compromising course content. Is this void in the literature due to the belief that it is not important to include the development of lifelong learning skills as a course objective in college-level business and accounting courses? Or do business educators agree that the development of lifelong learning skills is important but believe that the development of these skills comes at the expense of the teaching and learning of content knowledge? Perhaps efforts are being made to develop these skills but the results of these efforts are not being measured or empirically tested, and consequently, not being published. The lack of research in the accounting discipline in particular is contradictory to the recommendations made by the AECC. Today's rapidly changing accounting profession requires professionals to be able to learn on their own and the development of lifelong learning skills is becoming even more important than it was in 1990 when the AECC issued its report.

Finally, it is important to recognize that the literature is profuse with studies related to the theoretical aspects of lifelong learning skills and self-regulated learning in particular. It is important that accounting educators receive training related to these theories of learning. However, understanding the theoretical basis of learning constructs and appreciating why the development of learning skills is important at the college level does not sufficiently prepare educators to design classrooms that provide powerful learning environments. Future research is needed to unravel the mystery of how actual classrooms can be designed to move students to higher levels of academic performance while simultaneously equipping students with lifelong learning skills that can benefit them as they approach future learning tasks in the academic setting and in their professional lives.

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APPENDICES

APPENDIX A – Course Syllabus Excerpt

Principles of ACCT I – Treatment Group

Course Objectives: After completing this course, the student will be able to:

- Construct an income statement, owner's equity statement, and balance sheet for a sole proprietorship
- Describe the informational purpose of each financial statement and the inter-relationships that exist between the statements
- Identify the steps in the accounting cycle and their related purposes
- Describe the role and importance of internal controls in an accounting system
- Identify and explain the fundamental accounting concepts and principles upon which accounting rules (GAAP) are based
- Use a debit/credit system to record basic financial information in an accounting system
- Describe how basic business transactions affect the financial condition (accounting equation) of a firm
- Differentiate between the cash and accrual methods of accounting and explain how these methods affect the recognition of revenues and expense on a firm's financial statements
- Explain the role of ethics in accounting, how ethical dilemmas may arise in providing financial information for users, and how the 4-step Ethics Model can be applied
- Use EXCEL skills in the preparation of the end-of-period worksheet and financial statements

As a result of learning-how-to-learn classroom activities in this course, the student will:

- Develop an increased awareness of his(her) knowledge beliefs, personal use of strategies, and his(her) level of self-regulation in learning
- Better understand the importance of self-regulation in learning and how learning strategies can be used to accomplish academic tasks

APPENDIX B –MSLQ Instructions for Participants

MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE (MSLQ)

The MSLQ was developed by Paul R. Pintrich, David A. F. Smith, Teresa Garcia, and Wilbert J. McKeachie from the National Center for Research to Improve Postsecondary Teaching and Learning and the School of Education at the University of Michigan. Permission to use the MSLQ was obtained by L. Becker on 8/23/2009.

Date _____

Code Name _____

(Please write your CODE Name in a safe place as only you will know your code name.)

Your name will *not* appear on the questionnaire and you will remain anonymous as your responses are scored and feedback is provided.

After feedback is provided to you using your code name, you will re-submit only this cover page with your name added so that you receive credit for your participation.

The purpose of this questionnaire is to raise your awareness of how you “go about learning” so **honesty** in completing the survey is very important *to you* as a lifelong learner.

NOTE: To receive credit for participation and to receive feedback, you must submit this cover page and responses at our next class meeting (Monday, September 27 – deadline 2:00pm).

APPENDIX C – MSLQ Feedback Report for Participants

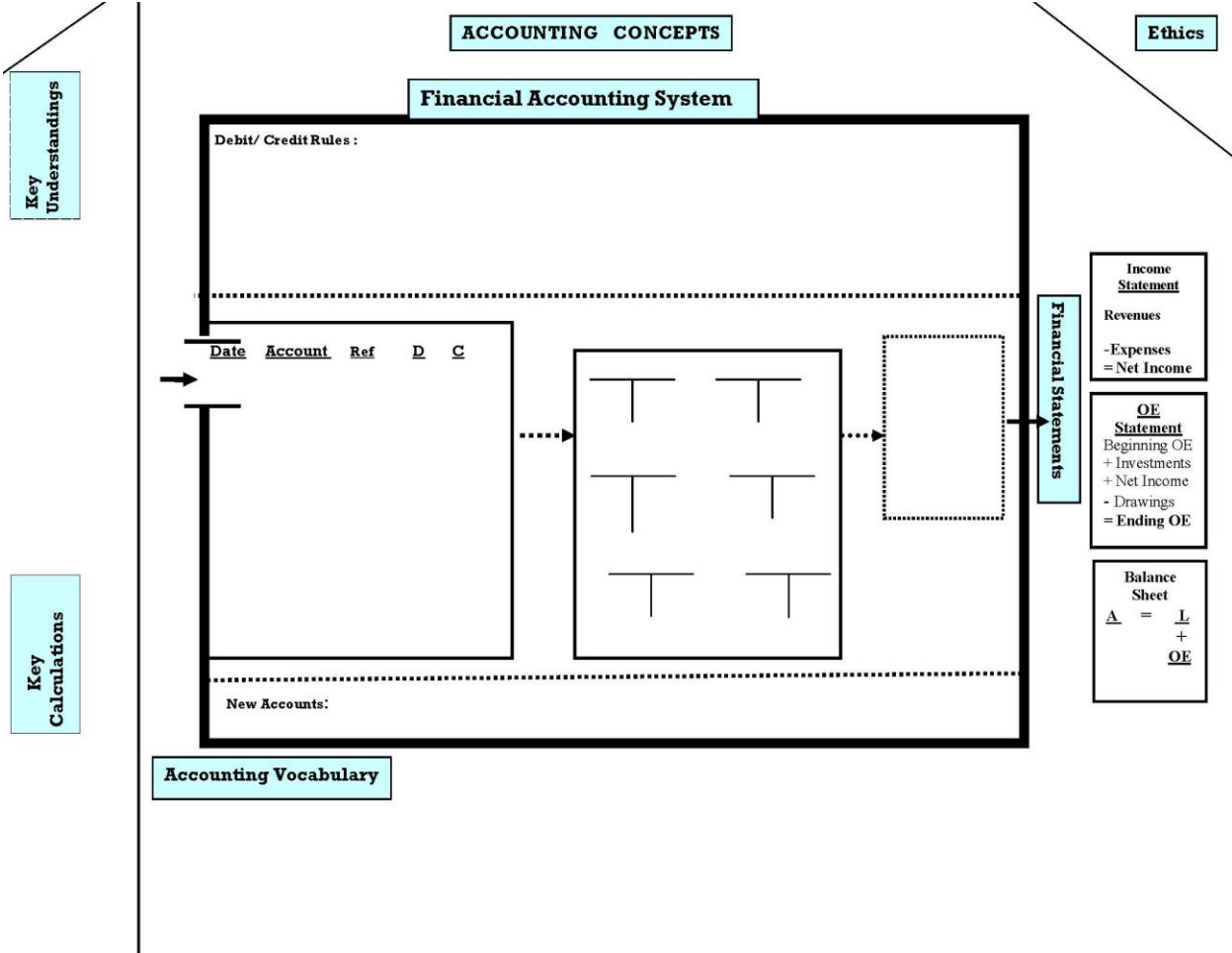
MSLQ Results for _____ (Code Name)

This handout describes an interpretation of your responses to the MSLQ (Learning Strategies) questions. You may want to use this feedback to determine how you can improve the use of learning strategies to complete academic tasks..

Score of 6-7 Strategy is highly used; 3-5 Strategy is moderately used; 1-2 Strategy is rarely used

Strategy	Your score	Description of strategy
Rehearsal		This strategy represents the use of memorization techniques to learn new information.
Elaboration		This strategy involves attempts to summarize, paraphrase, use examples, and relate new material to what you already know.
Organization		This strategy involves focusing on “seeing the Big Picture” (main points) and recognizing key relationships in the course material.
Critical Thinking		This strategy involves applying previous knowledge to solve new problems in new situations.
Metacognition		This strategy involves efforts to try to plan your work and to check on whether or not you are <i>understanding</i> the course material.
Time and Study Environment		This strategy involves deliberately managing your time and schedule for studying and managing the places where you study.
Effort Regulation		This strategy involves your willingness to try hard to learn course material, even when the work is difficult.
Peer Learning		This strategy involves collaborating with classmates to clarify course materials and asking your classmates questions when you don’t understand.
Help-Seeking		This strategy involves acknowledging that you are <i>not</i> understanding course material <i>and</i> seeking assistance from your instructor, classmates, the accounting lab, or other resources.

APPENDIX D – Examples of Structural Schema (Organizational Aid)



APPENDIX E – Example of In-Class Assignments

**In-Class Assignment:
Do you understand the Accounting Equation?**

_____ *Name*

Instructions:

- Enter an (X) in the ____ **IF** the analysis is an *unreasonable* answer (remember the accounting equation must stay balanced!)

OR

- Enter (OK) in the ____ **IF** the analysis is a *reasonable answer*. **THEN** describe a transaction that could have resulted in this particular analysis, using the space in the right margin.

	A	=	L	+	OE	<i>Transaction:</i>
1. ____	+		-		NE	
2. ____	+/-		NE		NE	
3. ____	+		+		NE	
4. ____	-		NE		+	
5. ____	+		NE		+	
6. ____	NE		+		-	

APPENDIX F – Examples of “One-Minute” Papers

Example #1: “One-Minute” paper Revenue recognition – Accrual Basis

Do I understand revenues?

Business: Piano Tuning

For each situation, answer this question: “Was revenue earned today?”

Enter : yes or no

_____ Tuned a piano today for a customer and will receive payment in 30 days

_____ Received cash today for piano tuning done last month

_____ Received cash today for piano tuning to be done next month

Example #2: “One-Minute paper Adjusting Entries
--

Do I understand Adjusting Entries?

Check the box which describes your level of understanding:

After today’s class, I understand:

	<u>Completely</u>	<u>Somewhat</u>	<u>I am confused</u>
1. The difference between a “prepaid” and an “accrual” type of adjustment.			
2. <i>Why</i> the CASH account is never used when preparing adjusting entries			
3. What questions (ex: how many supplies were “used” during the period?) must be asked in order to prepare adjusting entries			
4. <i>Why</i> each entry involves either an expense or a revenue account			

Other questions I have about adjusting entries:

APPENDIX G – Self-Reflection Activity (Pre-Exam) Example 1

Instructions for

Self-Evaluation: *You are encouraged to complete this activity as you BEGIN to study for Exam 2.*

You will find the **Master Frameworks** for Chapters 5, 6, 8 attached. Using these 3 frameworks:

- (1) circle a minimum of 6 areas where you feel least proficient and you will need to work harder in these areas as you prepare for your exam.

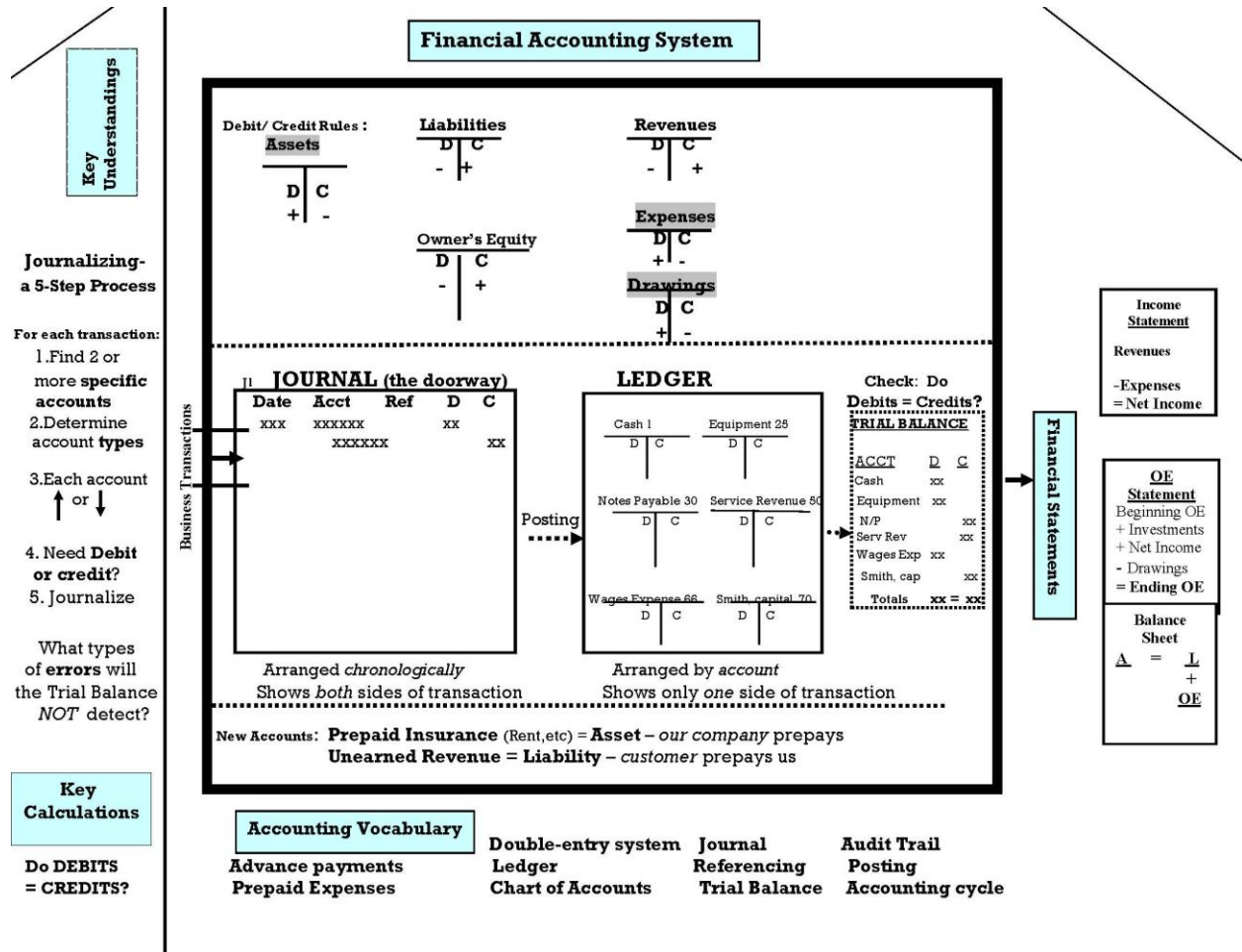
- (2) Place a checkmark (✓) in a minimum of 6 areas where you feel more confident in your understanding and will need to spend less time.

Bring your self-evaluation to class to submit *BEFORE* your exam on Monday, Nov 15.

Check: You should have a minimum of 6 circles and 6 checkmarks **TOTAL** for the 3 frameworks.

Self-Reflection Activity (Pre-Exam) Example 1 – Appendix G Page 2

Example of a Master Framework (structural schema)



Accounting Vocabulary

Advance payments	Double-entry system	Journal	Audit Trail
Prepaid Expenses	Ledger	Referencing	Posting
	Chart of Accounts	Trial Balance	Accounting cycle

Key Calculations

Key Calculations

Accounting Vocabulary

Advance payments	Double-entry system	Journal	Audit Trail
Prepaid Expenses	Ledger	Referencing	Posting
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Key Calculations

Key Calculations

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Key Calculations

Appendix H – Self-Reflection Activity (Pre-Exam) Example 2

NAME _____	Code _____			
Bonus - Exam 4 (1 bonus pt)				
You should use this self-evaluation <i>AS YOU BEGIN PREPARING FOR EXAM 4</i>				
Bring this self-evaluation to Exam 4 class.				
No late or incomplete submissions will be accepted.				
<i>As you BEGIN to prepare for Exam 4,</i>				
<i>Check the box that best reflects your level of understanding</i>				
		Minimal understanding	Fair understanding	Good understanding
CHAPTER 9 - RECEIVABLES				
1	Accounts receivable versus Notes receivable			
2	Direct Write-off Method - why disallowed?			
3	Allowance Method:			
	Year end adjustment			
	Write-off of specific customer's account			
	Recovery of written-off customer account			
4	Balance Sheet Presentation of Accounts Receivable			
5	Cash Realizable Value: CRV			
6	Using an Aging Schedule to estimate uncollectibility of Acct Rec Why is this method of estimation called the "Balance Sheet" Approach?			
7	Allowance for Doubtful Accounts: as a Contra Asset Effect of Allowance Balances on year end adjustment Credit Balance? Estimate Over or Underestimated last year? Debit Balance? Estimate Over or Underestimated last year?			
8	Credit Card Sales:			
	How many parties are involved?			
	How are credit card sales recorded?			
9	What is "Factoring" of Accounts Receivable? Why factor A/R?			
10	Notes Receivable:			
	Life Cycle of an Account Receivable			
	Interest Calculations: Days, months, years (t=?)			
	Find Maturity Date			
	Find Maturity Value			
	Honor and Dishonor of Notes Receivable			
CHAPTER 10 - LONG-TERM ASSETS				
Determining the COST of a FIXED ASSET				
	Land			
	Vehicles			
	Land Improvements			
Depreciation:				
	GAAP Concepts - Matching Principle and Going Concern Assumption			
	What are SALVAGE VALUE, ACCUMULATED DEPRECIATION?			
	How is BOOK VALUE Calculated?			
	Using Straight-line Method			
	Using Units-of-activity Method			
	Using (Double)-Declining Balance Method			
	How different methods Affect Net Income			
	Following the CONSISTENCY Principle when choosing deprec. Methods			
	PARTIAL Year Calculations			
CAPITALIZE versus EXPENSE:				
	Meaning of these 2 terms			
	How to record additions, improvements to fixed assets			
	How to record ORDINARY repairs and maintenance			
ASSET DISPOSALS:				
	Retirement of Assets			
	Sale of Assets			
	Disposals that occur in middle of year (Partial Year Calculations)			
Natural Resources:				
	What are Natural Resources? What is Depletion?			
	Method used to DEplete Natural Resources			
Intangible Assets:				
	What are Intangible Assets?			
	When are Patents capitalized? When are they expensed?			
	Are Research and Development Costs expensed or capitalized?			
CHAPTER 11 - LIABILITIES				
What is a CURRENT Liability?				
Sales Taxes collected from customer - what are they to the business?				
Contingent Liabilities:				
	What is a Contingent Liability?			
	Why do product warranties create a contingent liability?			
	WHEN should Warranty Expense be recognized?			
Liabilities related to PAYROLL				
	GROSS Pay versus NET Pay - relate to Wages Expense/Cash for business			
	What are Payroll Deductions?			
	How are Payroll deductions recorded on the books of the business?			

Appendix I – Self-Reflection Activity (Post-Exam)

Exam II Self-Reflection Activity (1 bonus pt)

Name _____ Seating code _____ Class time _____

After reviewing your graded Exam 2, complete the following:

A. Place a checkmark () in the appropriate box

	The multiple Choice questions	The problems	About the same on both
On this exam, I had more difficulty with:			

	Lack of understanding of the particular accounting subject	Reading Errors	Both
For the multiple choice questions that I missed, my major problem seemed to be:			

B. Check () the most appropriate level of performance as demonstrated on Exam 2:

FINANCIAL ACCOUNTING SYSTEM:	Good	Fair	Poor
My ability to use the debit/credit system to <i>prepare adjusting entries</i>	_____	_____	_____
My ability to use the debit/credit system to <i>prepare closing entries</i>	_____	_____	_____
My ability to CLASSIFY accounts on the Balance Sheet	_____	_____	_____
ACCOUNTING VOCABULARY/CONCEPTS			
My understanding of accounting vocabulary related to Chapters 3,4,5	_____	_____	_____
My understanding of the ACCRUAL basis of accounting (recognize revenue when it is earned and expenses when they occur)	_____	_____	_____
My understanding of the effects of adjusting entries	_____	_____	_____

Identify three strategies that you believe were **beneficial to you** as you prepared for this exam: (Ex: accounting lab, LYRYX practice, review of lecture notes, studying with classmates, working textbook and packet problems, reading textbook and many others)

1. _____ 2. _____ 3. _____

Describe a strategy **you could use during the next examination period** to try to improve your exam score (or maintain your current level of performance if satisfactory to you) _____

Appendix J – Informed Consent Form

This Informed Consent will explain about being a participant in a research study. It is important that you read this material carefully and then decide if you wish to be a volunteer.

PURPOSE: The purpose of this research study is to determine whether a course designed to focus on self-regulated learning and standard course content can improve academic achievement in the course. Prior studies indicate that a positive relationship exists between self-regulation and academic achievement. Based on an extensive review of other self-regulated learning studies, classroom activities have been designed to foster students' self-regulation.

DURATION : The participation in this research study will last for the entire semester. All three sections of ACCT 2010 taught by Lana Becker in the Fall semester of 2010 will be involved in this research study.

PROCEDURES: The elements that comprise your grade in the course and the examinations associated with this course are unchanged. However, classroom activities will be designed to foster self-regulation. At the beginning of the course, you will be asked to complete the Motivated Strategies for Learning Questionnaire. This is a non-graded classroom activity. After grades have been assigned at the completion of the course, students' raw exam scores, GPA prior to the course, major, and Composite ACT scores will be used in the study. Names and all personally identifiable information will be removed from the data for the purpose of this study.

If you drop the course, withdraw from the course, or do not take the final exam at the end of the course, you will be removed from the study.

ALTERNATIVE PROCEDURES/TREATMENTS: If you elect not to participate in this study, you may drop this course according to the guidelines established by the university. If you need assistance in adding another section of ACCT 2010, please contact your instructor or the ACCT Department Chairperson at 439-4432.

POSSIBLE RISKS/DISCOMFORTS: The possibility exists that the instructional invention could have no effect or negatively impact academic achievement in this course.

POSSIBLE BENEFITS: The possible benefits of your participation include the opportunity to develop self-regulated learning skills which contribute to lifelong learning and have been shown to be positively associated with academic achievement in prior research studies.

FINANCIAL COSTS: There are no additional costs to the participant that may result from participation in the research.

VOLUNTARY PARTICIPATION: Participation in this research experiment is voluntary. You may refuse to participate.

CONTACT FOR QUESTIONS: If you have any questions at any time, you may call Lana Becker at 439-8592 or Gary Burkette at 439-4432. You may call the Chairman of the Institutional Review Board at 423/439-6054 for any questions you may have about your rights as a research subject. If you have any questions or concerns about the research and want to talk to someone independent of the research team or you can't reach the study staff, you may call an IRB Coordinator at 423/439-6055 or 423/439-6002.

CONFIDENTIALITY:

Every attempt will be made to see that the study results are kept confidential. A copy of the records from this study will be stored in Office 105, Sam Wilson Hall for at least 5 years after the end of this research. The results of this study may be published and/or presented at meetings without naming you as a subject. Although your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, ETSU IRB, and personnel particular to this research have access to the study records.

By signing below, you confirm that you have read or had this document read to you. You will be given a signed copy of this informed consent document. You have been given the chance to ask questions and to discuss your participation with the investigator. You freely and voluntarily choose to be in this research project.

_____ SIGNATURE OF PARTICIPANT	_____ DATE
_____ PRINTED NAME OF PARTICIPANT	_____ DATE
_____ SIGNATURE OF INVESTIGATOR	_____ DATE
_____ SIGNATURE OF WITNESS (if applicable)	_____ DATE

VITA

LANA L. BECKER

- Education: East Tennessee State University, Johnson City, Tennessee
EdD, 2011
East Tennessee State University, Johnson City, Tennessee
MBA, 1990
East Tennessee State University, Johnson City, Tennessee
BBA, Accounting, 1983
Central Missouri State University, Warrensburg, Missouri
BME, 1976
- Professional Experience: Lecturer, East Tennessee State University, Johnson City,
Tennessee, 2002-2011
Instructor, East Tennessee State University, Johnson City,
Tennessee, 1990-2001
Instructor, Northeast State Community College,
Blountville, Tennessee, 1985-1987
Cost Accountant, AFG Industries, Kingsport, Tennessee
1983-1984
- Publications: Becker, L. and Schneider, K. N. (2004, Aug/Sept). Motivating
students: 8 simple rules for teachers. *The Teaching
Professor*. Reprinted in *Faculty Focus*, March 2009.
- Schneider, K. N. and Becker, L. (2011). Using the COSO model of
internal control as a framework for ethics initiatives in
business schools. *Journal of Academic and Business Ethics*,
Volume 4.
- Honors and Awards: ETSU College of Business Excellence in Teaching Award 2001
Presentation Excellence Award, 4th Academic Business World
International Conference, May, 2008
- Profession Certifications: Certified Public Accountant, State of Tennessee, 1985 (Inactive)
- Professional Memberships: Institute of Management Accountants
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