

Regulation of Motivation in Undergraduate Business Students Learning With the Case Method:

Examining an Underemphasized Aspect of Self-Regulated Learning

by

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Abstract

This dissertation investigates relations among personal epistemology, goal orientation, and regulation of motivation in a case method learning environment. The primary purpose was to examine relations between student characteristics and their use of regulation of motivation strategies. A secondary purpose was to examine whether students' learning through the case method can develop more sophisticated epistemic beliefs and goal orientation that are more adaptive for learning.

Eighty seven third- and fourth-year accounting students participated in the study. Thirty six participants were in the treatment, a case method group; the other fifty one participants learned through traditional instructional methods. All participants completed pretest questionnaires at the beginning of the Spring 2010 semester and completed posttest questionnaires at the end of the semester. Various statistical techniques were used to analyze the data.

Although no pretest differences were found between the groups, at posttest the treatment group participants were found to have more sophisticated epistemic beliefs and more adaptive goal orientation. Regulation of motivation strategies appeared to vary slightly between the groups.

Dedication

I dedicate this dissertation to my late parents. When you lost Dr. Chow, my brother, I promised to give you another one. Today, I deliver.

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I have many people to thank for their generous help to make my research possible. In particular, I owe a sincere debt of gratitude to Dr. John Nesbit, senior supervisor, and Dr. Philip Winne, supervisor, who have been a valued mentor throughout my journey to complete my work. I appreciate the considerable efforts and time they spent to review my work, provide cons feedback until the very end of this research.

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CHAPTER 1: INTRODUCTION

Context of Problem

According to some accounts (e.g., Barnes, Christensen, & Hansen, 1994; Masoner, 1988), the pioneer of the case method in formal educational settings was Christopher Columbus Langdell, a former dean of Harvard Law School who introduced the case method in 1878. Langdell replaced the more passive teaching methods such as text-studies and lectures with the active-participatory case-analysis method (Shulman, 1986). Harvard Business School, the pioneer of the present day business education, adopted the case method in 1908 (Masoner, 1988). Since that time, a number of schools and disciplines have emulated and adapted Harvard's popular case teaching model (Roselle, 1996; Masoner, 1988; Shulman, 1986). In recent years, the use of the case method has increased in a diverse array of disciplines, including medicine, teacher education, engineering, and public policy (Anayansi-Archibong, Czuchry, & House, 2000; Roselle, 1996; Shulman, 1992).

Today, the case method has become the principal, if not the only, teaching method in major graduate business schools (Masoner, 1988). In undergraduate business education, the case method most often appears in a final year capstone module (Rippin, Booth, & Jordan, 2002). For instance, in the School of Business at Kwantlen Polytechnic University, a significant number of third and final year courses (but no entry level courses) are described as "case" courses. In professional public accounting education, the Certified General Accountants of Canada highlighted in its 2009-2010 syllabus (Certified General Accountants of Canada, 2009) the aim of the case method in *Issues in Professional Practice* is to "...emphasize[s] competencies...

financial accounting, management accounting, information technology, taxation, assurance, and leadership...give students an opportunity to integrate and apply knowledge acquired through the Education levels of the program. In addition, online discussion groups give students practice dealing with situations encountered by accounting professionals, and group project work develops competencies in communication, teamwork, and time management." (pp. 84-86). This aim echoes Harvard's ideal of case method teaching: "The best type of teaching bears in mind the desirability of ... interconnection. It puts the student in the habitual attitude of finding points of contact and mutual bearings" (Barnes, Christensen, & Hansen, 1994, p. 9).

Despite the popularity of the case method, there is very little empirical work that thoroughly examines its effectiveness (Ertmer, Newby, & MacDougall, 1996). According to J. Erskine (personal communication, April 18, 2008), professor and case-writer of Ivey Richard School of Business of the University of Western Ontario, there is a dearth of research on the case method, and much of the existing research is dated. Given this paucity of the research on the case method, Banning (2003) suggests a good starting point may be to examine whether the case method is successful in achieving some of its desired outcomes.

One desired outcome is critical thinking. Case scholars in different discipline areas (e.g. Ellet, 2007; Shulman, 1992) are united in sharing Dewey's emphasis on thinking; that is, the ability of conceptualizing an event or activity as a whole in context rather than approaching it in isolation. Masoner (1988) describes the type of thinking promoted by the case method learning process as active-reflective thinking. Shulman (1992) suggests that ill-structured tasks, such as those presented in cases, are particularly suited to promote cognitive flexibility. One critical goal of professional education is to help students achieve high levels of cognitive flexibility (Spiro, Fletovich, & Coulson, 1996). In Guilford's (1959) theory, the definition of flexibility emphasizes

the capability of the problem solver to change beliefs and strategies. As beliefs and attitudes are often resistant to change (Bendixen, 2002), the challenge to educators then is to design instructional methods that foster adaptive transformation.

The other desired outcome is that students become active learners. According to Barnes et al. (1994), "The active intellectual and emotional involvement of the student is a hallmark of case teaching. That involvement offers the most dramatic contrast with a stereotypical lecture class" (p. 48). The unique part of the case method is that students are required and expected to learn on their own, with no or minimal instructor's guidance, regarding skills or concepts required for case analysis. For instance, students often need to expand beyond their existing knowledge and develop the confidence for doing this largely on their own (Ertmer & Stepich, 1999). This self-discovery process has been described as self-guided learning and self-learning by case practitioners (Ellet, 2007; Erskine, 2008). One requirement for this self-learning process is a highly developed sense of self-discipline to persevere and self-motivate in working through the uncertainties and confusions embedded in a case (Ellet, 2007).

In the field of self-regulated learning, self-learning has been described as self-education. It is a way individuals become educated about their own resources, primarily through self-initiated and self-directed activities (Zimmerman, 1994). The most salient feature of self-regulated learning is that the learner actively takes control of his or her own learning (Zimmerman & Schunk, 2008). However, to engage in self-regulation requires that students possess a level of willingness to engage in a task or activity, often for a lengthy period. This involves motivation, another key in the self-learning process that has been an under-researched component of self-regulated learning (Pintrich, 2000).

One of the key processes of motivation is regulation of motivation, a process that is central to self-regulatory mechanisms (Bandura, 1988). Related constructs in researching regulation of motivation are implicit beliefs and goal orientation (Wood & Bandura, 1989). While understanding implicit beliefs is an important first step in understanding the self-regulatory process, examining goal orientation also sheds light on the process of self-regulation and achievement. Ill-structured tasks, such as case studies, that involve complex decision making and in which motivation takes central place, provide rich ground to research motivation as a part of an integrated theoretical framework of self-regulation (Tompson & Dass, 2000; Wolters, 2004; Wood, Bandura, & Bailey, 1990).

Purpose of Study

The study was designed to investigate the effects of goal orientation, epistemic beliefs, and the case method on students' regulation of motivation in a postsecondary educational environment. More specifically, the goal was to examine the effects of case method through an integrative rigorous educationally relevant theoretical framework, incorporating contextual, motivational, and belief variables.

Significance of Study

There are four major contributions of this study. The first goal is to highlight the role of regulation of motivation in learning. Featuring motivation as the central focus of a study of self-regulation will advance the understanding of a currently under-researched area in the self-regulated learning literature and will advance the understanding of self-regulated learning as an integrative model. By examining self-regulated learning as an integrative model, this study also

answers the call by Bendixen (2002) to investigate the contribution of motivation and context in epistemic belief change.

The second purpose of this research is to overcome some of the limitations of self-regulation interventions in achievement contexts. Zimmerman and Schunk (2001) point out that although many self-regulation interventions produce positive results in school settings, they often fail to sustain students' use of these processes in less-structured environments. In other words, when tasks are complicated students need to regulate their motivation to maintain it at a level adequate to support the execution of cognitive strategies.

The third purpose of this research is to advance the understanding of the effectiveness of the case method in modifying students' beliefs, goal orientations, and regulation of motivation. To the best of my knowledge, this is the first study on the case method using a pretest-posttest with control group design in an authentic setting, in which the investigator was also the instructor. This design can minimize many confounds, such as testing and maturation effects, in measuring and interpreting the results of study findings (Cook & Campbell, 1979).

Finally, as the investigator-practitioner, the findings of my study not only provide grounds for immediate improvement in my teaching, but also inform case method practitioners in general about some important factors which may contribute to more effective use of the case method.

Research Questions and Hypotheses

The general purpose of this study was to examine relationships among students' goal orientations, beliefs about knowledge, and their response to two different kinds of instructional

methods. On the basis of this overall objective and from the literature reviewed in chapter two, there seem to be two main assumptions underlying the case method. The first is that an authentic, realistic case as a teaching tool at a higher level of difficulty (see chapter 3 for details) will enable students to become active, self-directed, and self-motivated learners. This will improve their ability to work through problems that are often ill-structured, ill-defined, complex, and open-ended. The second is that higher level knowledge (e.g., evaluation and synthesis) and application of skill can be best acquired through the practice of a self-discovery process in such a partially self-guided learning environment (Blumenfeld, Soloway, Marx, Krajcik, & Palinscar, 1991).

This conceptualization of the case method led me to frame a series of research questions about its hypothesized effects on students' learning:

1. How do students' characteristics, such as pre-existing goal orientations and beliefs about knowledge, affect their use of motivational strategies?

Hypothesis [1]: Goal orientation and epistemic beliefs scores will predict the regulation of motivation strategy use in the direction as articulated in the literature, aligning them with the theory that sophisticated beliefs and mastery orientation are positively associated with regulation of motivation strategies. This hypothesis also responds to the call by Wolters (2004) to incorporate students' epistemic beliefs into predicting students' motivational strategy use.

2. How do students self-regulate motivation in a case-based learning environment? To what extent do ill-structured tasks motivate students to be active, self-directed, and self-motivated learners?

Hypothesis [2]: Sophisticated epistemological beliefs and adaptive motivational orientation will have a stronger predictive relationship with students' use of regulation of motivation strategies in a case method class than in a traditional lecture class. This hypothesis is grounded in research (e.g., Paulsen & Feldman, 2005; Pintrich, Marx, & Boyle, 1993; Schraw, Dunkle, & Bendixen, 1995; Tompson & Dass, 2000) on relationships between students' epistemological beliefs, and their sustained motivation in complex, authentic, and ill-structured task environments.

3. What are the relationships among goal orientations, epistemological beliefs, and regulation of motivation across different task domains?

A study of college students (Paulsen et al., 2005) has shown that students with sophisticated beliefs (e.g., incremental view of knowledge acquisition) are more likely to invest effort, and students with more naïve beliefs (e.g., simple knowledge) are less likely to maintain a mastery goal orientation. Another study by Sungur and Tekkaya (2006) discovered that students in a problem-based learning environment have a higher level of mastery goal orientation. Paulsen et al. (2005) and Wolters (2004) have called for future research to explore the dynamic relationships among task, epistemological beliefs, and goal orientations.

Summary of Chapters

Although the case method has long been a popular teaching method in law and business and is increasingly being used in professional education, such as public accountancy, very little research has been done that critically examines the key cognitive processes and the effectiveness of case method instruction. Furthermore, the paucity of research that has been done in this area

has mainly focused on one or two desired learning outcomes rather than on the deeper psychological effects of the case method on students. Chapter one outlines the context of the problem and describes a set of research questions to frame the context of this research.

Chapter 2 begins with a brief introduction of epistemological beliefs and explains how self-regulated learning is metacognitively connected with epistemological beliefs (Zimmerman & Kitsantas, 2005). From an integrative perspective, the relationship between self-regulated learning and epistemological beliefs is reciprocal (Hofer, 2005; Winne & Hadwin, 1998). Epistemological beliefs influence self-regulated learning and self-regulated learning influences epistemological development. However, epistemological beliefs and self-regulated learning are both context-dependent, and therefore it may be prudent to examine these two conceptual frameworks in specific contexts such as the case method learning environment.

The second section of chapter 2 reviews some conceptual and empirical studies that concerned regulation of motivation, an area that is under-researched in self-regulated learning (Pintrich, 2000). In cognitive psychology, motivation is generally viewed as a state or a product, whereas regulation of motivation is conceived of as an operation or a process (Winne & Hadwin, 2008). Consequently, most empirical works researching regulation of motivation investigate how a motivational state, for instance goal orientation, influences regulation of motivation; as well, how the use of regulation of motivation strategies impacts motivational states.

The final section of chapter 2 describes the case method. It outlines the key characteristics of the case method and explains how the two key learning processes, individual and group learning processes, are related to self-regulated learning and social cognitive theory respectively. It then reviews some empirical works in the field.

Chapter 3 presents methods and procedures used in this study. This is a quasi-experimental study with pretest-posttest and control group design. This type of design avoids some potential confounds so as to enhance the validity of findings.

The final two chapters discuss results and implications. Overall, the case method learning experience may have the effect of reducing students' naïve epistemological beliefs and maladaptive goal orientations.

In sum, this study advances theory by identifying implications derived from an integrative analysis of contextual, motivational, and epistemological beliefs factors in examining students' engagement in regulation of motivation processes in a case method environment. It measures the effect of case method instruction on not only regulation of motivation, but also adaptive epistemological beliefs and goal orientation changes. This finding may be generalized to similar task environments involving ill-structured or complex tasks.

CHAPTER 2: LITERATURE REVIEW

Selection of literature for review was based on the following criteria presented in declining order of significance for this study. Articles were selected if they were able to (1) demonstrate links among contextual (i.e., case method or ill-structured task environment), personal (i.e., beliefs and goal orientations), and motivational (i.e., regulation of motivation) factors; (2) clarify key theoretical constructs; and (3) inform conceptualizations of tertiary or professional education.

Epistemological Beliefs

Epistemological beliefs, also described as personal epistemology, epistemic beliefs, or knowledge beliefs, are implicit beliefs about the nature of knowledge and learning. As such, they are likely to affect many aspects of an individual's day-to-day functioning, including reasoning, learning, and decision making. In addition, these beliefs shape an individual's self-theories that affect their meaning systems and behaviours (Dweck & Molden, 2005; Schommer, 1994). Perhaps for these reasons, Pajares (1992, p. 329) describes epistemological beliefs as "the single most important construct in educational research."

Broadly, the construct of epistemic beliefs has been dichotomized into categories: naïve vs. sophisticated, dualistic vs. relativistic, and entity vs. incremental. While individuals with naïve beliefs tend to view knowledge as absolute, black-and-white, and relatively unchanging in nature, individuals with more sophisticated beliefs embrace knowledge as complex, tentative, and changeable. The former view is also described as dualistic or an entity view of beliefs, and

the latter broadly includes relativist and incremental beliefs (Bendixen, 2002; Dweck & Molden, 2005; Schommer, 1994).

Schommer (1990) proposed a multidimensional view of epistemic beliefs with five dimensions: (a) Simple Knowledge - knowledge consists of isolated facts rather than an interconnected set of concepts; (b) Omniscient Authority - authority as the source of knowledge rather than reasoning; (c) Innate Ability - ability to learn is fixed rather than malleable; (d) Quick Learning - learning occurs in a quick or not-at-all manner rather than a gradual process; and (e) Certain Knowledge - knowledge is certain rather than tentative. According to Hofer and Pintrich (1997), this multidimensional framework is particularly important for educational research.

Epistemic Beliefs and Self-Regulated Learning

An inclusive definition of self-regulated learning (SRL) describes it as the degree to which "students are metacognitively, motivationally, and behaviourally active participants in their own learning process" (Zimmerman, 2008, p. 167). Many SRL theorists view SRL processes as cyclical, incorporating and integrating components of Bandura's social cognitive learning theory (Pintrich, 2000; Schunk, 2001; Winne & Hadwin, 1998; Zimmerman, 2008).

One such cyclical model of SRL has been proposed by Zimmerman and Kitsantas (2005). In this model, Zimmerman and Kitsantas have distinguished three cyclical phases: forethought, performance, and self-reflection. At the heart of the forethought phase is a set of self-motivation beliefs, such as goal orientation, self-efficacy, and task interest. The performance phase includes self-regulatory strategy use such as self-instruction, environment structuring, and attention

focusing strategies. In the self-reflection phase, students judge or evaluate their performance on the basis of their belief of whether their ability is fixed, or could be improved by controllable factors such as strategy use. Winne and Hadwin (1998) clarified that SRL is only weakly sequenced and recursive such that input from one phase can feed into any other phase of SRL. The latter view makes SRL a highly dynamic model of learning.

To examine the validity of this cyclical model, Zimmerman and Kitsantas recommended SRL researchers adopt research designs that can reveal "specific links between an individual's beliefs and use of self-regulatory process during efforts to learn" (p. 517). However, Hofer (2005) argued that the relationship between personal epistemology and learning is reciprocal. For instance, not only do beliefs influence learning, but learning is also an influential factor in the development of epistemology.

There are many other models of SRL (e.g., Boekaerts, Pintrich, & Zeidner, 2000). Models of SRL have one common element. At any stage of students' engagement in SRL, they are engaging in metacognition (Winne & Hadwin, 1998). Flavell (1976) defined metacognition as one's knowledge of one's cognitive processes and how one regulates these processes. Later theorists (e.g., Muis, 2007; Richter & Schmid, 2000) conceptualized epistemological beliefs as components of metacognition. Muis (2007) presented a set of propositions to integrate epistemic beliefs with aspects of SRL. These are: (a) epistemic beliefs are one component of internal cognitive and affective conditions of a task; (b) epistemic beliefs influence the standards students set as goals to achieve; (c) epistemic beliefs translate into epistemological standards that serve as inputs to metacognition; and (d) SRL may play a role in the development of epistemic beliefs. This set of propositions neatly incorporates metacognition and epistemological beliefs in an integrative model of SRL.

Recent research indicates that epistemological beliefs predict SRL behaviours of university business students (Braten & Stromoso, 2005). Paulsen and Feldman (2005) found that college students with more sophisticated beliefs were more likely to be engaged in a variety of SRL strategies. Wood and Bandura (1989) found direct association between entity beliefs and performance goals, and incremental beliefs and mastery goals. Using the Motivated Strategies for Learning Questionnaire (MSLQ), Sungur (2007) found intrinsic goal orientation was a strong predictor of metacognitive strategy use. Results of all these studies are indicative of the central role of students' epistemic beliefs in SRL research.

Review of these studies suggests that epistemological beliefs predict selection of SRL strategies and goals for academic learning, and may influence certain motivational components of SRL in the cyclical architecture of Zimmerman's and Katsantas' (2005) model. For instance, the term goal orientation, one of the central constructs of SRL motivation, is used by achievement goal scholars "not only to refer to a broad network of beliefs and feelings, but also to refer to a dispositional goal adoption tendency" (Elliot, 2005, p. 66). Current research has explored how epistemic beliefs are related to goal orientations and SRL strategy use. However, as Muis (2007) noted, what has not been fully elaborated about epistemic beliefs in SRL models are motivation and context. More specifically, Zimmerman (2008) proposed three emerging issues in SRL to address the gaps in current research: (1) whether increases in students' level of SRL in personally managed contexts, such as at home or in the library, are linked to improvement in their overall academic achievement; (2) whether teachers can modify their classrooms to foster increases in SRL among their students; and (3) what is the role of students' beliefs in initiating and sustaining changes in their SRL strategies. Roughly, the aforementioned issues correspond with the three research questions outlined in chapter one.

Contextual Considerations

Some epistemological theorists (e.g., Hofer, 2005; Muis, 2007; Pintrich, Marx, & Boyle, 1993) argued that because prior knowledge, epistemological conditions, and task vary across domains, it may be prudent to examine epistemic beliefs in specific contexts rather than in general.

One important contextual factor is classroom structure. Ames (1992) defined classroom structure as the ways "in which certain kinds of instructional demands, situational constraints, or psychosocial characteristics relate to various cognitive and affective outcomes in students" (p. 263). Ames argued that the key issue is whether the salient features in the classroom environment can contribute to a mastery goal orientation. Moreover, a mastery goal orientation is made salient when value is placed on the process of learning by stressing meaningful learning, self-referenced standards, and opportunities for self-directed learning.

Tasks are the central instructional element of classroom activities (Ames, 1992; Doyle 1993). How students see or define a task is the important first step of SRL in Winne's and Hadwin's (1998) model. In their model, students' initial task understanding activates a sequence of SRL processes, including goal directed activity; changes in knowledge, skills, beliefs, dispositions; and self-motivation factors. In epistemological research, most researchers commonly hypothesize how authentic (Pintrich, Marx, & Boyle, 1993) or ill-structured (Lodewyk & Winne, 2005; Shraw, Dunkle, & Bendixen, 1995) or complex tasks (Stahl, Pieschl, & Bromme, 2006; Wood & Bandura, 1989) can challenge students' maladaptive beliefs and foster belief change, thus contributing to conceptual change and learning. These studies provided the empirical basis to support hypothesis two stated in the previous chapter. The literature on

task conditions suggest that some common features of authentic, ill-structured, and complex tasks are that they have: (a) many components; (b) no definitive solution procedure or method; and (c) no clear-cut right-or-wrong answers.

On the basis of the findings from a number of empirical studies, Muis (2007) argued that the psychological basis undergirding the purported effects of ill-structured tasks on students' epistemic development is constructivist thinking. The key features of a constructivist learning environment is that it presents ill-structured tasks, and includes whole-class discussions, small group assignments, individual assignments, and the instructor's scaffolding to engage in learning activities. Muis suggested that it is the explicit cognitive and metacognitive strategy exercises that cause students to develop a more constructivist approach to learning. Pintrich, Marx, and Boyle (1993) argued that the a student's discovery process in working through authentic tasks can influence the adoption of a mastery goal orientation, which in turn can lead to potential for conceptual change.

From a Piagetian theory of cognitive development perspective, Bendixen (2002) postulated that real life problems may prompt epistemic doubt in students; and that social interaction is a factor in resolving epistemic doubt, thereby contributing to attainment of formal operational thinking. Lodewyk (2007) hypothesized that ill-structured tasks may prompt cognitively mature students to think epistemologically, relativistically, and dialectically in ways that go beyond formal operational stage. However, Masoner (1988) reported that only about 50% of the college students he studied had reached formal operational stage. The problem of why a significant portion of college students failed to reach the formal operational stage is perhaps the reason why Hofer (2005) and Schraw, Dunkle, and Bendixen (1995) called for more epistemological research on higher education and among older adults.

Implications for Research

I have presented evidence and theory that epistemological beliefs affect the extent to which individuals: (a) persist in challenging tasks, (b) become actively engaged in learning, and (c) cope well with ill-structured task domains. More importantly, according Schommer (1994), "All of these attributes are related to higher level of learning" particularly so because " higher level learning continues to rise in importance as our society becomes more technologically advanced and informationally oriented" (p. 306).

Extant scholarship clearly expresses the view that epistemic beliefs are a necessary condition for effective higher level learning. As such, incorporating beliefs in an integrative framework of SRL may shed light on important processes in learning. The challenge for education researchers is then to investigate the contextual factors that may contribute to adaptive belief change.

Regulation of Motivation

Overview

In recent years, self-regulated learning has emerged as a significant paradigm in education. The vast majority of self-regulated learning research has been in the area of academic learning and achievement (Boerkaerts, Pintrich, & Zeidner, 2000). Motivation researchers (e.g., Corno, 2001; Pintrich, 2000) argue that by restricting self-regulated learning to the cognitive and metacognitive components that students use to move their learning process along, important

steering processes are left out of the picture. They also highlighted that students need to self-regulate their motivation for learning and investment of effort. For example, they must initiate activities that set the scene for learning, assign value to the learning activity, and they must motivate themselves to actually get started on learning tasks and sustain effort until the task is completed. In other words, students need to make use of motivation strategies (Wolters, 2003). In addition, as research by Pintrich and de Groot (1996) shows students' motivation and cognitive strategy use differ across subject areas, they must also have access to metacognitive strategies to facilitate adaptive strategy change across domains. Further, though many self-regulated interventions produced successful outcomes in classroom settings, they often failed to sustain students' use of these processes in less structured environments (Zimmerman & Schunk, 2001). Therefore, the relationships between contexts for learning and student behaviour needs to be investigated (Winne & Perry, 2000). Pintrich (2000) acknowledged there is not much research on regulation of motivation, and calls for more research in this area to provide a more complete picture of self-regulated learning.

The Construct of Motivation

The term motivation is derived from the Latin verb *movere* – that is, “to move” (Pintrich, 2003). However, contemporary definitions of motivation and its related constructs are numerous and varied, and there is much disagreement over the precise nature of motivation (Pintrich, 1999; Wolters, Pintrich, & Karabenick, 2003). The definition used in this study is one that is consistent with that of cognitive psychology, which focuses on a person's thoughts, beliefs, and emotions as central to motivation. From a cognitive perspective, motivation is the process whereby goal-

directed activity is instigated and sustained. It is an internal state that arouses, directs, and maintains behaviour (Woolfolk, Winne, & Perry, 2000). According to this definition, motivation can be viewed more as a process, concerning how to activate, steer, and sustain activity than as a product, an outcome of certain operations, beliefs, or experience (Wolters, 2003).

Consistent with this cognitive view of motivation, the term motivation is used broadly to refer to both the level of motivation and the processes that contribute to or account for a certain state of motivation. From this perspective, motivation refers to not just the end state but also the process to achieve the end state (Wolters, 2003). Accordingly, important constructs that account for the process of motivation are regulation of motivation and volition. These two constructs have been described by leading self-regulated learning scholars Corno (2001) and Wolters (2003) as “non-traditional” and “under-researched” respectively.

Distinguishing between Motivation and Regulation of Motivation

Wolters (2003) defines regulation of motivation as “activities through which individuals purposefully act to initiate, maintain, or supplement their willingness to start, to provide work toward, or to complete a particular activity or goal” (p. 190). The central theme of this conceptualization is that individuals need to exercise agency to take active control, or make a conscious effort, to reach and maintain a level of motivation that is adequate for a task. Most notably, regulation of motivation concerns only thoughts and actions students consciously and intentionally attempt to regulate in regard to a task. However, models of motivation do not typically propose that students are necessarily conscious of the underlying processes and strategies that influence their motivation. (Wolters, Pintrich, & Karabenick, 2003).

According to Wolters (2003), the theoretical distinction between motivation and regulation of motivation is the difference between subjective control and active control. Whereas theories of motivation emphasize the subjective control of various beliefs and students' characteristics on their choice, effort, and persistence, regulation of motivation concerns students' active control of the processes that influence these outcomes. This theoretical distinction is analogous to that of cognitive processes and regulation of cognition. Wolters (2003) also points out that this distinction is somewhat fuzzy in practice.

The distinction between motivation and regulation of motivation may be clarified in a larger conceptual framework of self-regulated learning proposed by Winne and Hadwin (2008). In that framework, motivation can be seen as an outcome of the effort of self-regulated learning; in other words, self-regulated learning can be viewed as an instance of motivational behaviour. In this dynamic model, motivation (a state or a product) and regulation of motivation (an operation or a process) are mediated by a standard and by evaluative feedback. Winne and Hadwin propose that it is the recursive property of self-regulation that allows students to focus on changing motivation or other elements in their learning. This recursive property of self-regulation seems consistent with earlier research results which showed that self-regulation of motivation may change students' goal orientations, leading to better achievement (Schunk, 2005). Overall, Winne and Hadwin (2008) propose that active control over one's motivation, which Wolters (2003) described as the regulation of motivation, might be rooted in a student's metacognitive awareness of their motivational and emotional states and the strategies available to them to regulate these states for optimal performance.

Despite some ambiguity between the constructs of motivation and regulation of motivation, conceptual clarity of the construct of regulation of motivation is achieved by

operationalizing these ideas in measurement tools. Importantly, Wolters, Pintrich, and Karabenick (2003) developed a set of scales to assess regulation of motivation strategies. These strategies include self-consequating, environment structuring, mastery self-talk, relevance enhancement, interest enhancement, performance self-talk, and extrinsic self-talk. Although this set of strategies is not exhaustive, for instance it does not include volitional control (Corno, 2008), it does represent a broad spectrum of ways and aspects of self-regulation as described by Winne and Hadwin (2008) in general models of self-regulated learning.

Self-consequating as a strategy refers to students using self-administered or self-generated consequences, such as rewards as reinforcement, for their own motivated behaviour. Environment structuring describes students' efforts to reduce distractions in their environment or proactively to arrange their surroundings to make it more conducive for work. Another strategy applying the self-reinforcing verbal statements strategy is mastery self-talk. In this strategy, students sub-vocalize to bring to consciousness the need to invoke mastery-related behaviour. Students may also use a relevance enhancement strategy to remind themselves of the practical value of their learning.

The next strategy, closely related to mastery orientation, is intrinsic motivation or an interest enhancement strategy. In this strategy students may include plans and actions to increase the immediate enjoyment or the situational interest of a task. A somewhat different strategy is performance self-talk. This falls under the larger category of extrinsic regulation in which students vocalize to motivate themselves to perform better than their peers. According to Wolters (1998, 1999), performance self-talk may be positively related to students' performance but not to their use of cognitive strategies. Finally, extrinsic self-talk strategy focuses more on extrinsic

rewards beyond the immediate learning context, such as the benefits of getting good grades or the consequences of not doing well.

Importantly, many of these strategies to regulate motivation can also be selectively used by students to regulate their cognition and behaviour in different academic contexts (Wolters, Pintrich, & Karabenick, 2003). As self-regulated learning is presumed to be, to some extent, a context specific process (Winne & Perry, 2000), the strategies and measurement scale developed by Wolters (1998, 2003) should flex to tap into those aspects of learning that are most relevant to a particular learning task or context. For instance, these regulation of motivation strategies, to the extent that they transcend across different self-regulatory processes, may be useful to study how motivational factors interact with other behavioural, contextual, and cognitive variables in a self-regulated learning model (Winne & Hadwin, 2008; Winne & Perry, 2000).

Empirical Studies - Regulation of Motivation

With the exception of some earlier studies which viewed aspects of regulation of motivation from a more behavioural perspective, often as a form of self-conditioning or self-reinforcement, more recent research tends to investigate regulation of motivation from a social cognitive perspective (Wolters, 2003). Consistent with a social cognitive perspective of SRL, research in this area has typically focussed on the hypothesized effect of epistemic beliefs and goal orientations on SRL strategy use. Hypothesis one described in chapter one was derived on the basis of these research findings.

For example, using goal orientations and self-belief of capabilities, Wolters and Rosenthal (2000) successfully predicted five regulation of motivation strategies. These were: (a) self-consequating; (b) environment structuring; (c) interest enhancement; (d) performance self-talk; and (e) mastery self-talk. Most significantly, mastery goal orientation was most consistently related to students' use of the strategies. Wolters et al. (2003) also distinguished between performance-avoidance and performance-approach goal orientation, and found that the latter may be beneficial to students' learning and achievement. In particular, students who emphasized getting good grades reported using a self-consequating strategy more than other students. Sansone, Wiebe, and Morgan (1999) found university students who reported they had control over their learning were more able to sustain their motivation in boring tasks by using an interest enhancement strategy. However, in this research the construct of belief was loosely conceived as controllability of experiences and subsumed under the construct "hardiness" (p. 706). Therefore, it remains somewhat unclear how multidimensional epistemic beliefs may relate to the use of an interest enhancement strategy in similar task condition.

For more authentic academic learning tasks, Wolters (1998) found that college students were more likely to report using an interest enhancement strategy that was consistent with the profile of their reported orientation towards mastery and performance goals. The study also found direct association between students' use of an intrinsic form of motivation and mastery orientation, and between extrinsic motivation and performance orientation. Wolters (1999) found while mastery self-talk strategy was positively related with several higher order cognitive strategies, such as critical thinking, performance self-talk strategy was related to students' performance but not their use of cognitive strategies.

Using various motivational learning regulation strategies as predictors, Zimmerman and Martinez-Pons (1990) also tested the recursive property of the triadic relationship of SRL. The researchers investigated various regulatory strategies, including self-consequating and environment structuring strategies, as predictors of students' level of self-efficacy. In their study, providing oneself with a consequence for sustained effort on task is one effective strategy that may achieve one's established goals. Students reported using a self-consequating strategy particularly when faced with the alternatives between homework and more enjoyable activities. Students were also able to use the environment structuring strategy to reduce the possibilities of off-task behaviours. Purdie and Hattie (1996) investigated cross-cultural generalizability and found Australian and Japanese students also reported using self-consequating and environment structuring strategies in achievement contexts; in particular, the environment structuring strategy was found to be one of the most important strategies cross-culturally.

In summary, there are several empirical and theoretical justifications supporting the view that beliefs and goal orientations may be important for understanding students' use of regulatory strategies. However, the empirical and theoretical research in the field of the regulation of motivation is still emergent and relatively scarce. For instance, to the best of my knowledge, currently there is no study on the regulation of motivation strategies, relevance enhancement and extrinsic self-talk, as these are conceptualized by Wolters, Pintrich, and Karabenick (2003).

The Case Method

Terminology

There is no consensus about what the case method really is. Individual definitions vary, and different terms are used (e.g. case study, case-based instruction). Further, Argyris (1980) found that not only did the definition vary by individual, “but the same individual varied in different situations. For example, when basic concepts and procedures... had to be taught, many instructors lectured... some used role play, simulations, films, and straight long lectures... faculty members interviewed believed that these teaching modes represented the case method..” (p. 291).

In the scholarly works I reviewed for this study, the terms case method, case-based instruction, and case study method are conceptually similar. Many scholars used these terms interchangeably in their works. For instance, Ertmer, Newby, and MacDougall (1996) titled their work “students’ approaches to case-based instruction” under the data base category of “case studies,” but cited extensive law and business case method literature without making any distinction between the case method and case-based instruction. At Harvard Business School’s website under “case studies,” it describes case studies as participant-centered learning and uses it in conjunction with the term “the case method” (Heskett, 2008).

The Defining Characteristics of the Case Method

Argyris (1980) listed five defining characteristics of the case method: “(1) the use of actual problems, (2) the maximal possible involvement of the participants in stating their views, inquiring into others’ views, confronting differences, and making decisions, resulting in (3) a minimal degree of dependence on the instructor, who in turn (4) holds the position that there are rarely any right or wrong answers, that cases are incomplete and so is reality, and (5) who will strive to make the case method as involving as possible through the creation of appropriate levels

of drama.” (p. 291). However, there is much variation in how the case method is used in practice. This may not be a weakness; as Shulman (1986) has noted, the social sciences may be poorly served by any single paradigm, by a conceptual monotheism.

Conceptual Framework

In my study, I focused on examining the case method as used in business university education contexts. Accordingly, my focus was examining key learning processes of a typical case method based classroom as described by Mauffette-Leenders, Erskine, and Leenders (2007). These authors argue for a three-stage case learning process: individual preparation, small group discussion before class, and large group discussion. Each stage has its own processes and routines to augment student learning. The details of these processes are described in Chapter 3: Methods and Procedures.

Individual Processes – Self-Regulated Learning

Scholars have not explicitly described case-based instruction in self-regulated learning terms, nor characterized case learning process as an instance of self-regulatory activity, nor discussed the need to incorporate elements of self-regulatory skills into their teaching. Nonetheless, the case method shares many elements of self-regulated learning. First of all, Ellet (2007) characterizes the case method as “self-guided learning” (p. 19). Leenders and his colleagues (Leenders, Mauffette-Leenders, & Erskine, 2001) claim that cases engage students in a process of learning by doing and by teaching others. Corno (2001, 2008) suggests that academic settings that provide environments of participation in social practices of inquiry

promote self-regulatory work habits, and that public performance requirement such as project presentation is an example of such an environment.

In a case-based course, students have to work alone on cases but also need to research outside materials, to acquire procedural skills or gain conceptual clarity to resolve issues embedded in a case. Mauffette-Leenders et al (2007) describe this process as a “self discovery” process. Although there are many ways to characterize the case method mode of learning, active learning seems to stand out as a prominent feature. According to some scholars (e.g., Eison & Bonwell, 1993) the case method has become more popular across disciplines in post-secondary education as a response to calls to promote active learning. According to Shulman (1992), cases are situational context to stimulate cognitive processes. The idea that it is the situated nature of learning that fosters active learning is gaining support by contemporary cognitive scholars (Borko & Putnam, 1996). In addition, the self-discovery process is consistent with constructivist tradition of self-directed learning, contributing to promoting cognitive flexibility in ill-structured contexts (Spiro, Coulson, Feltovich, & Anderson, 1998). Although self-directed learning and self-regulated learning are rarely compared, according to Zimmerman and Lebeau (2000) conceptually they are similar.

In sum, although there are differences in how the case method is used in practice, there is considerable agreement that case-based instruction tends to involve complex problems in the world of practice, in which contextualization of performance takes center stage. (Howard, McGee, Shia, & Hong, 2000; Shulman, 1992). Also, business students tend to be less homogenous as a group in terms of demographics and academic background (Kwantlen Polytechnic University, 2010), and students in a more complex environment may need to have more sophisticated self-regulatory strategies (Hofer, Yu, & Pintrich, 1998). For instance, in the

first two stages of the three-stage learning process described by Mauffette- Leenders et al (2007), students need a high level of self-discipline and hard work of good individual preparation prior to having a small group discussion. One advantage of the small group process is to have peer pressure on individuals in the group to prepare properly in order to contribute to group discussion. In other words, these processes enhance students' self-regulatory abilities to be self-motivated active participants in their learning.

Looking at the case method from a social interaction perspective, Argyris (1980) claimed that case-based learning is double-loop in nature. Simply put, the two loops are action and reflection. For instance, students may take action to correct errors, but it may even better to reflect in past mistakes to avoid making the same mistake. In double-loop learning, students must learn to discriminate the differences between their perceptions and reality through social interaction. In similar social interaction veins, many case scholars have also characterized case learning in social-cultural terms such as "community of learners" (McAlister, 1999), "cognitive apprenticeship" (Shulman, 1992), and "legitimate peripheral participation" (Paris, 2001). Wang and Ahmed (2002) proposed that because double-loop learning integrates both social and cognitive processes to motivation, emotions and action, Bandura's social cognitive theory, particularly its central construct self-efficacy, provides a general framework to understand the processes involved in case-based learning. According to Pintrich (2003) social cognitive constructs are assumed to be much more situation and domain specific. As individual cases are situational in nature, describing specific events or incidents, examining specific aspects of case-based learning under social cognitive lens may be insightful.

Group Processes – Social Cognitive Theory

The social cognitive perspective of learning addresses the interrelationship between the learner, the learner's behaviour or performance, and the social environment (Bandura, 1997). This conceptual framework lends itself well to understanding students' learning of a case, the nature of the case, and the classroom processes in a case-based instructional environment.

According to Bandura (1986), there are two kinds of learning. The first is enactive learning, which occurs when one learns by doing something. Bandura argues that enactive achievements are the most important form of learning because they provide direct feedback about performance and a series of successful performances gives rise to high sense of self-efficacy (i.e., the confidence that one has the ability to achieve a goal). The second type of learning is vicarious learning, which happens when a learner observes or models expert performance.

Erskine (2008) also stresses the role of vicarious learning as an important component of case-based teaching. First of all, the cases themselves represent vicarious experiences about "what went wrong" or "how things could be handled." Secondly, class discussions provide opportunities for students to observe the performances of other students and the instructor. In terms of learning outcomes, Mauffette et al (2007) listed "build confidence", "test ideas", and "teach others" as possible results from a case-based learning experience. These learning outcomes are roughly in line with Bandura's conceptions of self-efficacy, environmental feedback, and performance in his framework of reciprocal determinism (1997).

In terms of developing students' sense of agency, Erskine (2008) made it abundantly clear that case study begins with students exercising their agency in individual preparation and ends with expanding and refining their ideas, which include imagining possible

scenarios for case outcomes, in a case study episode. This student-centered approach seems concordant with Bandura's idea that humans possess self-directive abilities that enable them to exercise control over their thoughts, feelings, and actions. Psychological function, is therefore, regulated by an interplay of self-generated and external sources of influences (Bandura, 1986). Bandura (1989) further suggests that basic human capabilities include symbolic capability, vicarious capability, forethought capability, self-regulating capability, and self-reflective capability. Accordingly, a student going through a case exercise in processes as described by Mauffette et al (2007), would need not only self-regulating one's own learning activities, but also co-regulating with peers and instructor (Meyer & Turner, 2001). Apparently, the verbalization of reasoning process in small- and large-group case discussion, promotes metacognitive processing, particularly when the task is complex (Dominowski, 2002).

Empirical Investigations of the Case Method

Possibly, the first ever comprehensive study of the case method was a longitudinal study by Livingston (1971), a professor of Harvard Business School. Livingston's study did not focus specifically on the case method, rather it studied the career path over fifteen years of more than one thousand graduates who were taught mainly by the case method. He found that the advantage of career advancement of a Harvard education levelled off approximately seven years after entering the work force. Masoner (1988) reviewing Livingston's work remarked that to evaluate the effectiveness of the case method, a focused longitudinal study comparing career development of two groups of students, one under the case method and another under traditional

method, was needed to draw meaningful conclusions about the long-term effects of case-based education.

To date, very little empirical work has been done that thoroughly examines the effectiveness of the case method (Ertmer, Newby, & MacDougall, 1996). Given this paucity of research, it is not surprising that most currently available works are exploratory. However, as the case method has become more popular (Li & Baillie, 1993), its applications have expanded beyond traditional professional areas, such as law, medicine, and business, into other academic disciplines (Shulman, 1992). As a result of this development, some empirical work has begun to examine the case method from more rigorous theoretical lenses. One such theoretical framework is self-regulated learning (Ertmer, Newby, & MacDougall, 1996; Travers & Sheckley, 2000).

A review of sixteen empirical studies across different disciplines attributed many advantages related to using the case method. The general theme extracted is that, if used properly, the case approach has the potential to elevate learning to a higher level. Although not a comprehensive list, evidence exists that the case method may: (1) promote better strategy use leading to better problem-solving skills (Stepich, Ertmer, & Lane, 2000): (2) contribute to developing the use of reflective strategies and become better self-regulated learners (Ertmer, Newby, & MacDougall, 1996): (3) involve students in their own learning, encourage self-reflection, and become self-regulated learners (Travers & Sheckley, 2000): (4) motivate students to be more task-engaged (Li & Baillie, 1993): (5) encourage cooperative learning and active participation (Parent, Neufeld, & Gallupe, 2002): (6) shorten the learning curve in becoming expert problem-solvers (Ertmer & Stepich, 1999): (7) improve self-efficacy (Tompson & Dass, 2000): and (8) improve tolerance of ambiguity (Banning, 2003).

Although advantages to the case method seem captivating, the approach has its limitations. Very broadly, the success of the case method depends on instructor's skills, learners' characteristics, and appropriate case materials. Specifically, Parent, Neufeld, and Gallupe (2002) noted that the success of the case method in teaching depends on the adaptive ability of the instructor to change his or her approach to a student-centered one. Stepich, Ertmer, and Lane (2000) pointed out that instructors need to have specific coaching skills to elicit effective strategy use in students. As well, the case method may not be suitable for all students. Li and Baillie (1993) found that students who dislike uncertainties may not benefit from case-based instruction. Study by Ertmer, Newby, and MacDougall (1996) found that students low in self-regulatory skill many not adapt well in a case-based environment.

In summary, the value of the case method lies in its potential to represent the messy world of practice, to stimulate active learning in a realm where there is no right or wrong answer. Though there are some doubts as to whether the case method can be successfully implemented, there is little disagreement that the desired learning outcomes of the case approach are critical thinking and flexible decision-making abilities. Results of the empirical studies reviewed were promising, showing positive results for better problem-solving and higher quality of learning in students under the case approach. However, it is important to note that available empirical works are very limited and, consequently, cautious interpretation of findings is warranted.

Chapter 3: Methods and Procedures

Participants

The sample consisted of 87 third- and fourth-year business students enrolled in Kwantlen Polytechnic University for the Spring 2010 courses. I was the course instructor of all these participants. Of a total of 112 students, 16 did not complete either pretest or posttest, and 9 were enrolled in both case method (CM) and traditional lecture method (L) classes. These students were excluded from this study. Of the remaining 87 participants, 36 (or 41.35%) were in the treatment or Case Method (CM) group, and the other 51 (or 58.62%) were in the comparison or Lecture (L) group. In the CM group, 23 (or 63.89%) were males and 13 (or 36.11%) were females. In the L group, 30 (or 58.82%) were males and 21 (or 41.18%) were females. No exclusion bias was detected using ANOVA procedure on any of the variables.

Owing to my dual-role as instructor-investigator, I was prevented by the university's Research Ethics Board from collecting any personal data, such as age and GPA, from my participants. However, the above-described gender distribution and other informal observation of participants' characteristics, such as age and ethnicity, seemed consistent with the latest university student survey (Kwantlen Polytechnic University, 2010) and with prior research involving the same student population (Yang, 2006).

The university's Bachelor of Business Administration Program courses have a maximum class size of 35 students per class. Course duration is 15 weeks and 3 hours class time per week.

Treatment Group

The treatment group of 36 participants was enrolled in two different courses; namely, Intermediate Financial Accounting (21 participants) and International Issues for Financial Managers (15 participants). The former was a mandatory third year course and had other sessions taught by other instructors; the latter was an elective fourth year course and the only session offered in the semester. Because the prerequisite courses needed to enrol in these courses were all basic technical courses, it was reasonable to assume that these participants had had no case method experience prior to the treatment. There was just one other case method capstone course offered in the same semester, so it was not likely the third year treatment group participants would enrol in similar case method courses simultaneously. For their text books, the Intermediate Financial Accounting course used Volume Two: Intermediate Accounting, 8th Canadian edition (Kieso, Weygandt, Warfield, Young, & Wiecek, 2007), and the International Issues for Financial Managers course used Fundamentals of Multinational Finance, 3rd edition (Moffett, Stonehill, & Eiteman, 2008).

In general, I used the CM processes according to the theoretical framework outlined by Ellet (2007) and the practical guidelines used by Erskine (Mauffette-Leenders, Erskine, Leenders, 2007). According to Ellet (2007), case learning requires students to have two distinct sets of skills. First, they need to be able to analyze the case and to give meaning in relation to its key issues or questions embedded in case materials. The goal is to reach a level of understanding congruent with the reality of the case taking account of its gaps and uncertainties. However, to analyze a case, students may need technical skills to solve problems or a theoretical understanding of abstract issues. This is when students' self-learning and self-discovery occurs. Second, students have to be able to communicate their thinking effectively through case

presentation and discussion in class. More specifically, Mauffette et al. (2007) outlined a three-stage process of learning with cases. The three stages are:

1. Individual Preparation
2. Small-Group Discussion
3. Large-Group Discussion

Stage 1: Individual Preparation. This is the first step for students to ready themselves for discussion in class. To begin, students need to be familiar with the information contained in a case. The next step is to analyze the data and to solve problems identified in the analytical process. Often, additional outside readings are needed for case analysis and resolution. This happens when there are theoretical concepts relevant to the case that need to be clarified. Mauffette-Leenders et al. (2007) emphasize that reading of the case or outside reference materials is to be carried out in a focused and selective manner. Throughout the whole process, students are encouraged to bring personal skills and background experiences along with biases to the situation at hand.

Stage 2: Small-Group Discussion. In class, students are formed into small groups of four to six per group. Mauffette-Leenders et al. (2007) listed eight reasons to have small-group discussion prior to large-group discussion. Perhaps the most important is “teach others” because “there is no better way to learn than having to teach others.” (p. 21). The idea of students teaching others is to have them test their understanding and communicate their understanding to others. This reflects the basic philosophy of learning with cases that students learn better by being actively involved in their own learning.

Stage 3: Large-Group Discussion. In large-group discussions, instructors use the Socratic Method in which students carry the discussion through answers to a stream of questions posed by

the instructor. In class, the entire group, including the instructor, works collaboratively on a case. Large-group discussions involving the whole class are the final step in developing a thorough understanding of a case. Lastly, Erskine et al. (2003) recommend a short period of reflection right after class discussion to evaluate the whole learning process of a case.

Erskine (2008) suggests that, as a rule-of-thumb in the context of Ivey Business School's undergraduate Honours Business Administration Program, students have to spend up to two hours of individual preparation for every half an hour of small-group discussion before the eighty minutes of large-group class discussion. Though learning occurs rapidly at the individual level in the beginning, it soon plateaus as diminishing returns set in. At this stage, small-group discussion is expected to elevate learning to the next level. Finally, with the contributions from the whole class, some common understandings and conclusions are reached to conclude a case.

Accordingly, the treatment group's main class activities were case presentations, small-group discussions of important issues in mini cases in class, and plenary whole class discussions on key issues and decisions. Prior to the Spring 2010 semester, the CM course outlines were sent to a leading University of Western Ontario case researcher and business professor for review. This was to ensure that the courses as designed were in line with the guidelines of CM. The reviewer concluded that courses as designed were in accordance with CM principles (J. Erskine, personal communication, November 26, 2009).

Course Design and Classroom Processes

The courses were designed to develop post formal-operational thinking in which effective decision making through social reasoning is considered the most important skill development

(Masoner, 1988). More specifically, students have to integrate and apply different domain knowledge and apply them in real situations through social negotiation to resolve critical issues.

Students are expected to take responsibility for their own learning for the week's materials (e.g., hedging and the assigned case for the week), test and share their ideas in small-group discussions, and validate their understanding in large-group discussions.

Cooperative learning was the key part of course designs. Students were allowed to form their own team with the only restriction of not having more than four students per group. These self-chosen groups were to work together to prepare assigned weekly case reports for the course. In class, students were randomly assigned to work in small groups to share ideas to "warm up" before whole class discussions. From experience, these randomly assigned small-group discussions were helpful to ease some reticent students to open up before individual question-and-answer period in whole class discussions of the assigned case for the week.

A typical day in class started with the instructor summarizing the previous week's case discussions and clarifying some common misunderstanding, assigning the following week's work, arranging small-group discussions, and facilitating whole-class discussions. Depending on the complexities of the learning materials, occasionally a short lecture on key concepts and techniques was delivered to wrap up the previous week's chapter materials prior to group discussions.

Regarding class time allocation, roughly the first 30 to 60 minutes was spent on reviewing the previous week's work or having a lecture, if appropriate; the next 30 to 60 minutes was spent on mini-problems posed to randomly formed small groups for discussion; the rest of the 60 to 80 minutes was spent on whole-class discussions of the week's assigned case.

In terms of individual preparation, as small groups needed to submit work that would be presentable to a client in a professional setting, students reported that they spent up to two or three days to complete a difficult case report. One advantage of case report assignments was to ensure in-depth individual preparation; another was to have traces of students' self-regulatory efforts. To ensure active participation and positive contribution in small- and large-group activities, an individual's contribution accounted for 20% of the final course grade. Evaluation of contribution was by peer evaluation. This was a continuous process. Every week, except days for mid-term tests and the final exam, every student had to submit a form to nominate at least three class members who were not their regular small-group members, and one small-group member whom they felt contributed the most to his or her learning during the case classroom discussion and in case report preparation.

To add variety to the class routine, the final case assigned prior to the final exam required each small group to make a formal case presentation. Erskine et al (2003) cited many advantages of including a case presentation in a case method class, such as developing presentation and communication skills.

Cases

The cases used were taken from the course textbooks. For the Intermediate Financial Accounting course, the publisher's representative confirmed that all 32 cases described real companies and that the publishers had obtained legal release for their use (Phil Mills, personal communication, March 21, 2011). For the International Issues for Financial Managers course, the publisher's representative also confirmed that all the cases were field tested and that legal release

had been obtained (Ewan French, personal communication, March 21, 2011). The textbooks and case method teaching were mandated for these courses by the university.

The length of these cases varied from one to seven pages. The average length was about two to three pages. This was consistent with most undergraduate accounting and finance cases. Accounting and finance cases typically contain financial statements or refer users to a company's website to access such public information. Financial statements are information-dense. For instance, for a trained analyst, a one-page multi-year comparative financial statement may reveal information of a firm's business strategy, investment style, financial policy, key value drivers, competitiveness, trends, and overall financial health as well as its strengths and weaknesses (Penman, 2010).

In regards to case difficulty, Mauffette-Leenders et al (2007) listed three levels of difficulty across three dimensions (i.e., an analytical dimension concerning key issues or decisions, a conceptual dimension concerning relevant theories of concepts, and a presentation dimension concerning skills needed to sort and structure information). For instance, a case with a single issue, which clearly relates to an explicit theory in the textbook and requires a short write up or brief statement, is rated at the lowest level of difficulty across the three dimensions (i.e., 1,1,1).

In the current treatment condition, most of the cases involved multiple, often less obvious, issues, required issues to be examined from multiple perspectives (e.g., external vs. internal users of financial information) under different conceptual frameworks (e.g., stakeholder wealth maximization model vs. agency theory) and presented challenges to present coherent or

well-structured responses (e.g., conflicting quantitative and qualitative outcomes). These cases would probably be rated at a medium difficulty level across the three dimensions.

At the lower end of difficulty was a mini-case (see Appendix A) used for the first class to initiate students to case discussions. This mini-exercise required students to identify multiple, less obvious issues involving proper accounting treatment of transactions, managerial motives, and financial implications, from multiple conceptual bases such as relevant generally accepted accounting principles and agency theory. Owing to its short length, this mini case probably would have a low difficulty rating (e.g., 1, 2, 1). According to Leenders et al (2001), low difficulty cases are suitable for introductory parts of the course, and cases with difficulty levels (2, 1, 1), (1, 2, 1), or (1, 1, 2) are suitable for students beginning to learn with cases.

Role of the Instructor

I had been teaching one of the treatment group courses with cases since 2007 and was teaching the other for the first time. My teaching style reflects my belief that students benefit from taking active control of their own learning. My teaching also reflects my understanding that students have different ability levels and preferences for learning. My teaching tends to be facilitative rather than directive but provides cognitive assistance to assist less able students when necessary.

To set the stage for case learning, after an initial introduction, the instructor then briefed the class on the nature of case learning, arranged small group exercises to familiarize students with each other, and conducted a mock whole-class case discussion. Students were also provided with samples of previous case reports and referred to "learning with cases" (Mauffette-Leenders et al, 2007), which was placed on hold in the library.

In class, the instructor's role shifted from directive in initial small group exercises, discussions, and lecture (if any), to facilitative in whole-class case discussions. As a facilitator in whole-class case discussions, the instructor would make sure a smooth flow of contributions from individual students, either through volunteering or cold call if volunteers were not forthcoming, through a stream of questions on key issues, recommendations, and problem resolutions. However, class dynamics were constrained by its small class size. For instance, a round of questioning may soon exhaust all the possible contributions from the whole class before getting anywhere near the main issues. If that happened, the instructor had to be more direct by asking specific "leading" questions to the class. Occasionally, for more difficult cases, other more interesting or less intimidating arrangements such as brain-storming or debates would be used as whole class activities.

Outside class, the instructor's role was that of organizer and motivator. As organizer, the instructor resolved small group problems, arranged reference materials for reading, and planned for coming week's class activities. As motivator, the instructor often had to counsel students on motivational issues such as general frustration and time management problems.

Control Group

The control group of 56 participants was roughly equally divided between two separate classes of one course, Managerial Finance. The course was a mandatory third-year accounting major course. These two classes were grouped in the control group because university ethics policy prohibits different treatments of students in the same course. The text book used for this course was Introduction to Corporate Finance (Booth & Cleary, 2007). The course was

structured in line with existing theoretical and empirical research frameworks of a traditional mode of instruction involving well-structured tasks. Class time was spent mainly on lectures with an emphasis on developing abstract skill and acquiring specific content acquisition (Kaplan, Lichtinger, Gorodetsky, 2009). In addition to classroom lectures, students were assigned home work and later provided with solutions when assignments were marked. Appendix B provides an example of a typical course assignment for this group.

Common Goal Structure in Treatment and Control Groups

Despite differences in courses and teaching methods of the two groups in four different classes, all the participants were presented with a similar goal structure. Goal structure is generally described as the type of achievement goal emphasized by the prevailing instructional policies and practices within a classroom or learning environment. For example, the type instructional feedback, the degree of autonomy students are provided, and the grading practices are thought to have an effect on the type of achievement goals students adopt, and therefore constitute the classroom goal structure (Ames, 1992; Kaplan, Middleton, Urdan, & Midley, 2002). Generally, most researchers in the field have endorsed a mastery goal structure as beneficial for learning. A mastery goal structure describes a learning environment in which the practices and norms convey to students that learning is important, and that all students can be successful if they work hard to learn (Midgley, Kaplan, Middleton, Maehr, Urdan, Anderman, Anderman, & Roeser, 1998).

I adopted a mastery goal structure for all my classes. At the outset, I made clear to my students that they always have options in my class. For instance, if they prefer certain procedures in another book instead of that of the textbook or my own modified approach, they will be free to

seek out that information. As far as possible, accounting analogies were used to stress the importance of learning. For instance, I emphasized the importance of investing effort, likened it to capital investment, to make course knowledge an "asset," defined in accounting as resource that will bring a future stream of benefits; and it would be self-defeating to view effort as an "expense," defined in accounting as spent resource with no recurring benefit such as tuition paid and time spent just to get a diploma. Most importantly, students have to thoroughly understand the subject matter lest any misconception may turn a potential "asset" into "liabilities," such as defective product design might turn a product into potential liabilities. I told students that I do not use norm-referenced grading. I told them that I would not reveal the class mid-term test average because it would elicit a norm-referenced comparison and that I recommended that they should gauge performance by self-referencing against the standard they thought achievable or desirable.

Measures

I used three well-researched instruments to assess variables of interest. These instruments use a Likert scale format in which participants indicate their agreement with each item on the instruments. The first instrument was the Epistemic Belief Inventory (EBI) and is presented in Appendix C. The second instrument was the Motivated Strategies for Learning Questionnaire (MSLQ), which combined items on goal orientations and regulation of motivation and is presented in Appendix D. Goal orientation and regulation of motivation items were combined because they are interconnected in the same self-regulated learning framework outlined by Wolters, Pintrich, and Karabenick (2003). Some items in these instruments were reverse-coded to obviate potential response-bias (Babbie, 2005). These instruments and measures are described below.

Epistemic Belief Inventory (EBI)

The Epistemic Belief Inventory (Schraw, Bendixen, & Dunkle, 2002) was used to assess students' epistemic profiles. The EBI is a 28-item self-report measure designed to measure adults' beliefs in five different dimensions: Certain Knowledge (i.e., absolute knowledge exists and will eventually be known), Simple Knowledge (i.e., knowledge consists of isolated facts), Omniscient Authority (i.e., authorities have access to otherwise inaccessible knowledge), Quick Learning (i.e., learning occurs quickly or not at all), and Innate Ability (i.e., the ability to acquire knowledge is endowed at birth). Participants rated each item on a 5-point rating scale ranging from "1" (strongly disagree) to "5" (strongly agree).

Previous research has linked epistemic beliefs to a variety of cognitive tasks, such as thinking, problem solving, and reasoning. Research using EBI has supported that it is domain-specific and that it has better reliability in the contexts in which it was used (Schraw et al., 2002). Accordingly, of the original 28 EBI items, 13 items were contextualized to better measure participants' epistemic experience in the research setting designed for this study. The contextualized EBI is presented in Appendix C; contextualized items are shown in Table 1.

Table 1: Contextualized EBI Items

Item	Dimension
Most things worth knowing about financial statements are easy to understand.	Simple Knowledge
What is true about financial analysis is a matter of opinion.	Certain Knowledge
People should always follow the steps in text examples.	Omniscient Authority
Absolute truth about financial analysis does not exist.	Certain Knowledge

Instructors should teach their students all there is to know about a course.	Certain Knowledge
If a person tries too hard to understand a problem or a case, they will most likely end up being confused.	Simple Knowledge
Most of the problems in the course are simpler than most professors would have you believe.	Simple Knowledge
If two people are arguing about possible solutions or outcomes, at least one of them must be wrong.	Certain Knowledge
Students should be allowed to question their instructors' authority.	Omniscient Authority
Accounting and/or finance are easy to understand because it contains many facts.	Simple Knowledge
When my instructor tells me a particular way to solve a problem, I usually do it that way.	Omniscient Authority
Students learn best by following suggested solutions.	Omniscient Authority
Sometimes there are no right answers to accounting or real company case problems.	Certain Knowledge

Two Kwantlen instructors with advanced degrees in accounting and psychology respectively verified that the contextualized version was suitable for the target group of participants.

Goal Orientations

Eight items pertaining to mastery goal orientation (four items) and performance goal orientation (four items) were extracted from the Motivated Strategies for Learning Questionnaire (MSLQ) developed by Pintrich, Smith, Garcia, and McKeachie (1991) was used. The mastery goal scale assessed students' tendency to adopt goals related to increasing knowledge or mastering the course information, whereas the performance goal orientation scale assessed the

extent to which students adopted goals based on their desire to get better grades than their peers. Participants rated each item on a 7-point rating scale ranging from "1" (strongly disagree) to "7" (strongly agree).

It should be pointed out that although research has shown that the MSLQ is a valid and reliable self-report questionnaire, it may be limited in capturing the actual events or ongoing dynamic processes of motivation (Pintrich, 2004). Therefore, in interpreting the findings of this study, the limitations of the MSLQ as a self-report instrument in assessing students' motivation orientations should be taken into consideration.

Regulation of Motivation (RoM)

I used a set of scales developed by Wolters (1998; 1999; Wolters, Pintrich, Karabenick, 2003; Wolters & Rosenthal, 2000) to assess seven regulation of motivation strategies. The subscales are mastery self-talk (i.e., how students may sub-vocalize or think about mastery related goals), relevance enhancement (i.e., how students may consciously remind themselves about the importance of learning for later life), interest enhancement (i.e., extent of students' use of different strategies to enhance their intrinsic interest for a task), performance self-talk (i.e., degree of students' concern of out-performing their peers), self-consequating (i.e., how students may provide themselves with rewards as encouragement for the completion of a task), environment structuring (i.e., how students may rearrange their studying environment to make it more conducive for learning), and extrinsic self-talk (i.e., how students may remind themselves the benefits of doing well in a course).

Participants rated each item on a 7-point scale ranging from "1" (strongly disagree) to "7" (strongly agree). Research has shown that these scales exhibited moderate correlation, indicating

that they reflect similar, but not overlapping theoretical constructs (Wolters, 1999; Wolters, Pintrich, & Karabenick, 2003).

Reliabilities

Cronbach's coefficient alpha (α), a widely used method for gauging internal consistency reliability (Gall, Gall, & Borg, 2003) was used to evaluate the reliabilities of scales collected from EBI, MSLQ, and RoM. For the purpose of this study, I used $\alpha \leq 0.60$ as cut off. Using this criterion, Certain Knowledge ($\alpha = 0.013$), Omniscient Authority ($\alpha = 0.31$), and Quick Learning ($\alpha = 0.57$) measured at pretest were dropped from further analysis. Variables retained for this study are shown in Table 2.

Table 2: Sample Items and Cronbach's α of Variables

Variables	Sample Items	Pretest α	Posttest α
<u>Predictors</u>			
Mastery Goal	In a class like this, I prefer material that arouses my curiosity, even if it is difficult to learn.	0.68	0.72
Performance Goal	If I can, I want to get a better grade than most of the other students.	0.76	0.77
Simple Knowledge	Too many theories just complicate things.	0.60	0.62
Innate Ability	People's intellectual potential is fixed at birth.	0.65	0.61
<u>Outcomes</u>			
Mastery Self-Talk	I tell myself that I should keep working just to learn as much as I can.	0.86	0.79

Relevance Enhancement	I think up situations where it would be helpful for me to know the materials or skills.	0.83	0.79
Interest Enhancement	I make studying more enjoyable by turning it into a game.	0.88	0.84
Performance Self-Talk	I tell myself that I should work at least as hard as other students.	0.67	0.71
Self-Consequating	I promise myself I can do something I want later if I finish the assigned work now.	0.88	0.83
Environment Structuring.	I change my surroundings so that it is easy to concentrate on the work.	0.72	0.81
Extrinsic Self-Talk	I remind myself about how important to get good grades.	0.89	0.90

Overall, the reliabilities of these variables were consistent with research in their respective fields. Though reliabilities of EBI variables were generally lower than those of MSLQ and RoM, this result was expected. Study by Shraw et al. (2002) reported EBI reliabilities ranging from $\alpha = 0.58$ to $\alpha = 0.68$. Another study using university undergraduate students reported a low certain knowledge alpha at $\alpha = 0$ (actually negative value but assigned a value of zero as negative alpha was a theoretical impossibility; Sha, 2008). Pintrich, Smith, Garcia, and Mckeachie (1991) reported the reliabilities of the two goal orientation variables were between $\alpha = 0.74$ and $\alpha = 0.62$. The relatively higher reliabilities of RoM variables were consistent with previous research which reported alphas between $\alpha = 0.86$ and $\alpha = 0.74$ (Wolters & Rosenthal, 2000).

Procedure

Data were collected at the beginning and at the end of the Spring 2010 semester. At the beginning of the semester, participants were briefed about their rights as participants and the nature of the survey. A pretest survey consisting of the questionnaire items was administered after these briefings. At the end of the semester, after students had presented their final course projects or assignments, they were asked to complete the posttest survey. This was followed by a short debriefing of the purpose of the study. Participants took about 30 minutes to complete each survey at pretest and posttest. Although self-report instruments have limitation in comparison with other methods of assessing self-regulation strategy use (e.g. help-seeking, think aloud), research has shown that they are more valid when administered immediately after engagement (Pintrich, Wolters, & Baxter, 2000).

Because data were collected at two different points in time, I needed a method for matching each student's pretest and posttest while maintaining anonymity in order to meet the university's ethics requirements. Participants were recommended to identify themselves with their mother's maiden name or any other self-chosen, easy to remember, pseudonym on the survey. Pretest and posttest questionnaires were then matched 10 days after final grades were released to ensure grades could not be affected by participation.

Because this study involved an untreated control group with pretest and posttest, and because I used a natural group of students in authentic classrooms, this study fits the definition of type-a non-treatment control group design, and type-f cohort design described by Cook and Campbell (1979). According to Cook and Campbell, quasi-experimental studies using these types of design have reasonable degree of possibility to rule out threats to internal validity, and their findings are "generally interpretable." (p. 103)

Instructor's Observations

As an instructor of the participants, I had the distinct advantage of having first-hand observational experience of my participants' learning and behaviours over an extended period of time. My personal observations add rich description and insider knowledge that helped interpret quantitative data collected with self-report measures. These observations allowed me to investigate SRL (process) as related to students' actions, as evidenced by traces of students' self-regulated learning efforts, such as assignments and project papers, embedded in a larger, longer series of situations that unfold over time. According to Winne and Perry (2000), triangulation across measurement protocols is one area that deserves attention to advance the understanding of SRL as events rather than as aptitude.

However, my dual-role as instructor-cum-investigator alerted me to two questions of the validity and propriety of a dominant-group investigator representing the views of the dominated group. This unequal relationship raised two concerns. One was ethical: that in asking students to participate I was actually using my dominant position to compel students to provide information for the research, notwithstanding the university's ethical constraints in place to safeguard voluntary participation and confidentiality requirements. The other was epistemological: that information offered in a relationship of such inequality may not be reliable.

Seller (1994) has argued that the power relations between researchers and respondents can be dismantled through uncovering the commonalities and common concerns that lie beneath their differences. In this study, a shared concern for and a focus on students' future professional education and career seemed to over-ride this problem. Although I initiated the research process, it was the students themselves who chose to volunteer information that provided feedback about the teaching methods.

CHAPTER 4: RESULTS

Data screening for outliers, normality, and multicollinearity was performed for each variable of treatment and control group separately. Using z-score ≥ 3.29 ($p < .001$, 2-tailed) criterion, one pretest univariate outlier was detected. The influence of this outlier was reduced by adjusting its raw score to be one unit larger than the next most extreme score (Tabachnick & Fidell, 2007).

Initial Group Differences

Owing to the lack of randomization of my sample, the first task was to explore for pre-existing differences at pretest. This was important because without making apparent any initial differences between the groups, it would be difficult to evaluate the treatment effect of CM.

With eleven continuous variables in my design, comprising four predictor and seven outcome variables, I needed to use a multivariate approach to assess the complex interrelationships among the variables. In my study, I used discriminant analysis for the predictor variables (i.e. epistemic beliefs and goal orientations) and MANOVA for the outcome variables (i.e. regulation of motivation strategies described in chapter 3) to examine any pre-existing differences between the treatment and control groups, as well as potential differences within the two classes embedded within each of the groups.

Results of the three discriminant analyses are presented in Table 3.

Table 3 : Summary of Pretest Discriminant Analysis

Groups / Tests	Box M p-value	Wilks' lambda	Chi-Square	P -value
CM vs. L	.93	.99	1.03	.91
CM-A vs. CM-B	.72	.90	3.54	.47
L-A vs. L-B	.37	.90	4.77	.31

CM: Case Method; L: Lecture; CM-A: Class A in Case Method; CM-B: Class B in Case Method; L-A: Class A in Lecture; L-B: Class B in Lecture

Results indicate that the collective predictor failed to separate the treatment (CM) and control (L) groups (Wilks' lambda = .99, Chi-Square [4, N = 87] = 1.03, $p = .91$). The value of Box's M was not statistically detectable at $\alpha < .05$ level, indicating that there was no violation of equal group variance / covariance matrices.

Results also indicate that the four predictor variables as a group failed to separate the two classes (CM-A and CM-B) in the treatment group (Wilks' lambda = .90, Chi-Square [4, N = 36] = 3.54, $p = .47$), and the two classes (L-A and L-B) in the control group (Wilks' lambda = .90, Chi Square [4, N = 51] = 4.77, $p = .31$). Values of Box's M indicate that there was no violation of equal group variance / covariance matrices between CM-A and CM-B ($p = .72$) and between L-A and L-B ($p = .37$) at $p = .05$ level.

MANOVA results using Wilks' lambda criterion at $\alpha \leq .05$ revealed no pre-existing differences between the treatment and control groups ($F [7, 79] = .93$, $p = .49$, $\eta^2 = .076$). Results indicate that the two groups were similar to each other with respect to the collective outcome variable for regulation of motivation strategies. Using the same $\alpha \leq .05$ criterion, the collective outcome variable did not vary detectably within the treatment group ($F [7, 28] = .46$, $p = .86$, $\eta^2 = .10$) and within the control group ($F [7, 43] = .44$, $p = .87$, $\eta^2 = .07$).

Correlational Analysis

The purpose of correlational analysis was twofold. The first was to provide an overview of the relationships among the predictor and outcome variables at pretest and posttest. The second was to examine differences between the groups after treatment at posttest. The purpose was to provide an overview of changes over the treatment duration across the groups. Summary of CM and L scores across pretest and posttest are presented in Appendix E.

Correlations among variables were calculated as an initial assessment of the strength of associations between predictor and outcome variables, as well as to evaluate the interrelationships among individual groups of predictor and outcome variables. Two correlational matrices were produced. These were (1) pretest and (2) posttest. For both pretest and posttest, correlations of all predictor and outcome variables and Method, a categorical variable, at pretest and posttest, were included to evaluate initial and posttest differences across the groups. Analyses of these matrices were focussed on initial group differences and on changes over the treatment period between treatment and control groups. The correlational matrices were also used to check possible multicollinearity among predictor variables.

Pretest correlation results are summarized in Table 4.

Table 4: Correlation Matrix: Pretest Results

Variables	SK	IA	MG	PG	MST	RE	IE	PST	SC	ES	EST
Method	-.07	-.05	-.08	.00	-.23*	-.14	-.14	-.05	-.09	-.10	-.11
<u>Predictors</u>											
1. Simple Knowledge (SK)	1	.32**	.12	.23*	.24*	.23*	.32**	.18	.23*	.18	.19
2. Innate Ability (IA)		1	.03	.22*	.04	.16	.11	.08	-.10	.13	.24
3. Mastery Goal Orientation (MG)			1	.16	.37**	.50**	.33**	.33**	.23*	.30**	.19
4. Performance Goal Orientation (PG)				1	.35**	.18	.12	.51**	.06	.47**	.61**
<u>Outcomes</u>											
1. Mastery Self-Talk (MST)					1	.55**	.59**	.54**	.32**	.32**	.56**
2. Relevance Enhancement (RE)						1	.60**	.43**	.28**	.44**	.39**
3. Interest Enhancement (IE)							1	.49**	.29**	.17	.33**
4. Performance Self-Talk (PST)								1	.10	.37**	.56**
5. Self-Consequating (SC)									1	.20	.24*
6. Environment Structuring (ES)										1	.54**
7. Extrinsic Self-Talk (EST)											1

*Detectable at the .05 level. ** Detectable at the .01 level

For the pretest results, first I examined relations among predictor variables. The two belief variables, simple knowledge and innate ability, were positively associated with each other ($r = .32, p < .01$). Simple knowledge was also positively related to performance goal orientation ($r = .24, p < .05$). However, somewhat surprising, mastery goal orientation was not detectably correlated with any other predictor variable. Overall, the relations among predictor variables were consistent with the theoretical relations among these constructs.

Next, I examined the relations among outcome variables. All pairs of correlations were positive and fully 82% (18 out of 22 coefficients) were statistically detectable, indicating that these regulation of motivation strategies were not mutually exclusive. Given that the correlations among outcome variables were moderately strong, they may be mutually reinforcing.

Then, the relations between predictor and outcome variables were examined. Simple knowledge was positively correlated with four (i.e., 57.14%) regulation of motivation strategies. In contrast, innate ability was not correlated with any of these outcome variables in a statistically detectable way. Of the two goal orientation variables, mastery goal orientation was detectably correlated with six (i.e., 85.71%) of the seven strategies, and performance goal orientation had four (i.e., 57.14%) of detectable correlations with the strategies. Both performance goal orientation and mastery goal orientation correlations with the strategies were in the positive direction, suggesting that there may be a multi-goal effect on regulation of motivation.

Finally, the categorical variable "method", with the control group (L) coded "1" and the treatment group (CM) coded "2", was used to evaluate how this variable was able to distinguish the two groups. Result indicates that the correlation relationships at pretest, before the treatment,

CM had only one detectable relation ($r = -.23, p < .05$) with mastery self-talk. This is evidenced that the two groups were similar before the treatment.

None of the correlations among predictor variables exceeded 0.70; therefore, multicollinearity may not be a problem. Overall, the predictors were not strongly correlated with each other but more with the outcome variables, indicating that the predictors as a group are suitable to be used in predictive multiple regression models (Tabachnick & Fidell, 2007).

Posttest correlation results are summarized in Table 5.

Table 5: Correlation Matrix: Posttest Results

Variables	SK	IA	M G	PG	MST	RE	IE	PST	SC	ES	EST
Method	-.14	-.32**	.07	-.36**	-.16	-.12	.01	.03	.02	.02	-.24*
<u>Predictors</u>											
1. Simple Knowledge (SK)	1	.21*	.08	.23*	.21*	.15	.30**	.20	.13	.05	.16
2. Innate Ability (IA)		1	-.17	.28**	-.07	-.09	-.09	-.02	-.17	-.02	-.07
3. Mastery Goal Orientation (MG)			1	.16	.24*	.37**	.07	.24*	.23*	.34**	.14
4. Performance Goal Orientation (PG)				1	.44**	.28**	.10	.55**	.33**	.43**	.62**
<u>Outcomes</u>											
1. Mastery Self-Talk (MST)					1	.56**	.46**	.55**	.69**	.30**	.53**
2. Relevance Enhancement (RE)						1	.60**	.52**	.46**	.36**	.43**
3. Interest Enhancement (IE)							1	.53**	.38**	.06	.30**
4. Performance Self-Talk (PST)								1	.49**	.40**	.56**
5. Self-Consequating (SC)									1	.34**	.55**
6. Environment Structuring (ES)										1	.48**
7. Extrinsic Self-Talk (EST)											1

*Detectable at the .05 level. ** Detectable at the .01 level

Similar to the pretest, simple knowledge was positively correlated with innate ability ($r = .21, p < .05$) and performance goal orientation ($r = .23, p < .05$) with a slight variation in degree. Though not statistically detectable, mastery goal orientation was negatively associated with innate ability ($r = -.17, p = .11$). All predictor variables were positively correlated with one another, though no detectable correlation was found for mastery goal orientation with other predictor variables. None of the correlations among predictor variables exceeded 0.70; therefore, multicollinearity may not be a problem. As well, the correlations among predictors and between the predictors and outcome variables were similar to those of the pretest; this result indicates that the predictors as a group may be suitable to be used in predictive multiple regression models (Tabachnick & Fidell, 2007).

As for the outcome variables, all of them were positively correlated with each other, and fully 91% (20 out of 22) of them were statistically detectable. As for relations between predictor and outcome variables, the pattern was similar to that of the pretest but with some major differences. Whereas simple knowledge and performance goal orientation had equal numbers (4 out of 7) with detectable relations at pretest, in contrast, at posttest performance goal orientation had become the dominant link with detectable relations (6 out of 7). Innate ability and mastery goal orientation each had none and five detectable relations as they were at pretest.

Finally, the categorical variable "method" was coded "1" for the control group (L) and "2" for the treatment group (CM). At posttest, method was negatively associated with innate ability ($r = -.32, p < .01$), performance goal orientation ($r = -.36, p < .01$) and extrinsic self-talk ($r = -.24, p < .05$), indicating that CM may be a factor in causing these changes.

Pre-existing Students' Characteristics and Regulation of Motivation

To explore the theoretical relations of beliefs and goal orientations on the regulation of motivation strategies, a series of standard multiple regression analyses using $\alpha \leq .05$ criterion were conducted, in which belief and goal orientation variables were used to predict each of the seven regulation of motivation strategies.

Overall, results of these multiple regression analyses indicate that the predictors as a group predicted a fairly significant portion of six of the seven regulation of motivation strategies.

Table 6 presents a summary of the regression analyses.

Table 6: Summary of Beta Coefficients of Standard Multiple Regression Analyses Predicting Regulation of Motivation Strategies from Beliefs and Goal Orientations at Pretest

Predictors	R1	R2	R3	R4	R5	R6	R7
SK	.30	.26	.28*	.12	.53*	.03	.18
IA	-.13	.16	.01	-.09	-.18	.08	.03
MG	.31**	.47**	.29**	.29*	.24	.22**	.10
PG	.28**	.05	.01	.55**	-.01	.39**	.59**
R ²	.25	.29	.19	.33	.10	.27	.39
F (4, 82)	.25**	8.29**	4.79**	10.167**	2.299	7.749**	12.966**

*Detectable at the .05 level. ** Detectable at the .01 level

[SK: Simple Knowledge; IA: Innate Ability; MG: Mastery Goal Orientation; PG: Performance Goal Orientation; R1: Mastery Self-Talk; R2: Relevance Enhancement; R3: Interest Enhancement; R4: R5: Self-Consequating; Performance Self-Talk; R6: Environment Structuring; R7: Extrinsic Self-Talk]

Mastery Self-Talk:

As expected, mastery goal orientation ($\beta = .31, p < .01$) had the strongest positive relation with this strategy. Surprisingly, performance goal orientation ($\beta = .28, p < .01$), was equally as strong and together, the two goal orientation variables accounted for the bulk of the explained variance. Results indicate that students' goal orientations, instead of beliefs, tended to have a

more direct association with students' reported tendency to remind themselves the importance of learning and mastering the course materials.

Relevance Enhancement:

Results indicate that only mastery goal orientation was a significant individual predictor of relevance enhancement. The significant positive coefficient for mastery goal orientation indicates that students' who reportedly focussed on learning and mastering the course materials were also more inclined to resort to using relevance enhancement strategy ($\beta = .47; p < .01$).

Interest Enhancement:

Results indicate that mastery goal orientation ($\beta = .29; p < .01$) was the dominant predictor of this strategy. Surprisingly, simple knowledge ($\beta = .28; p < .05$) was also a strong predictor of students' reported use of interest enhancement strategy. Hence, students who reportedly focussed on learning and those who tended to believe knowledge is simple were like-minded in using interest enhancement strategy.

Performance Self-Talk:

Surprisingly, bulk of the variance was explained by not only performance goal orientation ($\beta = .55; p < .01$) but also mastery goal orientation ($\beta = .29; p < .05$). This result indicates that mastery oriented students were also using, though to less extent than did performance oriented students, the performance self-talk strategy, reminding themselves of the importance of outperforming their peers.

Self-Consequating:

The model was not able to predict this strategy ($F [4, 82] = 2.299; p > .05$). This result indicates that epistemic beliefs and goal orientations may not be good predictors of students' use of the self-consequating strategy.

Environment Structuring:

Results indicate that only mastery goal orientation ($\beta = .22; p < .01$) and performance goal orientation ($\beta = .39; p < .01$) were detectable predictors of the environment structuring strategy. The positive coefficients of the two goal orientations suggest that students who reportedly had specific goals, whether learning or performance in nature, tended to report that they would also consciously manage their environment to make it more conducive for learning tasks.

Extrinsic Self-Talk:

Not surprisingly, performance goal orientation ($\beta = .59; p < .01$) was the only significant predictor for this strategy. This result indicates that students who reportedly were more concerned about outperforming their peers in class, also tended to report reminding themselves about the specific short-term and long-term benefits of getting good grades.

Predicting Regulation of Motivation at Posttest: Case Method vs. Lecture

Using epistemic beliefs and goal orientations as predictors, a series of standard multiple regression analyses ($\alpha \leq .05$) were used to predict each of the seven regulation of motivation strategies for the treatment group and control group respectively. Results of these analyses are presented in Table 7.

Table 7: Summary of Regression Analyses:- CM vs. L at Posttest

Outcome Variables	Treatment (CM)	Control (L)
	R ² F(4, 31)	R ² F (4, 46)
Mastery Self-Talk	.23	.29**
Relevance Enhancement	.29*	.15
Interest Enhancement	.17	.10
Performance Self-Talk	.60**	.25*
Self-Consequating	.19	.26**
Environment Structuring	.18	.39**
Extrinsic Self-Talk	.47**	.35**

*Detectable at the .05 level. ** Detectable at the .01 level

Results indicate three major differences between the two groups. First, CM and L differed in terms of numbers of regulation of motivation strategies predicted. While L had five successful models predicting mastery self-talk ($R^2 = .29$, $F[4, 46] = 4.66$; $p < .01$), performance self-talk ($R^2 = .25$, $F[4, 46] = 3.75$; $p < .05$), self-consequating ($R^2 = .26$, $F[4, 46] = 4.06$; $p < .01$), environment structuring ($R^2 = .39$, $F[4, 46] = 7.27$; $p < .01$), and extrinsic self-talk ($R^2 = .35$, $F[4, 46] = 6.26$; $p < .01$) respectively, CM had only three successful models for the strategies. These were relevance enhancement ($R^2 = .29$, $F [4, 31] = 3.20$; $p < .05$), performance self-talk ($R^2 = .60$, $F [4, 31] = 11.39$, $p < .01$), and extrinsic self-talk ($R^2 = .47$, $F[4, 31] = 6.78$; $p < .01$). Second, CM and L had some different successful predictive models from each other to predict regulation of motivation strategies. For instance, the predictors as a group were successful in predicting mastery self-talk in L but not in CM. Similarly, beliefs and goal orientations were able to explain relevance enhancement in CM but not in L. Finally, on average,

the successful models in CM (*mean* $R^2 = .45$) were able to explain more variance than did those of L (*mean* $R^2 = .31$).

A supplementary analysis to assess the predictive potential of teaching method using a series of hierarchical multiple regression analyses was conducted. The purpose was to test whether inclusion of teaching method would add significantly to the original model as found in a study by Tompson and Dass (2000). In these analyses, pretest differences were also controlled for by including pretest scores in block 1 with the four predictor variables; "method" was then entered in block 2. The only detectable result was found in predicting performance self-talk ($R^2 = .39$ ($F[5, 81] = 10.34$; $p < .01$); and incremental $R^2 = .05$ ($F[1, 80] = 6.70$; $p < .01$).

To further explore the hypothesized interaction effect of teaching method and epistemic beliefs (Paulsen & Feldman, 2005; Tompson & Dass, 2000; Wood, Mento, & Locke, 1987), another series of hierarchical multiple regression analyses were conducted. Instead of the categorical variable method, the interaction term, for instance method x simple knowledge as well as for each of the other three predictors, was entered in block 2. When the interaction terms entered the predictive equation, R^2 increased by 5% for predicting performance self-talk; but no other increases in the predictive potential in other regulation of motivation strategies were discovered as indicated by F-tests.

Posttest Group Differences: Case Method vs. Lecture

In this section, I first used discriminant analysis to assess group differences as a function of the predictors epistemic beliefs and goal orientations. Next, group differences across the

outcome variables regulation of motivation strategies were evaluated with a MANOVA. Finally, changes in each predictor and outcome variable of the groups were determined by ANCOVA.

Group Membership as a Function of Predictors

A discriminant analysis was performed to determine whether students' learning experience in CM or L over the semester can be distinguished from students' posttest epistemic beliefs and goal orientation profiles.

The predictors, simple knowledge, innate ability, mastery goal orientation, and performance goal orientation, significantly aided in separating students in the treatment group, CM, and the control group, L (*Wilks' lambda* = .29, *Chi Square* [2, *N* = 87] = 6.15; *p* < .01). The categorical variable method was coded "1" for L group and "2" for CM group. The coefficients of the standardized discriminant function are shown in Table 8.

Table 8: Standardized Discriminant Function Coefficients

Predictors	Standardized Function Coefficients
Simple Knowledge	.06
Innate Ability	.52
Mastery Goal Orientation	-.21
Performance Goal Orientation	.74

Based on the values shown in Table 8, innate ability and performance goal orientation appear to contribute substantially to the discrimination between CM and L participants. Results also indicate that the discriminant function derived from the analysis successfully predicted group membership status of 100% of the cases in the sample. As an indication of the ability of the discriminant function to classify cases, the leave-one-out procedure, a cross-validation procedure to predict the group a case belongs to when the case is excluded from the computation of the discriminant function (Norusis, 2008), correctly classified 66.70% of the cases.

According to Norusis (2008), the actual signs of the coefficients are arbitrary. Coefficients of the same sign should be examined to the underlying variables to determine how they relate to the groups. From Appendix E, the L group outscored CM in innate ability ($t = -3.11; p < .01$) and performance goal orientation ($t = -3.56; p < .01$). No detectable differences were found for simple knowledge and mastery goal orientation between the groups. This result indicates that at posttest, the CM group participants differentiated themselves from the L group participants in having more sophisticated belief and lower tendency to engage in social comparison.

Group Differences of Regulation of Motivation Strategies

MANOVA analyses were conducted to assess whether there were detectable differences between the treatment and the control groups, and between different classes within each group. Using Wilks' lambda criterion at $\alpha \leq .05$, results indicate that the groups differed detectably with regard to their regulation of motivation strategies profiles ($F [7, 79] = 2.42, p < .05, \eta^2 = .18$). No within group differences were discovered in the treatment group ($F [7, 28] = .18; p > .05$), and no within group differences were discovered in the control group ($F [7, 43] = .35; p > .05$).

Pretest- Posttest ANCOVA Analysis

Owing to the lack of randomization of participants, I needed to control the initial group differences to help explain the observed variations in the variables. The recommended method of analysis to provide some statistical control to compensate for the lack of experimental control is analysis of covariance or ANCOVA (Cook & Campbell, 1979). In my analysis, I used ANCOVA to control for initial differences by treating pretest scores as covariates; thus, reducing

the effect of pretest differences as an extraneous variable. The adjusted posttest scores of CM group were subtracted from the corresponding adjusted posttest score of the L group. The results of ANCOVA are shown in Table 9.

Table 9: Summary of ANCOVA Results

Variables	Adjusted Mean-Differences:- CM - L	F (2, 84)
Simple Knowledge	-.14	1.38
Innate Ability	-.37	9.67**
Mastery Goal Orientation	.13	0.41
Performance Goal Orientation	-.78	12.61**
Mastery Self-Talk	-.18	0.79
Relevance Enhancement	-.19	0.84
Interest Enhancement	.03	0.02
Performance Self-Talk	.13	0.26
Self-Consequating	.14	0.32
Environment Structuring	.04	0.03
Extrinsic Self-Talk	.48	3.89*

** Detectable a $p \leq .05$, * Marginally detectable at $p \leq .05$

Results of evaluation of the assumptions of homogeneity of variance and homogeneity of regression were satisfactory. After adjusted for pretest differences, only three variables had detectable variation with the treatment. These variables were innate ability ($F = 9.67 [2, 84]$ $p = .003$, $\eta^2 = .10$), performance goal orientation ($F = 12.61 [2, 84]$, $p = .001$, $\eta^2 = .13$), and extrinsic self-talk ($F = 3.89 [2, 84]$, $p = .052$, $\eta^2 = .04$). While L outscored CM in simple

knowledge and performance goal orientation, CM outscored L in extrinsic self-talk strategy. Results indicate that there may be some tentative evidence of treatment effects on these variables. For performance goal orientation in particular, the treatment explained about 13% variation of this variable.

General Observation

The control group participants did not demonstrate any adjustment issues from the very beginning of the semester. This was evidenced by little change in enrolment during course add/drop period; which is a window of the first two weeks during which a student may add or drop a course without consequence. Attendance rate remained roughly unchanged throughout the semester. In class or during my office hours, these participants' main concerns were on technical problems in the text or assignments, and on coverage in tests and exams. A typical learning question from these participants was how-to in nature relating to technicalities. In the end, participants' feedback on my teaching generally described whether they viewed the tests or exams as easy or hard.

The treatment group did not settle down until mid-semester; that is, between the first mid-term test around week five and the second mid-term test around week ten. In one class, initial enrolment dropped from a full-capacity of thirty five to the eventual number of twenty seven in the first two weeks of the semester. Participants were clearly uncomfortable with the unfamiliar teaching method during the first half of the semester. In particular, participants were clearly unsettled with the evaluation criteria and the lack of right-and-wrong answers for their work. Attendance during the first half of the semester was desultory, depending partly on the

weather and partly on other academic demands outside the course. In class, participation in class discussion was minimal and students often offered non-instrumental suggestions for examining or "solving" cases.

In the second half of the semester, the treatment group showed clear signs of settling down. The attendance rate picked up and remained high and participation was active. Instead of asking me for solutions or guidance, they focused on sharing and selling their ideas to the rest of the class. In the end, the feedback from these participants focused more in experiential and utilitarian terms, expressing their general enjoyment of the learning process and usefulness of the materials learned.

CHAPTER 5: DISCUSSION

In the final chapter I discuss the current study in the light of the theoretical frameworks (e.g., Hofer, 2005; Winne & Hadwin, 1998; Zimmerman, 2008; Zimmerman & Kitsantas, 2008) outlined in chapter 2 and the relevant empirical studies (e.g., Wolters, 1998; Wolters & Rosenthal, 2000) described in that chapter. The discussion is presented in line with the three research questions which correspond roughly with the three emerging issues in SRL research described by Zimmerman (2008). In particular, I use Zimmerman's and Kitsantas' (2008) cyclical model of SRL to interpret and discuss my findings. This model may explain the findings by Wolters (1998; Wolters & Rosenthal, 2000) that the relations between goal orientations and regulation of motivation may be recursive.

The first section relates to research question one. It answers the question of whether students' pre-existing goal orientations and epistemic beliefs profiles affect students' use of regulation of motivation strategies. The second section discusses effects of treatments on students' use of regulation of motivation strategies and corresponds with research question two. Finally, research question three is answered in the final section. It discusses the effects of treatments on students' goal orientations and epistemic beliefs.

Findings and Implications

Pre-existing Students' Characteristics and Regulation of Motivation

As students' general goal orientations and epistemic beliefs are thought to be relatively stable at least in the short term (Paulsen & Feldman, 2005; Wolters, 1999), the first goal of this study was to examine how these two trait-like constructs relate to regulation of motivation strategies. Though the relationships between goal orientation and regulation of motivation were relatively well researched by Wolters (e.g., 1998, 1999), this was the first study in which epistemic belief was incorporated in the predictive relationships with these regulation of motivation strategies in an authentic setting.

Although as a group, goal orientations and epistemic beliefs accounted for a significant portion of the variance in all but the self-consequating strategy, the two goal orientation variables were more consistently related to these regulation of motivation strategies. In contrast, of the two epistemic belief variables, only simple knowledge had some weak positive relations with four of the strategies. Therefore, the claim of the first hypothesis that adaptive goal orientation and sophisticated epistemic beliefs should predict regulation of motivation strategies is only partially supported.

Of the two goal orientation variables, mastery goal orientation was most consistently related to students' use of regulation of motivation strategies in that it was correlated significantly to six of the seven strategies, with extrinsic self-talk as the only exception. More importantly, students who reported a mastery orientation were more likely to report engaging in six of the seven regulation of motivation strategies, even when accounting for performance goal orientation and epistemic beliefs were included in the analyses. Thus, to maintain their engagement and continue working on academic tasks, students who expressed a strong learning orientation would be more likely to remind themselves of the learning and performance reasons to accomplish the task, highlight practical value of the learning material, identify areas of

situational interest embedded in the task to arouse interest and engagement, and make effort to avoid distractions. Simply put, mastery oriented students tend to use more strategies, and are more active self-regulators. In general, this finding is consistent with research investigating the relation between students' mastery goal orientation and task engagement. For instance, mastery goal orientation has been associated with active engagement and effective use of a wide range of strategies (Ames, 1992; Pintrich & De Groot, 1990; Wolters, 2004). The current findings therefore successfully replicated Wolters' (e.g. 1999) research on the effect of goal orientations on regulation of motivation strategies in a complex task environment. However, Ames (1992) noted that before students could use any self-regulatory strategy, they must be aware of appropriate strategies and knowing when and how to apply them. In the current study, orientation toward mastery goals was found to relate most consistently with the relevance enhancement strategy, a previously untested strategy. The current findings therefore expand the list of motivational strategies that students may use to overcome motivational problems.

Wolters and Rosenthal (2000) found students' motivational strategy may be incongruent with their pre-existing goal orientations. Therefore, in the current study it is not too unexpected to find students reported orientation toward mastery goals also tended to remind them of the importance of outperforming their peers. This finding may explain the reason why, though not statistically detectable, mastery goal orientation was positively correlated with performance goal orientation. The connection is perhaps the performance self-talk strategy. The conceptualization of performance self-talk, which measures how students motivate themselves to get better grades than others, may be conceptually similar to performance-approach orientation in that they both represent a tendency to work toward outperforming others. This finding is consistent with prior

research and supports the notion that performance-approach may relate positively to students' effort and persistence (Elliot, McGregor, & Gable, 1999; Schunk, 2005; Wolters, 2004).

In regard to students' reported orientation towards performance goals, findings indicate that students who expressed the importance of getting good grades or outperforming peers, were more likely to report using four of the seven strategies. These four strategies were mastery self-talk, performance self-talk, environment structuring, and extrinsic self-talk. Simply put, on average these students more frequently evaluated how much they have learned, and/or worked harder when noticing others may be doing better, and/or rearranged work environment for advantage, and/or reminded themselves to keep studying to do well in class. Because of the association between performance goal orientation and the two performance related strategies (i.e., performance self-talk and extrinsic self-talk) and because of the positive association between performance goal orientation and mastery goal orientation in this study, this finding provides some tentative evidence that performance oriented students may continue to engage on task when faced with motivational problems. Therefore, the current measurement of performance goal orientation may be characterized as performance-approach orientation; consequently, this may not be maladaptive (Wolters & Rosenthal, 2000).

For the two types of goal orientations, the somewhat surprising positive relations between mastery goal orientation and performance self-talk, and between performance goal orientation and mastery self-talk suggest that students who were reportedly driven by achievement, or were approach-oriented, may use strategies relatively independent of their existing goal orientation. For instance, a mastery-oriented student may use performance self-talk strategy to overcome motivational difficulties; likewise, a performance oriented student may use mastery self-talk strategy if learning the task may contribute to the objective of performing better than others.

Overall, though this explanation needs to be further tested empirically, it offers a very tentative but potentially encouraging indication that these regulation of motivation strategies may be useful to students with different goal orientations that they may apply in different learning contexts.

As for students' epistemic beliefs, of the two variables only simple knowledge had positive association with most of the seven regulation of motivation strategies. However, when students' goal orientations were factored in the analyses, simple knowledge was related to only two of the strategies; namely, interest enhancement and self-consequating. Perhaps, to sustain their motivation to be on task, students who harboured the belief that knowledge is structured in isolated pockets of facts tried to focus on areas of situational interest and provide some self-rewards as encouragement for completing a task.

One possible explanation of the dominant effect of simple knowledge over other epistemic belief variables is students' early education in the program. Typically, foundational entry level accounting courses are taught in modules. Instead of a focus on the big picture (e.g., emphasizing the interconnectedness of the components of financial statements) students focus on learning different components in different modules in the first two to three years of their education. Spiro, et al. (1996) reasoned that at the entry level students discriminate and categorize knowledge into selected lots. In other words, foundational level well-structured information can be taught in a traditional linear fashion. Consequently, as students moved through entry level modules successfully into upper level courses, they might bring with them their learning experience in a well-structured task environment, treating knowledge as a series of isolated components (Lodewyk, 2007). However, from a constructivist perspective, as one learns more advanced principles and problem solving, rather than categorizing the information,

generalization to other knowledge domains must occur (Spiro, et al., 1996). For instance, when facing ill-structured tasks, students need to construct needed skills from different knowledge domains and prior experience to apply them in complex problem solving.

Consistent with prior research (e.g., Keith, 2006), the findings suggest that the effects of epistemic beliefs on regulation of motivation may be mediated by goal orientations. Various theoretical frameworks further support this hypothesis. For instance, from a psychological-behavioural perspective, Dai and Sternberg (2004) postulate that goal orientation has directional quality on framing the mindset, and can significantly influence the allocation of attentional resources, effort expenditures, and emotional reactions to overcome difficulties. In other words, goal orientation is more readily translated into students' engagement on task and strategy use. From a social-cognitive perspective, the social-cognitive mediation model proposed by Pintrich and his colleagues (McKeachie, Pintrich, Lin, Smith, & Sharma, 1990; Pintrich & Zusho, 2000) is particularly relevant for college students. This model assumes that students' characteristics are mediated by motivational factors, affecting the self-regulation strategies that students use in their learning. Owing to the exploratory nature of this study and sample size limitation, I was unable to explore the potential mediational effects further with more advanced statistical technique such as structural equation modelling (Tabachnic & Fidell, 2007).

Changes over the Treatment Period

Method and Regulation of Motivation

The present study provides some evidence that students in the case method group may use different strategies other than those in the lecture group. Students' overall epistemic beliefs

and goal orientations predicted more strategies in the traditional group than in the case method group. However, the determinant strength, on average, of epistemic beliefs and goal orientations was stronger in a more focused range of strategies in the case method group than that in the traditional group. Therefore, the second hypothesis that epistemic beliefs and goal orientations were able to predict regulation of motivation strategies more strongly in the case method group than in the traditional group was only moderately supported.

Findings also provide some tentative evidence for instructional method as a moderator on one of the motivational strategies. Instructional method moderated the effects of the predictors (i.e., simple knowledge, innate ability, mastery goal orientation, and performance goal orientation) on students' use of a performance self-talk strategy. This finding corroborates with the result of a meta-study on complex tasks such as business games simulation (Wood, Mento, & Locke, 1987). The researchers found that task complexity has a robust moderating effect on specific difficult goals, and that individuals would develop different strategies for complex tasks. After controlling for initial differences, the current study results provide tentative but clear evidence of differences in terms of the types and reported intensity of strategies used by participants in the case method group as measured against the traditional group. As the instructor, I observed that though some participants in the case method group clearly floundered in the beginning, some of these participants seemed able to cope well as the semester progressed. In contrast, no noticeable change was observed among the participants in the traditional group. Overall, though not statistically detectable with one exception, the case method participants outscored the traditional group participants in five of the seven strategies. It is important to bear in mind that not-significant findings are best viewed as speculative but may be construed as trend, particularly for explorative studies (Lodewyk & Winne, 2005; Stahl, Pieschl, & Bromme,

2006). The current finding provides some tentative evidence that the case method participants may have become better self-regulated learners through their case-based learning experience.

Regardless of the instructional methods, students need to have some minimal level of motivation and use some personally relevant regulation of motivation strategies to sustain effort to complete a task. Travers and Sheckley (2000) reasoned that ill-structured tasks may enhance learners' self-regulation by triggering their engagement in and experimentation with different self-regulation strategies to overcome problems. In other words, when facing unfamiliar challenges, students may be cued to bootstrap self-regulation; more so, when they also have the opportunities to observe others (Winne, 1997). In a typical case in a case method class, students often need a large number of resources to work through different domain areas and examine issues from multiple perspectives, therefore, they need to have access to more strategies (Brown, Collins, & Duguid, 1989). In the current study, the case method participants clearly felt the need for learning strategies to cope with an unfamiliar learning environment. Most of my discussions with these participants in class or in my office were on how to overcome their frustrations; and a fair amount of time during small group discussion of these participants were spent sharing experience on strategies, such as time management and selecting good study areas. Put differently, the social interaction in the case method group provided participants with more opportunities to share experience and model behaviour. Consistent with theories of self-regulated learning holding that a challenging task may either facilitate or hinder students' self-regulation (Muis, 2007), some of my participants adapted well after the first month of so and others floundered until the end. Blumenfeld, Soloway, Marx, Krajcik, Guzdial, and Palinscar (1991) suggested that "without adequate attention to ways of supporting students..., learning-by-doing will not be done" (p.374).

However, from my observations, no participants in the case method group who were highly motivated and able at the beginning of the semester, as evinced by the quality of their project papers and contributions to class discussion, had become less so later in the semester. Encouragingly, some participants who were discouraged by the case method at the beginning had become more active and participatory as the semester progressed. I speculate, it was my availability to assist students exemplified by a commitment to respond to their emails within twenty four hours including weekends and public holidays, that provided students with much of the support to help them to ease into the new learning environment. In contrast, in the traditional group, no noticeable differences were observed of any change of participants' performance and motivated behaviour, such as quality of assignments and attendance, over the semester.

Extant research supports the view that complex tasks may stimulate or stifle students' self-regulation. More specifically, empirical studies provide evidence that high ability students tend to thrive better than less able students when facing complex tasks (Lodewyk & Winne, 2005; Stepich, Ertmer, & Lane, 2000). Wolters (2003) hypothesized that the relation between students' level of motivation and regulation of motivation may be curvilinear and recursive. It is perhaps curvilinear because this relation is likely to be strongest among students with a moderate level of motivation, while weaker among students with a very high or a very low level of motivation. This relation may be recursive because students' motivation affects their use of motivational regulation strategies, while at the same time the use of the motivational strategies influences students' ongoing motivation. Winne and Hadwin (1998) provided a more complete model to include task in the analysis. In their model, self-regulated learning occurs in four distinct stages: (1) task definition; (2) goal setting and planning; (3) enactment; and (4) adaptation. For a less able student facing a very difficult task, a case which is judged to be very

difficult and impossible to solve at the task definition phase, this task definition may result in low expectation for achievement and inability to adapt to the task condition, and may lead to minimal effort. The same process may be exactly the opposite for more able students. These more able students may feel challenged and be motivated by the task. They may set high goals and be energized to invest great effort.

Effects of Method on Epistemic Beliefs and Goal Orientations

One aim of my study was to explore whether the case method has the effect of changing students' epistemic beliefs. Prior research indicates that beliefs are formed as a result of cumulative past life experiences and may be slow to change. As beliefs are rooted in past experiences, therefore, in order to change beliefs emphasis should be placed on providing new environments in which students are given opportunities to reflect on their beliefs and gradually shift to more adaptive new beliefs (Bendixen, 2002; Ertmer & Stepich, 1999; Hofer, 2001). Paulsen and Feldman (2005) found, among the dimensions of epistemological beliefs, beliefs in fixed ability and simple knowledge have the most significant impact on college students' self-regulation in student-centered classrooms.

Overall, from their initial undifferentiated form, the case method group was able to differentiate itself from the traditional group, in terms of their epistemic beliefs and goal orientations profiles, over the treatment period. After controlling for initial differences, the case method group participants held substantially lower beliefs in innate ability in comparison with the traditional group participants. Put differently, the treatment may have the effect of making the case method participants hold more sophisticated beliefs. It seems that the self-discovery and discussion mode of the case method, particularly with co-learners, helped these participants a

great deal in re-examining their attitudes and epistemological beliefs. Exposed to the different ways of looking at the same situation with peers may provoke the process of changing these participants' past thinking habits. Bandura (1997) reasoned that modelling is an extremely important component in the development of self-beliefs, and peer models are particularly effective because peers are most similar to the individual attempting to model.

From a cognitive theory perspective (Spiro, Feltovich, & Coulsen, 1996), the most important factor in fostering more flexible thinking is the establishment of appropriate habits of mind; that is, ways of thinking, worldviews, mindsets, and so on that prefigure the kinds of knowledge that will be built by an individual. Exposure to complex tasks may foster the building of knowledge characterized by multiple representation, interconnectedness, and relativistic thinking.

The case method learning environment may have provided the kind of dynamic environment to challenge students' beliefs. Some of my past students described the case method class as democratic; it levels the playing field for all ability levels. Often, tasks embedded in a case may require multiple skill sets; for instance, number-crunching, writing, computer modelling, communication, and even artistic (as needed in creating presentation materials) skills. In this environment past achievements and strength in a particular area may have less of an impact on current performance. Ertmer and Stepich (1999) found that successful students in a case-based course work forward to fill in what they don't know, while less successful ones work backward to fill in what they need to know for solution. In the current study, while successful students sought my advice on new knowledge needed to resolve problems, less successful students either complained the problem did not match their past course knowledge, or used knowledge ill-suited for the case and complained later that it worked in their previous courses.

Consequently, some students' previous experiences seemed to cause them to get "hung up on the trivial details of a case..... because of past success with such a solution" (Ertmer & Stepich, 1999, p. 19). In another words, prior knowledge may at times impede conceptual change and cause rigidity in thinking (Pintrich, Marx, & Boyle, 1993).

The major implication of the case method learning process is that every case learning episode may provide an opportunity to trigger epistemic change in a process as described by Bendixen (2002). When students found prior knowledge or past experiences were unable to help with the current case problem, this triggered epistemic doubt, a resolution of doubt occurred in the case discussion process, and finally new beliefs were developed or former beliefs were modified. In the case method group perhaps students' most profound initial doubt was whether they would be able to come up with the "solution" and overcome the uneasiness of knowing no "official" suggested solution would be provided. Students originally seemed in disbelief when they saw their inputs were weighed in to form the eventual collective "solution" of a case. Towards the end of the semester, students seemed eager to contribute their thoughts towards constructing the collective final class output of a case.

Consistent with prior research (e.g. Dweck & Leggett, 1988; Wolters, 2004), the findings were that innate ability was positively associated with a performance goal orientation. Dweck and Leggett (1988) claimed that students' goal orientation patterns predict their patterns of learning in real world settings, and one of the hallmarks of effective learning is the ability to transfer what is learned across contexts. Generally, these researchers endorsed the view that a mastery goal orientation contributes toward adaptive learning in a less-structured authentic environment. In particular, Dweck and Leggett (1988) found positive relationships between entity view of belief (e.g., strong belief in innate ability) and performance goal orientation, and

between incremental view of belief (e.g., weak belief in innate ability) and mastery goal orientation.

The findings indicated that after controlling for initial differences, the case method participants reported significant reduction in performance goal orientation, though mastery goal orientation remained largely unchanged. It appears that the case method learning process had significantly challenged these participants' entity belief (i.e., innate ability) and contributed to reducing their performance goal orientation tendency. Moreover, given that these participants maintained a stable level of mastery goal orientation but reported an increase in extrinsic self-talk, a measure of performance-approach orientation, they may have become more effective learners in bootstrapping SRL. In other words, "these students self-regulate not merely performance but also how they learn" (Winne, 1997, p. 397).

From an investigator-instructor perspective, I have two speculative explanations for the treatment effect of reducing performance goal orientation. First, to be successful in the case method courses, participants need to cooperate and co-regulate their learning with small group peers. Owing to the complexity inherent in a case, it was not likely that a single participant would have the time resource and skills needed for the task. As well, a significant portion, 20%, of course grade was based on peer evaluation. Members of a group would have no incentive to compete with each other but would have to focus on the task. Second, as cases may vary from a one-page document to a seven-page article, and from a certain topical area to another topical area, a group may feel they had the competitive advantage over other groups owing to past experience or expertise in a particular case, but may not have the same advantage in the next case. As a performance goal orientation needs to be sustained with high confidence, when confidence fluctuates from case to case it may be difficult to maintain a performance goal. A

mastery goal orientation, however, tend to be less vulnerable to fluctuations in confidence (Dweck & Leggett, 1988).

Overall, the participatory mode of case-based learning may have created the kind of learning environment described by Lave and Wenger (2007) as legitimate peripheral participation. Participants in the treatment group were legitimate because they were members of a learning community, and they were peripheral because they were in the group to learn from more experienced members, or instructor, in different domain areas. The groups provided not only access to different experiences but also opportunities for trial-and-error as costs of errors were reduced. In such an environment, task knowledge acquired and skill learned were its intrinsic rewards as well as being part of a learning community. Shulman (1992) proposed that the kind of psychology that explains participatory authentic learning is situated learning. Woolfolk, Winne, and Perry (2000) described situated learning as "enculturation, or adopting the norms, behaviours, skills, beliefs, language, and attitudes of a particular community" (p. 261). From this perspective, the case method may have the potential to create the kind of learning community needed to foster adaptive beliefs and goal orientations change.

Implications for Case Method Instructors

Participative case method teaching is impossible without motivated students in the classroom (Mauffette-Leenders, Erskine, & Leenders, 2007). However, students are not necessarily motivated at a level adequate for the task, particularly in an unfamiliar learning environment. Evidence that the case method participants may exhibit different regulation of motivation profiles suggest that they may need different motivational strategies to adapt to the case method environment. The results of this study and other research suggest that students may

have to be taught how to use these regulation of motivation strategies to overcome motivational issues in their learning. The results also indicate that it may be helpful for the instructor to adopt a more active motivator role. The instructor may assume this role by being more accessible and empathetic to listening to students' frustration and problems. Often, a quick response over email giving student simple encouragement such as "I know it is difficult, just try your best to focus on one or two main issues of the case" is sufficient to keep students on task.

As well, course instructors may use the current measures of goal orientation, epistemic beliefs, and regulation of motivation strategies to assess students' psychological profile at the beginning of a course. Using "the participants as a starting point" is helpful for course design and managing the classroom process (Erskine, Leenders, Mauffette-Leenders, 2003, p. 50). For instance, if the students in general exhibit naïve beliefs, maladaptive goal orientation, and low awareness of regulation of motivation tendency, the instructor may, at first, have to assume a more directive role in the class and initiate students with less difficult cases. After the students have gained more confidence the instructor may then gradually move to a more facilitative role and use more difficult cases. As well, an instructor may consider mixing students with different levels of epistemic beliefs, goal orientations, and regulation of motivation to maximize observational learning afforded under the case method.

Limitations and Future Research

Though this study makes some contributions to the field, it is important to highlight some issues that may affect the interpretation and generalization of its findings.

First, this study involved only a single institution in a single discipline and with a very limited sample size under the same instructor. Further, the treatment had only one iteration of a case course experience and across two different courses. Therefore, the generalizability of findings of this study needs to be replicated in other settings, such as other business disciplines over a longer period. Prior research in the field also highlighted the importance of including instructor's characteristics, such as experience and beliefs, in order to evaluate the effectiveness of the case method (Ertmer & Stepich, 1999; Parent, Neufeld, Gallupe, 2002; Thompson & Dass, 2000). Findings of this study, therefore, need to be validated across different instructors.

The second issue concerns measurement. Self-report questionnaires were used as the primary means of data collection of this study. As with all self-report constructs and measures, there can be problems with capturing the dynamic self-regulatory processes of learning (Pintrich, 2004; Winne & Jamieson-Noel, 2002). Further, the scores for epistemic beliefs had very low reliability, resulting in only two out of five dimensions being captured. The epistemic profiles of the participants may not be fully captured in the remaining two dimensions. In addition, this study was not able to access other more reliable and objective student data, such as GPAs. A broader measure of students' characteristics, particularly performance indicators, would enable testing of the hypothesized effects of ill-structured tasks across different ability levels (Lodewyk & Winne, 2005; Wolters, 2004). The lack of randomization of treatments of participants further

compromised the interpretability of its findings. Therefore, future research under more rigorous experimental research design is needed to validate the findings of the current study.

A related third issue is the possible confounding effects of experimenter bias.

Experimenter bias refers to the investigator's expectations about the outcomes of the experiment that are unintentionally transmitted to the participants so that their response is affected (Gall, Gall, & Borg, 2003). In the current study, though this potential bias was somewhat mitigated by ethics constraints and partially neutralized by the investigator by avoiding suggesting to the participants advantages of the treatment, it could never be totally ruled out. A randomized double-blind research involving different instructors would overcome this limitation.

The fourth limitation concerns the many constraints in the current treatment setting that prevented the full implementation of the case method. In addition to the lack physical facilities for small-group discussions before class, the small class size of 15 and 21 was below the ideal class size of 20 to 60 for effective case learning (Erskine et al 2003). In the current study, to overcome the issue of small class size, the treatment had to be supplemented with in-class small-group discussions and exercises, debates, and brain-storming that were considered "case use variations" (Erskine et al 2003). Consequently, the treatment condition was only a partial test of the case method. Future research in a larger class of 30 or more is recommended to investigate the full effect of the case method.

Finally, as a summary, the above limitations or constraints limited breadth and depth of the investigation of the potential effects of the case method. Though some qualitative observational data were collected, because of the lack of systematic collection methods, such as structured interviews, data was limited to what the investigator-instructor came across passively

during the treatment period. Future research may consider using a larger sample size with more liberal data collection techniques in its design. A larger sample size would allow testing of directional and mediational effects among variables by using more advanced statistical techniques (Tabachnick & Fidell, 2007). In other words, more studies are needed that use these techniques to investigate the cyclical phases of the case method in the framework described by Zimmerman and Kitsantas (2005).

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Appendix A: Example of a Case in Case Method Class

Ecom Inc. (EI) is in the telecommunications industry. The company builds and maintains telecommunication lines which are buried in the ground and often lie on the bottom of the ocean. The company is a public company and recently has been having some bad luck. One of its main undersea telecommunications lines was cut by accident and the company cannot determine the exact location of the problem. As a result, many of the company's customers have lost service. Because EI did not have a backup plan, it is uncertain about how long it will take to restore service. The affected customers are not happy and are threatening to sue. In order to calm them down, EI has managed to purchase some capacity from a competitor. Unfortunately, the cost of the service is much higher than the revenues from EI's customers. EI is also currently spending quite a bit on consulting fees (on lawyers and damage control consultants.)

In addition, EI is spending a significant amount of money on its very old telecommunications lines that were beginning to degrade due to age. It has capitalized these amounts and they are therefore showing up as investing activities on the cash flow statement. The company's auditors have questioned this as they feel that the amounts should be expensed.

As a result of all this, EI's share price has plummeted, making its stock options worthless. Management has historically been remunerated solely based on these options, however. The company's CFO meanwhile has just announced that he is leaving and is demanding severance pay for what he is calling constructive dismissal. He feels that because the stock options are worthless, he is working for free - which he cannot afford to do - and that the company has effectively fired him.

Instructions: Adopt the role of the company controller and discuss the financial reporting issues.

Appendix B: Example of an Assignment in Traditional Class

A company's capital structure is made up of 200,000 common shares and \$1,000,000 debt at 12 percent interest. The company's tax rate is 50 percent. An additional \$500,000 has to be raised, and the following financing alternatives are available:

Common shares: The Company can sell additional shares to net \$10 a share. Hence, 50,000 new shares would have to be issued.

Debt: Debt can be issued at 12 percent, requiring interest payments of \$60,000.

Requirements:

1. Compute breakeven EBIT of the two financing alternatives.
2. For the same company, assuming the company follows pecking order principle of financing preference and has a 100% payout policy (i.e. pay out all earned profit as dividend), given the company is now at breakeven level of EBIT, which financing alternative the manager of the company would prefer and why?

Appendix C: Contextualized EBI

Contextualized EBI Questionnaire

If you **strongly agree** with the statement, circle 5.

If you **strongly disagree** with the statement, circle 1.

If you think the statement is more or less true, pick a number between 1 and 5.

1	2	3	4	5
Strongly Disagree			Strongly Agree	

1. Most things worth knowing about financial statements are easy to understand.	1	2	3	4	5
2. What is true about financial analysis is a matter of opinion.	1	2	3	4	5
3. Students who learn things quickly are the most successful.	1	2	3	4	5
4. People should always follow the steps in text examples.	1	2	3	4	5
5. People's intellectual potential is fixed at birth.	1	2	3	4	5
6. Absolute truth about financial analysis does not exist.	1	2	3	4	5
7. Instructors should teach their students all there is to know about a course.	1	2	3	4	5
8. Really smart students don't have to work as hard to do well in the course.	1	2	3	4	5
9. If a person tries too hard to understand a problem or a case, they will most likely end up being confused.	1	2	3	4	5
10. Too many theories just complicate things.	1	2	3	4	5
11. The best ideas are often the most simple.	1	2	3	4	5

12. Instructors should focus on facts or procedures instead of theories.	1	2	3	4	5
13. Some people are born with special gifts and talents.	1	2	3	4	5
14. How well you do in schools depends on how smart you are.	1	2	3	4	5
15. If you don't learn quickly, you won't ever learn it.	1	2	3	4	5
16. Some people just have a knack for learning and others don't.	1	2	3	4	5
17. Most of the problems in the course are simpler than most professors would have you believe.	1	2	3	4	5
18. If two people are arguing about possible solutions or outcomes, at least one of them must be wrong.	1	2	3	4	5
19. Students should be allowed to question their instructors' authority.	1	2	3	4	5
20. If you haven't understood a chapter the first time through, going back over it won't help.	1	2	3	4	5
21. Accounting and/or finance are easy to understand because it contains many facts.	1	2	3	4	5
22. The more you know about a topic, the more there is to know.	1	2	3	4	5
23. What is true today will be true tomorrow.	1	2	3	4	5
24. Smart people are born that way.	1	2	3	4	5
25. When my instructor tells me a particular way to solve a problem, I usually do it that way.	1	2	3	4	5
26. Students learn best by following suggested solutions.	1	2	3	4	5
27. Working on a problem with no quick solution is a waste of time.	1	2	3	4	5
28. Sometimes there are no right answers to accounting treatment or real company case problems.	1	2	3	4	5

Appendix D

MSLQ

Please rate the following items based on your behaviour in this class.

If you **strongly agree** with the statement, circle 7.

If you **strongly disagree** with the statement, circle 1.

If you think the statement is more or less true, pick a number between 1 and 7.

1 2 3 4 5 6 7

Strongly

Strongly

Disagree

Agree

1. I tell myself that I should keep working just to learn as much as I can.	1	2	3	4	5	6	7
2. I tell myself I can do something I like later if right now I do the work I have to get done.	1	2	3	4	5	6	7
3. I challenge myself to complete the work and learn as much as possible.	1	2	3	4	5	6	7
4. I convince myself to work hard just for the sake of learning.	1	2	3	4	5	6	7
5. I tell myself that I should study just to learn as much as I can.	1	2	3	4	5	6	7
6. If I can, I want to get better grades in this class than most of the other students.	1	2	3	4	5	6	7
7. I tell myself that it is important to learn the material because I will need it later in life.	1	2	3	4	5	6	7
8. I change my surroundings so that it is easy to concentrate on the work.	1	2	3	4	5	6	7
9. I think up situations where it would be helpful for me to know the material	1	2	3	4	5	6	7

or skills.							
10. I try to make the material seem more useful by relating it to what I want to do in my life.	1	2	3	4	5	6	7
11. I make an effort to relate what we are learning to my personal interests.	1	2	3	4	5	6	7
12. I make studying more enjoyable by turning it into a game.	1	2	3	4	5	6	7
13. I try to get myself to see how doing the work can be fun.	1	2	3	4	5	6	7
14. I make the work enjoyable by focusing on something about it that is fun.	1	2	3	4	5	6	7
15. I think of a way to make the work enjoyable to complete.	1	2	3	4	5	6	7
16. I tell myself that I should work as least as hard as other students.	1	2	3	4	5	6	7
17. I keep telling myself that I want to do better than others in my class.	1	2	3	4	5	6	7
18. In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.	1	2	3	4	5	6	7
19. I remind myself about how important to get good grades.	1	2	3	4	5	6	7
20. I tell myself that I need to keep studying to do well in this course.	1	2	3	4	5	6	7
21. I convince myself to keep working by thinking about getting good grades.	1	2	3	4	5	6	7
22. When I have the opportunity in this class, I choose course assignments that I can learn from even if they don't guarantee a good grade.	1	2	3	4	5	6	7
23. I remind myself how important it is to do well on the tests and assignments in this course.	1	2	3	4	5	6	7
24. I promise myself I can do something I want later if I finish the assigned work now.	1	2	3	4	5	6	7
25. I make a deal with myself that if I get a certain amount of the work done I can do something fun afterwards.	1	2	3	4	5	6	7
26. I promise myself some kind of a reward if I get my readings and studying done.	1	2	3	4	5	6	7
27. I persuade myself to keep at it just to see how much I can learn.	1	2	3	4	5	6	7
28. I set a goal for how much I need to study and promise myself a reward if I reach that goal.	1	2	3	4	5	6	7

29. I try to study at a time when I can be more focused.	1	2	3	4	5	6	7
30. I try to connect the material with something I like doing or find interesting.	1	2	3	4	5	6	7
31. I make sure I have as few distractions as possible.	1	2	3	4	5	6	7
32. I try to get rid of any distractions that are around me.	1	2	3	4	5	6	7
33. I eat or drink something to make myself more awake and prepared to work.	1	2	3	4	5	6	7
34. I try to make a game out of learning the material or completing the assignment.	1	2	3	4	5	6	7
35. I think about doing better than other students in my class.	1	2	3	4	5	6	7
36. I try to make myself see how knowing the material is personally relevant.	1	2	3	4	5	6	7
37. In a class like this, I prefer course material that really challenges me so that I can learn new things.	1	2	3	4	5	6	7
38. I make myself work harder by comparing what I am doing to what other students are doing.	1	2	3	4	5	6	7
39. The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.	1	2	3	4	5	6	7
40. I think about how my grade will be affected if I don't do my reading or studying.	1	2	3	4	5	6	7
41. Getting a good grade in this class is the most satisfying thing for me right now.	1	2	3	4	5	6	7
42. The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.	1	2	3	4	5	6	7
43. I think about trying to become good at what we are learning and doing.	1	2	3	4	5	6	7
44. I want to do well in this class because it is important to show my ability to my family, friends, employer, and others.	1	2	3	4	5	6	7

Appendix E

Means and Standard Deviations

Test	<u>Treatment (CM)</u>		<u>Control (L)</u>		CM - L
	M	SD	M	SD	
<u>Pretest</u>					
Simple Knowledge	3.23	0.61	3.31	0.55	-0.08
Innate Ability	2.75	0.58	2.81	0.71	-0.06
Mastery Goal Orientation	4.58	1.13	4.75	1.03	-0.17
Performance Goal Orientation	5.68	1.07	5.68	1.08	0
Mastery Self-Talk	4.51	1.14	5.00	0.94	-0.49*
Relevance Enhancement	4.80	1.07	5.11	1.08	-0.31
Interest Enhancement	3.65	1.37	3.78	1.32	-0.13
Performance Self-Talk	4.54	1.19	4.75	1.29	-0.21
Self-Consequating	4.51	1.33	4.84	1.26	-0.33
Environment Structuring	5.02	0.99	5.22	1.01	-0.20
Extrinsic Self-Talk	5.33	1.33	5.70	0.94	-0.37
<u>Posttest</u>					
Simple Knowledge	3.13	0.57	3.28	0.51	-0.15
Innate Ability	2.61	0.53	2.95	0.49	-0.34**
Mastery Goal Orientation	4.67	0.97	4.54	0.91	0.13
Performance Goal Orientation	4.97	1.10	5.75	0.94	-0.78**
Mastery Self-Talk	4.62	0.96	4.91	0.89	-0.29
Relevance Enhancement	4.74	0.91	4.97	0.98	-0.23
Interest Enhancement	3.65	1.04	3.63	1.24	0.02
Performance Self-Talk	4.78	1.29	4.71	1.10	0.07
Self-Consequating	4.69	1.30	4.64	1.16	0.05
Environment Structuring	4.98	1.07	5.04	1.06	-0.06
Extrinsic Self-Talk	4.98	1.34	5.53	0.93	-0.55*

* Detectable at the .05 level. ** Detectable at the .01 level.