Effect of Learning Contracts and Examination Problem Types on Students' Mastery of Managerial Accounting Principles

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Doctor of Education

By

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Title of Dissertation: **EFFECT OF LEARNING CONTRACTS AND EXAMINATION PROBLEM TYPES ON STUDENTS' MASTERY OF MANAGERIAL ACCOUNTING PRINCIPLES**

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Abstract

The purpose of this study was to inform the teaching of introductory accounting and to contribute to the research aimed at understanding how students learn in the accounting discipline by exploring the effect of learner directed contracts on student approaches to learning and learning outcomes. In order to provide some evidence on the effectiveness of the intervention, two groups of introductory managerial accounting students were surveyed using the Revised Study Process Questionnaire (R-SPQ-2F) (Biggs, Kember & Leung, 2001) at the beginning and end of the course. A comparison of R-SPQ-2F scores for the treatment group was expected to reveal an increase in students' deep scores and a decrease in their surface scores. Further, the research investigated whether specific types of learning tasks and examination problems commonly used in teaching the discipline would be successful at focusing students' awareness on both the accounting concepts to be learned and the learning aspects of seeking meaning.

The results of the intervention utilizing learner-directed learning contracts were confounding in that there was no statistically significant increase in students' deep scores or a decrease in surface scores observed in the treatment group when compared to the comparison group, suggesting that learning contracts were not effective. However, sample size, duration of the research, selected textbooks and the appropriateness of entry level courses as the research venue were identified as factors that may have contributed to the results.

This research also examined whether students' mean examination scores could be influenced by learning approach. This research failed to make a correlation between learning approach and students' mean examination scores, and calls into question the appropriateness of examinations as an effective tool to assess student approaches to learning.

Finally, this research sought to establish a relationship between students' learning approach and their performance on various types of accounting examination problems. Three predictive models were developed to examine the relationship between examination question results and learning approach scores while accounting for the effect of question type. The models all had similar results in that there was a significant relationship between examination results, learning approach and question types, yet there was no significant interaction effect between learning approach scores and question type.

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Chapter I

Statement of the Research Problem

Introduction

The purpose of this study was to inform and influence the teaching of introductory accounting and to contribute to the development of research aimed at understanding how students learn in the accounting discipline by exploring the effect of learner directed contracts on student approaches to learning and learning outcomes. Competencies deemed to be important to accountants include critical thinking, problem-solving skills, written and oral communication skills, and the motivation to adopt a lifelong learning agenda (Sharma, 1997). These skills, needed to become a successful accountant, are complex and are better mastered through a deep learning approach rather than a surface approach. Understanding how accounting students learn may be a key factor in instilling these qualities in our future graduates.

A deep approach to learning is characterized by a personal commitment to learning and an interest in the subject. The student approaches learning with the intention to understand and seek meaning and searches for relationships among the material and interprets knowledge in the light of previous knowledge structures and experiences. According to Hall, Ramsay, & Raven (2004), a deep approach to learning is more likely to result in better retention and transfer of knowledge and may lead to quality learning outcomes such as a good understanding of the discipline and critical thinking skills.

A surface approach to learning is characterized by an intention to acquire only sufficient knowledge to complete the task or pass the subject. The student relies on

memorization and reproduction of material and does not seek further connections, meaning, or the implications of what is learned. A surface approach is externally focused and tends to result in a lack of engagement with the subject and views learning as the accumulation of unrelated pieces of information for assessment purposes (Hall et al., 2004). Students are unlikely to experience high-quality learning outcomes. Figure 1 highlights the differences in learning approach.

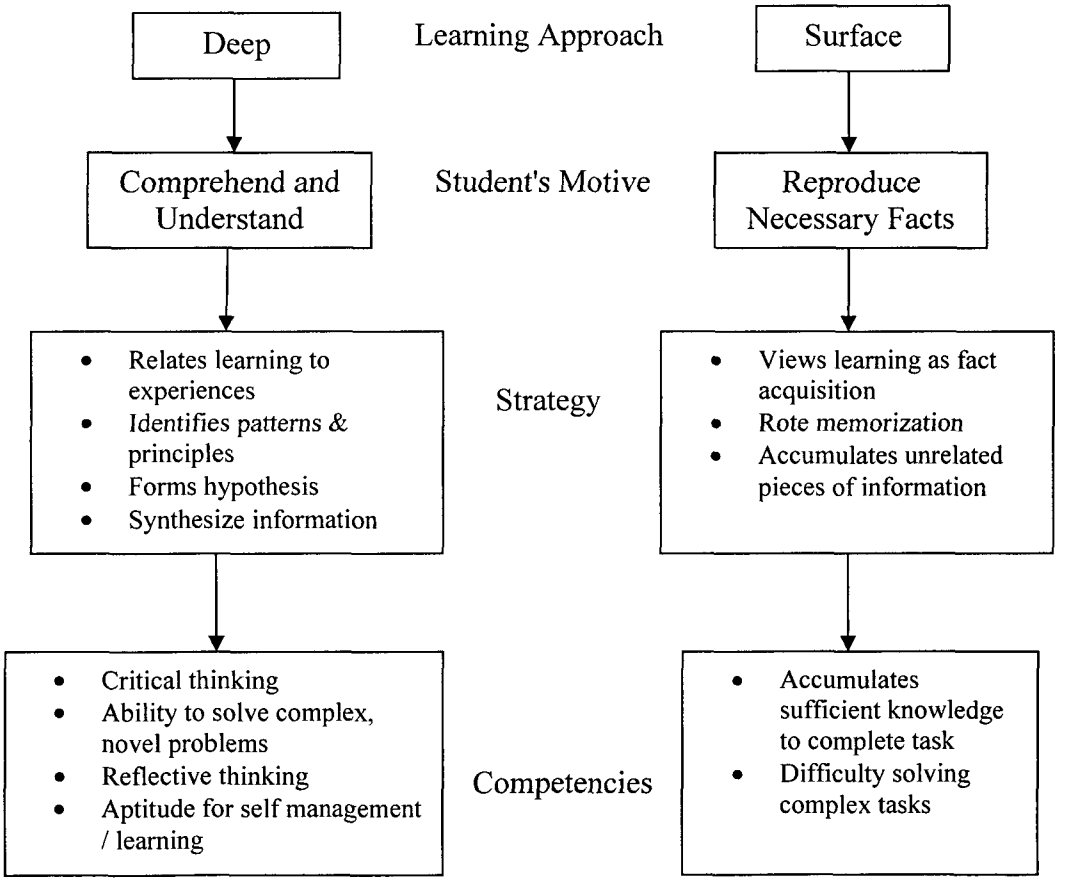

Figure 1. The differences in learning approach

This research contributes to the existing literature on student approaches to learning by providing a rich description of an intervention aimed at fostering a deep

approach to learning involving students in their learning environment. This intervention was designed to foster an element of independence in learning through the utilization of learner directed contracts as a means of establishing the out-of-class study requirements. The aim of the contract was to draw on the students' desire for control and independence in their learning. There is evidence to suggest that student independence is a contributing factor to the use of a deep learning approach (Gow & Kember, 1990; Jackling, 2005; Ramsden, 2003).

The selection of contractual tasks was designed to encourage a deep learning approach and such other higher quality learning outcomes as improved analytical and conceptual thinking skills. The research provides insight into the effects that the various accounting problem constructs typically used as practice sets and examination problems have on a student's choice of learning approach. The literature suggests that certain types of problems and assessments are more effective at fostering a deep learning approach (Biggs, Kember & Leung, 2001; Davidson, 2002). This research explores the effectiveness of various problem constructs in fostering the desired deep approach to learning by identifying the relationships between examination problem types and the student's reported approach to learning. Examination problem types were those typically found on accounting examinations. An understanding of the relationships between problem constructs and approaches to learning allows educators to design practice sets and examination problems that encourage students to adopt a deep approach. Finally, the study attempted to make a connection between course outcomes as measured by the total

mean grade achieved on course examinations and the student's reported approaches to learning.

The research was a quasi-experimental design utilizing in-tact groups. Two classes of introductory managerial accounting students were selected; one class received the treatment while the other, the comparison group, was taught in the traditional manner.

The study approaches adopted by the students in both study groups where identified by administrations of the Revised Study Process Questionnaire (R-SPQ-2F) (Biggs et al., 2001). The questionnaire was administered to both the treatment and the comparison groups at the beginning of the course to determine their typical approach to learning. The questionnaire was again administered to both groups of students at the end of the course to observe any change in approach as measured by the R-SPQ-2F scores between those students who experienced the intervention and those students who undertook the traditional accounting course.

Historical and more recent research suggests that learning takes place in context (Biggs, 1987; Lucas & Mladenovic, 2004; Marton & Saljo, 1976b; Mladenovic, 2000, 2003; Ramsden, 1979, 2003), and that a student's choice of learning approach is a function of the students past experiences, the particular discipline, as well as the curriculum and assessment methods. Students will adopt an approach to learning that they believe will be effective for the required task. This study draws on existing research in various disciplines related to students' approaches to their learning and whether it is possible to encourage students to adopt a deep approach to learning through interventions in the learning context. Ramsden (2003) presents a model of Student Leaning in Context

that identifies the student's orientation to study and the context of learning as key variables affecting the choice of a student's approach. Birkett and Mladenovic (as cited in Hall et al., 2004) suggest that the learning context is the mechanism through which teachers can affect their students' motives, perceptions and approaches that they use in learning. Accordingly, this study aimed to manipulate the learning environment in ways intended to encourage a student's deep approach to learning.

Rationale and Design of the Project

There has long been a debate over whether introductory accounting should be taught from a conceptual or a procedural point of view (Shute, 1979). Arguments for the procedural viewpoint have centered on the pragmatic fact that these methods generally work, that is, students learn what is taught in the introductory courses. The conceptualists argue that procedures are necessary and important but that a heavy emphasis on procedures focuses the learning on the bookkeeping aspects of accounting rather than the presentation and interpretation of financial statements.

Traditional definitions of accounting emphasize the procedural aspects of accounting (Shute, 1979). Consider first the definition of accounting as set forth by the American Institute of Certified Public Accountants (AICPA) in 1933 (as cited in Shute, 1979):

> The art of recording, classifying and summarizing in a significant manner and in terms of money, transactions and events which are, in part at least, of a financial character and interpreting of events thereof.

Wild (2011) provides a current and similar definition of accounting:

> Accounting is an information and measurement system that identifies, records, and communicates relevant, reliable and comparable information about an organization's business activities (pp 4).

The AICPA definition emphasizes the mechanical aspects of the discipline. Similarly, the second more current explanation contains the same mechanical aspects, yet includes a responsibility to communicate results.

Extending the definition beyond the process of creating records and reports to identifying meaningful relationships between events and financial results, then the process of accounting education may be as important as the content of such education. Meigs, Johnson, and Meigs (as cited in Shute, 1979) view accounting as follows:

> Accounting extends beyond the process of creating records and reports....[Accountants] look for meaningful relationships between events and financial results; they study the effect of various alternatives; and they search for significant trends that may throw some light on what will happen in the future.

As cited above, Wild (2011) and Meigs et al. suggest that accounting has advanced beyond the recording of transactions; subsequently, this researcher believes that accounting education must follow this practice accordingly. The professional training for accountants must include the ability to analyze and solve independent problems and situations, purports Shute (1979). Reliable solutions require the use of knowledge, reasoning and judgment. Shute further emphasizes, accounting education programs must provide the emphasis on reasoning and judgment.

Accounting programs have been criticized for developing technicians who lack a broad perspective. Shafer & Kunkel (2001), note that practitioners have repeatedly called for greater emphasis on communication and interpersonal skills, teamwork, analytical thinking, and a broader knowledge base in the field. Commensurate with Shafer & Kunkel, the call for reform in accounting education intensified after the passage of the 150-hour education requirement by the AICPA membership in 1988 and the issuance of an influential White Paper by the "Big Eight" accounting firms in 1989. Although accounting graduates have the requisite technical knowledge, they have been criticized for lacking broad perspective, thinking analytically, exhibiting limited written and interpersonal communication skills, as well as working collaboratively report Shafer & Kunkel. Additionally, a fundamental concern, note Byrne, Flood, & Willis, (2004), as well as Hall et al. (2004) is for accounting education programs to instill in students the value of life-long learning and professional development. Hence, Shafer & Kunkel emphasize a shift from the procedural tasks and the memorizing of professional standards, to a more conceptual and analytical form of learning. The Accounting Education Change Commission (AECC) (1990) endorses the need for students to acquire critical thinking processes by stating:

> Accounting programs should prepare students to become professional accountants, not to be professional accountants at the time of entry to the profession. Graduates cannot be expected to have the range of knowledge and skills of experienced accountants. Rather, pre-entry education should lay the base on which life-long learning can be built. Graduates should be taught how to learn.

The commission further states that to become successful professionals, accounting graduates must possess the more complex skills of effective communication including reading, writing, listening and speaking and the ability to work effectively in groups and provide leadership when appropriate.

Finally, a strong fundamental understanding of accounting is necessary for successful accounting careers. This understanding includes 1) the ability to identify goals, problems, and opportunities, 2) the ability to identify, gather, measure, summarize, verify, analyze, and interpret financial and non-financial data that are useful for addressing the goals, problems, and opportunities, and 3) the ability to use data, exercise judgments, evaluate risks, and solve real-world problems. The focus should be on developing analytical and conceptual thinking, not on memorizing professional standards.

The overriding objective of accounting programs should be to teach students to learn on their own. Therefore, accounting programs should not focus primarily on preparation for professional examinations. Students should be taught the skills and strategies that help them learn more effectively and how to use these effective learning strategies to continue to learn throughout their lifetimes. Students must be active participants in the learning process, not passive recipients of information. They should identify and solve unstructured problems that require use of multiple information sources. Learning by doing should be emphasized. The content of the program must create a base upon which continued learning can

be built. A focus on memorization of rules and regulations is contrary to the goal of learning to learn.

Learning is often defined and measured in terms of knowledge of facts, concepts, or principles. This "transfer of knowledge" approach to education has been the traditional focus of accounting education. One goal of the AECC is to change the educational focus from knowledge acquisition to "learning to learn," that is, developing in students the motivation and capacity to continue to learn outside the formal educational environment. Learning to learn involves developing skills and strategies that help one learn more effectively and to use these effective learning strategies to continue to learn throughout his or her lifetime. (AECC, 1990, p. 1-4).

Consequently, the profession has responded to the need for improved accounting education. The membership of the American Institute of Certified Public Accountants (AICPA) approved an amendment to its bylaws requiring 150 semester hours of education for membership in the organization (Shafer & Kunkel, 2001). Further, State Boards of Accountancy in a majority of the United States and its jurisdictions, cite Fuller & Hargadon (2008), have adopted the 150-hour requirement for licensure as a Certified Public Accountant (CPA). This increased educational requirement acknowledges the fact that being successful in accounting requires a broad range of difficult technical, ethical, and professional judgment knowledge as well as problem-solving and technological skills (Fuller & Hargadon).

A study by Shafer and Kunkel (2001) suggests that the 150-hour requirement has not met its intended objective of providing a richer general education curricula. Although the intent was to encourage a broadened management-education experience for accounting graduates and improve the CPA's overall work quality (Fuller & Hargadon, 2008), undergraduate accounting programs have continued to follow their traditional formats (Shafer & Kunkel) and are not much different today from what they were 10, 20 or 40 years ago claim Siegel, Sorensen, Klammer & Richtermeyer (2010). Most schools have been meeting the five year educational requirement by having their students earn either a Master's degree in accounting or a Master's degree in Business Administration. This approach is in opposition to the vision which would have modified the focus of undergraduate programs to permit a broader, more liberal educational experience.

Davidson (2002) says that the development of analytical and conceptual thinking requires a conceptual form of learning, which is very different from simply memorizing facts and procedures. Knowledge is far more usable if gained through the use of high-level reasoning processes. He claims deeper levels of understanding should result in a view of accounting as a means of solving complex problems and developing new insights used in understanding the discipline. Students who experience accounting as a means of solving complex problems are aware that numbers and rules are tools used to solve problems, according to Cope (2002). Students who only experience the study of accounting as learning those rules may have a view of accounting that could limit them in solving the complex problems they will encounter in practice.

It should also be noted that certain base level information is necessary for the further study of accounting (Entwistle, Hanley and Ratcliffe,1979; English, Luckett & Mladenovic, 2004; Shute, 1979). Students without this base knowledge will likely experience difficulty and could lose interest with the discipline. Furthermore, Entwistle, et al. draw attention to students who lack prerequisite knowledge or interpretative skills as they may approach learning with a deep intention, yet fail to exhibit either deep level processing or a deep level outcome.

Approaches to Learning

During the early part of the twentieth century, responsibility for high achievement in a course of study was perceived as the student's responsibility, with effort explained in terms of the student's motivation and application exhibited through study habits, note Entwistle & McCune (2004). It is now clear that student achievement is affected by a much more complex web of interaction (Ramsden, 2003;Biggs, 1987).

Summarizing a series of studies they conducted at Gothenburg University, Marton and Saljo (1976a) concluded that students used basically two different levels of processing: a deep level and a surface level. In the case of surface level processing the student directs his attention towards learning the text itself, he has a reproductive conception of learning which means that he is more or less forced to keep to a rote learning strategy. Conversely, deep level processing directs the student towards the intentional content of the learning material. The aim is to comprehend what the author wants to say about a certain problem or principle.

The deep approach to learning is one in which students aim to understand the subject and seek meaning, emphasizes Lucas (2001). They express an intrinsic interest and derive enjoyment from studying. They adopt strategies that allow them to relate ideas to their own experience, distinguish evidence from argument, identify patterns and principles, form hypotheses, and relate what they learn to other subjects or to topics. The surface approach to learning, on the other hand, is one in which students aim primarily to memorize or reproduce material. Students see the task of learning as externally imposed, are extrinsically motivated, and adopt strategies that focus on fact acquisition and rote memorization. They treat parts of the subject as separate entities, while failing to integrate topics into a coherent whole.

Accounting programs need to produce graduates who are active, independent learners, with the knowledge, skills and competencies necessary to perform effectively throughout their careers. Beattie (as cited in Byrne & Flood, 2004) states that to achieve these outcomes, accounting education must move away from procedural learning towards a more conceptual form which encourages deep approaches to learning. The learning approaches adopted by accounting students may be a key factor influencing the quality of their learning outcomes (Davidson, 2002).

Research by Duff (2004) suggests that accounting students appear to favor surface over deep learning approaches. One explanation for their use of this approach may lie in the procedural approach of teaching the discipline which is supported by curriculum design, the CPA examination requirements, and the types of examination problems and practice sets utilized in teaching the discipline.

Surface approaches by their nature are focused towards memorization and reproduction of course material. When difficulties arise, the appropriate solutions may not be generated by the memorized material. Conversely, Duff & McKinstry (2007), purport that students who predominantly follow a deep approach to learning would be better prepared to resolve these difficulties as they arise, since their problem-solving skills are developed as part of this approach. Thus, Booth, Luckett, & Mladenovic (1999) argue that encouraging deep learning approaches among accounting students will facilitate achievement of the learning objectives outlined by the Accounting Education Change Commission (AECC).

Historical and more recent literature, (Biggs, 1987; Marton & Saljo, 1976b; Ramsden, 2003) suggest that a student's learning approach is in response to a context. Furthermore, Lucas and Mladenovic (2004), as well as Biggs (personal communication, October 8, 2009) agreed by suggesting that there is no such thing as a student who is a "surface" or a "deep" learner. Rather, the approach taken by a student is more likely to be influenced by personal factors such as motivation and contextual factors such as curriculum design, course culture, and assessment tasks. Lucas and Mladenovic's work revealed that students have tendencies toward or may favor particular approaches to learning regardless of context. Variability and consistency of learning approach coexist in that some students exhibit tendencies toward particular approaches regardless of context claims Ramsden (2003) and Biggs (1987).

Learning in Context

The different approaches to learning do not constitute a characteristic of the student; rather, they are instead a response to the student's perception of the context within which the teaching and learning takes place. Ramsden (1992) states that although the same student may use different approaches, it is also true that students have tendencies toward particular approaches, which are largely the result of previous educational experiences. While educators cannot influence the orientations to learning that students' bring to their studies, they can manipulate the learning context, providing a window of opportunity to influence the approach students adopt, and therefore the quality of student learning (English et al., 2004).

Approaches to learning focus on personal and contextual factors and their relationship to how students choose or avoid particular learning strategies (Lucas & Mladenovic, 2004). Accordingly, a student's response to a context may change depending on how the student perceives the context. Since one important aspect of context is the discipline being studied, this emphasizes the importance of research being carried out within an accounting education context.

Although much has been done on how students learn, a review of the literature suggests that there is a need for further research within specific disciplinary settings (Neumann, 2001; Lucas, 2001; and Hall et al., 2004). Meyer and Eley (as cited in Lucas, 2001) argue: "Individual students might well adopt differentiated patterns of learning behaviors that are attributable to the learning contexts shaped by different subjects. That is, perceptions and experiences of learning contexts might be shaped also by the

epistemology of a discipline and they might therefore vary considerably from one discipline to another" (p.162). Further, Ramsden (2003) reinforces that the same student learns differently in different situations. What constitutes an approach to learning will vary according to the academic task. Since typical tasks vary between different disciplines, the way in which approaches manifest themselves will also vary.

Ramsden (2003) presents a model of Student Learning in Context shown in Figure 2 that identifies the student's orientation to study and the context of learning as key variables affecting the choice of the student's approaches to learning. The figure helps to visualize the contextual nature of learning and the possible relations between different aspects of learning and teaching. It suggests a chain of connections which establish points of intervention at which educators might enhance the quality of student learning by changing the curricula, teaching methods, or methods of assessment; resulting in a change in students' approaches to learning.

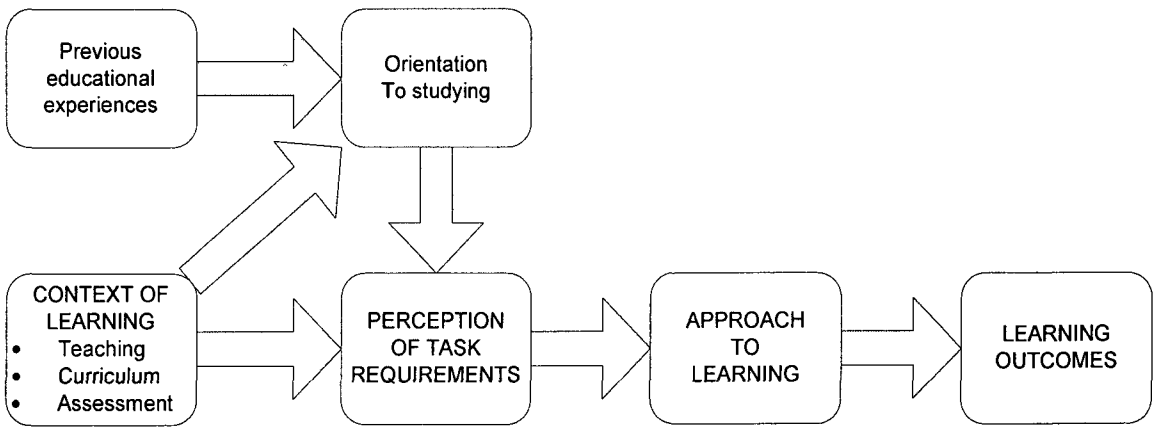

Figure 2. Student learning in context (Ramsden, 2003, p. 82)

Biggs (1987) proposed a similar learning model which indicated that both personal and institutional factors affected the choice of students' approaches to learning. Students' approaches to learning are conceived as forming part of a total system in which an educational event takes place as evidenced in the Presage-Process-Product (3P) model exhibited in Figure 3. Student factors, teaching context, on-task approaches to learning, and the learning outcomes in the 3P model interact to form a dynamic system. Presage factors refer to what exists prior to engagement that affects learning. For the student, this includes such factors as prior knowledge, ability, and the student's preferred approaches to learning. Presage includes the nature of the content being taught, methods of teaching and assessment, the institutional climate and procedures for the instructor. Biggs' model theorizes that on the basis of the complex interaction of its components, students will choose to approach their learning using either surface, deep or achieving strategies, or some combination of these, which best fits their perception of the circumstances confirm Gordon & Debus (2001). The appropriateness of their choice of strategy will be informed by the outcomes of their engagement in the process. Biggs' model of learning, therefore, also defines some points in the process at which interventions might take place and confirms that learning is contextual.

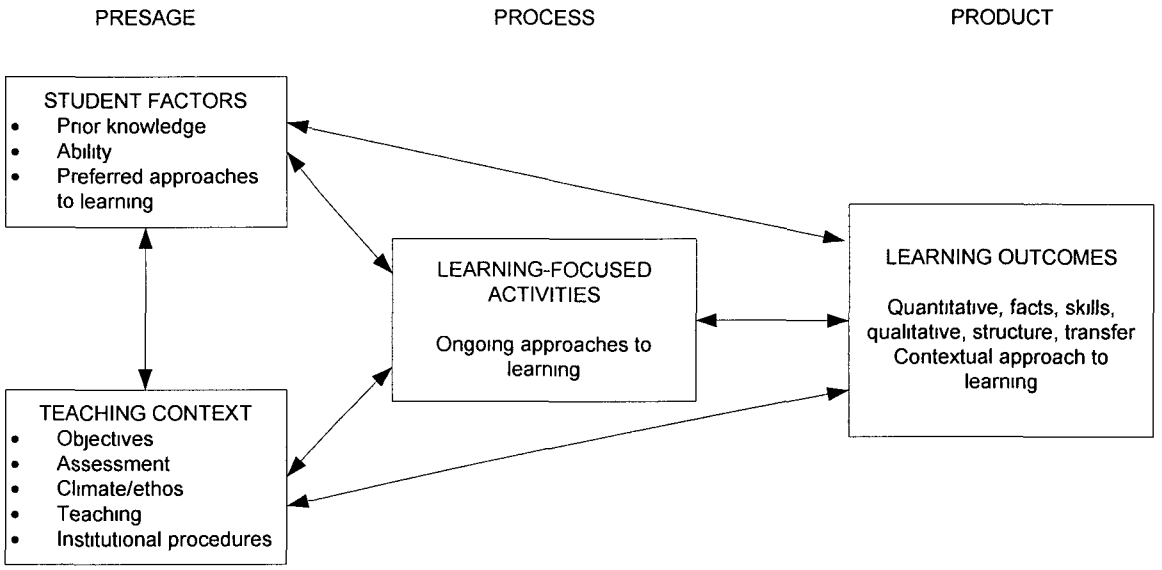

Figure 3. The 3P model of teaching and learning (Biggs, Kember & Leung, 2001, p.136)

Learning Contracts

High quality teaching implies recognizing that students must be engaged with the content of learning tasks in a way that enables them to reach understanding. Perceptions of choice over how to learn the subject matter, and of control over which aspects to focus on relate to high quality learning. Research focusing on teaching evaluations by Ramsden and Entwistle (1981) revealed that academic departments with highest mean scores on meaning orientation (deep learning) were perceived as having good teaching and allowing freedom in learning. Departments with the highest mean scores on reproducing orientation (surface learning) appeared to place a heavy workload on students and a lack of freedom in learning prevailed.

Good teaching fosters a sense of student control over learning (Ramsden, 2003). Perceptions of choice over how to learn the subject matter are related to high-quality

learning. This study draws on those perceptions by attempting to alter the student's learning approach through the use of learner directed learning contracts. Good teaching provides relevant learning tasks at the appropriate level for the student's current understanding; it recognizes that each student will learn best in their own way and avoids creating over-dependence on the instructor. Moreover, it helps students to understand the essence of scholarship and investigation by providing them the opportunity to practice the art of inquiry.

Marton, Hounsell and Entwistle (as cited in Anderson, Boud & Sampson, 1996) suggest that a significant feature of contract learning is its potential to promote deep approaches to learning. When well prepared, learners are encouraged to go beyond assembling subject knowledge to consider how this knowledge may actually be acquired, what it may mean to them, how successful their learning has been and what further implications it may hold. The contract method can stimulate learners to examine their own assumptions, beliefs, and learning preferences while being self-reflective and collaborative in their work.

Assessment

Deep and surface approaches to learning are responses to the educational environments in which students learn, emphasizes Ramsden (2003). Students' experiences of curricula, teaching methods, and assessment procedures create an educational environment or context for learning, as they respond to the situation they perceive. Accordingly, expecting students to use deep approaches when the educational environment rewards surface approaches is unrealistic.

Assessment methods are one of the most critical influences on student learning, claims Ramsden (2003). Assessment practices demonstrate to undergraduate students what competence in a subject really means and reveal educator's ambitions to develop understanding and critical thinking in specific disciplines. Nijhuis, Segers, & Gijselaers, (2005) believe good teaching should seek to find assessment methods that motivate students toward and promote a deep approach to learning. Assessment methods that are perceived to test students' ability to reproduce large quantities of information or to manipulate procedures unthinkingly, tell students that the aims for conceptual understanding are really those of recalling facts. Nijhuis et al. further conclude that the process of assessment then influences the quality of student learning in that it affects students' approaches, and if it fails to test understanding, it permits students to pass courses without the understanding of the subject matter. According to Ramsden, students will adopt learning strategies that enable them to earn high grades. Assessment methods can impose pressures on a student to take the wrong approaches to learning tasks. It is, therefore, assessment, not the student, that is the cause of the problem.

This is not to imply that examinations are bad and essays good; rather, Ramsden (2003) suggests that inappropriate assessment methods may push students towards learning via ineffective and daunting ways. Inserting numbers in formulas may have some advantages when learning a new topic, but more often implies poor quality engagement with the material. The literature suggests that problem formats can play a key role in a student's selected approach to learning (Biggs et al., 2001; Davidson, 2002). Generally, multiple-choice and short answer tests elicit a surface approach to learning,

according to Sugrue (1993), while essay or problem questions which require the demonstration of personal understanding encourage a deep approach.

Succinctly, the aim of this research was to examine the various problem constructs traditionally utilized in accounting course assessments and practice sets and identify the relationships between those problem types and students' assessed approach to learning. Knowledge of how the various problem types associate with learning approaches will inform assessment design and result in assessments consistent with students acquiring the desired skills of the discipline.

Overview of Methodology

This research involves changing the way in which a group of students approach their learning in an introductory managerial accounting course. Specifically, it attempts to encourage a deep approach to learning by manipulating the learning context. Marton and Saljo (1976b) learned in their studies that it was easy to push students into using surface approaches by altering the context of learning, but that changes in the questions asked did not necessarily lead to students adopting a deep approach. As might be expected, other elements of the learning context have their effect. While it is possible to create environments favorable to a deep learning approach, other unmeasured factors of the learning context may cause unintended results. Possible reasons for this are difficulty overcoming entrenched notions of learning and studying on the part of students and the difficulty associated with students responding to their perceived learning environment, not the learning environment envisioned by the instructor note Hall, Ramsey & Raven, (2004).

Although there is a wide variety of innovative instructional approaches used in teaching accounting, research that examines the possible effects of those approaches on students' learning approaches or learning outcomes is scarce as noted by Hall et al., (2004) and this researcher. Although, research has examined changes in accounting students' approaches to learning over time and across different subjects, there appears to be little research on how specific changes in the learning environment influence accounting students' approaches to learning.

Prior attempts at interventions designed to encourage deep learning approaches, claim Hall et al. (2004) have had mixed results. Byrne et al. (2002) reported that students who scored higher on the deep approach scale also performed at an academically higher level. Duff (2004) reported no relationship between approaches to learning and academic performance. Davidson (2002) made an association between the deep approach and complex examination questions but failed to find any association between surface approaches and performance. Booth et al. (1999) were not successful in relating a deep approach and performance, but did report a negative relationship between a surface approach and academic outcome.

Multiple administrations of the Revised Study Process Questionnaire (R-SPQ-2F) were used to assess the success of the intervention as measured by both changes in students' approach scores from the beginning of the course to the end, as well as student mean total examination scores. Information derived from R-SPQ-2F can serve as indicators in a number of research contexts (English et al., 2004). First, it can measure students' orientations to learning, that is, their predisposition to adopt a particular

approach. Second, the scores can be used descriptively to indicate the approach to learning students employ in various educational settings, and third, when used in comparative studies, the scores can indicate the effect of the learning context on students' learning processes.

Research Questions

Marton and Saljo (1976a) found that the ways in which students approach the task of learning followed two paths: a deep approach or a surface approach. Their work revealed that the learning process had a contextual meaning, and learning outcomes were the result of many factors in a particular learning environment. Both Biggs (1987) and Ramsden (2003) systemized the learning process and theorized how the various elements of context were related. Both of their models suggest points in the learning process at which we can intervene, manipulate the teaching context and alter the student's approach to learning and ultimately the learning outcome.

The literature (Ramsden & Entwistle, as cited in Duff, 2004; Gow & Kember, 1990; Jackling, 2005) further suggests a connection between the contextual elements of student independence and some level of freedom in choosing their learning and assessment activities and students' adopting a deep approach to learning. Ramsden (2003) concludes that the connection between low independence programs and a reproducing orientation is much stronger than the connection between high independence programs and a meaning orientation. The first research question that guided this study was:

1. Can modifications to the learning environment of an introductory managerial accounting course in the form of learner directed contracts yield an increase in students' deep approach scores or a decrease in students' surface approach scores, as measured by multiple administrations of the R-SPQ-2F?

The results of studies attempting to link examination results as a measure of learning outcome with learning approaches are poorly correlated report Byrne et al. (2002) and English et al. (2004). Furthermore, Booth et al. (1999) found a significant negative correlation between the surface approach and academic performance, but no relationship existed for the deep approach. Byrne et al. discovered a significant positive relationship between the deep approach and assessment results, yet a highly significant negative correlation for the surface approach. Davidson's (2002) work revealed a significant relationship between performance on complex examination questions and the use of a deep study approach; however, no significant relationships between the use of a deep study approach and performance on questions that are less complex or mean examination scores or between the use of a surface study approach and any examination results were discovered. The inconsistent research results linking study approach and quantitative learning outcome lead to the second, domain specific research question in this study:

2. Which learner grouping, deep or surface, will benefit more from a managerial accounting course utilizing learner directed contracts as measured by their mean examination scores throughout the semester?

Research suggests that students will select or vary their approaches to learning to coincide with the construct of the particular task (Byrne et al., 2002; Marton & Saljo, 1976b; Ramsden, 2003). Given that a deep approach to learning is believed to be more desirable in reaching course objectives, specific learning tasks should be employed that foster a deep approach. A third purpose of this research was to identify practice set and examination problem types that stimulate the use of a deep approach. An understanding of which problem types result in better learning outcomes, as measured by both achieved grade and adopted approach to learning, will better inform educators on practice set and examination design consistent with achieving the complex thought processing the profession demands of its graduates. The third question explored by this research was:

3. Which students will perform better on various problem types: those who scored higher on the deep approach scale or those who scored higher on the surface learning scale?

Definition of Terms

Approach to learning. An approach to learning is the way in which someone goes about learning (Ramsden, 2003). It is a relation between the person and the material being learned. The concept of approach describes a qualitative aspect of learning which is about how people experience and organize the subject matter of a learning task. It is about "what" and "how" they learn rather than "how much" they remember. Students use different approaches for different tasks.

Deep learning approach. A deep approach to learning is characterized by a personal commitment to learning and an interest in the subject. The student approaches

learning with the intention to understand and seek meaning and searches for relationships among the material and interprets knowledge in the light of previous knowledge structures and experiences. A deep approach to learning is more likely to result in better retention and transfer of knowledge and may lead to quality learning outcomes such as a good understanding of the discipline and critical thinking skills (Hall et al., 2004).

Learning strategy. A learning strategy is one of two definitive components of a student's approach to learning. A learning strategy is a tactic for handling a procedure (Jackling, 2005). Tactics include rewriting notes, memorizing, and reperforming homework assignments. Selective memorizing and seeking meaning are considered strategy for the surface and deep approaches to learning, respectively (Biggs et al., 2001).

Learning motives. A learning motive is the second definitive component of a student's approach to learning. Jackling (2005) identifies such motives as: obtaining high grades; just doing enough work to pass; completing the course with minimum effort; and seeking depth of understanding. Fear of failure and intrinsic interest are seen as the motives for a surface or deep learning approach, respectively (Biggs et al., 2001).

Learning outcome. Entwistle (as cited in Byrne, Flood & Willis, 2002) defines the outcome of learning as "what students can demonstrate of their increases in knowledge and changes in understanding as a result of their experiences in school or college." For purposes of this research, learning outcomes will be defined as the mean examination grades earned by students.

Learning contract. A learning contract is a document used to assist in the planning of a learning project. It is a written agreement negotiated between a learner and

an instructor that a particular activity will be undertaken in order to achieve a specific learning goal or goals (Anderson et al., 1996). Learning contract theory derives largely from the ideas of educators such as Malcolm Knowles who believed that adult learners should be encouraged to take more responsibility for their own learning and to use their existing skills and experiences as the basis for new learning and that they should also be allowed in formal educational settings to learn things which are of importance to them.

A learning contract typically specifies (a) the knowledge, skills, attitudes, and values to be acquired by the learner (objectives); (b) how these objectives are to be accomplished (resources and strategies); (c) the target date for their accomplishment; (d) what evidence will be presented to demonstrate that the objectives have been accomplished; and (e) how this evidence will be judged or validated (Knowles, 1986).

Surface learning approach. A surface approach to learning is characterized by an intention to acquire only sufficient knowledge to complete the task or pass the subject. The student relies on memorization and reproduction of material and does not seek further connections, meaning, or the implications of what is learned. A surface approach is externally focused and tends to result in a lack of engagement with the subject and the accumulation of unrelated pieces of information for assessment purposes (Hall et al., 2004). Students are unlikely to experience high-quality learning outcomes.

Significance of the Research

This research contributes to the existing body of knowledge on discipline specific approaches students adopt by describing the effects of an intervention in the learning context of an introductory managerial accounting course designed to encourage students

to adopt a deep approach to learning. It provides a rich description of a discipline specific intervention exploring the effectiveness of the use of learning contracts and the effects various practice set and examination problem types have on students' choice of a learning approach.

Student approaches to learning has been the subject of vigorous research efforts by accounting education researchers in United Kingdom, Australia, and Hong Kong, as evidenced by its widespread use in university faculty development programs (Duff & McKinstry, 2007). Accordingly, this research contributes to the existing body of literature by extending research on the topic to include students in the United States.

A better understanding of students' study strategies is valuable to colleges and universities in demonstrating the effectiveness of their teaching in response to increasing requirements on institutions to justify their funding (Entwistle & McCune, 2004). Similarly, this research supports pressures placed by accreditation bodies on universities to document student learning outcomes. Byrne, Flood, and Willis (2004) contend that since learning outcomes are so heavily influenced by the approaches students take to learning, gaining an understanding of these approaches is crucial to designing and implementing effective teaching strategies. Additionally, the results may be used to support the argument that more resources should be allocated to introductory accounting courses because the teaching approach and learning materials are so crucial to student attitude formation. Friedlan (1995) contends that desirable teaching approaches are more labor intensive than the traditional alternatives.

Managerial accounting, as one of the first accounting courses and a service course to many majors, is considered to be one of the most important business courses because its content plays a key part in the academic success of business students (Lloyd & Abbey, 2008). All business majors are required to take the course and obtain a C grade or better in order to advance in the major. Given its quantitative nature, managerial accounting also tends to fall into the category of courses labeled as high risk with a high rate of failure, claim Lloyd & Abbey. It is important, therefore, that instructors and developers of introductory accounting courses provide an informed course context and develop the skills and techniques necessary to effectively teach the content in order to improve the rates of failure.

The AECC (1992) emphasizes the importance of introductory accounting in influencing students' perceptions in its Position Statement No. 2 which states: "The first course in accounting has even more significance for those considering a career in accounting and those otherwise open to the option of majoring in accounting. The course shapes their perception of 1) the profession, 2) the aptitudes and skills needed for successful careers in accounting, and 3) the nature of career opportunities in accounting" (p. 1). These perceptions will affect whether the supply of talent will be sufficient for the profession to thrive, according to Friedlan (995).

Students' perceptions of the accounting discipline are a key factor in attracting and retaining the high quality students the profession needs. Studies that explored the factors leading to university enrollment declines of accounting majors reported that such declines were due largely to the perceptions held among non-accounting majors

regarding the accounting profession (Saudagaran, 1996). With accounting as a gateway subject in the business curriculum, Lloyd & Abbey (2008) content that concerned administrators and designers of university programs of business administration must be cognizant of the important function of teaching methodologies in changing perceptions about accounting. Accounting courses that create realistic perceptions about the profession are likely to attract students with the qualities consistent with those perceptions to choose accounting as a major. Holland (as cited in Friedlan, 1995) states that to make career choices, people gather information about careers, form stereotypes according to their preferences, and imagine how they will fit into the stereotype. Friedlan (1995) argues accounting courses that offer students the "wrong" perceptions of accounting may contribute to the "right" people choosing non-accounting careers and the wrong people becoming accountants.

A final benefit to be derived from this research is the potential advantage of helping students become aware of their approaches to learning. Research by Entwistle Hanley, and Ratcliffe (1979) reveal that certain students recognized their approach to learning had not been successful. However, when the students were questioned about their level of satisfaction with their performance one replied, "I feel that some of my answers are vague and need more detail....I made the mistake of trying to retain everything, rather than just the important features" (p. 109). This researcher believes that making students aware of their approaches to learning suggests the possibility that they could be changed or manipulated.

Summary

Ramsden (2003) purports that deep approaches to learning generate high-quality, well structured, complex outcomes and commitment to the subject. Surface approaches lead at best to the ability to retain unrelated details, often for a short period. Since learning is best understood in context, the precise descriptions of surface and deep approaches differ from task to task, and from subject area to subject area, just as learning outcomes in different subjects vary. The approaches, however, have enough in common across different tasks to allow us to speak confidently about the universal relevance of their differences.

The accounting profession has defined the qualities students must possess to be successful in the discipline. Those qualities are believed better developed through the use of a deep approach to learning. Accordingly, a learning environment that fosters a deep approach would be consistent with attaining those qualities. Learning is contextual. Both Biggs (1987) and Ramsden (2003) present learning models conceptualizing the learning process and implying points at which it is appropriate to intervene to effect or change the learning outcome. This research intervened in the learning context by introducing the use of learner directed learning contracts and problem constructs designed to foster a deep learning approach. The use of learner directed contracts draws on students' relationships between independence in learning and the use of a deep learning approach, as well as life-long learning, both being attributes considered desirable in accounting graduates claim Byrne et al. (2004).

The next chapter reviews the current body of literature on student approaches to learning. Literature on assessment and its relation to learning approaches is presented. Finally, given the contextual nature of learning, research on the various elements of learning context is presented along with a brief review of learning contracts.

Chapter II

Review of the Relevant Literature

Introduction

The first section provides the theoretical grounding for the proposition that students approach their learning tasks in different ways by reviewing the seminal research of Marton and Saljo, Ramsden and Biggs. The second section reviews the literature on student assessment and its relationship to learning approach and provides some theoretical grounding for the proposition that various problem types encourage specific learning approaches. The third section reviews the literature examining other elements of the learning context effecting a students learning approach as grade point average, gender, perceptions of the subject being studied, and student workload. Finally, the literature examining contract learning is briefly reviewed.

Deep and Surface Approaches to Learning

An early attempt to define effective study methods was done by Brown and Holtzman (as cited in Entwistle & McCune, 2004). Their inventory of study methods contained four subscales: effective study procedures; promptness in completing work; favorable opinions about teachers; and approval of educational objectives. About the same time, Pask (as cited in Entwistle & McCune, 2004) used a variety of experiments to demonstrate the existence of distinct learning styles and strategies. He found that students adopted either a holistic or a serialist strategy.

Marton and Saljo's (1976a) phenomonagraphic research became the point of departure for the conceptual framework recognized today as "student approaches to

learning" (Biggs et al., 2001). The starting point of their research was that learning should be described in terms of its content. Their studies found that a number of categories or levels of outcome containing different conceptions of the content of the learning task could be identified. Further, the corresponding differences in level of processing could be described in terms of whether the learner engaged a surface or deep level of processing (Marton & Saljo, 1976a). The aim of their research was to explore the differences in what students learned and to describe the differences in the process of learning which gave rise to the differences in outcome.

The outcome of learning is commonly described in quantitative terms as the total number of correct answers to a test. Research projects concerning learning at university level conducted by Marton and Saljo (1976a) found a great deal of evidence of the inadequacy of the traditional method of describing the outcomes of learning. Both for instructional purposes and for the understanding of 'what it takes to learn' a description of 'what' the students learned was preferable to the description of 'how much' they learned. They repeatedly found examples of distinctive qualitative differences in how students grasped or comprehended ideas and principles which were presented in readings or in texts similar in kind to those used as material for learning in experimental settings. Groups of students were asked to read passages of prose in a series of experiments and subsequently asked specific questions about the passages as well as to explain what the passages were about. Students were then given a second series of open questions to elicit how they had tackled the process of reading, and asked to answer specific questions designed to assess what had been understood.

Forty female first term students in one experiment were asked to read partial chapters of prose the aim of which was to give the reader a thorough understanding of the effects of education on individuals and society. To assess whether the students had understood what the author wanted to say they were asked the question "What is meant by the output of an educational system?" The researchers found that although the words chosen to answer the question varied considerably, students had adopted four different ways of comprehending what was meant by the output of an educational system. Marton and Saljo (1976a) termed their observed qualitative differences in learning 'levels of outcome'.

The four observed levels of outcome constitute the outcome space for the question 'What is meant by the output of an educational system'. Those answers categorized as level A contained the intentional content of the author's argument with evidence showing that the students had grasped the more elaborate way of looking at output. Level B answers contained a part of the intentional content. Level C answers were merely an explanation of the output of the educational system which was the exact opposite of the intentional content the author intended to give the reader. Finally, level D answers were virtually empty of content and in most cases merely contained a translation of the term "output". Marton and Saljo (1976a) concluded then that these different students learned different things from one and same text. If there were qualitative differences in the learning outcome then it seemed likely that there were corresponding differences in the way students set about learning.

Marton and Saljo's (1976a) various studies of university students found marked differences in the types of learning process that students engaged in when confronted with learning material. They found two basically different levels of processing they called a 'deep level' and a 'surface level'. In the case of surface level processing the student directed his attention toward learning the text itself with a reproductive conception of learning. In the case of deep level processing the student was directed towards the intentional content of the learning material or towards comprehending what the author wanted to say.

Thirty university students in another experiment were instructed to read a newspaper article dealing with a curriculum reform. The analysis of qualitative differences in learning outcome for this experiment was based on the student's free recall of an article as well as on the answer to a question asking students to summarize the article in one or two sentences and explain what the author was trying to say. In order to assess long-term effects of the level of processing on retention, students were again contacted and asked to recall the article and answer the summary question approximately five weeks later. Again, Marton and Saljo (1976a) were able to identify four different conceptions of the intentional content of the passage from the students' recall of the text.

Students were then asked introspective questions probing how they had undertaken the process of reading which could explain the differences in the outcome of learning. Again the two levels of processing, deep and surface, were clearly detectable from the students' comments on how they set about learning. Marton and Saljo (1976a)

found that surface level processing students focused on the discourse itself or the recall of it while deep level processing students had concentrated on what the discourse was about.

The primary aim of their research was to explore qualitative differences in what was learned and to describe the differences in the process of learning which gave rise to the differences in outcome. Marton and Saljo (1976a) described the process and outcome of learning in the sense that the variation observed in the learning outcome had its counterpart in the learning process. The most important conclusion drawn from their research was that learning should be described in terms of its content.

Entwistle, Hanley and Ratcliffe (1979) agreed that it was possible to distinguish between students who stressed the conclusion presented in an article from those who described the information in the article without relating it to the conclusion suggesting the existence of different approaches to learning. They cautioned that since the observed qualitative differences in learning outcome have to be examined in relation to each separate article used, no close agreement on ways of classifying outcome should be anticipated.

Influencing a Student's Approach to Learning

Further research done by Marton and Saljo (1976b) suggested that posing surface type questions after reading lead students toward a surface approach to learning but questions demanding a deep answer did not necessarily result in the expected shift to a deep approach. The common reaction was to interpret the requirement as asking for a superficial response. This research then suggested that the approach to learning could change given the task and the expectations.

Marton and Saljo (1976b) believed that a learner's attention during learning could be conceived of as being either on the surface of the text or on its author's intentional content. The independent variable in this study, intended to induce different levels of processing, was the nature of the questions put to subjects after reading. By giving questions which could be answered only if subjects paid very close attention to information in the surface structure of the text, and by making this demand highly predictable through repeated exposure to such questions, it was hoped that surface-level processing could be induced. Thus they imposed on one group of students a conception of learning which was essentially reproductive in that learning was to be equivalent to being able to recall exactly what was said in the texts. Another group of subjects was exposed to questions which aimed at inducing deep-level processing. These questions were constructed with the specific aim of testing whether the subjects had comprehended some of the fundamental assumptions and conclusions in the author's argument.

While studies involving students have generally yielded results indicating that the type of test expected affects the kind of processing that students engage in, those involving an assessment of actual differences in performances have produced a more diffuse picture. Meyer (as cited in Marton & Saljo, 1976b) compared the influence of two different examination sets. One set of examinations required recall and utilized essay or completion type questions. Another set required recognition and utilized true/false or multiple choice type questions. Meyer found that the type of test expected had a considerable impact on the performance as measured by immediate as well as delayed

testing. The recall set and the anticipation of an essay test lead to higher performance except on immediate testing with recognition questions.

Marton and Saljo (1976b) randomly assigned 40 female first-year university students to one of two groups. Both groups were given portions of three chapters from a text to read and told only that they would have questions to answer upon completion of the reading. The only clues available to students as to how to behave was the nature of the questions they received after the first two chapters. After the first two chapters the two groups received different types of questions. One group received questions which demanded a thorough understanding of the meaning of the passage. The other group was given detailed factual questions. Other research has suggested that expectations of an objective test leads to a more superficial level of processing while expecting an essay or oral test is reported as leading to the focusing of attention on general principles and main points suggesting deeper processing. Besides being exposed to questions aimed at inducing deep-level processing, the deep-level group was required to recall each chapter just read and to state its main points in a few sentences. The surface-level group was given five questions to answer after reading the first two chapters and the deep-level group was given only three to compensate for the extra work required of them as part of the experimental manipulation.

After reading the third chapter, both groups were required to recall and summarize the main points in it as well as answer questions intended to measure surface-level and deep-level aspects of the content. A semi-structured interview was also conducted to gather introspective data on the effect of the experimental manipulation on

level of processing. All subjects were again given all the questions approximately 45 days later as a measure of retention.

Both the questions and answers were analyzed with the aim of detecting qualitative differences in outcome. For Marton and Saljo (1976b) the description of qualitative differences in outcome referred to differences in how students answered the same question or recalled the same topic. This lead to their conclusion that there must be different approaches to student learning. Marton and Saljo found that the different conceptions of the various topics that were inherent in the answers to questions were classifiable as four separate levels of outcome constituting an outcome space for the particular questions.

The results of students' subjective reports on the effect of the questions under the different experimental conditions indicated that the characteristics imposed on the students through the questions had a considerable impact on their level of processing. The impact on the surface-level group was uniform. The group, given factual questions, reported that they paid very close attention to the surface structure of the text, lists of points, figures, etc. Some students suggested this was consistent with their usual conception of learning while others had to modify their regular learning strategy in order to fulfill the requirements as they experienced them.

The influence of the experimental manipulation was less uniform for the group whose questions required a deeper understanding. They evidenced two modes of coping with the requirements. One category of student used the predictability of the demands of the tasks to develop an algorithm for learning focusing primarily upon being able to recall

the text and summarize the author's main idea in one or two sentences. The researchers believed that the demands imposed through the deep questions were too vague for these students in that they did not realize that they needed to undertake deep processing. As a consequence they "technified" learning by trying to fulfill only the demand to summarize the text in one or two sentences (Marton & Saljo, 1976b). The second category of coping with the requirements was more in line with the researcher's intentions behind the experiment using the predictability of the coming demands as a reason for adopting a certain type of processing. Here they noted that some students had a negative definition of the demands in the sense that they realized what type of information would not be tested.

Marton and Saljo (1976b) concluded that there was a clear modifiability and context dependence of a person's conception of leaning. Learning seemed to be defined differently depending on anticipated task demands. Students adopted an approach determined by their expectations of what would be required of them. Further, their research suggested that learning could be technified when the task demands became predictable. Lastly, they suggest that while many students are apparently capable of using deep or surface strategies, the demands of the examination system at the school level could be interpreted as requiring mainly the recall of factual information to the detriment of a deeper level of understanding.

Motivation as an Influence on Learning Approach

Fransson (1977) also concluded that it was possible to differentiate between the qualitatively different levels of processing and outcome. His research identified a deep

and surface approach to learning and further suggested that it was possible to show that the type of motivation for reading a particular text was an important factor influencing the choice of approach to learning and thus determining likely levels of outcome.

Fransson (1977) theorized that intrinsic motivation caused distinctly different kinds of learning compared with extrinsic motivation. Intrinsic motivation for learning is a state where the relevance of the material content for the learner is the main reason for learning. Extrinsic motivation for learning is a state where the reasons for the learning effort have nothing to do with the content of the material. A good learning performance serves merely as a means for achieving some desired end result. Fransson had students read a text containing a description of the examination system at the Institute of Education at University of Gothenburg. Since the level of intrinsic motivation is difficult to manipulate in an experiment, Fransson recruited test subjects from the Institute of Education who were presumed to have high intrinsic motivation. Students presumed to have low intrinsic motivation for reading the text were recruited from sociology and had not taken education courses.

Immediately after the reading session all subjects were asked to write summaries of the most important information of the text. The question required the subjects to summarize the most important information of the text they had just read. The subjects were then asked to answer a 15 item short answer test of factual knowledge based on the content of the text. Finally each subject was interviewed about his way of approaching the text and his experiences while reading.

Fransson (1977) identified the same two levels of processing found by Marton and Saljo (1976a), deep and surface. When the transcribed interviews were analyzed and categorized, in addition to the two levels of processing identified by Marton and Saljo, two levels of attention were also identified. Within each level of processing some subjects were working very intensively while others seemed to be satisfied by forming a general impression. The deep-level processors working with a high level of attention tried to go behind the information given in great detail. Deep-level processors working with a low level of attention tried to form a general impression of the information material in order to be able to return to the text when their need for this special information became more pressing. Surface-level processors working with a high level of attention tried to press the text into their minds, while a low level of attention meant a kind of lazy reading with hopes that at least some information might slip into memory.

The categories of answers to the summary question resulted in four qualitatively different categories of learning outcome or levels of understanding:

1. Conclusion-oriented, content. The student is able to summarize the main conclusions, explain his thoughts, and summarize what he found most interesting.

2. Conclusion-oriented, mentioning. The student finds certain information interesting but does not summarize the contents.

3. Description, content. The student can give a neutral and complete summary of the articles contents.

4. Description, mentioning. The student attempts to write a complete listing of the articles content.

Fransson (1977) observed a clear tendency for surface level learners to try to give complete descriptive summaries. Deep level learners distributed more evenly over all the categories.

Fransson (1977) expected the students registered for education would be intrinsically motivated to read the experimental text. While the research suggested that extrinsically motivated students showed a stronger tendency to choose surface level processing, no corresponding pattern among students with strong intrinsic motivation was observed. The important conclusion for teaching is that if deep level processing is valued, conditions which rely mainly on extrinsic motivation should be avoided. This is especially important when the initial interest of the students in the learning task is low. The natural impulse of the intrinsically motivated learner, unthreatened by expectations of a factual knowledge test, is deep level processing.

The Strategic Approach to Learning

Ramsden (1979) looked at the relationship between student learning and its academic and social context. By context he meant the teaching, course organization, subject areas, and assessment methods of various university departments. He examined students' perceptions of their courses and teachers in six departments at a British university, identified the characteristics of those environments, and showed how contextual variables were related in the students' minds to the ways in which they learned. His research was informed by use of a course perceptions questionnaire and a series of semi-structured interviews.

The questionnaire identified eight dimensions used by students to describe the various academic environments. They were in order of importance, lecturer relationship with students, staff commitment to teaching, student workload, formality of teaching method, vocational relevance, social climate, existence of clear goals and standards, and freedom in learning or the amount of discretion possessed by students in choosing and organizing their work. The questionnaire was administered to 285 second-year students across six university departments and a second time to 767 first-year students. The results of the course perceptions questionnaire showed that students in the different departments saw the process of learning and teaching in contrasting ways. Each department appeared to possess a distinctive atmosphere or culture in which approaches to learning were realized.

The course perceptions questionnaire identified components of the learning environment in the academic departments and showed how each made different demands on the way students learned. However, examination of the relationship between perceptions of the learning environments and the students' approaches to learning could not be carried out effectively by means of questionnaires alone. Although the questionnaire provided a broad picture of learning contexts and components, in order to approach the detail of an individual student's interaction with the environment semi-structured interviews of a sample of students were carried out.

Ramsden (1979) found that students constantly related the identified contextual variables to their approaches to learning. Although Marton and Saljo's (1976a; 1976b) research focused on student processing of reading materials, analysis of the interviews in

this study showed that the concepts of deep and surface levels of learning were also applicable to such tasks as essay writing and problem solving in science. The interviews also made it clear that a student often showed indications of different levels of processing of different tasks. It also became clear in analyzing the interviews that one small group of students stood out from the majority. These students were less negatively influenced by the course and departmental context than the others, made special efforts to use assessment systems to their own ends, were assured that they would do well in their work, and were often extremely successful. Ramsden named this assured approach to assessment tasks as "strategic". The most striking characteristic of students who used this approach was the ability to adapt to the demands made by the learning context. What appeared as adversity to some students was made to work towards the strategic student's goals. Ramsden, according to Duff and Mckinstry (2007), had identified a third approach to learning, a strategic approach by which students maximized academic performance by effective study organization.

The strategic approach describes the focus of students whose intentions are attaining the highest grades and they will use whichever approach seems appropriate to that end. Later work by Janssen and then by Entwistle (as cited in Duff & Mckinstry, 2007) concluded that the strategic approach identified by Ramsden was really a subset of the deep and surface approaches. They suggested that the strategic approach was really what motivated a student to adopt a deep or surface approach so as to maximize their grades.

Motives, Strategies, and Learning in Context

Biggs (1987) defined the study process or approach to learning as a combination of students' motives (why) and strategies (how) they use in learning. Biggs hypothesized that effective learning required congruence between the motive and strategy adopted. If a student's motive was to develop an interest and competence in a subject area, then employing a rote-learning strategy was unlikely to lead to effective learning outcomes. He suggested that students could deliberately choose the approaches that were most likely to result in the desired learning outcome.

Biggs (1987) hypothesized that a student's study behavior bridged the connection between cognitive style and performance. He said that the dogmatic student would go about study in a different way from that of the non-dogmatic student affecting performance. Needing an instrument to test his hypothesis, he designed the Study Behavior Questionnaire (SBQ). Early administrations of the SBQ measured 80 items and yielded 10 scales suggesting that study behavior items were academic manifestations of certain basic personality characteristics and that these manifestations were related to performance (Biggs, 1987).

The 10 scales that emerged from the first studies, although theoretically and empirically justified, were too diverse for practical use in a questionnaire. A shorter version with fewer scales and a more coherent theory was needed. A principal components analysis done using three different student samples yielded a three factor solution. The first factor was defined by fact-rote, pragmatism, test anxiety, neuroticism and class dependence. The second factor was defined by academic motivation,

internality, meaningful learning and openness. The third and final factor loaded with study skills being the highest scoring factor, low anxiety, academic motivation and meaning. An interpretation of these three factors was assisted by correlating the original 80 items with the three second-order factor scores. It became clear that items on each factor grouped themselves into an affective and a cognitive group; that is, a group of items in each of the three factors addressed a motive, and another group a cognitive strategy. This suggested to Biggs (1987) the need to rethink the theory of study behaviors. Biggs' proposed model, given at Figure 4, suggested the three stages of presage, process and product.

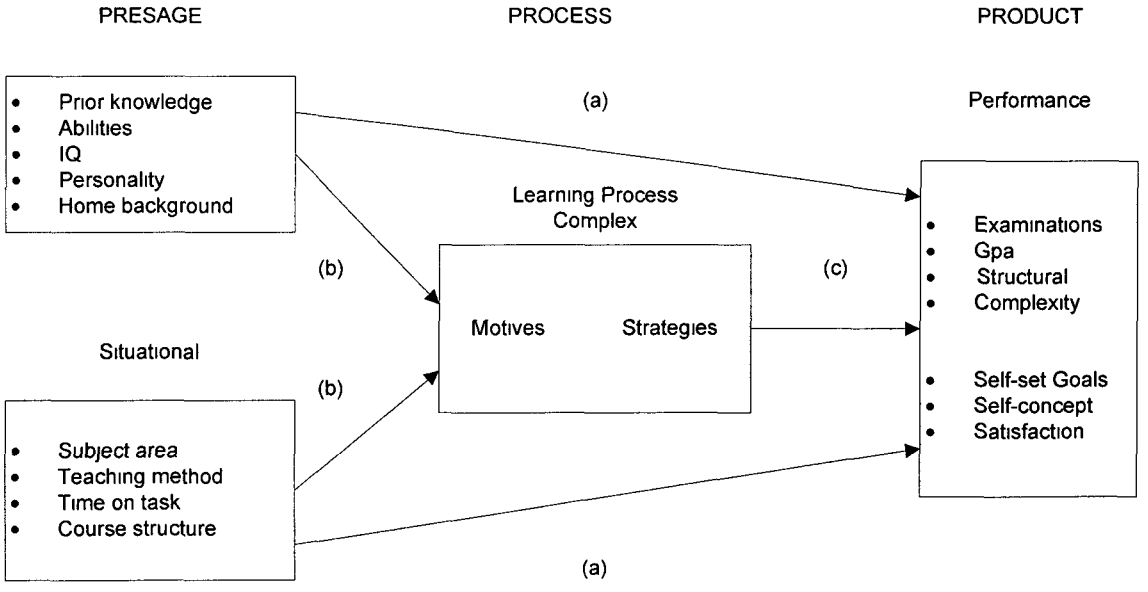

Figure 4. General model of student learning (Biggs, 1987, p. 9)

The presage factors exist before the student enters the learning situation. These are of two kinds: personal and situational. Students have a certain amount of prior knowledge relating to the academic task, a particular IQ, values and attitudes deriving

from their home backgrounds, and other personality characteristics that affect their approach to learning. Each of these factors has an immediate and direct effect on performance (a), and is also likely to affect the student's motives for undertaking learning, and the strategies adopted in approaching learning (b). The same points can be made about the situational factors. The amount of time spent on a task, the difficulty of the task, the structure of the course, and methods of learning and evaluating, all have direct effects on performance (a). They also affect the student's motives and perceptions of the task, and the effectiveness of the ways of going about the task (b).

A secondary sequence is via the process variables using paths (b) and (c) in the figure. Biggs (1987) refers to these intervening variables as the learning process complex which represents the way the student perceives the academic environment. According to that perception, a student decides to go about learning in this or that way, with consequent effects on the product, performance (c). These effects may be defined in two ways: objectively in terms of examination marks as an index of the quality of the performance; or subjectively, for example, the satisfaction with whatever level of performance is attained.

According to Biggs (1987) the learning process complex is presumed to refer to the students' motives and strategies for learning. Each motive-strategy combination then defined a distinct approach to learning. To bring the SBQ into line with other research, the terms surface, deep and achieving were proposed with the terms approach, motive and strategy denoting what is being referred to. Thus Surface Motive (SM) refers to the

motive component of the Surface Approach (SA) and Surface Strategy (SS) to the strategy component (see Table 1).

Table 1

Motive and Strategy in Approaches to Learning and Study (Biggs, 1987, p. 11)

Approach	Motive	Strategy
SA: Surface	Surface Motive (SM) is instrumental: main purpose is to meet requirements minimally; a balance between working too hard and failing.	Surface Strategy (SS) is reproductive: limit target to bare essentials and reproduce through rate learning.
DA: Deep	Deep Motive (DM) is intrinsic: study to actualize interest and competence in particular academic subjects.	Deep Strategy (DS) is meaningful: read widely, interrelate with previous relevant knowledge.
AA: Achieving	Achieving Motive (AM) is based on competition and ego-enhancement: obtain highest grades, whether or not material is interesting.	Achieving Strategy (AS) is based on organizing one's time and working space: behave as "model student".

Biggs (1987) concluded there was a "psycho-logic" in how students view their role in a learning situation. If in a learning situation a student decides that a passing grade is sufficient, then it would seem to make best sense to rote learn only those facts and details which are believed most likely to be tested. If a student is interested in a particular subject, then it would make best sense to learn as much as possible about it and work out what it all means, regardless of any testing that may follow. However, Biggs emphasizes that it is the student's psycho-logic that is at issue here, not the teachers.

Marton and Saljo (1976a; 1976b), working from phenomenological psychology, came to a very similar position. They distinguished surface and deep level processing, which correspond quite closely in practice to the approaches defined above by Biggs

(1987). Marton and Saljo showed that students would adopt one approach or another to processing an academic task according to their intentions. If they wished merely to display the symptoms of having learned, they would adopt a surface-level approach. If students intended to extract maximum meaning, they would adopt a deep-level approach.

Hall et al. (2004) agreed that the essential difference between a surface and deep approach was in a student's intentions or motives for studying. Under the deep motive, the student's intention is to seek meaning, whereas under the surface motive, the student's intention is to acquire only sufficient knowledge to complete the task. Accordingly, a student cannot simultaneously adopt a surface and a deep motive in study. In contrast, a surface strategy and a deep strategy are compatible. A student adopting a deep motive might use a memorization technique and seek further connections and relationships to prior knowledge consistent with a deep approach whereas a student adopting a surface motive might rely on memorization techniques only as a means to an end. Their argument suggests that cognitive levels are a continuum rather than certain ones being associated with a deep approach and others associated with surface.

Biggs (2003) refined his earlier model by placing approaches to leaning as a component in a total learning system. He schematized the educational event in the Presage-Process-Product Model (3P) (see Chapter I, Figure 2). His later model suggests that student factors, teaching context, approaches to learning, and the learning outcomes interact forming a system. The inclusion of multi-directional arrows suggests that each factor can affect other factors thus allowing a students' approach to learning to adjust for a particular learning context. Leveson (as cited in Lloyd & Abbey, 2008) believes that a

very important aspect of presage is the educator's approach to teaching. He concluded that, in the accounting discipline, a strong relationship exists between choice of teaching strategy, teaching intention and conceptions of teaching, and learning.

Course Alignment

Lucas and Mladenovic (2004) suggest that the 3P model is particularly valuable in that it suggests the need to align the three aspects of the model. The model reminds us that identified learning outcomes for a course need to be addressed by learning activities designed to support the achievement of those learning outcomes. The design of learning activities should take account of the presage factors within that particular teaching context. Learning activities can be designed to support or change any student preconceptions that might affect their choice of approach to learning. A course must be thoughtfully aligned if an educator intends to encourage a deep approach to learning.

The Role of Assessment in SAL

Marton and Saljo (1976b) found in their research that by structuring the assessment questions they could, to some degree, direct the approach to learning selected by students. They found that while repeated experience of surface questions after reading an article shifted students towards a surface approach, experience of questions demanding deep answers created a less clear-cut effect. Some students adopted a deep process in response to such questions but the common reaction was to interpret the requirement as demanding a superficial summary, rather than a real understanding of the article.

Byrne, Flood and Willis (2002) suggest that the method of assessment chosen plays a key role in approach to learning. Tang (as cited in Byrne et al., 2002) states that

if an assessment is perceived to require simply the reproduction of detail, then students will tend to adopt a surface approach. Conversely, assessments that are perceived to require a thorough understanding will guide students toward a deep approach. Generally, multiple-choice and short answer tests elicit a surface approach to learning (Thomas & Bain, 1984; Tang, 1994; as cited in Byrne et al., 2002), while essay or problem questions which require the demonstration of personal understanding encourage a deep approach (Entwistle, 1997; as cited in Byrne et al., 2002). Given its effects on learning, assessment must be appropriately set to achieve the desired learning outcomes. An appropriate assessment is one that is aligned (Lucas & Mladenovic, 2004) with criteria set out in the course objectives. Care should be exercised in the design of questions to be certain they require students to demonstrate their understanding and are consistent with student approaches to learning and the goals of the course.

Although an adequate understanding of a topic is unlikely to occur as a result of selective memorization, the choice of inappropriate assessment tasks can allow students to get good marks on the basis of memorizing facts (Biggs et al., 2001). The problem is not that the student is a surface style learner, rather the teaching and assessment conditions set by the learning context facilitated the choice of the surface approach. This suggests that careful selection of assessment methods can facilitate the selection of the more desirable deep approach to learning. Since learning approaches are contextual, students will make strategic decisions on approach use based on perceived needs to complete a task. Biggs et al. warns that the presence of a surface approach then signals

that something is off in our teaching or in our assessment methods, both being contextual items that can be manipulated.

Ramsden (1979) suggests students' approaches to learning can become dominated by the grade point average perspective; high grades in assessment tasks become the most important goals. Students come to perceive a conflict between learning and grades and speak of using strategies to get good marks at the expense of understanding the material they are expected to learn. He contends that, in this way, the process of assessment comes to have the unintended consequence of inhibiting rather than facilitating learning.

A Relationship Between SAL and Examination Performance

Davidson (2002) considered the relationship between study approach and examination performance. His research showed a significant relationship between performance on complex examination questions and the use of a deep study approach. However, he found no significant relationships between the use of a deep study approach and performance on questions that are less complex or between the use of a surface study approach and any examination results. His findings also showed that prior academic achievement as indicated by cumulative GPA and motivation for taking the course were the best predictors of examination performance. These findings imply that educators should encourage students to develop and use a deep study approach to become more proficient with complex material.

Davidson (2002) set out to answer two questions. First, he wanted to know if the use of a surface study approach was related to lower grades for either complex or less complex questions and, second, was the use of a deep study approach related to higher

grades for complex or less complex questions. Since higher order cognitive skills cannot be measured directly, researchers normally use an indirect measure such as observing the ability to work with complex problems. This in turn requires that the relative complexity of problems can be assessed in order to differentiate complex problems from those that are less complex. Complex problems require different problem solving skills and abilities compared with problems of low complexity which require only responding with memorized facts and methods. Nutt (as cited in Davidson, 2002) suggests that a problem's level of technical difficulty increases as the number of alternatives and criteria increase.

Davidson (2002) gathered his data from two large sections of introductory financial accounting in one semester at a Canadian university. He administered Biggs' Study Process Questionnaire (SPQ) including questions on demographics at the beginning of the semester to measure the study approach variable. Midterm and final examinations were used from both sections to measure examination performance.

Examination performance was measured by calculating the mean grade received on the midterm and final examinations. The midterm examinations were different between sections but the final examination was common. The questions on all three examinations consisted of problems and one midterm examination had 20 multiple choice questions worth 20 points out of 100. Complexity of the problems was ranked using a classification system developed by Shute (1979). Under Shute's system any problem involving only definitions, memorizing facts, formats, or concepts, classifications, or the use of algorithms, was classified as low complexity. Any problem involving

proportional, combinatorial, probabilistic, hypothetico-deductive, or correlational reasoning was classified as highly complex.

The purpose of Davidson's (2002) research was to provide empirical evidence on the relationship between study approach and examination performance. Regression models were used to analyze the data. Davidson found that the deep study approach as measured by the SPQ was related to performance on complex examination questions as described by Shute's model. However, he also found that the deep approach was not related to mean grades received on either the total examinations or for mean grades received on less complex questions. Further, the surface study approach was not related to any of the grade performance measures.

One possible problem with Davidson's (2002) research was the single administration of the SPQ at the beginning of the course. Approach to learning scores reported would be based on the students' normal or preferred approach to learning as experienced to date and would not reflect the experience of the course being currently examined. Saddler-Smith (as cited in Byrne et al., 2002) suggest that the absence of correlation between approach to learning and performance may be caused by the questionnaires used and student grades may be measuring different constructs reasoning that grades reflect students' actual approach to learning while the questionnaires measured students' perception of their approach. Significant differences would make a correlation hard to detect.

Gender, Learning Outcome and SAL

Byrne et al. (2002) set out to investigate the relationships between learning approaches and learning outcomes of first-year accounting students and to consider the existence of gender differences. The subjects of the investigation were 110 first-year students taking a management accounting course. The assessment for this research consisted of an oral presentation worth 10% of the grade for the course and a final examination worth the remaining 90%.

The purpose of the oral presentation was to introduce the importance of communication in the discipline and develop student confidence. The examination was composed of two problem solving type questions and one essay question all designed to be representative of the knowledge presented in the course. The examination structure required students to demonstrate the higher level skills associated with deep learning while allowing students with only basic skills to achieve a passing grade. The researchers administered the Approaches and Study Skills Inventory for Students (ASSIST) only once at the beginning of the management accounting module to establish the students' approach to learning.

Byrne et al. (2002) found that the mean scores calculated on the main scales of deep, strategic and instrumental (surface) revealed that the group taken as a whole scored highest on the deep scale. Women obtained their highest scores on deep while men scored their highest on strategic. The instrumental scale scored lowest for all these groups. Female students scored higher than men on all three scales. They further found

that, with respect to the assessments, females scored higher than males on the three categories of problem solving, essay question, and presentation.

A correlation matrix of assessment marks and ASSIST ratings suggested that for the sample there was a positive relationship between the deep approach and assessment. There was also a significant positive relationship between the strategic approach and assessment and a significantly negative correlation with the instrumental approach.

Again for the full group, the correlations between learning approaches and the assessment elements were examined. The relationship of problem solving questions to approaches mirrored the pattern for the total assessment. This result suggests then that problem solving questions were influential in determining students' approaches to learning. The essay questions were related to the strategic approach. Byrne et al. (2002) suggest this may be explained since students were given a choice in this question area thus enabling them to behave strategically. The researchers found no relationships for presentations between the marks awarded and approaches to learning.

Relationships of approaches to learning and the total assessment marks for women were all present as expected, i.e., the deep and strategic approaches were positively correlated with high academic performance whereas the instrumental approach was negatively correlated. However, none of the correlations were present for men suggesting that learning approach had little to do with assessment outcome in relation to management accounting. Examining the individual assessments on a gender basis, the pattern for females followed the total sample but, again the researchers found little

support for learning approach impacting the related outcome for the various assessment components for male students.

Writing Assignments and SAL

English, Luckett and Mladenovic (2004) cite research conducted at Harvard University into the significance of writing as a means of understanding course content. The Harvard researchers found that the more writing students were required to do in their undergraduate courses, the better they learned, and the more they reported being intellectually challenged. Their studies suggest that setting writing tasks that require reflection and independent engagement should be a central tool of interventions to encourage students to adopt a deep approach to learning.

English et al. (2004) conducted research using students in two introductory accounting courses at two Australian universities. A set of interventions was designed to support a deep approach to learning through improving their written communication skills. Students in both courses were administered the SPQ at the beginning and end of the courses. English et al. showed that both groups of students evidenced a decline in deep approach scores. However, the declines were significantly less for the group experiencing the written communication skill intervention. The results of their research suggest that the effectiveness of an intervention might also be judged by the resulting limiting of an expected decrease in deep approach.

English et al. (2004) designed an intervention for University of Sydney (USYD) accounting students based on functional linguistics and using reflection based writing tasks as the basis for their intervention. Halliday (as cited in English et al., 2004) says

functional linguistics is concerned with the role language plays in representing a discipline. Learners access subject matter through language and become familiar with a subject by mastering the language of the discipline. English et al. hypothesized that writing tasks requiring reflection and independent engagement should encourage students to adopt a deep approach to learning.

Acknowledging that the language of the discipline is complex and can seem formidable for the novice reader, English et al. (2004) prepared a series of interactive reading guides. Their purpose was to help students comprehend the subject matter, introduce them to a discipline-based writing style, and to example how students could approach new material and make sense of it for themselves. Tutors were requested to cover course content first, then to focus on the process of writing appropriate responses to questions. As the process progressed more sophisticated problem solving activities in the form of case studies were introduced to develop a higher cognitive level and associated writing skills. The case studies which supported the use of a deep approach to learning were ambiguous, unstructured, unfocused and presented facts in random order to mirror reality.

Examinations also reinforced the emphasis on writing in the course. About 50% of total marks in the final examination were assigned to questions that required written responses demonstrating critical thinking and analysis. The curriculum redesign included the preparation of a detailed manual for tutors to ensure a uniform approach to teaching avoiding the problem of students facing differing interpretations of what constitutes appropriate writing.

In order to control for other factors that could impact the effectiveness of their intervention at USYD, English et al. (2004) compared their group with another similar cohort of first-year accounting students. To achieve this control, a cohort of students at the University of New South Wales (UNSW) was selected and a detailed comparison of the learning contexts was conducted. English et al. concluded that the learning contexts were similar and that the UNSW cohort could be considered a control group and proposed that: "Compared to students in a traditional learning context, those subjected to interventions in a learning context designed to encourage the adoption of a deep approach to learning will have lower surface-approach scores and higher deep-approach scores at the end of the year" (p. 471). It was also of interest to the researchers the extent to which students at USYD benefited from the experiences as measured by learning outcomes. The researchers expected the USYD test group's surface-approach scores would be negatively correlated and deep-approach scores would be positively correlated with academic performance.

English et al. (2004) utilized the SPQ to explore both students' orientation to learning at the commencement of their accounting studies at the university and to assess the effects of an intervention introduced in the learning context designed to encourage a deep approach to learning. Final usable sample sizes were 354 students from USYD and 706 students from UNSW with similar proportions of males and females at both universities. The first administration of the SPQ was collected from students at each institution at the beginning of studies and reflected their orientation to studying as influenced by previous educational experiences. The second administration of the SPQ

was at the end of the students' first year of studies and represented their learning in the accounting context. Final assessment marks were obtained for USYD students' as the measure of learning outcome.

English et al. (2004) found that the individual surface approach scores for the USYD test group were lower relative to the control group at the end of the year, indicating that there was a significantly lower tendency to adopt a surface approach given the intervention. In contrast, the deep approach to learning scores were significantly higher for the USYD students by the end of the year. The results supported a conclusion that interventions, such as the writing initiatives undertaken at USYD that are carefully designed to encourage students to take a more critical and reflective appreciation of the subject matter, can result in students adopting a deep approach to learning as well as reduce their tendency to employ a surface approach.

The researchers also found that USYD surface and deep approach scores were correlated with students' final grades at the end of their first year of introductory accounting. English et al. (2004) reported a negative correlation between students' surface approach scores and performance scores. The correlation coefficient was very small, suggesting that the impact on grades is minimal. A marginally significant positive correlation was found for the deep approach. While the findings indicate that there are benefits to students when they are encouraged to take a deep approach to learning, English et al. caution that aggregate assessment grades used here were not found to be very sensitive to the level of deep and surface approach scores. The researchers suggest

that disaggregated data would have enabled a closer examination of the nature of each of the assessment tasks in terms of eliciting a deep or a surface learning outcome.

Group-Based Problem Solving Activities and SAL

Hall, Ramsey, and Raven (2004) changed the learning environment of second semester introductory accounting students by focusing on group-based problem solving activities. They hypothesized that group-based problem solving activities would generate higher quality learning outcomes. Their study used the SPQ (Biggs, 1987) to assess changes in the students' deep and surface approaches to learning across the semester in which the subject was taught.

Hall et al. (2004) made limited changes to the learning environment. Lectures continued largely unchanged. Previously the program involved providing solutions to accounting problems that had been completed by students prior to the class. The class was redesigned to include group problem solving exercises, presentations and assignments. The researchers believed that the focus on group work and use of case studies would increase the students' engagement with the material, develop critical thinking and problem solving skills, and make the classes more student and less teacher centered. Ramsden (as cited in Hall et al., 2004) contends that group work is associated with the adoption of deep approaches to learning.

The results of the study by Hall et al. (2004) showed that the introduction of the various types of group activities as part of a first-year undergraduate accounting course was associated with an increase in students' deep approach to learning and a decrease in students' surface approach. They pointed out, however, that despite the positive signals,

they could not conclude that the changes in the learning environment caused the changes in students' approaches to learning. They observed a slight change in students' approaches to learning at the same time as group problem-solving activities were introduced into the tutorial program. They concluded that the results of their study suggest that accounting educators can influence students' learning approaches by adopting specific changes in the learning environment.

Hall et al. (2004) also pointed out that students increased their use of deep strategies but did not significantly reduce their use of surface strategies. Although it might have been expected that changes in the learning environment may reduce students' reliance on surface strategies, in some learning contexts lower level strategies are required in order to progress to higher levels of understanding (Entwistle et al., 1979; Shute, 1979). Accounting students must first learn terminology, basic concepts and procedures before being able to apply knowledge to novel problems and reflect on the appropriateness of various treatments and methods.

Hall et al. (2004) concluded that encouraging the adoption of a deep approach to learning is possible but that, in accounting, as in many other disciplines, lower level strategies such as rote learning, paraphrasing and describing are required to underpin progression to higher levels of understanding. Thus students without the requisite base knowledge will experience difficulty and may lose interest with the discipline. Entwistle et al. (1979) agree that students who lack prerequisite knowledge or interpretative skills may approach learning with a deep intention but fail to exhibit either deep level processing or a deep level in the outcome. English et al. (2004) suggest that a deep

approach to learning can be encouraged through modifications to the learning context but that lower level strategies form prerequisites for higher level ones, suggesting the need for a staged progression of learning activities.

It would be inappropriate to assume that surface approaches to learning are inferior to deep approaches and should be discouraged. Subjects like accounting are associated with algorithmic content and require rote memorization more than others. Entwistle and Ramsden (as cited in Lucas, 2001) speculated that learning within certain disciplines may actually require a preliminary stage of rote leaning difficult to distinguish from a surface approach. Shute (1979) says that much accounting content can be acquired by memorization. However, this is an inadequate method of acquiring knowledge insofar as it will be less generalizable and applicable in different situations.

Other Contextual Elements Impacting Students' Approaches to Learning

Students' perceptions of accounting. The primary objective of the phenomenographic research done by Lucas (2001) was to identify key aspects of what constitutes 'learning accounting' for students and to identify students' conceptions of accounting. She identified two approaches to learning she called "format" and "relating" characteristically similar to the surface and deep approaches identified by Marton & Saljo (1976a). Her research further yielded two features which are critical to an understanding of the context in which approaches to learning are adopted. The first is the nature of preconceptions that many students bring to their study of accounting. The second is relevance. Both of these appeared to predispose some students to regard accounting in such a light that a surface approach to learning accounting appeared reasonable to them.

Lucas (2001) found that the key preconception was that accounting was about numbers and mathematics. Her student interviews showed it to be a powerful preconception because it survived their acknowledgement that accounting may be about more than numbers and influenced their subsequent choice of options. This is clearly an important contextual factor which may also predispose students to take a surface approach to their learning of accounting. They approached their learning of accounting assuming that it was a subject where they did not need to think about concepts, where they could 'fit things in' and where the financial statements lacked meaning and were seen solely as the end product of the application of a technique.

Most students in the Lucas (2001) research distanced themselves from accounting and did not perceive it to be immediately relevant. Although students found individual topics to be relevant, the most important aspect of relevance was that students perceived accounting to be important to their future careers in business, but not currently interesting. Lucas suggests that for these students there is a failure of relevance and it is therefore not surprising if this is associated with learning a technique. Passing the course became synonymous with learning the technique. This suggests that for these students accounting lacked any inherent meaning and again prompted a format or surface approach.

Friedlan (1995) showed that a nontraditional approach to teaching an introductory financial accounting course had a desirable effect on students' perceptions of the importance of the required technical and intellectual skills. Friedlan examined the effect that the teaching approach had on students' perceptions of the skills and abilities needed

for success in accounting courses and by accounting practitioners. Students enrolled in two courses that covered similar subject matter but used different teaching approaches were surveyed at the beginning and end of the courses. One course used a traditional lecture and highly technical approach. The other course used a nontraditional approach that made extensive use of case studies and other contextual materials, used classroom discussions, stressed critical thinking skills and placed less emphasis on technical material.

Friedlan (1995) used a survey instrument containing statements about 12 skills and abilities needed for success in accounting courses and 13 skills and abilities needed by accounting practitioners. For ease in analysis, the statements were typed into four groups: technical and intellectual skills, problem solving skills, communication skills, and general business knowledge. The results showed that the nontraditional course moved students' perceptions of accounting more towards those identified by the profession. For statements pertaining to accounting courses, desirable significant differences were observed for 9 of the 12 statements. For statements pertaining to practitioners, desirable significant differences were observed for 8 of the 13 statements. In striking contrast was the effect that the traditional teaching approach had on students' perceptions. For all but one statement, traditional group students' perceptions of the needed skills and abilities were either unchanged from September to December or their perceptions at the end of the course were significantly less desirable. The results suggest that the traditional approach to introductory accounting may actually 'turn students off' accounting.

The implications of Friedlan's (1995) findings are that course design and teaching methods can affect the perceptions students have about accounting. This is important because the career choices that students make are based on the stereotypes formed about different careers, and an introductory accounting course is likely to be an important source of information for forming those stereotypes. Thus in addition to helping students learn about accounting, accounting courses are vehicles for communicating information about the nature of the accounting profession. Accounting courses that create realistic perceptions about the profession are likely to attract students with qualities consistent with those needed by the profession.

Student workload. The easiest mistake to make in deciding upon course content and aims is to include too much content. Further, it is difficult to reduce the amount of content in many courses especially those more technically orientated. Ramsden (2003) holds that it would be better to include less, but to ensure that students learn that smaller part properly arguing that information is nothing except organized data until the students make sense of it. Many courses are saturated with detail and over-demanding on students' time leaving little space for the activities of thinking about and integrating the content. The inevitable result of too much busy work is that many students adopt minimizing strategies and complete their courses with sketchy and confused knowledge of the topics they have studied.

Workload research done by Cope and Staehr (2005) found that a significant factor in the relative lack of success in interventions in 1998 through 2001 designed to foster a deep approach to learning appeared to have been students' perceptions of excessive

workload. Despite interventions in an information systems development course (ISD) designed to decrease the number of contact hours and gradually decrease the amount of content and assignments, a majority of students believed that they lacked enough time for learning at least half the time. This may suggest that course and curriculum restructuring or overhaul may be required before the consistent application of deep learning approaches can be achieved. Lizzio (as cited in Jackling, 2005) also found that perceptions of heavy workload were associated with surface approaches to learning, but that no such relationship existed between the perceptions of the appropriateness of work load and a deep approach to study. Cope and Staehr did find, however, that perceptions of quality teaching and appropriate assessment were strongly related to a deep approach to learning.

Cope and Staehr (2005) believe that all of a student's commitments impact on the amount of time they have for their studies in a particular subject. The problem with perceptions of not enough time for learning could lie then in the workload in other subjects students were studying. Students enrolled in the subject ISD course commonly took a total of four or five subjects a semester, with up to three assignments per subject. Cope and Staehr suggest that time pressure is not conducive to students' use of quality learning approaches.

An issue in decreasing the amount of content in a subject is which topics to remove or emphasize less, while still allowing students to achieve the subject aims. A solution to the issue may lie in the notion that particular concepts or aspects of content have identifiable, educationally critical aspects (Cope, 2000). Without addressing the

educationally critical aspects in learning tasks, the development of an appropriate level of understanding of the content is unlikely. Cope's point being made here is that it is possible to pare a subject's curriculum down to its educationally critical aspects and still achieve the subject objectives.

Cope and Staehr's (2005) research further suggested that monitoring of students' perceptions of the workload was important to manipulating the learning environment to encourage deep learning approaches. Through gradually decreasing the workload in the subject, there appeared to be a point where enough educationally critical content was covered to satisfy the subject aims, but significantly more students perceived they had enough time to apply deep learning approaches.

Maturation. Gow and Kember (1990) sought to understand the extent to which higher education promotes the ability of students to act as independent learners. Their study was conducted at an institution in Hong Kong and used both quantitative and qualitative approaches. Student approaches to study were measured with the SPQ. Their sample consisted of approximately 1,043 first and final year students from the institution. The students were from a selection of departments with approximately 509 from accountancy. The questionnaires were administered during the third and fourth weeks of the academic year.

The researchers used stepwise multiple linear regression to search for relationships between the six subscales of the SPQ and other variables of age, number of years since the student left school, marital status, highest qualification and year of study. The results of their research suggest that the use of both surface motive and surface

strategy decrease with the number of years since a student left school and that deep motivation increases with age. Deep motivation and the use of deep strategies decline from the first year to the final year of a course and the use of achieving strategies declines from the first to the final year of study.

Gow and Kember (1990) suggest that it is possible to visualize an image of the population employing a surface orientation less as the influence of their schooling declines. It could be concluded that schooling tends to encourage a surface approach. However one views it, with the passage of time, there seems to be a general tendency away from a surface orientation towards a deeper approach.

As part of the project, Gow and Kember (1990) conducted semi-structured interviews to attempt to gain possible explanations for their observations. Their responses were categorized under the following headings: work pressures, assessment pressures, extrinsic motivation, didactic versus interactive teaching, surface demands of lecturers, and rote memorization. They concluded that the use of a deep approach was associated with intrinsic motivation. Fransson (1977) also found that students who read an article of interest to them were associated with a deep approach whereas students who were uninterested in the article tended to adopt a surface approach. Several of the students commented that their motives for doing the course were to obtain a qualification rather than because of an interest in the subject.

Teaching quality. Jackling (2005) explored the relationships between the context of learning and learning approaches paying particular attention to the role of memorization in the study of accounting. Further, the study examined the relationship

between learning approaches and learning outcomes as measured by the understanding of concepts taught in accounting units of study rather than performance on formal assessment tasks. Twelve second-year accounting majors were selected from a pool of 121 students who had completed the SPQ as part of another study. Since prior research had resulted in varying results regarding gender differences in approaches to learning, an equal number of males and females were chosen. The 12 students were interviewed about their experience and understanding of financial accounting concepts. The interviews focused first on how the students had gone about the process of learning accounting and secondly on what they had learned.

The interviews suggested four main recurring motives: obtaining high grades which was identified as an achieving approach, doing enough work to pass and completing the course with minimum effort which were both labeled as surface approaches, and seeking depth of understanding considered to be a deep approach. Similarly, five learning strategies were identified: reading notes (deep), completing past examination questions (achieving), redoing homework exercises (achieving), completing computer assisted learning tasks, and re-writing class notes (surface approach). Perceptions of teaching quality variables were perceptions of workload, perceptions of good teaching, appropriateness of assessment, and independence in learning.

The results of Jackling's (2005) research showed that students who perceived teaching quality less favorably tended to have surface motives in learning. Assessments that seemed to require good memory and workload deemed inappropriate tended to encourage surface motives in learning. Students who viewed the teaching quality more

favorably tended to utilize deep motives. A relationship was also noted between perceptions of independence in learning and deep motives.

Second, Jackling (2005) noted that students who held favorable perceptions of teaching quality tended to utilize deep and achieving strategies in preparing for assessment tasks. Further, similar patterns were noted with respect to workload, independence in learning, and good teaching. Students with favorable perceptions tended to utilize deep and achieving strategies in their studies.

Finally, with respect to learning outcomes, the research suggested that students who utilized surface motives, generally, were unable to answer more conceptual type questions. It further suggested that surface motives did not lead to appropriate strategies that would have enabled students to answer more conceptual questions. The finding also showed that deep and achieving strategies were associated with correctly answering the more sophisticated questions. Generally, Jackling's (2005) research suggests that elements of the learning environment under the control of the instructor can influence the way in which students approach their learning of accounting and, accordingly, the learning outcome as well.

Alignment of the learning environment. Mladenovic (2000) holds that learning accounting is contextual but that manipulating or changing the teaching method alone will have limited success in changing the negative perceptions of accounting held by many first-year students. Saudagaran (1996) suggests that negative perceptions of the discipline center on its being a mechanical, repetitive, numbers type discipline. These perceptions are important because aside from influencing student's career choices, these

perceptions influence student's approaches to learning which have an effect on learning outcomes (Ramsden, 1992). Mladenovic looked for a more effective design to teach introductory accounting courses. She theorized that, given the contextual nature of learning, course objectives are more likely to be achieved if objectives, curriculum, teaching methods, and assessment were all in alignment (Biggs, 1987; Ramsden, 2003).

Mladenovic (2000) set out to examine the effects on student's perceptions of accounting of an aligned teaching environment versus an environment where only the teaching method was changed. She used groups from two prior studies as quasi-control groups. The two control groups were originally used to explore the issue of changing perceptions of accounting, the subjects were similar to those of the current study, and both varied teaching method as the main intervention. Using an aligned introductory accounting course, her study was conducted in three phases.

A questionnaire was administered to 925 students in introductory accounting courses during the first phase. The questionnaire consisted of 15 Likert scaled questions about student learning and perceptions of accounting. Results of the phase one survey confirmed that students held many of the negative stereotypes of accounting.

The second phase consisted of two interventions. During week three, faculty were given summaries of the students' responses to the original questionnaire and asked to discuss all the responses with the students with an emphasis on challenging the students' negative perceptions and supporting positive perceptions. During week nine, students were shown a summary of their initial responses and asked to consider whether

they had changed at all. During the third and final phase the questionnaires were re-administered to the students during week twelve.

Mladenovic (2000) concluded that there were significant changes in 14 of the 15 perceptions examined. The perceived importance of communication skills evidenced the least amount of change largely because no specific intervention was attempted to change this perception. Overall, alignment of teaching method, curriculum and assessment appeared to be more effective in changing students' perceptions of accounting than only changing teaching method. Focus group discussions among participants further revealed that the aligned teaching environment was more a factor in changing students' opinions than were the two direct discussion interventions.

Grade point averages. Watkins and Hattie (as cited in Ramburuth & Mladenovic, 2004) examined the relationship between approaches to learning and grade point averages (GPA) of students at an Australian university. They found significant negative correlations between a surface approach to learning and GPAs for science students, and a significant positive correlation between a deep approach and GPAs for art students. However, researchers attempting to examine the relationship between GPA and student approaches to learning have come up with mixed results. Likewise researchers focusing on relationships between demographic factors, such as gender or completion of a high school accounting class, and learning approaches have met with similar results. Accordingly, Elias (2005) set out to advance previous research. He hypothesized first that there is no significant correlation between overall GPA and class grade in introductory accounting and the surface and deep approaches to studying. Second, there

were no differences between deep and surface approaches to learning based on gender, age, grade level, major, and prior accounting education among introductory accounting students.

Elias (2005) conducted his research using 480 students from 14 different sections of introductory financial accounting and introductory managerial accounting from two universities. Sections were taught by eight different instructors each using their own examinations consisting of multiple choice questions, exercises and essays. To assess their approach to learning, he administered a questionnaire during the final week of the semester.

Elias (2005) concluded first that there existed a significant positive correlation between the deep approach to learning and GPA and a negative correlation between the surface approach and GPA. He found secondly that there was a positive correlation between the deep approach and expected class grade and a negative correlation between the surface approach and expected class grade. It is noted that Elias chose to use self-reported expected class grades given that the classes were all taught by different instructors, with different testing methods and a host of other potential contextual differences. The use of expected grades as perceived by the students suffers from the possibility of optimistic or pessimistic expectations (Elias).

Finally, Elias (2005) concluded that demographic factors were important determinants of study approach. Through an analysis of variance, he found that women and nontraditional students used the deep approach more often than men and used the surface approach the least. Second, he found that freshman and seniors used the deep

approach the most; seniors using the surface approach the least. He concluded that accounting majors used the deep approach the most.

Contract Learning

Much of the learning in higher education is accomplished utilizing mass production standards, handling each individual student in the same way while knowing that students learn in different ways (Ramsden, 2003). Engagement, inquiry and the finding of a suitable learning style are more likely to occur if teaching methods that necessitate student energy, problem solving and cooperative learning are employed. These kinds of methods permit a degree of student control over learning and can accommodate individual differences in reaching understanding, as well as having the potential to free students from over-dependence on teachers. They are also likely to result in students becoming engaged with what they are learning at a high cognitive level. It is worth stressing that students who experience teaching of the kind that permits control by the learner not only learn better, but that they enjoy learning more.

The conceptual roots of contract learning go back to the theory and practice of independent study starting in the early 1920s. Dresser and Thompson (as cited in Knowles, 1986) say the basic premise of independent study is that the ability to carry on independent study alone or with peers should be a major goal of education. These researchers define independent study as the students self directed pursuit of academic competence in as autonomous a manner as he is able to exercise at any particular time. They believed independent study described an ability that should be developed in every student. It meant motivation, curiosity, a sense of self-sufficiency and self-direction,

ability to think critically and creatively, awareness of resources, and some ability to use them.

Researchers as Bloom, McKeachie and Minter (as cited in Knowles, 1986) enriched the concept in the 1960s with experimentation and research into the individualization of instruction by proposing that instruction should be suited to students' individual differences and goals. These findings were summarized by Siegal (as cited in Knowles, 1986) who suggested that to be most effective instruction must be tailored to the needs, capabilities and histories of the individual learners.

In the late 1960s and early 1970s the concepts of independent study, individualized instruction, and self-directed and lifelong learning were incorporated into one comprehensive theoretical framework labeled andragogy meaning the art and science of helping adults learn and was later extended to helping people learn (Knowles, 1986). Contract learning is an approach to education that is most congruent with the assumptions about learners on which the andragogical model is based (Knowles).

The andragogical model (Knowles, 1986) presumes learners need to understand the need to learn something or how it will benefit them if they learn it or what the consequences will be if they do not. In the process of drafting a learning contract, learners are challenged to think through why they are undertaking to learn something. The model presumes the need to be self-directing. Contract learning at its best involves the learners in making decisions about what will be learned, how it will be learned, when it will be learned, and whether it has been learned. Finally, the model presumes the need to tap into the learner's intrinsic motivation. Children and youth are conditioned by their

school experience to rely on such extrinsic motivators as parents, teachers and grades. Although adults respond to extrinsic motivators, their deepest motivation comes from intrinsic motivators as increases in self esteem, responsibility, creativity, and self-fulfillment. Learning contracts challenge learners to tap into the intrinsic motivators.

Learning contracts offer numerous advantages to the learner. Sabin (2009) says contracts help to develop skills such as negotiation, personal responsibility, and life-long learning, skills increasingly necessary in our society. The process of negotiating the contract develops in the learner a sense of personal ownership of his or her education. That sense of ownership may lead to students putting forth the extra energy which leads to extraordinary learning and development. Because learners have negotiated their own goals into the curriculum, the courses become more relevant to each individual student. Additionally, because students have negotiated what work will be done, and how learning will be assessed, students are more likely to believe that grades more accurately represent their learning.

Where it was once common for people to remain in one career field, even with a single employer, throughout their working lives, today the average person will not only change their employers several times, but will even change their career fields (Sabin, 2009). The changing technology of many career fields has created a need for life-long learning skills. Few people will be able to leave school with all the technical knowledge their careers will ever require. Students who have used learning contracts develop intellectual independence and the ability to direct their own learning.

Marton (as cited in Anderson et al., 1996) suggests that a significant feature of contract learning is its potential to promote deep approaches to learning. When well prepared, learners are encouraged to go beyond assembling subject knowledge to consider how this knowledge may actually be acquired, what it may mean to them, how successful their learning has been and what further implications it may hold (Anderson et al., 1996). The contract method can stimulate learners to examine their own assumptions, beliefs and learning preferences, to be more reflective about their work, and to work collaboratively.

Summary

Student approaches to learning theory is grounded in there being two approaches to learning taken by students as they approach a learning task. Early qualitative research done by Marton and Saljo (1976a) identified these two approaches as deep and surface. Students who adopted a deep approach sought to thoroughly understand the lesson being learned. Those who adopted a surface approach sought only a superficial understanding of the topic under study. While there are clear differences in conception between the various approaches to learning there is a great deal of overlap (Biggs, 1987). It would be agreed that a student who adopts a deep approach:

1. Is interested in the academic task and derives enjoyment from carrying it out; Searches for the meaning inherent in the task;

2. Personalizes the task, making it meaningful to their own experience and to the real world;

3. Integrates aspects or parts of the task into a whole, sees relationships between this whole and previous knowledge; and

4. Tries to theorize about the task and forms hypothesis.

A student who adopts a surface approach:

1. Sees the task as a demand to be met, a necessary imposition if some other goal is to be reached, as a qualification;

2. Sees the aspects or parts of the task as discrete and unrelated either to each other or to other tasks;

3. Is worried about the time the task is taking;

4. Avoids personal or other meanings the task may have; and

5. Relies on memorization, attempting to reproduce aspects of the task, the words used, or a diagram.

The literature suggests that each student will choose an approach based on contextual factors (Biggs, 1987; Lucas & Mladenovic, 2004; Marton & Saljo, 1976b; Mladednovic, 2000; Ramsden, 1979, 2003). Biggs' model suggests that these factors interact to determine a students approach to a particular learning task which will in turn determine the learning outcome (Biggs et al., 2001). Ramsden (2003) suggests that students do things in response to the implicit or explicit requirements of their teachers and courses. They read or write for a particular audience and they do these things in response to the requirements of their teachers. Students' approaches to learning are, therefore, related to the task itself including students' previous experiences of dealing with similar tasks, the quality of interaction with lecturers, the curriculum and

assessment, and the atmosphere of the course, program of study and institution. Ramsden suggests that each of these levels represent a point at which an intervention can occur to change students' approaches.

The research revealed wide use of the older SPQ and the newer shortened version R-SPQ-2F as an instrument to identify students' observed learning approach. Most used the instrument at the beginning of their research ignoring the fact that the questionnaire so administered measured the student's approach to date. The second administration of the questionnaire in the current research provided insight as to the students' approach in this particular learning context and went to further validate the effectiveness of the intervention.

Research suggests correlations between overall course final grades and approaches to learning (Davidson, 2002; English et al., 2004). Generally students who use surface approaches have difficulty answering more conceptual question types while students utilizing a deep approach are better able to answer the more sophisticated questions.

Research suggests that the type of assessment the student expects plays a major part in the choice of learning approach (Marton & Saljo, 1976b; Tang, 1994, as cited in Byrne et al., 2002). Research has been completed on such selected task based interventions as writing exercises, presentations, group activities and case studies. The current research differs in that it sought to relate the constructs traditionally used in the teaching of accounting with a learning approach with the expectation of engaging the student. There is some evidence to suggest that multiple choice questions encourage a

surface approach (Thomas & Bain, 1984; Tang, 1994; as cited in Byrne et al., 2002) while essay or problem type questions lead to a deep approach (Entwistle, 1997; as cited in Byrne et al., 2002). Other research failed to associate surface learning with any particular problem type. The appropriate assessment is the one that results in the objectives of the course being met.

Davidson (2002) employed the SPQ to examine the relationship between students' approaches to learning and examination performance. Results revealed no significant relationships for a surface approach to learning, and a significant positive relationship between the use of a deep approach to learning and complex examination questions, but no relationship between a deep approach and less complex examination questions.

Byrne et al. (2002) found that problem solving questions were influential in determining students' approaches to learning. Presentations had no relationship. They suggest that giving students a "choice" may have enabled them to choose strategically. Conversely, that same choice may lead them to deep approaches. They also found that females scored higher on the deep approach and scored higher on problems, essays and presentations. They noted a positive relationship between the deep approach and assessment.

English et al. (2004) found that writing assignments intellectually challenged students. However, their writing skills intervention resulted in both the treatment and control group's deep scores declining from the first to the last SPQ administration. Declines were less for deep than surface approach students suggesting that success might

also be judged by limiting the decrease in expected deep score declines. Their research found that surface approach scores were lower relative to control groups and deep approach scores were significantly higher. They found final grades to be negatively correlated with surface scores. The positive correlation of final grade with deep scores was not as clear suggesting that assessment grades were not very sensitive to approach scores. They further suggest that disaggregated data would have enabled a closer examination.

Hall et al. (2004) found that various types of group activities were associated with increased deep scores and decreased surface scores. They also noted that in some learning contexts surface strategies are required in order to progress to higher levels of understanding.

Finally, the research suggests that various other elements impact a student's choice of learning approach. A study by Frannson (1977) concluded that extrinsically motivated students tended to use a surface approach to their learning. Although his research was not able to conclude such a relationship between intrinsic motivation and a deep approach, he did suggest that care should be exercised such that when student interest is low instruction doesn't foster a surface approach.

Jackling (2005) found that students with favorable perceptions of workload, teaching and independence in learning tended to utilize deep and achieving strategies. Deep and achieving strategies were associated with correctly answering sophisticated questions. She further found that elements under the control of the instructor can influence the way students approach their learning and hence the learning outcome.

Mladenovic (2000) found that alignment of teaching method with curriculum and assessment appeared to be more effective in changing students' perceptions of accounting than only changing teaching method. Evidence suggests that as students mature they utilize the deep approach more (Gow & Kember, 1990). Elias (2005) found that nontraditional students used the deep approach more and surface less.

Although results seem mixed, a review of the literature suggests that carefully designed interventions can be effective in encouraging students to adopt a deep approach or reduce their tendency to employ a surface approach to their learning (English et al., 2004; Hall et al., 2004). A successful intervention can be measured not only by increased deep scores but by decreased surface scores (English et al., 2004).

Chapter III

Methodology

Introduction

This chapter presents the research questions, describes the intervention, the instrumentation to be utilized, and the planned analysis. Summarizing a series of studies they conducted at Gothenburg University, Marton and Saljo (1976a) concluded that students used basically two different levels of processing: a surface level and a deep level. In the case of surface level processing the student directs his attention towards learning the text itself; he has a reproductive conception of learning which means that he is more or less forced to keep to a rote learning strategy. Conversely, deep level processing directs the student towards the intentional content of the learning material. The aim is to comprehend what the author wants to say about a certain problem or principle.

Purpose of the Study

The relationship between students' approaches to learning, methods of assessment and learning outcomes was of interest in the present study. The purpose of this study was to inform and influence the teaching of introductory accounting and to contribute to the development of research aimed at understanding how students learn in the accounting discipline by exploring the effect of learner directed contracts on student approaches to learning and learning outcomes.

A deep approach to learning is characterized by a personal commitment to learning and an interest in the subject. The student approaches learning with the intention

to understand and seek meaning and searches for relationships among the material and interprets knowledge in the light of previous knowledge structures and experiences. According to Hall, Ramsay, & Raven (2004), a deep approach to learning is more likely to result in better retention and transfer of knowledge and may lead to quality learning outcomes such as a good understanding of the discipline and critical thinking skills.

A surface approach to learning is characterized by an intention to acquire only sufficient knowledge to complete the task or pass the subject. The student relies on memorization and reproduction of material and does not seek further connections, meaning, or the implications of what is learned. A surface approach is externally focused and tends to result in a lack of engagement with the subject and with the student viewing learning as the accumulation of unrelated pieces of information for assessment purposes (Hall et al., 2004). Students are unlikely to experience high-quality learning outcomes.

The second aim of this research was to examine the various problem constructs traditionally utilized in accounting course assessments and practice sets and identify the relationships between those problem types and students' assessed approach to learning. Knowledge of how the various problem types associate with learning approaches will inform assessment design and result in assessments consistent with students acquiring the desired skills of the discipline.

Research Questions

Marton and Saljo (1976a) found that the ways students approach the task of learning followed two paths: a deep approach or a surface approach. Their work revealed that the learning process had a contextual meaning, and learning outcomes were the result

of many factors in a particular learning environment. Both Biggs (1987) and Ramsden (2003) systemized the learning process and theorized how the various elements of context were related. Both of their models suggest points in the learning process at which educators can intervene by manipulating the teaching context and altering the student's approach to learning and ultimately the learning outcome. The research questions that guided this study were:

Question 1. Can modifications to the learning environment of an introductory managerial accounting course in the form of learner directed contracts yield an increase in students' deep approach scores or a decrease in students' surface approach scores, as measured by multiple administrations of the R-SPQ-2F?

Question 2. Which learner grouping, deep or surface, will benefit more from a managerial accounting course utilizing learner directed contracts as measured by their mean examination scores throughout the semester?

Question 3. Which students will perform better on various problem types: those who scored higher on the deep approach scale or those who scored higher on the surface learning scale?

Design of the Study

Study participants. The participants included undergraduate students enrolled in Managerial and Financial Accounting courses taught by the researcher during the 2009-2010 academic year at a southeastern Pennsylvania university. The courses were both entry-level and upper-level with sophomores, juniors, and seniors enrolled. The upper-

level courses were comprised primarily of accounting majors, while the entry-level courses were open to students not identified as accounting majors.

As random assignment of participants to study groups was not feasible, the researcher employed a nonequivalent, quasi-experimental design. The researcher hypothesized in Questions 1 and 2 that any observed differences between the treatment and the comparison groups might be the result of the intervention.

Other variables. To mitigate concerns related to a possible dissimilarity between the treatment and comparison groups, the researcher examined gender, class standing as a proxy for age, grade point average (GPA), and entrance examination scores (EES). Students' scores from a managerial accounting pretest developed by the researcher (noted in Appendix B) were considered as well.

Specifically, for research Questions 1 and 2, the participants were enrolled in two sections of Introductory Managerial Accounting. In addition to the courses identified for Questions 1 and 2, four additional course sections of students were included in the research group for Question 3 primarily to increase the sample size. The additional sections were taught by the researcher during the Spring 2010 semester and included two sections of Managerial Accounting (AC202), one section of Intermediate Accounting I (AC301), and one section of Cost Accounting (AC303). The format of all four sections included lecture, guided practice in the classroom, and assigned homework exercises and problems. None of the additional sections employed contract learning related to research Questions 1 and 2. The AC202 sections met three times each week for a 50-minute session. Common examinations, not administered during class, were used both Fall 2009

and Spring 2010 sections. Conversely, AC301 and AC303 met twice weekly for 75 minutes. The text for AC301 was *Intermediate Accounting* by Kieso, Weygandt, and Warfield; AC303 used *Cost Management* by Blocher, Stout, and Cokins as the primary text. Examinations for AC301 and AC303 were administered during normal class times.

The AC202 course content focused on the accumulating, processing, and analyzing of financial information utilized in business decision making and included such topics as might be considered standard for a beginning level managerial accounting course. The AC202 course was not taught using a traditional managerial accounting textbook, instead an electronic text was selected. The electronic text was not as rich with examples as a traditional managerial text; rather, it highlighted areas considered to be important. A workbook was required which provided brief topic outlines and example problems for the students to solve. Although the workbook exercises provided solution formats, the course examinations generally did not.

Three examinations were administered to the treatment and comparison groups during the semester not during regular class times. Both groups completed the same examination at the same time. Open study labs were offered to all students in advance of each examination. Duration of the labs was approximately two hours per session; they were well attended. Demographics of the research groups are noted in Table 2.

Table 2

Research Group Demographics

Variable	Course sections					
	Treatment	Comparison	AC202-1	AC202-6	AC301	AC303
N	28	31	31	30	34	22
Males	15	23	14	14	22	11
Females	13	8	17	16	12	11
Freshmen	2	2	0	0	3	1
Sophomores	14	22	26	12	7	5
Juniors	11	6	4	15	19	14
Seniors	1	1	1	3	5	2
Business Majors	19	14	16	19	5	2
Accounting Majors	2	3	8	3	25	16
Other Majors	7	14	7	8	4	4
Mean GPA	2.99	2.91				
Mean EES Score	1,687	1,558				
Mean Pretest Score	25	31				

Treatment and comparison groups. The "treatment" group experienced the learning independence associated with learner-directed contracts, while the "comparison" group was instructed using typical syllabus-driven methods. The Revised Study Process Questionnaire (R-SPQ-2F) was administered to both groups at the beginning of the class described as Trial 1 to determine the students' general approach to learning. The questionnaire was administered a second time at the end of the semester considered Trial

2, to assess each student's learning approach during the class considering the effect of the treatment, learner-directed contracts. Consequently, the change in learning approach scores for both groups was compared and examined to answer research Question 1.

The second research question was answered by first determining if mean examination scores for the treatment group were significantly different from those recorded for the comparison group. Students' overall course performance was measured by calculating the mean grade received on all examinations during the semester. Next, the treatment and comparison groups were combined to consider whether mean examination scores for students who scored highest as deep learners differed from those students who scored highest as surface learners. Finally, learning approach scores and mean examination scores collected from the four additional sections of accounting from the Spring 2010 semester were included with the treatment and comparison group data to consider whether mean examination scores for students who scored highest as deep learners from this expanded group differed from those students who scored highest as surface learners.

The third research question was answered by categorizing examination questions according to Shute's (1979) Cognitive Demand Classification System (CDCS) and comparing all students' scores in each category with their observed learning approach scores. The study group for Question 3 included both the treatment and comparison groups and the four additional sections of accounting taught by the researcher. The end-of-semester R-SPQ-2F scores for all students were used to determine each students' approach to learning.

Learning modules and learning contracts. The AC202 courses were divided into three learning modules, each module concluding with a comprehensive examination. Both the treatment and comparison groups were given the same course syllabus. Knowles (1986) suggests that a contract may have as its purpose the accomplishment of the objective of a particular unit of learning or of an entire course. The treatment group utilized a learning contract for each module to select the out-of-class problems for assessment, while problems for the comparison group were assigned by the researcher. Related, as assessment processes were a major emphasis at the university, this research dovetailed existing practices in accounting courses.

Managerial accounting is a course with high information content notes Elias (2005). As student learners may not be familiar with the contract learning process, the type of learning contract was restricted to learning objectives associated with the particular module. Nonetheless, each student had the opportunity to complete a self-selected project for the instructor to evaluate. Besides the three learning contracts, the treatment group had no other work to submit for evaluation.

The first contract was modest and executed over a short period of time. It was assessed and returned to the students to provide them with a successfully completed piece of work as quickly as possible. Contract tasks were aimed at fostering a deep approach to learning. Each learning contract included learning exercises to ensure each student's understanding of the curricular content, while allowing the students sufficient freedom of choice, a benefit of contract learning. Additionally, every effort was made to ensure

contract-related workload was not perceived to be overwhelming, thereby encouraging the adoption of a surface learning approach (Cope & Staehr, 2005).

Each module's learning contract was distributed to the students electronically. Students were not required to sign and return a hard copy but were instead asked to confirm their selection of learning outcome by electronic mail. The choices of learning outcome ranged from problems requiring solution, the writing of a brief research paper, a brief teaching presentation to the class of a topic from the module, to a self-designed option requiring some negotiation and instructor approval. The researcher's expectations and assessment requirements were made clear to the students. General factors the researcher used in assessing completed contracts are noted in Appendix C. The three contracts administered during the course are noted in Appendix D.

Instrumentation

The Revised-Study Process Questionnaire (R-SPQ-2F). The instrument currently in use to assess each student's approach to learning was the Revised-Study Process Questionnaire R-SPQ-2F developed by Biggs et al. (2001). The R-SPQ-2F includes 20 items using a fully anchored 5 point Likert scale ranging from: (1) never or only rarely true to (5) always or almost always true. The Revised-Study Process Questionnaire (R-SPQ-2F) was administered to both groups at the beginning of the class described as Trial 1 to determine the students' general approach to learning. The questionnaire was administered a second time at the end of the semester considered Trial 2, to assess each student's learning approach during the class considering the effect of the treatment, learner-directed contracts. Students were informed of the assessment

procedures at the university and assured that the results would remain confidential and in no way affect their grade for the course. A copy of the instrument is included in Appendix E.

Contract learning questionnaire. To assist the researcher in understanding student perceptions of the learning contract instructional model, a questionnaire was designed by the researcher included in Appendix F. It was administered to the treatment group at the end of the Fall 2009 semester to ascertain the students' perceptions of learning contracts relative to research Question 1.

Cognitive Demand Classification System (CDCS). Shute's (1979) Cognitive Demand Classification System (CDCS), included as Appendix G, establishes some theoretical foundation for understanding which question types were effective in terms of points scored and the student's adopted approach to learning. Although Shute used the system to assess the student's cognitive development level required to respond to accounting questions, this research sought to link his various question constructs with approaches to learning. Hence, this researcher used the CDCS as the framework to analyze the various examination questions to facilitate understanding each question's relationship to the student's learning approach score related to research Question 3.

The researcher considered Blooms Taxonomy (Bloom, 1956) as a possible model for classifying examination questions. One of the most frequent uses of the taxonomy has been to classify curricular objectives and test items in order to show the breadth of the objectives across the spectrum of the six categories (Amer, 2006).

The original Bloom's Taxonomy (1956) divided educational objectives into three domains: affective, psychomotor, and cognitive (Bloom, 1956). It further defined the cognitive domain as having six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. A revision of the taxonomy put forth by Anderson, Krathwohl, Airasian, Cruikshank, Mayer, Pintrich, Raths and Wittrock (2001) suggested that the cognitive domain was two dimensional comprised of a knowledge dimension and a cognitive process dimension each with sub categories. The revised taxonomy has four categories under the knowledge dimension: factual, conceptual, procedural and metacognitive. The cognitive process dimension has six categories: remember, understand, apply, analyze, evaluate, and create.

Both the CDCS (Shute, 1979) and the revised Bloom's Taxonomy (RBT) (Anderson et al., 2001) would have been appropriate models for use in classifying examination questions. A comparison of the CDCS to RBT required considering both dimensions of the RBT. The various levels of reasoning ability defined in the CDCS were all found to be represented within the RBT. This researcher concluded that two cognitive dimensions of RBT, evaluate and create, appeared to have no direct counterpart in the CDCS and was considered to be of no consequence in application to accounting courses. Accordingly, the researcher believed the use of either model to classify examination questions would likely have yielded similar results. Hence, the CDCS was chosen because of the researcher's familiarity with the model and its use in research by Shute (1979) and Davidson (2002), both considered important to this research.

Psychometric Characteristics of the R-SPQ-2F and CDCS

Early research into student approaches to learning failed to present a clear picture of how accounting students approach the task of learning accounting. Byrne, Flood and Willis (2004) pointed out that one of the main reasons for the inconsistencies could be found in the instruments used in testing. The variation in instruments hindered comparison and generalization. Further, few of the early studies discussed the validity or reliability of the instruments used. Instead researchers relied on studies done in different disciplines suggesting that student's approaches to learning in a particular learning context would be no different in another. Byrne et al. concluded on a need to identify an instrument that could be validly used to measure accounting student approaches to learning.

R-SPQ-2F. Although early research into student approaches to learning lead to the development of several inventories to assess students' learning approaches, one of the most popular ones was Biggs (1987) Study Process Questionnaire (SPQ). The SPQ was developed from an earlier 10-scale Study Behavior Questionnaire (Biggs, Kember, Leung, 2001). Factor analysis suggested that the 10 scales could be interpreted in terms of three factors. The most suitable interpretation of these factors was the student approach to learning conceptual framework. Two of the three factors were found to be comprised of two kinds of items, those relating to a motive and those related to a strategy recalling Marton and Saljo's (1976a) original point that a student handled a reading task according to his or her intentions prior to engaging the task. Whereas Marton and Saljo were concerned with two motives, Biggs found that there were three such motives: to

exert minimal effort, to engage the task appropriately, and to maximize grades. Each motive was associated with a strategy: selective memorizing, seeking for meaning, and optimal time and space management, respectively. Biggs' work revealed that the first two motives were similar to Marton and Saljo's surface and deep approaches. The original SPQ yielded three approaches: surface and deep, those being the ones identified by Marton and Saljo, and the third being achieving, each with a component motive and strategy score as shown in Table 3.

Table 3

The Original Study Process Questionnaire: Dimensions, Motives and Strategies (Biggs et al., 2001, p. 135)

	Surface	Deep	Achieving
Motive	Fear of failure	Intrinsic interest	Achievement
Strategy	Narrow target, rote learn	Maximize meaning	Effective use of space and time

The role of the achieving scales was not as evident as those of the deep and surface scales (Biggs et al., 2001). Whereas deep and surface strategies describe the way students engage the task itself, the achieving strategy refers to how the students organize when, where and how long the task will be engaged. Factor analysis usually associated the achieving motive and strategy with the deep approach motive and strategy, but occasionally they loaded on the surface approach. Biggs et al. concluded that the SPQ could most conveniently be described in terms of two factors: deep and surface with achieving motive and strategy subscales aligning themselves on both factors. Consequently, there appeared then to be a need for a shorter, two-factor version of the

SPQ addressing the deep and surface approaches only. Changes in the student population, the range and depth of curricula, the advances in the method of delivery, in addition to the new pressures emphasizing assessment, combined with a growing body of research on approaches to learning, suggested that the factor structure of the constructs measured and the items defining those constructs should be re-examined and updated as appropriate (Biggs et al., 2001).

The redesign of the SPQ began by selecting 43 items for testing (Biggs et al., 2001). Confirmatory factor analysis performed on the original 43 items resulted in a total of 20 items being mapped to two main scales: a deep and a surface approach, each with 10 items. The four subscales, deep motive, deep strategy, surface motive, and surface strategy each included five questions on Biggs et al. revised SPQ.

The revised SPQ was tested using a sample of 495 undergraduate students across various disciplines and in all years of study (Biggs et al., 2001). The dimensionalities of the four subscales were examined by confirmatory factor analysis to check whether items contributed to the intended component. The Cronbach's alpha values for each component were then computed to determine the scale and subscale reliability coefficients..

The unidimensionality of each of the subscales was separately tested by fitting a single factor model to the corresponding five items. Biggs et al. (2001) assessed the goodness of fit of the model to the data using the standardized root mean squared residual (SRMR) supplemented with the comparative fit index (CFI). A CFI value greater than 0.95 and an SRMR less than .08 was determined by Biggs et al. to be an indication of a relatively good fit between the hypothesized model and the observed data.

The results of separately testing each of the subscales are show in Table 4 (Biggs et al., 2001). Good fits of the single factor models for the four subscales to the observed data were supported suggesting that the items are unidimensional for each of the four subscales. Cronbach's alpha values for each subscale in the instrument were computed and also included in Table 4. The values all reach acceptable levels indicating that the subscales can be interpreted as internally consistent. The Cronbach's alpha values for the main constructs of the deep approach and the surface approach were noted to be .73 and .64, respectively, which were also considered acceptable. The rigorous testing performed on the final version of the Revised Study Process Questionnaire (R-SPQ-2F) included as Appendix E suggests that the questionnaire has very good psychometric properties and is an ideal tool for use in evaluating and researching classrooms (Biggs et al., 2001).

Table 4

Unidimensionality and Reliability Check for the Four Subscales of R-SPQ-2F (Biggs et al., 2001, p. 142)

Subscales	CFI	SRMR	Alpha
Deep motive (DM)	0.997	0.01	0.62
Deep strategy (DS)	0.998	0.02	0.63
Surface motive (SM)	0.988	0.02	0.72
Surface strategy (SS)	0.998	0.02	0.57

Note. CFI = comparative fit index; SRMR = standardized root mean squared residual; Alpha = Cronbach's alpha.

Cognitive Demand Classification System (CDCS). The CDCS includes the identification of various skills or schemes commonly required in university accounting

examinations. Shute (1979) separated these skills into two major groups: concrete-operational and formal-operational. Shute noted that the skills included in the concrete-operational category were not necessarily operational by definition; rather, they were not formal-operational. Accordingly, some of the concrete-operational skills were specifically identified by Piagetian terms while others in the group were simply rote processes. Similarly, some of the skills in the formal-operational group were clearly Piagetian while others Shute believed were formal in nature although not clearly identified.

Limitations

Genuine educational settings are particularly difficult for experimental research designs because of the complex array of contextual variables which can interact with the variable under study (Kember, Charlesworth, Davies, McKay and Stott, 1997). It is sometimes possible to control statistically for extraneous variables, but some variables are difficult to measure and factors which were not anticipated can and often do play a part when the research setting is the classroom. Holding extraneous variables constant becomes more difficult the longer the trial.

It would be inappropriate to formally categorize students as either surface or deep learners solely on the basis of SPQ responses, as if a score measured a stable trait of the student. Rather, SPQ responses are a function of individual characteristics and the teaching context (Biggs et al., 2001). The teacher and the student have a shared responsibility for the learning outcome.

Despite the researcher's inclusion of students from six different accounting classes, it is acknowledged that the sample size was small. Hence, the ability to generalize the findings is limited.

Analysis of the Data

For Question 1, can modifications to the learning environment of an introductory managerial accounting course in the form of learner directed contracts yield an increase in students' deep approach scores or a decrease in students' surface approach scores, as measured by multiple administrations of the R-SPQ-2F, a paired samples t test was conducted first on the students' scores in both the treatment and comparison groups to determine if any significant change in learning approach scores had occurred between Trial 1 and Trial 2. Next, a one-way analysis of variance was conducted to observe whether the average change in learning approach scores for the treatment group was significantly different from those of the comparison group.

The literature (Bigg, 1987; Ramsden, 2003) reveals that a student's choice of approach to learning can be affected by many factors. Biggs' (1987) 3P model suggests that factors include prior knowledge, ability and personality. Personal factors of interest in this research question for which data was collected were gender, grade point average, SAT scores, and class standing as a proxy for students' age. A linear regression model was utilized to consider the effect of these personal factors on the observed changes in learning approach scores.

A one-way analysis of variance was conducted first to examine differences on mean examination scores between the treatment and the comparison groups for research

Question 2, which learner grouping, deep or surface, will benefit more from a managerial accounting course utilizing learner directed contracts as measured by their mean examination scores throughout the semester. A second one-way analysis of variance was conducted to determine whether, combining treatment and comparison group students, students scoring highest on the deep approach or those students with highest surface approach scores performed better on examinations. Students from both groups were categorized as either surface or deep approach learners based on their reported learning approach scores from the Trial 2 administration of the R-SPQ-2F. Examination performance was specified as the students' total percentage of possible points for all examinations given in their respective classes. A linear regression model was again utilized to examine the effects of personal factors.

Finally, research Question 3 asked: Which students will perform better on various problem types: those who scored higher on the deep approach scale or those who scored higher on the surface learning scale? The approach used to examine Question 3 was a mixed model with a random intercept to predict outcomes of the dependent variable "ratiopoints", allowing also for different distributions of error on each of the examinations. The dependent variable ratiopoints was created for each question in order to facilitate the analysis. This variable is the number of points scored by each student on a particular examination question divided by the number of possible points. The mixed model is an optimal model for this analysis because it takes into account the correlation among different students and among different examinations. The use of a random intercept assumes a different intercept or baseline score for each student in the study.

Three versions of the model were generated to consider the effect on examination results while accounting for the effect of learning approach and question type. The first model considered the effects of deep and surface learning approach scores and examination question categories when question categories were held to be simple and complex. The second model considered the effects of learning approach scores and examination questions categorized according to the CDCS. Finally, the third model considered the effect of learning approach scores and the various question format types.

Summary

This chapter presented the research questions, explained the intervention for the treatment and comparison groups, and described the instrumentation, as well as the psychometric features, and the planned data analyses. Succinctly, the quantitative methodology was outlined in the chapter.

Chapter IV

Findings and Results

Introduction

The purpose of this study was to inform and influence the teaching of introductory accounting and to contribute to the development of research aimed at understanding how students learn in the accounting discipline by exploring the effect of learner directed contracts on student approaches to learning and learning outcomes. Specifically, this research sought to provide insight related to the following questions:

1. Can modifications to the learning environment of an introductory managerial accounting course in the form of learner directed contracts yield an increase in students' deep approach scores or a decrease in students' surface approach scores, as measured by multiple administrations of the R-SPQ-2F?
2. Which learner grouping, deep or surface, will benefit more from a managerial accounting course utilizing learner directed contracts as measured by their mean examination scores throughout the semester?
3. Which students will perform better on various problem types: those who scored higher on the deep approach scale or those who scored higher on the surface learning scale?

This chapter presents the findings and the quantitative results of the various models used in exploring, researching, and answering the aforementioned questions.

Research Question 1: Can modifications to the learning environment of an introductory managerial accounting course in the form of learner directed contracts

yield an increase in students' deep approach scores or a decrease in students' surface approach scores, as measured by multiple administrations of the R-SPQ-2F?

The first research question asked whether a classroom intervention designed around the use of learner directed learning contracts would be associated with an increase in deep or a reduction in surface learning approach scores. To answer the question the researcher considered the within group effects of the intervention, the between group effects, and the possible effects of personal factors.

Within group results. A paired-sample t test was conducted to determine if there was a significant change in deep or surface approach scores for students within either the treatment or the comparison group. Despite modest increases in overall deep scores for students in both groups and a decrease in the overall surface scores for students in the comparison group, the changes were not found to be statistically significant. Paired-sample t tests were also conducted on the motive and strategy subgroups for both deep and surface approach scores. These tests also resulted in no statistical significance.

The R-SPQ-2F was administered to the students in both the treatment and comparison groups during the first class meeting of the semester (Trial 1) and again immediately prior to taking the final examination at semester end (Trial 2) in order to establish each students' approach to learning score. Responses to the R-SPQ-2F for each student were first aggregated into their overall deep and surface learning approach scores. The deep approach scores for students in both groups ranged from a low of 15 to a high of 44 while surface approach scores ranged from 14 to 42. Minimum and maximum

scores for both the deep and surface approach scales were 10 and 50 points, respectively. The deep and surface learning approach scores were each further decomposed into their motive and strategy subscales for each student. The deep motive scores ranged from 6 to 22 and the deep strategy scores ranged from 8 to 23. Surface motive scores ranged from 5 to 22 while surface strategy scores ranged from 8 to 23. The descriptive statistics for the overall test scores for Trials 1 and 2 and the results of the paired-sample t test are presented in Table 5.

Table 5

Within Groups Change in Approach Scores

Group/Learning Approach	Approach Score [a]				
	Trial 1	Trial 2	*df*	*t*	*p*
Treatment					
Deep	29.39 (5.57)	30.61 (5.18)	27	1.14	.27
Surface	26.14 (4.62)	28.00 (5.14)	27	1.60	.12
Comparison					
Deep	28.52 (5.53)	28.84 (6.05)	30	0.46	.65
Surface	29.13 (7.26)	28.52 (6.16)	30	-0.64	.53

[a] Mean (standard deviation).

The mean deep scores reported in this research ranged from 28.5 to 30.6 when combining both research groups and trials and were similar to those reported by other researchers using the same instrument. Gijbels et al. (2004) and Gijbels and Dochy (2006) in their research reported deep scores of 29.9 and 28.9, respectively. These

researchers also reported respective surface scores of 22.1 and 24.6, both considerably below the range of 26.1 to 29.1 reported in the current research and resulting in a larger difference between their reported deep and surface scores. There appears to be no obvious reason for the differences in scores and are presented here simply as a frame of reference.

Between group results. Next, the researcher considered whether there was a significant difference in the change in deep or surface approach scores between the treatment and comparison groups. Following the method of Hall et al. (2004), two variables were created: change in surface and change in deep approach scores. Change scores were calculated for both the treatment and comparison groups as Trial 2 surface and deep scores minus those from Trial 1. The results of a preliminary independent samples t test suggested that there was no statistically significant difference in the change scores between the students in the two groups. The primary issue in Question 1 was whether the learning contract intervention was effective in changing learning approach scores for students in the treatment group over students in the comparison group. Accordingly, a one-way analysis of variance (ANOVA) was used to confirm the preliminary t-test finding. The results of the ANOVA, given in Table 6, confirmed that there was not a statistically significant difference in the change in deep or surface approach scores between students in the treatment and the comparison groups.

Table 6

Between Groups Change in Approach Scores

Variable	*df*	*F*	*p*
Change in deep approach score	1,57	0.51	.48
Change in surface approach score	1,57	2.74	.10

The results of the tests would suggest that learner directed contracts are not an effective tool for encouraging students to increase their use of a deep approach to learning. A learning contract questionnaire was administered to the students in the treatment group to provide a more rich description of the process and to better understand the outcome. The results of the questionnaire are discussed more fully in Chapter 5.

Effects of personal factors. It was important to understand whether other within-group differences might have obscured any real differences in student responses before and after instruction. A regression model was used to consider whether the student's personal characteristics of gender, grade point average, SAT scores, and class standings as a proxy for age had a significant effect on the observed changes in students' study approach scores. A regression model can be used when assessing the relationship between one continuous dependent variable and multiple independent variables. Two models were computed using each student's change in deep and surface approach scores as the dependent variables. The results revealed no significant relationships between the changes in deep or surface approach scores while accounting for the variables. None of the variables considered added significant explanatory power to the observed changes in either the deep or surface approach scores for the treatment or comparison group. These

results would suggest that the personal factors considered in this research were of little consequence in influencing changes in student's learning approach. The overall results of the model are presented in Table 7.

Table 7

Effect of Personal Factors on Approach Scores

Dependent Variable	R^2	*df*	*F*	*p*
Change in deep approach score	.04	6,40	0.24	.96
Change in surface approach score	.09	5,58	1.10	.37

Research Question 2: Which learner grouping, deep or surface, will benefit more from a managerial accounting course utilizing learner directed contracts as measured by their mean examination scores throughout the semester?

The second research question sought to understand whether students scoring highest as deep learners or those scoring highest as surface learners would benefit most from the use of learner directed learning contracts as measured by their mean examination scores. To answer this question the researcher first compared the examination results and learning approach scores of students in the treatment group with those of students in the comparison group. Second, the two groups were combined and examination results of students scoring highest on the deep scale were compared with those of students scoring highest on the surface scale to investigate whether learning approach score had an effect on examination results. Finally, this second research grouping was expanded to include the examination results and learning approach scores

for four additional sections of accounting extending the research by increasing the sample size.

Treatment group versus comparison group results. A one-way analysis of variance (ANOVA) with mean examination scores as the dependent variable was computed first to determine if mean examination scores for the treatment group were significantly different from those recorded for the comparison group. Mean examination scores for the treatment and comparison groups are reported in Table 8.

Table 8

Mean Examination Scores for the Treatment and Comparison Groups

	Examination Scores		
	Mean	*SD*	*n*
Treatment Group	67.70	9.34	27
Comparison Group	71.82	9.23	28
Deep Approach	70.04	10.21	28
Surface Approach	69.56	8.73	27

The results suggested that, on average, the students in the comparison group scored 4.12 points higher on examinations than students in the treatment group. This unanticipated result is discussed further in Chapter 5. The results of the ANOVA, however, confirmed that there was no significant overall difference in scores between the two groups $F(1, 53) = 2.70, p = .11$. Students in the treatment group did not appear to have benefited from the use of learning contracts as measured by examination performance.

Deep versus surface approach results for the combined treatment and comparison groups. The researcher combined the treatment and comparison groups to consider whether mean examination scores for students who scored highest as deep learners differed from those students who scored highest as surface learners. Mean examination scores for students scoring highest on the deep scale were .48 points higher than those for students scoring highest as surface learners. Although these examination results were encouraging, they were not determined to be statistically significant. The results of a one-way analysis of variance computed with mean examination scores as the dependent variable showed no significant difference in examination scores between the two groups of students $F(1, 53) = 0.04, p = .85$. The students' mean examination scores grouped by learning approach are also presented in Table 8.

Deep versus surface approach results for the expanded group. The primary interest in research Question 2 was whether the benefits of deep learning could be evidenced by examination scores. The results from the treatment and comparison groups suggested no relationship between examination scores and learning approach. The researcher added data collected from four additional sections of accounting from the Spring 2010 semester to the treatment and comparison groups data to expand the sample size and confirm the earlier result. Learning approach scores for the Spring 2010 accounting sections are noted in Table 9. The mean examination scores for the expanded research group, presented in Table 10, were .98 points higher for students scoring highest on the deep approach than for students scoring highest on the surface approach. Results of a one-way analysis of variance computed on the expanded group, using mean

examination scores as the dependent variable, indicated no significant difference in mean examination scores between the two learning approaches $F(1, 162) = 0.35, p = .55$. Results from the larger group confirmed the earlier finding suggesting that students' learning approach scores offered little explanation for their performance on examinations as measured in this research by mean examination scores.

Table 9

Learning Approach Scores for the Additional Groups

Learning Approach	Approach Score [a]			
	AC202-1	AC202-6	AC301	AC303
Deep	27.48 (6.94)	30.07 (7.75)	32.74 (6.47)	31.67 (6.52)
Surface	27.22 (6.03)	27.63 (7.35)	27.38 (7.11)	27.14 (5.36)

[a] Mean (standard deviation)

Table 10

Mean Examination Scores for the Expanded Research Group

	Examination Scores		
	Mean	*SD*	*n*
Deep approach	73.95	10.66	100
Surface approach	72.97	9.78	64

A follow-up analysis regressed the student characteristics of gender and class standing as a proxy for age on examination performance for the expanded research group. This analysis added no significant explanatory power to the observed examination scores.

Plotting learning approach scores. Categorizing students as either deep or surface learners based on R-SPQ-2F scores did not result in a significant relationship with students' mean examination scores. Evidenced by the range of deep and surface scores it was of interest to this researcher that some students scored higher or lower on the scales and what effect, if any, that would have on mean examination scores.

Gijbels et al. (2005) plotted both the deep and surface approach scores for 133 students in their research sample in order to gain more insight into the relationships between students' approaches to learning and the different components of problem solving that they were measuring using multiple-choice assessments. They found that most students fit into one of two groups: a group of students with high scores for deep learning approaches and low scores for surface learning approaches compared to a group of students with low scores for both the deep and surface learning approaches. They noted that few students employed high levels of both deep and surface approaches to learning. The group of students that had high scores for the surface learning approach and low scores for the deep learning approach was also small.

Plotting the individual surface and deep learning scores for the students in the expanded research group also suggested that most students fit into one of two groups: a group of students who scored high on deep and low on surface learning, consistent with the findings of Gijbels et al. (2005), and a second group of students who scored high on both deep and surface learning approach scales. Descriptive statistics for the four possible groups identified by the plotting are presented in Table 11. A one-way analysis of variance (ANOVA) calculated with mean examination scores as the dependent

variable and the four possible groups as factors indicated no significant difference in examination scores between the four groups $F(3, 171) = 2.09, p = .10$.

Table 11

Descriptive Statistics for Plotting Students by Approach Score

	Range Definition		Examination Scores		
Group	Deep	Surface	Mean	*SD*	*N*
1	>24	<25	74.10	9.74	50
2	>24	>24	72.07	11.02	92
3	<25	>24	74.03	8.78	23
4	<25	<25	80.20	7.71	10

Research Question 3: Which students will perform better on various problem types: those who scored higher on the deep approach scale or those who scored higher on the surface learning scale?

The third research question sought to establish a relationship between students' learning approach and their performance on various types of accounting examination problems. Did students who utilized a deep approach to learning tend to be the ones who scored highest?

Question classifications. It was necessary to classify all examination questions according to the Cognitive Demand Classification System (CDCS) before any work on Question 3 could be started. Results of the classification process and mean scores for each type of examination question are provided in Table 12.

The distribution of question classifications was of interest. First, there were no individual examples of serial ordering; however, certain examination problems required serial ordering in solution. Any higher order skills that may have been required in solution were considered precedent over the lower order skills. Succinctly, the researcher categorized any problem requiring multiple cognitive levels at the higher order. Second, it was difficult to distinguish between the CDCS 07 simple algorithm, direct application and the CDCS 08 simple algorithm, new application for the student. The researcher concluded that, given the introductory levels of both the managerial accounting courses and intermediate and cost accounting courses, these categories would likely be characterized by both direct and new applications of algorithms. Accordingly, all such applications were treated as simple algorithms. Finally, higher order questions were difficult to find, similar to Shute's (1979) observation, given the levels of the courses included in this research. Although no examples of probabilistic reasoning (22) were found, questions requiring this skill would more likely be found in an auditing course. Also noted was that 45 question types, or 42% (categories 01, 02, 03, 04 and 07), required only memorization or a simple algorithm to solve.

Table 12

CDCS Classification of Examination Questions

Complexity [a]	CDCS Category	*n*	*N*	Score [b]	*SD*
1	01 Definition	5	510	60.33	47.43
1	02 Fact Memorization	5	510	68.69	45.67
1	03 Format Memorization	3	357	83.39	27.93
1	04 Concept Memorization	27	2,243	59.96	47.38
1	05 Classification	5	595	78.26	30.09
1	06 Serial Ordering	0	-	-	-
1	07 Simple Algorithm	5	401	85.60	30.16
1	08 Simple Algorithm (new)	0	-	-	-
1	09 Complex Algorithm	22	1,676	63.98	39.56
2	10 Algorithm - Derived	17	1,051	65.22	32.49
2	20 Proportional Reasoning	5	341	78.93	33.73
2	21 Combinatorial Reasoning	2	44	77.84	27.37
2	22 Probabilistic Reasoning	0	-	-	-
2	23 Deductive Reasoning	4	56	58.38	36.08
2	24 Correlational Reasoning	7	653	59.72	49.08
	Totals	107	8,437		

Note. n = number of individual questions identified in a category. N = number of observations in a particular category.
[a] 1 = simple; 2 = complex. [b] Score = mean ratio of points earned / possible points.

The review of problem type questions sometimes suggested that a single category was not appropriate. Further it was clear in classifying examination problems that multiple skills were required to solve many problems. The highest order skill required to solve a problem took precedence over the lower order skills for classification purposes. Problems requiring answers to multiple parts were evaluated, separate categories were assigned to each part were appropriate, and treated as separate questions in determining the total number of examination questions.

The research Question 3 model. The approach used to examine research Question 3 was a mixed effects linear model with a random intercept. Three predictive models were developed to examine the relationship between examination question results and learning approach scores while accounting for the effect of question type. The models all had similar results in that there was a significant relationship between examination results, learning approach and question types but there was no significant interaction effect between learning approach and question type. The models vary in their use of learning approach scores and question type variables.

The dependent variable utilized to analyze the relationship between a student's learning approach and performance on an examination question was the ratio of points earned on a particular question to the number of possible points (ratiopoints). Since examination questions did not all have the same possible points value, this dependent variable was created to make the individual scores earned on the various categories and formats of questions equivalent to each other.

Model 1 results. The first variation of the model, Model 1, predicted ratiopoints as the dependent variable with learning approach scores, question complexity characterized as simple or complex, and possible points as independent variables. The results of the model are given at Table 13.

Table 13

Model 1 Solution for Fixed Effects with Ratiopoints as Dependent Variable

Effect	Estimate	SEM	*df*	*t value*	*Pr* > |*t*|
Intercept	82.03	5.913	173	13.87	<.001
Surface Score	-0.330	0.128	8259	-2.58	.010
Deep Score	-.0.376	0.121	8259	-3.12	.002
Complex Question	-4.759	0.921	8259	-5.16	<.001
Simple Question	0	-	-	-	-
Possible Points	1.038	0.067	8259	15.46	<.001

All effects of the model were found to be significant at the $p < .05$ level. Results of the model suggest that, on average, for each point increase in a students' surface score, they scored .330 percentage points lower on examination question scores while controlling for the effect of deep score, question type and possible points on a question. Similar results were found for the deep score. Percentage points earned on examination questions dropped .376 for each point increase on a students' deep score. Expectations were for the opposite result for the deep score.

The results of the model suggest that students scored, on average, 4.76 percentage points lower on complex questions than on simple questions while controlling for the other effects. The effects of possible points, although significant, was of less interest. Considering the effect of possible points, the higher the number of possible points on an examination question, the higher the student scored.

Model 2 results. The second variation of the model, Model 2, replaced the question complexity variables of simple and complex with the 12 categories of the CDCS to further investigate if learning approach had any explanatory power with respect to the ratio of points earned on particular categories of examination questions. Additionally, the deep and surface learning approach scores were replaced with the four learning approach categories put forth in Question 2. Plotting the individual surface and deep learning scores for the students in this research study resulted in four student groups as presented in Table 11 with most students fitting into one of two groups: a group of students who scored high on deep and low on surface learning, consistent with the findings of Gijbels et al. (2005); a second group of students who scored high on both deep and surface learning approach scales. The results of Model 2 are given at Table 14.

Table 14

Model 2 Solution for Fixed Effects with Ratiopoints as Dependent Variable

Effect	Estimate	SEM	*df*	*t value*	*Pr* > |*t*|
Intercept	67.84	3.460	171	19.61	<.001
High Deep High Surface	-9.266	3.263	8250	-2.84	.005
High Deep Low Surface	-8.253	3.407	8250	-2.42	.016
Low Deep High Surface	-8.504	3.690	8250	-2.30	.021
Low Deep Low Surface	0	-	-	-	-
01 Definition	-2.726	2.408	8250	-1.13	.258
02 Fact Memorization	9.503	2.346	8250	4.05	<.001
03 Format Memorization	16.14	2.722	8250	5.93	<.001
04 Concept Memorization	-3.438	1.806	8250	-1.90	.057
05 Classification	9.997	2.396	8250	4.17	<.001
07 Simple Algorithm	20.41	2.525	8250	8.08	<.001
09 Complex Algorithm	-0.791	1.914	8250	-0.41	.680
10 Derived Algorithm	-4.402	2.231	8250	-1.97	.049
20 Proportional Reasoning	13.49	2.686	8250	5.02	<.001
21 Combinatorial Reasoning	2.226	6.693	8250	0.33	.739
23 Deductive Reasoning	-14.96	5.632	8250	-2.66	.008
24 Correlational Reasoning	0	-	-	-	-
Possible Points	0.874	0.079	8250	11.11	<.001

The results of Model 2 suggest that there was a significant relationship between the variable ratiopoints and the learning approach variable categories while accounting for the secondary variables of question category and possible points. Students with high deep and high surface scores scored 9.266 percentage points lower on examination questions than students with low deep and low surface scores while accounting for the effect of question category and possible points on a question. The results of the remaining two learning approach categories were similar.

The Model 2 results with respect to CDCS categories of questions suggest that students scored better on the questions requiring surface learning approach techniques than on questions requiring more complex learning processes. Students performed better on questions requiring fact memorization, format memorization, classification and simple algorithm than on questions requiring derived algorithm, deductive or correlational reasoning.

Model 3 results. The third variation of the model, Model 3, examined whether question format added any explanatory power to the model by predicting ratiopoints as the dependent variable with learning approach scores, question format and possible points as independent variables. The distribution of examination questions by format is given at Table 15.

Table 15

Distribution of Examination Questions by Format

Group	Number of Examinations	Question Format					
		MC	SYW	MTCH	SA	PROB	FTB
Treatment	3	36	11	-	-	24	-
Comparison	3	36	11	-	-	24	-
AC202-1	3	32	6	-	-	18	-
AC202-6	3	32	6	-	-	18	-
AC301	4	-	-	3	1	15	1
AC303	3	-	-	-	-	18	-
Total	19	136	34	3	1	118	1

Note. MC = multiple choice; SYW = multiple choice requiring support for selected answer; MTCH = matching; SA = short answer; PROB = problem; FTB = fill-in-the-blank.

The results of Model 3 given at Table 16 suggest that, with the exception of fill-in-the-blank (FTB) format questions, there was again a significant relationship between the examination results variable ratiopoints and the learning approach variables deep and surface approach scores while accounting for the secondary variables of question format and possible points. The results were also consistent with those found in Models 1 and 2. Students, on average, scored .304 percentage points lower on an examination question for each point the higher a student's surface score. Similarly, students scored .312 percentage points lower on an examination question for each point the higher a student's deep score. Although this observed relationship between approach scores and

examination question results was not expected, the fact that it was observed in all three variations of the research Question 3 model lends credibility to the finding. Question formats were also, generally, significant in the model. Students appeared to score better on multiple choice questions requiring that they show supporting calculations (SYW) and problem format (PF) questions than on matching (MTCH) and multiple choice formats.

Table 16

Model 3 Solution for Fixed Effects with Ratiopoints as Dependent Variable

Effect	Estimate	SEM	*df*	*t value*	*Pr* > |*t*|
Intercept	62.17	6.287	173	9.89	<.001
Surface Score	-0.304	0.127	8253	-2.40	.017
Deep Score	-0.312	0.120	8253	-2.60	.009
FTB	7.398	7.512	8253	0.98	.325
MC	15.00	2.333	8253	6.43	<.001
MTCH	19.20	4.774	8253	4.02	<.001
PROB	23.18	2.430	8253	9.54	<.001
SA	16.57	7.512	8253	2.21	.027
SYW1	39.19	3.192	8253	12.28	<.001
SYW2	34.40	3.238	8253	10.62	<.001
SYW3	0	-	-	-	-
Possible Points	0.444	0.086	8253	5.17	<.001

Interaction effect. It was anticipated that a student's approach to learning would offer significant explanatory power over scores earned by students on specific types of questions. Succinctly, each of the three models developed to examine research Question 3 was extended to examine the interaction effect of deep and surface learning approach scores with certain other variables. Model 1 was extended to examine the interaction of deep and surface learning approach scores with questions typed as either simple or complex by including the four interaction pairs as variables in the model. The Type 3 tests of fixed effects considering the paired effects of surface and deep scores with complex and simple question types were not significant at the $p < .05$ level. These results suggest that there was no significant difference in ratio points for complex questions as compared to simple questions for different levels of deep or surface scores.

Model 2 included interaction variables between each of the four learning approach categories and the 12 CDCS question categories. Thirty-two pairwise combinations were added to the model. None of the combinations were found to be significant at the $p < .05$ level. The Model 2 results suggested that learning approach score provided little explanation for students' success on particular question types when categorized using the CDCS.

Finally, Model 3 was expanded to include interaction variables between learning approach scores and each question format. The Type 3 tests of fixed effects considering the 14 paired effects of surface and deep scores with question formats were not significant at the $p < .05$ level suggesting that, similar to the results of Model 1 and Model 2, the interaction effects of learning approach scores and question formats were

not important in predicting ratio points. These results suggest that learning approach scores offer little explanation for scores earned on the various question formats. The results of the type 3 tests for each of the three models are given in Table 17.

Table 17

Type 3 Tests of Fixed Effects for Interaction Variables

Model / Interaction	*df*	*F*	*p*
Model 1			
Surface Question Type	1/8,257	0.63	.428
Deep Question Type	1/8,257	0.91	.339
Model 2			
Shute Approach Category	32/8,218	0.79	.800
Model 3			
Deep Question Type	7/8,239	0.12	.997
Surf Question Type	7/8,239	0.27	.964

Summary of research Question 3 findings and results. The results of all three model variations used to investigate research Question 3 found similar results with respect to the effect learning approach scores had on examination results when accounting for certain other variables. The results suggested that, on average, students scored lower on an examination question for each point the higher a student's surface score. Similarly, students scored percentage points lower on an examination question for each point the higher a student's deep score. Although this observed relationship between approach scores and examination question results was not expected, the fact that it was

observed in all three variations of the research Question 3 model lends credibility to the finding.

The results of Model 1, which considered examination questions as either simple or complex, suggested that students scored lower on complex questions than on simple questions while controlling for the other effects. Considering the effect of possible points, the higher the number of possible points on an examination question, the higher the student scored.

The results of Model 2, which classified examination questions according to CDCS categories, suggested that students scored better on the questions requiring surface learning approach techniques than on questions requiring more complex learning processes. Students performed better on questions requiring fact memorization, format memorization, classification and simple algorithm than on questions requiring derived algorithm, deductive or correlational reasoning.

Finally, the results of Model 3, which classified examination questions according to their format, found that students appeared to score better on multiple choice questions requiring that they show supporting calculations (SYW) and problem format (PF) questions than on matching (MTCH) and multiple choice formats.

Each of the three models developed to examine research Question 3 was extended to examine the interaction effect of deep and surface learning approach scores with question types. Model 1 was extended to examine the interaction of deep and surface learning approach scores with questions typed as either simple or complex. Model 2 was extended to examine the interaction variables between each of the four learning approach

categories and the 12 CDCS question categories. Finally, Model 3 was extended to include the interaction variables between learning approach scores and each question format. The results of all three models were similar in that the interaction effect of learning approach scores and the various question types were not important in predicting the ratio of points earned. These results suggest that learning approach scores offer little explanation for scores earned on the various examination question types.

Summary

The first research question asked whether a classroom intervention designed around the use of learner directed learning contracts would be associated with an increase in deep or a reduction in surface learning approach scores. A paired-sample t test was conducted to determine if there was a significant change in deep or surface approach scores within either the treatment or the comparison group. Despite modest increases in overall deep scores for both groups and a decrease in the overall surface scores for the comparison group, the changes were not found to be statistically significant.

The researcher also considered whether there was a significant difference in the change in deep or surface approach scores between students in the treatment and comparison groups. Following the method of Hall et al. (2004), two variables were created: change in surface and change in deep approach scores. Change scores were calculated for both the treatment and comparison groups as Trial 2 surface and deep scores minus those from Trial 1. The results of an independent t test and confirmed by a one-way analysis of variance suggested that again there was not a statistically significant difference in the change in deep or surface approach scores between students in the

treatment and the comparison groups. The results of the tests would suggest that in this study with this limited sample size, learner directed contracts appeared to not be an effective tool for encouraging students to increase their use of a deep approach to learning.

A linear regression model was used to consider whether the students' characteristics of gender, grade point average, SAT scores, or class standings as a proxy for age had a significant effect on the observed changes in students' study approach scores. Two models were computed using each student's change in deep and surface approach scores as the dependent variables. The results revealed that none of the variables added significant explanatory power to the observed changes in either the deep or surface approach scores for the treatment or comparison group.

The second research question sought to understand whether students scoring highest as deep learners or those scoring highest as surface learners would benefit most from the use of learner directed learning contracts as measured by their mean examination scores. A one-way analysis of variance (ANOVA) with mean examination scores as the dependent variable was computed first to determine if mean examination scores for students within the treatment group were significantly different from those recorded for students in the comparison group. The results of the ANOVA confirmed that there was no significant overall difference in scores between the two groups. Students in the treatment group did not appear to have benefited from the use of learning contracts as measured by their examination performance.

Next, the researcher combined the treatment and comparison groups to consider whether mean examination scores for students who scored highest as deep learners differed from those students who scored highest as surface learners. The results of a one-way analysis of variance computed with mean examination scores as the dependent variable showed no significant difference in examination scores for students who scored highest on the deep approach scale from those who scored highest on the surface scale.

Finally, in investigating Question 2, data collected from four additional sections of accounting from the Spring 2010 semester were included with the treatment and comparison group data to expand the sample size. Results of a one-way analysis of variance computed on the expanded group of accounting sections, using mean examination scores as the dependent variable, indicated no significant difference in mean examination scores between students in the two learning approach groups.

The third research question sought to establish a relationship between students' learning approach and their performance on various types of accounting examination problems. Three predictive models were developed to examine the relationship between examination question results and learning approach scores while accounting for the effect of question type. The models varied in their use of learning approach scores and question type variables. The models all had similar results in that there was a significant relationship between examination results, learning approach and question types, yet there was no significant interaction effect between learning approach scores and question type. The type 3 tests of fixed effects for interaction variables added to all three models resulted in the same non-significance for the interaction variable. Learning approach

scores again provided little to no explanatory power over scores earned on individual examination question types. These results and findings are discussed more completely in Chapter Five.

Chapter V

Conclusions, Implications, Limitations, Recommendations for Future Research, and Discussion

Introduction

The purpose of this study was to inform and influence the teaching of introductory accounting and to contribute to the development of research aimed at understanding how students learn in the accounting discipline by exploring the effect of learner-directed contracts on student approaches to learning and learning outcomes. Two classes of introductory managerial accounting students were selected: one class received the treatment, the other, the comparison group, was taught in the traditional manner.

The study approaches adopted by the students in both study groups were identified by administrations of the Revised Study Process Questionnaire (R-SPQ-2F) (Biggs et al., 2001). The questionnaire was administered to both the treatment and the comparison groups at the beginning of the course to determine their typical approach to learning and again at the end of the course to observe any change in approach as measured by the R-SPQ-2F scores between those students who experienced the intervention and those students who undertook the traditional accounting course. Despite modest increases in overall deep scores for both groups and a decrease in the overall surface scores for the comparison group, the changes were not found to be statistically significant.

Second, the study attempted to make a connection between course outcomes, as measured by the total mean grade achieved on course examinations, and the student's

self-reported approaches to learning. The results of this research revealed no significant overall difference in mean examination scores between the treatment and the comparison groups. Students in the treatment group did not appear to have benefited from the use of learning contracts as measured by examination performance.

Finally, this research sought to establish a relationship between students' learning approach and their performance on the various accounting problem constructs typically used as practice sets and examination problems. Knowledge of how the various problem types associate with learning approaches will inform problem design and result in assessments that are consistent with students acquiring the desired skills of the discipline.

Three predictive models were developed to examine the relationship between examination question results and learning approach scores while accounting for the effect of question type. The models varied in their use of the variables, learning approach scores and question types. The models all had similar results in that there was a significant relationship among examination results, learning approach and question types; nonetheless, there was no significant interaction effect between learning approach scores and question type. Learning approach scores again provided little to no explanatory power over scores earned on individual examination question types. A discussion of these and other results are the subject of this chapter.

Conclusions

Research Question 1. The first research question sought to investigate whether modifications to the learning environment of an introductory managerial accounting course in the form of learner directed contracts would yield an increase in students' deep

approach scores or a decrease in students' surface approach scores, as measured by multiple administrations of the R-SPQ-2F. The treatment group experienced the learning independence associated with learner-directed contracts, while the comparison group was instructed using typical syllabus-driven methods. The Revised Study Process Questionnaire (R-SPQ-2F) was administered to both groups at the beginning of the semester described as Trial 1 to determine the students' general approaches to learning. The questionnaire was administered a second time at the end of the semester considered Trial 2, to assess each student's learning approach during the class considering the effect of the treatment, learner-directed contracts. Consequently, the change in learning approach scores for students in both groups was compared and examined to answer research Question 1.

Results from the Revised Study Process Questionnaire. The students' scores from the administrations of the R-SPQ-2F were encouraging. The number of students who scored highest on the deep scale for the treatment and comparison groups, based on the second administration of the R-SPQ-2F, was 15 and 13, respectively. The number of students scoring highest on the surface scales was 12 and 15 for the treatment and comparison groups, respectively. Considering both the treatment and comparison groups and the four additional sections of accounting students from the Spring 2010 semester included in the study, 100 students scored highest as deep learners and 64 scored highest as surface learners. These statistics suggest that approximately 61% of the students in this study self-describe study habits that are consistent with the deep approach.

Changes in student's learning approach scores. Both the treatment and comparison groups exhibited an increase in their deep approach scores. Surface approach scores decreased for the comparison group, while they increased for the treatment group. Results of the study revealed that average deep scores for the treatment group increased 1.22 points between Trials 1 and 2, and the average surface score also increased 1.86 points. Average deep scores for the comparison group also increased .32 points, while their average surface score decreased .61 points. The average change in deep approach scores was .89 points higher for the treatment group than for the comparison group. The average change in surface approach scores was 2.47 points higher for the treatment group than for the comparison group.

These changes were encouraging and would seem to provide a positive signal to accounting educators about the possible effects of changes to the learning environment on students' approaches to learning. However, despite these positive signals, they failed to show any statistically significant changes in learning approach scores for either the treatment or comparison groups. Hence, the results of this research would suggest that with this limited sample size, neither learner-directed contracts nor the conventional syllabus-driven method of teaching managerial accounting appeared to be an effective tool for encouraging students to increase their use of a deep approach to learning.

The effects of age, gender, and general academic ability. Gijbels and Dochy (2006) caution that although it seems theoretically simple to influence the approach students adopt when learning, it appears very difficult in practice. Hall et al. (2004) suggest that some groups of students may be more receptive than others to learning

environments designed to change approaches to learning. The learning environment is only one factor influencing the approaches to learning adopted by students (Biggs, 1987; Ramsden, 2003). Other factors, such as students' demographics, backgrounds, and previous educational experiences may also influence their learning approaches (Biggs, 1987). It was important, therefore, to consider variations in background and experiences of diverse groups of students as possible influences on the impact of the learning environment on their approaches to learning.

This research utilized a linear regression model to consider whether the students' characteristics of gender, grade point average, SAT scores, and class standings as a proxy for age had a significant effect on the observed changes in students' study approach scores. Two models were computed using each student's change in deep and change in surface approach scores as the dependent variables. The results revealed that none of the variables added significant explanatory power to the observed changes in either the deep or surface approach scores for the treatment or comparison groups.

The effects of other student characteristics on the results of the current research were similar to and confirm Shute's (1979) findings. Working with cognitive level rather than learning approach, Shute established that although class year, gender, major, age and GPA were significantly correlated with cognitive levels, the correlation coefficients were too small to use as predictors of cognitive level.

Student scores from a managerial accounting pretest developed by the researcher and administered to students in both the treatment and comparison groups at the beginning of the semester were investigated to establish a baseline of prior accounting

knowledge for the two groups. Results of a one-way analysis of variance conducted on the pretest scores for the treatment and comparison groups suggested there was a significant difference between the pretest scores for the two groups, $F(1,57) = 6.38, p = < .02$. The mean scores for the two groups were, however, very low (treatment 25, comparison 31, out of a possible 100) suggesting that neither group had the advantage of prior managerial accounting knowledge.

Research group size. The observed results could have been affected by the size of the study groups. Similar research has had mixed results using various size groups. Byrne et al. (2004) used 735 students, Booth, Luckett and Mladenovic (1999) used 397, while Hall et al. (2004) and Gijbels et al. (2005) used 158 and 133 students, respectively. Successful interventions seem to have involved larger numbers of students. English et al. (2004) observed a significant decrease in surface scores and an increase in deep scores for their intervention using Australian students totaling approximately 1,060. The treatment and comparison groups for this research contained 27 and 28 students, respectively, for a total of 55 students. It is possible that the confounding results occurred because of group size or some other specific function of this limited sample that was not considered.

Length of the study. It is noteworthy that successful interventions were conducted over periods of time longer than the current research. Gordon and Debus (2002) explored the impact of a series of interventions throughout a three-year teacher-training course. As a result of their study, they were able to report significant shifts to a deep approach, but noted that major changes in learning approach did not occur for two

of the three cohorts until the latter half of the second year and during the third year of the study. Cope and Staehr's (2005) research involved reducing student workload and concentrating on educationally critical areas within the curriculum that were introduced over a five-year information sciences course. Not until the fifth year did the researchers find a statistically significant increase in the proportion of students adopting a deep approach. The success of English et al's. (2004) research was over a period of two semesters or one academic year with students' approach to learning being assessed at the beginning of the first semester and at the end of the second semester. These successes would suggest that affecting change in learning approach scores are better observed over longer periods of time.

The results of surveys of leaning approaches by year of study suggest that over time students' use of the deep approach declines. Biggs (as cited in Biggs et al., 2001) used the SPQ for a survey of 2,365 students at ten Australian Colleges of Advanced Education and five universities; their work revealed that students' use of the deep approach declined as they progressed through their course. For arts students the mean deep approach scores rose in the second year, yet dropped during the third year. In a longitudinal study, Watkins and Hattie (as cited in Biggs et al., 2001) found that deep approach scores declined from the first to the third year. Although these declines could be associated with a variety of possible causes, this researcher suggests that this pattern may be a result of the high expectations educators place on the students to achieve high examination scores and to maintain high grade point averages, which does not foster or promote a deep approach to learning.

Choice of textbook. The textbook and workbook utilized in teaching both the treatment and comparison groups may also have been factors contributing to the results of this research. The textbook did not offer extensive coverage of the material and did not provide the in-depth reading sometimes necessary for student understanding of topics. Students' undocumented comments implied that the examination questions were not presented in the same format as the examples completed in the workbook suggesting memorization of format. Others commented that they did not find the textbook helpful or worthwhile suggesting that they paid minimal attention to reading and studying. Nijhuis, Segers and Gijselaers (2005) found that the perceived usefulness of required textbooks was an important variable in interventions aimed at affecting learning approaches. It is, therefore, possible that the students did not attain the requisite level of knowledge to achieve the deep approach. Entwistle et al. (1979) agreed that students without the requisite knowledge may approach their learning intending to utilize a deep approach, but fail to achieve deep level processing.

The utilization of a workbook in both the treatment and comparison groups may have contributed to learning characteristics consistent with a surface approach. Consistently presenting students with deep level study tasks (Kember & Gow, 1989) was the basis of this intervention. Workbook assignments provided students with a venue to test their understanding of topics by filling in blanks and were guided through problem solutions using prescribed templates. However, students were expected to solve similar problems on examinations without being provided with a template. This inconsistency may have lead students to expect similar surface type questions and formats on the

examination. The literature clearly supports the argument that students will vary their approach to learning and will adopt the study approach they believe will meet their expectations of assessment (Ramsden, 2003; Shute, 1979; Hall, et al., 2004; Entwistle, et al., 1979). This apparent disconnect may also have contributed to the lower than expected examination results found in research Question 2.

Use of introductory accounting course as setting. Finally, it should be considered whether an introductory accounting course was an appropriate setting for research involving learning contracts or approaches to learning. Davidson (2002) points out with his use of introductory financial accounting students that different results might be found with more senior accounting students. The treatment and comparison groups utilized in this research were comprised of 40 freshman and sophomores, 17 juniors, and 2 seniors. Thirty-three business majors comprised the research groups along with 5 accounting majors and 21 students from various non-business related disciplines.

Managerial accounting is a course with a high information content, which Anderson et al. (1996) and Knowles (1986) believe may compromise the learning contract as an effective instructional method. Additionally, certain levels of achievement must be attained as the course is the first in a series and required for success in subsequent courses. It is therefore important that students understand the main content knowledge associated with the discipline. It is only with this base knowledge that analytical thought and complex problem solution is possible. English et al. (2004) agree that lower level learning strategies are required to underpin progression to higher levels of understanding. Expecting students to use higher order learning strategies and to

increase their use of a deep learning approach via contract learning in a managerial accounting course of underclassmen and non-business majors may have been unreasonable. Consequently, research utilizing learning contracts with more senior accounting students is recommended for future research.

Design of the learning contract. Contract learning is in essence an alternative way of structuring a learning experience (Knowles, 1986). It replaces a content plan with a process plan. Instead of specifying how a body of content will be transmitted (content plan), it specifies how a body of content will be acquired by the learner (process plan). Although the form and content of a learning contract may vary, typical contracts contain the learning objectives or goals to be achieved, the strategies and resources available to achieve those objectives, the evidence which will be produced to indicate the objectives have been achieved, and the criteria which will be used to assess this evidence.

The design of the learning contract intervention in this research may not have been as robust as necessary to effect change in students' learning approaches. A learning contract was drafted by the researcher for each of three learning modules during the semester. Each contract outlined the specific learning objectives of the module. Since the student learners may not have been aware of resources that may prove useful in achieving the proposed objectives, the contract specified what material in the textbook and workbook would be covered. When subject matter is new, as it would be in this course, it is difficult for the learner to make decisions about what should be learned and the resources required to learn it (Anderson et al., 1996).

Each contract included a section of learning outcomes that each student was required to complete as evidence of coverage of module content and a section containing more difficult learning outcomes from which the student was required to select one and submit for evaluation. Generally, the student-selected options included a selection of case problems, a brief paper on a module topic of the student's choice, assume the role of professor and present a topic, or select a learning outcome of their own design with the researcher's approval.

Evidence of successful learning should adequately portray what has been achieved. Anderson et al. (1996) found that in most situations students elected to produce written work as evidence that their learning objectives had been met. Although it was expected then that the brief written paper was likely to be the most common product resulting from a learning contract, fewer than five students chose the option in this research. Students generally selected one of the problems to prepare and submit. There were no instances of a self-designed learning outcome or student presentations of a topic.

Successful interventions have utilized higher levels of treatment such as solving complex problems, writing, reading and evaluation of answers. Gordon and Debus (2002) made modifications to the learning environment by including group problem-based learning methods as case study formats and requiring students to produce either a class or public seminar, research poster session, or a written report of their research. English et al. (2004) redesigned the curriculum of an introductory accounting course to include writing and sophisticated problem solving activities in the form of case studies.

The case studies were ambiguous, unstructured and unfocused to be more reflective of the business environment. These successful question formats and modifications to the learning environment may have been difficult to implement and inappropriate for an entry level, information intensive course as managerial accounting. Future research utilizing learning contracts in accounting courses might focus on a specific project rather than the entire course.

Results from the contract learning questionnaire. A questionnaire was designed by the researcher and administered to the treatment group at the end of the Fall 2009 semester to assist the researcher in understanding the students' perceptions of the learning contract instructional model. Responses to the learning contract questionnaire provided some insight into the students' experience with and perceptions of learning contracts. Considering those students responses that were "always" or "almost always" true of them, the students reported, on the negative side, that they were not more motivated in class (18%). Conversely, 29% of students enjoyed the class more because of learning contracts, 18% felt their grades for the course fairly reflected their work, and only 4% felt that contracts were easy. These responses could have resulted from difficult examinations or students' feelings about the textbook and workbook formats. The relative newness and unfamiliarity of contract learning may also have been a negative factor affecting overall results. The number of students reporting previous experience with learning contracts (7%) was small.

Students reported that they considered their learning needs when selecting contract assessments (54%) and felt more motivated to complete the assessments because

they had selected them (50%). Contract learning also helped students avoid end of semester deadlines (54%). Students preferred to have a choice of assignments (71%) as opposed to having their learning prescribed by syllabus and the instructor (7%).

Although the desired change in student learning approach was not achieved by this intervention, the responses to the questionnaire suggest that further research involving learning contracts in the classroom is supported. The number of students reporting that they liked the use of learning contracts increased 11% during the semester and 57% of the students responding answered that they preferred learning contracts over traditional syllabus courses. Generally, the positive reflections of the students are consistent with a desirable learning attitude and a deep approach. Complete results of the contract learning questionnaire are provided in Appendix H.

Research Question 1 summary. The results of this intervention would suggest that learner directed learning contracts were not as effective in increasing a students use of a deep learning approach or reducing their use of surface learning as was anticipated. Research group size, length of the study, selection of textbook, and the choice of an introductory level, content intensive course for the research were all identified as possible confounding issues. The possible effects of gender, grade point average, SAT scores, and class standings were investigated and found to have had a minimal impact on the results.

Students' responses to a learning contract questionnaire designed to provide insight into the students' perceptions of the learning contract instructional model and administered to students in the treatment group were encouraging suggesting a need for further research using learning contracts.

Research Question 2. Research Question 2 asked which learner grouping, deep or surface, will benefit more from a managerial accounting course utilizing learner directed contracts as measured by their mean examination scores throughout the semester. Although mean examination scores were modestly higher for students scoring highest on the deep score, the results of this research did not yield evidence of any significant relationships between learning approach scores and examination performance. This result seems to be consistent with much of the existing literature (Davidson, 2002; English et al., 2004; Minbashian et al., 2004; Gijbels et al., 2005). A one-way analysis of variance (ANOVA) with mean examination scores as the dependent variable was computed first to determine if mean examination scores for the treatment group were significantly different from those recorded for the comparison group.

The results suggested that, on average, the students in the comparison group scored 4.12 points higher on examinations than students in the treatment group. The results of the ANOVA, however, confirmed that there was no significant overall difference in scores between the two groups. Students in the treatment group did not appear to have benefited from the use of learning contracts as measured by examination performance.

The researcher combined the treatment and comparison groups to consider whether mean examination scores for students who scored highest as deep learners differed from those students who scored highest as surface learners. Mean examination scores for students scoring highest on the deep scale were .48 points higher than those for students scoring highest as surface learners. Although these examination results were

encouraging, they were not determined to be statistically significant. Again the results of a one-way analysis of variance (ANOVA) computed with mean examination scores as the dependent variable showed no significant difference in examination scores between the two learning approach groups of students.

The primary interest in research Question 2 was whether the benefits of deep learning could be evidenced by examination scores. Data collected from four additional sections of accounting from the Spring 2010 semester were included with the treatment and comparison group data to expand the sample size. The mean examination scores for the Fall 2009 and Spring 2010 accounting sections were .98 points higher for students scoring highest on the deep approach than for students scoring highest on the surface approach. Results of a one-way analysis of variance (ANOVA) computed on the expanded research group of accounting sections, using mean examination scores as the dependent variable, indicated no significant difference in mean examination scores between the two learning approaches.

A linear regression model was again used to consider whether the student characteristics of gender and class standings as a proxy for age had a significant effect on the observed mean examination scores for the expanded research group of accounting sections. Gender and class standing as proxy for age added no significant explanatory power to the observed examination scores.

Summarily, categorizing students as either deep or surface learners based on R-SPQ-2F scores did not result in a significant relationship with students' mean examination scores. Plotting the individual surface and deep learning scores for the

students in this research study also suggested that most students fit into one of two groups: a group of students who scored high on deep and low on surface learning, consistent with the findings of Gijbels et al. (2005), and a second group of students who scored high on both deep and surface learning approach scales. A one-way analysis of variance calculated with mean examination scores as the dependent variable and the four possible groups as factors indicated no significant difference in examination scores between the four groups.

Appropriateness of examination scores. The results of this research and the research of others advance the question about the appropriateness of examination scores as a measure of the effectiveness of a learning approach or an intervention designed to encourage a change in approach to learning. Grades reflect the students' actual approaches to learning while R-SPQ-2F scores measure the students' perceived approaches which could be very different.

The lack of relationship between learning approach scores and examination scores in this research may be the result of grading practices, as all examinations were graded by the researcher. Examinations were graded by question in order to provide consistency in grading; each question being graded for all students before proceeding to grade the next question. Maximum points available, actual earned scores for each individual question, and total examination scores were recorded for each student. It should be noted that despite efforts to maintain grading consistency and objectivity, some subjectivity was possible.

This researcher believes that the grades assigned were suitable measures of the students' performance. The observed nonsignificant effect of learning approach on examination scores could be due to the fact that mastery of quantitative detail in accounting is such an important factor in accounting examination performance. Moreover, examinations tend to place more importance on the reproduction of the material rather than the understanding of it.

Student's maturity as learners. The profile of approach scores for the treatment and comparison groups and the four additional accounting sections from the Spring 2010 semester taken as a whole evidenced a majority of students falling into one of two groups. The group with high scores on both the surface and deep approach (n = 92) is quite large and of interest to the researcher. Gijbels et al. (2005) notes that a profile which consists of either low or high scores on both deep and surface approaches is quite typical of novice students and could be considered disintegrated, dissonant or characteristic of students who have not established a particular learning approach. These results would again suggest that students in this research study may not have developed the appropriate study habits to ensure success in the discipline and support the need for helping students understand their learning approach and develop better study habits.

It remains unclear why a study approach found to be related to the quality of learning achieved does not consistently relate with academic grades. Approaches to learning have meaning only if we can consistently and reliably measure when we have achieved or changed a desired approach. The literature (Davidson, 2002; English et al., 2004; Minbashian et al., 2004; Gijbels et al., 2005) and this research suggests that mean

examination scores, for any number of reasons, are insensitive to learning approach and may therefore not be the best method of assessing this outcome. Further, it could be argued that while the students R-SPQ-2F results suggest deep, the perceived demands of what was expected of them was interpreted as requiring mainly the recall of facts consistent with Marton and Saljo's (1976b) results. Research Question 3 disaggregated the examination scores into types of questions to investigate whether, similar to the findings of Minbashian et al. (2004), scores on particular types of questions help in understanding the mixed results relating examination scores to approaches to learning.

Research Question 2 summary. The primary interest in research Question 2 was whether the benefits of deep learning could be evidenced by examination scores. Students in the treatment group did not appear to have benefited from the use of learning contracts as measured by examination The researcher next combined the treatment and comparison groups to consider whether mean examination scores for students who scored highest as deep learners differed from those students who scored highest as surface learners. Again the results of a one-way analysis of variance computed with mean examination scores as the dependent variable showed no significant difference in examination scores between the two learning approach groups of students. Finally, results of a one-way analysis of variance computed on an expanded research group including the treatment group, the comparison group, and four sections of accounting taught in the Spring 2009 semester, using mean examination scores as the dependent variable, indicated no significant difference in mean examination scores between the two learning approaches. Gender and class standing as proxy for age added no significant

explanatory power to the observed examination scores. Summarily, categorizing students as either deep or surface learners based on R-SPQ-2F scores did not result in a significant relationship with students' mean examination scores.

The results of this research advance the question about the appropriateness of examination scores as a measure of the effectiveness of a learning approach or an intervention designed to encourage a change in approach to learning. Grades reflect the students' actual approaches to learning while R-SPQ-2F scores measure the students' perceived approaches which could be very different. Moreover, examinations in accounting tend to place more importance on the reproduction of the material rather than the understanding of it. This research suggests that mean examination scores, for any number of reasons, are insensitive to learning approach and may therefore not be the best method of assessing this outcome.

Finally, it was noted that the group of students with high scores on both the surface and deep approach scales was quite large. These results would suggest that students in this research study may not have developed the appropriate study habits to ensure success in the discipline and support the need for helping students understand their learning approach and develop better study habits.

Research Question 3. Research Question 3 investigated the question which students will perform better on various problem types: those who scored higher on the deep approach scale or those who scored higher on the surface learning scale. Three predictive mixed effects models were developed to examine the effects learning approach, question type or format, and possible points on an examination question would

have on ratiopoints. Although the models varied in their use of learning approach scores and question types, they all had similar results in that there was a significant relationship between examination results, learning approach scores and question types, yet there was no significant interaction effect between learning approach scores and question types. Learning approach scores provided little to no explanatory power over scores earned on individual examination question types.

Learning approach effect. The results of all three mixed models suggested that as the deep and surface scores increased, the points earned on examination questions decreased while controlling for question type and possible points on a question. Although this might have been an anticipated result with respect to the surface approach, this was counter to the expectation for the deep approach. Anticipating that some combination of higher or lower learning approach scores might offer more explanation with respect to points earned on examination questions, Model 2 was expanded to categorize each student on the basis of the plotting of the magnitude of their approach scores as discussed in Chapter 4. Students with the highest deep and surface scores (n = 92) had the largest negative effect on percentage points earned on an examination question scoring 9.3 percentage points lower on examination questions than students with low deep and low surface scores (n = 10). This finding was consistent with that of research Question 2 which found that learning approach scores did little to explain mean examination scores.

Appropriateness of examination scores and student's maturity as learners. Similar to the results of Question 2, these results advance the question about the

appropriateness of scores on individual examination questions as a measure of the effectiveness of a learning approach. The relationship observed between learning approach scores and individual examination question scores may have been the result of grading practices. Despite efforts to maintain grading consistency and objectivity, some subjectivity was possible.

The profile of approach scores for the treatment and comparison groups, when combined with the four additional accounting sections from the Spring 2010 semester, evidenced a majority of students falling into the group with high scores on both the surface and deep approach (n = 92). The group is quite large and of interest to the researcher. A profile which consists of either low or high scores on both deep and surface approaches is quite typical of novice students and could be considered not integrated, dissonant or characteristic of students who have not established a particular learning approach (Gijbels et al., 2005). These results would again suggest that students in this research study may not have developed the appropriate study habits to ensure success in the discipline and support the need for helping students to understand their learning approach and to develop better study habits.

Question type and format effect. Examination questions were selected from test banks supplied by the various textbook publishers and from the course textbooks themselves. Additionally, the examination questions were chosen to adequately test the students' knowledge of key concepts with no consideration being given their CDCS category at the time of selection. Selected question formats included multiple choice, multiple choice questions requiring the student support their selected answer, matching,

questions requiring the student to fill in missing words to complete a statement, and accounting problems to solve.

Where Shute (1979) found that, generally, individual question subtypes were not useful as predictors of class performance, this research found that students scored significantly different on examination questions when categorized using the Cognitive Demand Classification System (CDCS) or when categorized according to question format. All three predictive models suggest that, generally, questions categorized by either CDCS or format were significant variables in predicting ratiopoints.

The researcher emphasizes and duly notes that examination questions were not selected or designed to meet any particular research goal. Rather, the questions, their content and format were selected to be representative of the types of questions that might normally be included on examinations in the respective accounting courses. The intent was to create an authentic examination versus one specifically designed to complement the research. The mean scores earned on each question category are presented in Table 12 illustrated in Chapter 4.

Model 1 - simple and complex question categories. Model 1 categorized questions as either simple or complex. Complex problems require different problem-solving skills and abilities compared with problems of low complexity which require only responding with memorized facts and methods. An underlying difficulty in this area is that there is no well- accepted definition of task complexity in accounting. The categories of simple and complex used in Model 1, except for the algorithm derived

category 10, correspond to the concrete-operational and formal-operational categories suggested by Shute (1979).

Cognitive Demand Classification System category 10, algorithm derived, generalized and applied, was interpreted in this research to mean the student would need to develop and apply an appropriate algorithm for the particular problem solution, because no such algorithm had been explicitly presented. This type of question requires that the student understand the problem, the concepts underlying the problem, and demonstrate the ability to synthesize all into an algorithm necessary to solve an accounting problem of this type. Accordingly, the researcher considered algorithm derived as a complex category and one better handled by students evidencing a deep learning approach rather than the lower order concrete-operational (Shute, 1979).

The number of questions categorized as simple (n=72) versus complex (n=35) leads to the conclusion that the examination questions used in the courses in this research were largely aimed at assessing the students understanding of the accounting knowledge base or course content, and not on the reasoning processes required for solution. This result is also similar to the findings of Shute (1979); of the 685 questions and problems classified for his research, only 5.8% of the total questions required formal-operational reasoning. This researcher also noted that 45 questions or 42% (categories 01, 02, 03, 04 and 07) on his examinations, required only memorization or a simple algorithm to solve. Shute (1979) noted in his research that 62% of the problems required only memorization or direct application of a simple algorithm. These findings would suggest that if

educators' intentions are to encourage a deep approach to learning, their actions through their selection of examination questions are encouraging a surface approach to learning.

The results of Model 1 suggest that students scored nearly 5 percentage points lower on the examination question types categorized as complex than on those types categorized as simple, when controlling for the effect of learning approach category and possible points to be earned. Although no research evidence suggests that college students have not mastered concrete-operational skills (Shute, 1979), this researcher's findings suggest that students may not yet have developed the higher level cognitive skills or learning approach required to solve more complex accounting problems.

Model 2 - CDCS question categories. The second variation of the model, Model 2, replaced the question complexity variables of simple and complex with the 12 categories of the CDCS to further investigate if learning approach had any explanatory power with respect to the ratio of points earned on particular categories of examination questions. Results of the model were statistically significant for the CDCS categories of fact memorization (02), format memorization (03), classification (05), and simple algorithm (07). Students scored significantly better on problems requiring these skills than on problems requiring higher order correlational reasoning. Furthermore, statistically significant within the complex or higher order CDCS categories, students performed better on questions requiring proportional reasoning and worse on questions requiring deductive reasoning than on questions requiring correlational reasoning.

As noted in Table 12 presented in Chapter 4, this researcher had the greatest number of examination questions (44 questions representing 41% of all question

categories) requiring the use of an algorithm for solution on his examinations. Shute (1979) reminds us that accounting educators have a preference for algorithms as solutions to accounting problems because they generally yield correct answers. Students had the highest average scores (85.60) for the questions requiring the use of a simple algorithm (07) for solution. The remaining two higher order algorithm categories - derived (10) and complex (9), ranked seventh and eighth with average scores of 65.22 and 63.98, respectively. The mean scores on the two higher order algorithm categories suggest that students were only marginally successful with more difficult problems requiring algorithmic solution.

The second highest scores were obtained on questions measuring format memorization (03) with an average score of 83.39. The higher order questions measuring correlational reasoning (24) and deductive reasoning (23) had the lowest mean scores of 59.72 and 58.38 and ranked eleventh and twelfth, respectively. Considering a score of 70 to be a "C" grade, 81% of questions categorized in accordance with the CDCS evidenced average student performance to be below the C level. Similarly, considering the number of student responses in the various categories, approximately 79% evidenced performance below the C level.

The Model 2 results also suggest that students scored higher on CDCS category questions categorized as simple. Specifically, students performed best on questions requiring simple algorithm, format memorization, classification, and fact memorization, approximately in that order. Questions requiring concept memorization, although not significant in Model 2 (p =.057), would have earned 3.4 percentage points less than

problems requiring the higher order correlational reasoning suggesting that perhaps memorizing and understanding concepts represents a special difficulty for students.

Model 3 - question format. The third variation of the model, Model 3, examined whether question format added any explanatory power to the model by predicting ratiopoints as the dependent variable with learning approach scores, question format and possible points as independent variables. The results of Model 3 suggest that with the exception of fill-in-the-blank (FTB) format questions, question formats were statistically significant in predicting ratiopoints while accounting for the learning approach variables of deep and surface approach scores and possible points.

An interesting variation was the multiple choice question requiring the student to support their selection with appropriate calculations (SYW). Points earned on a question were split between the correct multiple choice selection and the calculations presented in support of the choice. This format of question can be effective in assessing concepts, principles and links from concepts and principles to procedures for application (Sugrue, 1993). This format's strength as an assessment tool, and its flexibility in grading makes it an ideal assessment format for accounting. The SYW formats were significant in Model 3 and among the highest scoring formats. Furthermore, the significance of the possible points effect in all three models considered suggest that, in terms of score, students benefit most from SYW and problem formats.

Interaction effect of question types and learning approach scores. It was anticipated that a student's approach to learning would offer significant explanatory power over scores earned by students on specific types of questions. Succinctly, each of

the three models developed to examine research Question 3 was expanded to examine the interaction effect of deep and surface learning approach scores with the respective question type variable. The results of the models suggested that learning approach scores offered little explanatory power over student scores earned on any question types.

The researcher believes that although the interaction variables were not found to be statistically significant in any of the models, it would seem unreasonable to expect that question types appearing to require only memorization and other surface type processes would be successful in fostering a student's deep approach to learning. Accordingly, this researcher believes that surface type questions might be successfully utilized to assure student learning of basic factual knowledge. Question types requiring higher order cognitive levels and questions formatted as problems and multiple choice requiring the student to support their choice of answer should be utilized to foster the use of a deep learning approach.

Possible points effect. The results of all three models imply that the more possible points on an examination question, the higher the students' earned scores. This would be consistent with the researcher's expectations. Multiple choice and other objective type questions carried lower possible point values than questions requiring lengthier, more involved solutions. Much of the theory of accounting is assessed by objective format questions.

Much of the practice aspect of accounting is assessed using problem type questions that include interpreting information and data, while preparing multiple step solutions to complex problems. These more complex problem types provided the

opportunity to earn partial scores for various correct concepts while reporting an incorrect final result. The objective and multiple choice format type questions provide no such opportunity.

Research Question 3 summary. Research Question 3 sought to explore the relationship between students' approaches to learning and quantitative outcomes from the perspective of the different types of cognitive attributes being measured by examination questions. Three predictive mixed effects models were developed to examine the effects learning approach, question type or format, and possible points on an examination question would have on examination results. Although the models varied in their use of learning approach scores and question types, they all had similar results in that there was a significant relationship between examination results, learning approach scores and question types, yet there was no significant interaction effect between learning approach scores and question types as was anticipated. Learning approach scores provided little to no explanatory power over scores earned on individual examination question types.

The results of all three mixed models suggested that as the deep and surface scores increased, the points earned on examination questions decreased while controlling for question type and possible points on a question. The expectation was that increased deep scores would result in increased points earned on examination questions. Similar to the Question 2 conclusion, these results would again suggest that students in this research study may not have developed the appropriate study habits to ensure success in the discipline, and support the need for helping students to understand their learning approach and to develop better study habits.

All three predictive models suggested that, generally, questions categorized by either CDCS or format were significant variables in predicting points earned on examination questions. Model 1 suggested that students did better with problems of low complexity which required only responding with memorized facts and methods. Moreover, the large number of questions categorized as simple versus the smaller number categorized as complex lead to the conclusion that the examination questions used in the courses in this research were largely aimed at assessing the students understanding of the accounting knowledge base or course content, and not on the reasoning processes required for solution. These findings would suggest that if educators' intentions were to encourage a deep approach to learning, their actions through their selection of examination questions were encouraging a surface approach to learning.

The SYW formats were significant in Model 3 and among the highest scoring formats. Furthermore, the significance of the possible points effect in all three models suggest that, in terms of score, students benefited most from SYW and problem formats.

The interaction variables placed in each of the three models between learning approach scores and the various problem types were not found to be statistically significant in predicting points earned on examination questions. The results of the models suggested that learning approach scores offered little explanatory power over student scores earned on any question types.

The results of all three models implied that the more possible points on an examination question, the higher the students' earned scores. This was consistent with the researcher's expectations. The more complex problem types were worth higher point

values and provided the opportunity to earn partial scores for various correct concepts while reporting an incorrect final result. The objective and multiple choice format type questions provided no such opportunity.

Relationship to Previous Research and Contribution to the Field

The results of this research shared some similarities with the findings of other researchers. Additionally, this research informs the field of accounting education by making a connection between the various question types and course goals.

Similarity with Findings of Other Research. Both research Questions 2 and 3 sought to make a connection between students' reported approaches to learning and their scores earned on examination questions. The results of this research were similar to those reported by other researchers.

English et al. (2004) found learning approach to be correlated with performance scores. The correlation coefficient was very small suggesting the impact on grades was minimal (p =.045). A marginally significant positive correlation (p =.082) was found for the deep approach, but again the correlation coefficient was small. They concluded that although there were benefits to encouraging a student's deep approach to learning, aggregate assessment grades were not very sensitive to the level of deep and surface approach scores.

Davidson (2002) in his research could not find any relationship between the deep or surface approach and mean examination scores. Gijbels et al. (2005) found that neither students' final examination grades nor results on examination questions asking for different components of problem-solving were significantly related to the extent to which

they used either a deep or surface approach to learning. Shute (1979) also found that there did not appear to be a consistent relationship between cognitive level and class performance with examination performance specified as a student's total percentage of possible points for all examinations given in a class.

Minbashian et al. (2004) investigated why the deep approach to study did not consistently result in higher examination scores. Their research was based on the administration of four short essay type examination questions, two emphasizing reproduction of information and two emphasizing synthesis of the information presented in the course. Questions were graded first for overall score and then ranked for quantity of response, evidence of relevant pieces of information, and quality of response in accordance with the Solo Taxonomy (Biggs & Collins, 1982). Accordingly, students received an examination mark, a quantity score and a quality score for each question.

The results of their research revealed no relationship between examination scores and either a deep or surface approach. However, regression analysis involving the quality scores yielded a significant positive relationship to the deep score but not with the surface score. A regression with the quantity scores related neither a deep nor surface approach. Minbashian et al. (2004) went beyond simple examination scores to include indicators of quality of examination response and quantity of information produced as indicators of academic performance and found that although examination scores were unrelated to study approach, the quality of examination responses was positively related to students' deep scores.

The results of surveys of learning approaches by year of study suggest that over time students' use of the deep approach declines. Biggs (as cited in Biggs et al., 2001) used the SPQ for a survey of 2,365 students at ten Australian Colleges of Advanced Education and five universities; their work revealed that students' use of the deep approach declined as they progressed through their course. For arts students the mean deep approach scores rose in the second year, yet dropped during the third year. In a longitudinal study, Watkins and Hattie (as cited in Biggs et al., 2001) found that deep approach scores declined from the first to the third year.

Although these declines could be associated with a variety of possible causes, this researcher suggests that this observed pattern of decline in utilization of a deep approach and the mixed results of research attempting to connect learning approach and learning outcomes in a positive way may be related. Educators place high expectations on their students to achieve high examination scores and to maintain high grade point averages and, as a result, are encouraging our students to surface learn. The observed decline in the use of a deep learning approach as students advance through their university experience would be consistent with this researcher's theory.

Further, the results of this research advance the question about the appropriateness of examination scores as a measure of the effectiveness of a learning approach or an intervention designed to encourage a change in approach to learning. This researcher would suggest that both students and educators would be better served by an outcomes assessment model that first provides an assessment of the students level of knowledge

attained from a course of study and, second, allows students to demonstrate and evidence their cognitive level attained.

Contributions to the Field. All three predictive models generated in investigating research Question 3 suggested that, generally, questions categorized by either CDCS or format were significant variables in predicting points earned on examination questions. Model 1 suggested that students did better with problems of low complexity which required only responding with memorized facts and methods. Moreover, the large number of questions categorized as simple versus the smaller number categorized as complex lead to the conclusion that the examination questions used in the courses in this research were largely aimed at assessing the students understanding of the accounting knowledge base or course content, and not on the reasoning processes required for solution. These findings would suggest that if educators' intentions were to encourage a deep approach to learning, their actions through their selection of examination questions were encouraging a surface approach to learning.

The researcher believes that although the interaction variables were not found to be statistically significant in any of the models, it would seem unreasonable to expect that question types appearing to require only memorization and other surface type processes would be successful in fostering a student's deep approach to learning. Accordingly, this researcher believes that surface type questions might be successfully utilized to assure student learning of basic factual knowledge. Question types requiring higher order cognitive levels and questions formatted as problems and multiple choice questions

requiring the student to support their choice of answer should be utilized to foster the use of a deep learning approach.

The courses included in the current research were information intensive. Expectations were for the students to complete the courses and demonstrate a firm understanding of the material. The results of this research suggest that the expectations of a course can be aligned with the types of questions used to assess the outcomes. Lucas and Mladenovic (2004) remind us that identified learning outcomes for a course need to be addressed by learning activities designed to support the achievement of those learning outcomes. The results of Question 3 suggest that instructional goals, CDCS category, and question format can be aligned as is presented in Table 18.

Table 18

Matrix Aligning Instructional Goals with Examination Question Types

Instructional Goal	Question	
	CDCS Category	Format
Learn course content	Definition Fact memorization Format memorization Concept memorization Classification Simple algorithm Complex algorithm	Short answer Matching Fill-in-the-blank
Problem solving / critical thought	Derived algorithm Proportional reasoning Probabilistic reasoning Combinatorial reasoning Hypothetico-deductive reasoning Correlational reasoning	Multiple choice Multiple choice-SYW Problems

Although the researcher makes a clear distinction between which question formats align with which instructional goals, it should be noted that the different question formats can be carefully crafted to draw on a desired cognitive level.

Finally, the profile of approach scores for the treatment and comparison groups, when combined with the four additional accounting sections from the Spring 2010 semester, evidenced a majority of students falling into the group with high scores on both the surface and deep approach (n = 92). Gijbels et al. (2005) suggest that a profile which consists of either low or high scores on both deep and surface approaches is quite typical of novice students and could be considered not integrated, dissonant or characteristic of students who have not established a particular learning approach. The results of this research would suggest that students in this study may not have developed the appropriate study habits to ensure success in the discipline. Accordingly, this research points to a need for educators to help students to understand their learning approach and to develop better study habits.

Limitations

Despite the researcher's inclusion of students from four accounting classes in addition to the treatment and comparison groups in investigating Questions 2 and 3, it is acknowledged that the sample size was small. Hence, the ability to generalize the findings is limited. The treatment and comparison groups used to investigate Question 1 contained 27 and 28 students, respectively, for a total of 55 students. It is possible that the confounding results occurred because of group size or some other specific function of this limited sample that was not considered.

Genuine educational settings are particularly difficult for experimental research designs because of the complex array of contextual variables which can interact with the variable under study (Kember, Charlesworth, Davies, McKay and Stott, 1997). It is sometimes possible to control statistically for extraneous variables, but some variables are difficult to measure and factors which were not anticipated can and often do play a part when the research setting is the classroom. Holding extraneous variables constant becomes more difficult the longer the trial.

This research did not attempt to verify the student's self-reported approach to learning. The reported learning approach scores described how the students in this study perceived their learning approach and study habits while their mean examination scores and scores earned on particular examination problem types were reflective measures of their actual approach and study habits. Although the R-SPQ-2F has been tested and widely used in similar research, it should be considered that there was a significant difference between the students' perceptions as self-reported and the realities of their study habits. Additionally, Biggs et al. (2001) point out the difficulty in formally categorizing students as either surface or deep learners solely on the basis of SPQ responses, as if a score measured a stable trait of the student. Rather, SPQ responses are a function of individual characteristics and the teaching context. The teacher and the student have a shared responsibility for the learning outcome.

It is noteworthy that successful interventions have been conducted over periods of time longer than the current research. Gordon and Debus (2002), Cope and Staehr (2005), and English et al. (2004) were able to report significant shifts in learning

approach over research periods ranging from two semesters to five years. These successes would suggest that affecting change in learning approach scores are better observed over longer periods of time.

Recommendations for Future Research

The results of this research utilizing learner-directed learning contracts and students' responses to the learning contract questionnaire administered to the treatment group suggest a need for further research. Students' generally gave a positive response to their learning contract experience, yet reported that they had no previous experience with contract learning. Furthermore, the learning contract intervention utilized in this research was conducted using a series of three contracts covering the coursework for an entire semester in an information intensive setting. Future research utilizing learning contracts as a means of encouraging the use of a deep approach to learning should consider a single contract designed around a specific learning project and assessed separately from the course examination scores. This would provide a more focused intervention and the opportunity for a clearer evaluation of the results.

This research notes that many students considered themselves deep learners, yet results on examinations and examination question types, measures of how they actually approached their learning, suggested something entirely different. It should be considered that there may be differences between what students perceive as the deep learning approach and how they actually prepare for accounting examinations. Additionally, the profile of approach scores for the research groups evidenced a majority of students falling into the group with high scores on both the surface and deep approach

suggesting they were novice students or had not established a particular learning approach. Further research might consider assessing students' approaches to learning and documenting their specific study habits, perhaps through the use of reflective journals, as a way of confirming the reported learning approach.

Interaction variables established in research Question 3 between learning approach and questions, categorized by both cognitive level and format, failed to establish any significant explanatory power when considering percentage points earned by students at the question level. Further, both research Questions 1and 2 were unable to report a clear connection between learning approach and mean examination scores. The Question 3 results did suggest that students earned higher scores on problem type questions and multiple choice questions requiring them to show supporting calculations for their answers, both types being versatile questions requiring the synthesis of the information and deserving of future research. Accordingly, future research should be conducted in an upper level accounting course utilizing an appropriate number of both question types on each examination. Scoring of the problems might be on two levels: a score on the quantity of the answer, and a score on the quality of the answer. The research would focus on linking learning approach with the quality scores.

Conclusion

This research sought first to encourage the use of a deep learning approach through the use of learning contracts by calling on students' desire to exercise some independence over how the learning was to be accomplished thought to encourage a deep approach. Although educators cannot alter the orientation a student brings to learning,

the literature is clear that educators can alter the context of learning which can in turn alter the approach a student takes to a particular learning task. This research, designed around the use of learner directed learning contracts, appears to have been unsuccessful in increasing the use of a deep approach or reducing reliance on surface methods as expected.

The effects of an intervention such as this may only be visible over a longer period of time (Nijhuis et al., 2005). The issues of research group size, duration of the research, teaching materials utilized and the choice of an introductory level course for this research may have been factors leading to the confounding results. The point should also be made that perhaps these students were not capable of making the transition from surface to deep approaches in this course (Nijhuis et al.). Accounting faculty need to help students explore and better understand their learning approaches and to encourage students as they attempt higher order problems.

The results of this research confirm the findings of Nijhuis et al. (2005), Gijbels and Dochy (2006) whose attempts to deepen students' approaches to learning did not meet the purpose. Accordingly, this study does highlight the difficulty in trying to foster a deep approach. It suggests that serendipitous attempts will not have favorable results, and only conscious efforts to that end have a chance of success.

The results of the intervention utilizing learner-directed learning contracts were confounding in that there was no statistically significant increase in students' deep scores or a decrease in surface scores observed in the treatment group when compared to the comparison group, suggesting that learning contracts were not effective. However,

sample size, duration of the research, selected textbooks and the appropriateness of entry level courses as the research venue were identified as factors that may have contributed to the results.

The second and third questions sought to examine whether those students scoring highest on the deep learning approach scales would achieve higher mean examination scores, and additionally, whether scores on particular question types could be influenced by learning approach. This research failed to make a correlation between learning approach and students' mean examination scores. The results of this research call into question the appropriateness of examinations as an effective tool to assess student approaches to learning. Gordon and Debus (2002) in their research shifted assessment tasks away from examinations either by reducing their contribution to the overall grade or removing them altogether. They placed greater emphasis on assessment techniques as lengthy essays and written reports.

Interaction variables established between learning approach and questions, categorized by both cognitive level and format, failed to establish any significant explanatory power when considering percentage points earned by students at the question level. Additionally, this research revealed that students performed best on questions requiring cognitive skills associated with the surface approach to learning. A deep approach to learning appears to have had no advantage as the researcher had anticipated it might.

A primary benefit of this research was to inform accounting educators on examination design consistent with achieving higher order thought processing. First,

assessment programs may not identify the lack of deep learning attributes and the related lack of ability to solve complex problems better handled by a deep approach. This fact is evidenced by the lack of complex questions. Rather, the concentration of questions requiring only surface-type learning methods suggest educators are examining content. Assessing higher order cognitive skills may require the use of essay questions, the inclusion of more complex problem type accounting questions, or the replacement of examinations altogether with a more appropriate method of assessment. It will be necessary to structure examination questions that require higher level thought processes in order for students to develop as deep learners. Students will approach their study for a course based on what they perceive to be the expectation. Accordingly, expectations must shift from questions assessing content to questions requiring synthesis of the information.

Second, this research suggests that question format is an important factor in examination design. Most question formats can be thoughtfully designed to foster the development of higher order cognitive levels. This research purports, however, that many of the commonly used question formats mapped to study skills associated with surface level learning approaches. This research reveals that problem type questions and multiple choice questions requiring the student provide supporting calculations for their choice of answer are versatile formats that can be used to assess higher order skills, while providing students with maximum scoring opportunities.

Finally, it remains unclear why attempts to link the deep approach to learning with examination performance has produced inconsistent results. This research study

failed to establish a clear and favorable relationship between it and performance, as measured by mean examination scores. This research notes that many students consider themselves deep learners, yet results on examinations and examination question types, measures of how they actually approach their learning, suggest something entirely different. It should be considered that there may be differences between what students perceive as the deep learning approach and how they actually prepare for accounting examinations. Taking into consideration that many students may not have fully developed a successful approach to their learning, accounting educators should help students understand their learning approaches, provide them with more challenging question formats and encourage them as they attempt problems requiring higher order cognitive skills.

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Widener University

Office of the Provost

Memorandum

Appendix A

To: Richard J. Barndt

From: Robert Wellmon, PT, PhD, NCS
Vice-chairperson & Secretary
Widener University Institutional Review Board

Date: April 7, 2011

RE: **Protection of Rights of Human Subjects Review**

This letter serves to inform you that your research application, "**(#100-11) Effect of Learning Contracts and Examination Problem Types on Students' Mastery of Managerial Accounting Principles**", has been reviewed and **approved** by the Widener University Institutional Review Board (IRB) for the protection of the rights of human subjects. You may begin data collection as proposed in your application.

The authorization to solicit participants for this study is in effect for one year from the date of approval contained in this letter (April 7, 2011) and is eligible for renewal or extension. The Widener University IRB must receive continuing review requests no later than 14 days prior to the meeting date before the expiration of approval to be placed on the IRB agenda. This form can be found on the IRB website www.widener.edu/irb. Should you fail to attain approval to continue the study prior to the expiration date, all research activity must cease until an approval to extend the study is obtained.

If, for any reason, the approved research data collection method changes, regardless of how minor, except to eliminate apparent immediate hazards to subjects, you are required to notify the IRB, in writing. Please, remember that the IRB and Widener University accept no responsibility for liabilities associated with this study. Ultimately, responsibility rests with the principle investigator(s).

Upon completion of the study, a final written report of the research is to be submitted to the IRB. This form can be found on the IRB website www.widener.edu/irb. The members of the IRB extend their best wishes for your successful completion of this research project. If you have any questions, please e-mail me at rhwellmon@mail.widener.edu or call 610-499-1295.

R. Wellmon

Robert Wellmon, PT, PhD, NCS

Cc: Dr. Barbara Patterson
Dr. Antonia A. DeGeus

Widener University, One University Place, Chester, PA 19013-5792
t: 610-499-4106 f: 610-499-4108 www.widener.edu

Appendix B

Managerial Accounting Pretest

1. The plans of management are often expressed formally in:
a. financial statements.
b. performance reports.
c. budgets.
d. ledgers.

2. The phase of accounting concerned with providing information to managers for use in planning and controlling operations and in decision making is called:
a. throughput time.
b. managerial accounting.
c. financial accounting.
d. controlling.

3. The cost of the cushions that are used to manufacture sofas is best described as a:
a. manufacturing overhead cost.
b. period cost.
c. variable cost.
d. conversion cost.

4. The one cost that would be classified as part of both prime cost and conversion cost would be:
a. indirect material.
b. direct labor.
c. direct material.
d. indirect labor.

5. Which of the following types of companies would typically use process costing rather than job-order costing?
a. A small appliance repair shop.
b. A manufacturer of commercial passenger aircraft.
c. A specialty equipment manufacturer.
d. A breakfast cereal manufacturer.

6. Contribution margin is computed as sales revenue minus:
a. fixed expenses
b. variable expenses
c. cost of goods sold
d. cost of goods manufactured

7. At the break-even point:
a. sales would be equal to contribution margin.
b. contribution margin would be equal to fixed expenses.
c. contribution margin would be equal to net operating income.
d. sales would be equal to fixed expenses.

8. The costing method that treats all fixed costs as period costs is:
a. absorption costing.
b. job-order costing.
c. variable costing.
d. process costing.

9. Which terms would make the following sentence true? Manufacturing companies that benefit the most from activity-based costing are those where overhead costs are a _____ percentage of total product cost and where there is _____ diversity among the various products that they produce.
a. low, little
b. low, considerable
c. high, little
d. high, considerable

10. The usual starting point for a master budget is:
a. the direct materials purchase budget.
b. the budgeted income statement.
c. the sales forecast or sales budget.
d. the production budget.

11. Which of the following benefits could an organization reasonably expect from an effective budget program?
a. Better control of the organization's costs.
b. Better coordination of an organization's activities.
c. Better communication of the organization's objectives.
d. All of these.

12. Poorly trained workers could have an unfavorable effect on which of the following variances?

	Labor Rate Variance	Materials Quantity Variance
a.	Yes	Yes
b.	Yes	No
c.	No	Yes
d.	No	No

13. The production department should generally be responsible for material price variances that resulted from:
a. purchases made in uneconomical lot-sizes.
b. rush orders arising from poor scheduling.
c. purchase of the wrong grade of materials.
d. changes in the market prices of raw materials.

14. The purpose of a flexible budget is to:
a. allow management some latitude in meeting goals.
b. eliminate fluctuations in production reports by ignoring variable costs.
c. compare actual and budgeted results at virtually any level of activity.
d. reduce the time to prepare the annual budget.

15. A budget that is based on the actual activity of a period is known as a:
a. continuous budget.
b. flexible budget.
c. static budget.
d. master budget.

16. Costs which can be eliminated in whole or in part if a particular business segment is discontinued are called:
a. sunk costs.
b. opportunity costs.
c. avoidable costs.
d. irrelevant costs.

17. Consider the following statements:

I. Assemble all costs associated with each alternative being considered.
II. Eliminate those costs that are sunk.
III. Eliminate those costs that differ between alternatives.

Which of the above statements does not represent a step in identifying the relevant costs in a decision problem?
a. Only I
b. Only II
c. Only III
d. Only I and III

18. A project's net present value, ignoring income taxes, is affected by:
a. the net book value of an asset that is replaced.
b. the depreciation on an asset that is replaced.
c. the depreciation to be taken on assets used directly on the project.
d. proceeds from the sale of an asset that is replaced.

19. Which of the following would be considered a "use" of cash for purposes of constructing a statement of cash flows?
a. a decrease in accounts receivable.
b. an increase in accounts payable.
c. an increase in common stock.
d. a decrease in bonds payable.

20. Under the indirect method, which item would be deducted from net income as part of the process of arriving at cash provided by operating activities on the statement of cash flows?
a. Patent amortization expense
b. Increase in accounts payable
c. Increase in prepaid expenses
d. Decrease in accounts receivable

Appendix C

Instructor Assessment Criteria

Achievement of the learning objective

Quality of presentation including completeness, organization, clarity, correctness

Evidence of critical thought

Evidence of further reading or research

An attempt to link theory with practice

Demonstrated awareness of key issues

Appendix D

Form of the Learning Contracts

Learning Contract
Managerial Accounting 202
Learning Module #1
Coverage: EBook Ch 1,2,3,4,5. WWB Ch 2,3,5,6.
Student Name:

Learning Objectives:

- Identify the three classifications of product or manufacturing costs, and how these three cost components are related to prime costs and conversion costs.
- Distinguish between product costs and period costs.
- Prepare a basic schedule of cost of goods manufactured, schedule of cost of goods sold, and income statement.
- Distinguish between raw materials, direct materials and indirect materials.
- Distinguish between actual overhead and applied overhead and the three, most frequently taught techniques for applying overhead.
- Understand the flow of costs in a job order costing system.
- Compute under- and over-applied overhead and prepare related journal entries to close these balances in manufacturing overhead to cost of goods sold.
- Understand how fixed and variable costs behave and might be used for forecasting.
- Understand mixed costs and how to separate them into their fixed and variable components.
- Understand the variable costing format income statement.
- Compute the break-even point.
- Understand the margin of safety.
- Review financial leverage and compare and contrast it to operating leverage.
- Understand the impact of sales mix on profitability.

Learning Strategies:

- Read the assigned EBook chapters.
- Attend and participate in class.
- Complete the required WWB assignments.
- Select and complete your learning outcome.

Required Learning Outcomes:

	Assignment	Due Date	Graded
Read EBook Ch 1 & 2 WWB Ch 2	Chapt 1 & 2 Quick Review. Review Problem COGM & IS "CMA" Products; pp 25-28.		
Read EBook Ch 3 WWB Ch 3	"Pretty Print Shop"; pp 38. "Comprehensive Review Questions".	18 Sept	yes
Read EBook Ch 4 WWB Ch 5	Review Problem-High Low Method-Mixed Costs; pp 49. High Low Method; pp50. Mixed Cost Review; pp 51.		
Read EBook Ch 5 WWB Ch 6	"Tricia Drake Company"; pp 58-59. "Julius Cease Her"; pp 60-61. CVP Analysis Review; pp 62.	7 Oct	yes

Selected Learning Outcomes (select 1)(THESE ARE DUE WED 7 OCT 2009):

	Grade	Selected
Prepare and present a 2 page paper on a topic of your choice from this module.	A	
"Southworth Company" (job order costing)	A	
"Frankel Ltd" (cost behavior)	B	
"Memofax, Inc" (CVP analysis)	B	
Assume the role of professor for a topic of your choice from this module.	A	
A selected learning outcome of your design (with my approval, of course).	TBD	

Your signature (student):

My signature (instructor):

PRINT THIS CONTRACT. READ AND UNDERSTAND IT. MAKE YOUR SELECTION. SIGN AND RETURN IT TO PROFESSOR BARNDT. KEEP A COPY.

Learning Contract
Managerial Accounting 202
Learning Module #2

Coverage:
From my notes: "Activity Based Costing".
EBook: EBook Ch 6 Activity-Based Costing; 9 Standard Costing; 10 Forecasting: Pro Forma Financials and Cash Budgeting.
WWB: WWB Ch 9 Budgeting; 10 Standard Costing/Variance Analysis.

Student Name:

Learning Objectives (WHAT I NEED TO LEARN):

- Understand the basics of activity based costing and distinguish between activity-based, job order and process costing.
- Compute direct material and direct labor variances, using standard costs for direct material and direct labor inputs.
- Prepare a sales budget, including a schedule of cash inflows, a production budget, including a schedule of cash outflows for direct materials, direct labor and manufacturing overhead, a general sales and administrative expenses budget and the overall cash budget.
- Reinforce your understanding of how the historical balance sheet, pro forma cash budget, balance sheet, and cash budget are integrated.

Learning Strategies (HOW I AM GOING TO LEARN):

- Read the assigned EBook chapters and handouts.
- Attend and participate in class.
- Complete the required WWB assignments.
- Select and complete your learning outcome.

Required Learning Outcomes (EVIDENCE THAT I HAVE LEARNED):

	Assignment	Due Date	Graded
Activity Based Costing Read Ebook Ch 6; and reading supplied by RJB.	To be determined	10/19	
Profit Planning Read Ebook Ch 10; WWB Ch 9.	WWB Cash Forecasts "Dalley", "WAM", "CPA" pp 80-84; WWB Production & purchases budgets "Nodagrah" pp 86.	10/26	
	Comprehensive Financial Statement Problem	Wed; 10/28	yes
Standard Costs Read Ebook Ch 9; WWB Ch 10.	WWB pp 70-77.	11/2	

Selected Learning Outcomes (select 1) (MY CHOICE OF EVIDENCE OF MY LEARNING) (OUTCOME IS DUE WED 4 NOV 2009):

	Grade	Selected
Prepare and present a 5 page paper on a topic of your choice from this module (SEE NOTE #1).	A	
Activity Based Costing; "Victorian Windows" (SEE NOTE #2).	A	
Profit Planning; "Cravat" (SEE NOTE #2).	A	
Prepare and present 15 minute lesson on "Process Costing".	A	
Assume the role of professor for a topic of your choice from this module.	A	
A selected learning outcome of your design (with my approval of course).	TBD	

NOTE #1. The paper should be 5 pages in length, double spaced, 12 pt "times new roman". Paper must have a reference page containing at least 2

references (not our textbook). The paper must evidence an amount of your research ***outside*** the class.
NOTE #2. Problems must be done in Excel and evidence use of appropriate spreadsheet functions. You must submit an electronic ***and*** a hard copy.

I HAVE READ THE ABOVE AND UNDERSTAND MY RESPONSIBILITIES.
Your signature (student):

My signature (instructor):

PRINT THIS CONTRACT. READ AND UNDERSTAND IT. MAKE YOUR SELECTION, SIGN AND RETURN IT TO PROFESSOR BARNDT. KEEP A COPY.

Learning Contract
Managerial Accounting 202
Learning Module #3

Coverage:
From my notes: "Flexible Budgets & Performance Analysis"; "Relevant Costs for Decision Making".
EBook: Ch 9 Standard Costing, Appendix 9B; Ch 11 Statement of Cash Flows; Ch 12 Capital Budgeting.
WWB: Ch 14 Capital Budgeting Notes; Ch 16 Financial Statements: Cash vs Accrual Income Statements.

Student Name:

Learning Objectives (WHAT I NEED TO LEARN):

- Prepare a flexible budget.
- Prepare a report showing activity variances.
- Prepare a report showing revenue and spending variances.
- Identify relevant and irrelevant costs and benefits in a decision.
- Prepare an analysis showing whether a product line should be dropped or retained.
- Prepare a make or buy analysis.
- Prepare an analysis showing whether a special order should be accepted.
- Determine the most profitable use of a constrained resource.
- Understand the balance sheet changes in terms of sources and uses of cash.
- Classify sources and uses of cash in terms of operating, investing, or financing activities.
- Prepare a statement of cash flows using the indirect method.
- Understand the basic differences between the indirect method and the direct method used to produce the statement of cash flows.
- Determine the acceptability and compute the net present value for a project.

Learning Strategies (HOW I AM GOING TO LEARN):

- Read the assigned EBook chapters and handouts.
- Attend and participate in class.
- Complete the required WWB assignments.
- Select and complete your learning outcome.

Required Learning Outcomes:

	Assignment	Due Date	Graded
Flexible Budgets Read Ebook Ch 9 appendix 9B, pp 88; reading supplied by RJB.	To be determined.	11/13	
Relevant Costs Reading supplied by RJB.	To be determined.	11/18	
Capital Budgeting Read Ebook Ch 12; read WWB Ch 14.	TVIF WWB pp 94-96; NPV WWB pp 97-99; IRR WWB pp 102; Payback period WWB pp 103; "Bates Brewery" pp 109.	11/25	
Statement of Cash Flows Read Ebook Ch 11; read WWB Ch 16.	WWB pp 113; "AACSB" pp 120-123; "Gina Newman" pp 125-126.	12/4	

Selected Learning Outcomes (select 1) (MY CHOICE OF EVIDENCE OF MY LEARNING) (OUTCOME IS DUE MON 7 DEC 2009):

	Grade	Selected
Prepare and present a 5 page paper on a topic of your choice from this module (SEE NOTE 1).	A	
Flexible Budgeting "Elgin" (SEE NOTE 2)	B	
Relevant Costs "Brandilyn" and "Timkin" (SEE NOTE 2)	A	
Capital Budgeting "Atwood" (SEE NOTE 2)	A	
Statement of Cash Flows "Damocles" (SEE NOTE 2)	A	
Assume the role of professor for a topic of	A	

your choice from this module.		
A selected learning outcome of your design (with my approval of course).	TBD	

NOTE #1. The paper should be 5 pages in length, double spaced, 12 pt "times new roman". Paper must have a reference page containing at least 2 references (not our textbook). The paper must evidence an amount of your research ***outside*** the class.
NOTE #2. Problems must be done in Excel and evidence use of appropriate spreadsheet functions. You must submit an electronic ***and*** a hard copy.

I HAVE READ THE ABOVE AND UNDERSTAND MY RESPONSIBILITIES.

Your signature (student):

My signature (instructor):

Appendix E

Revised Study Process Questionnaire (R-SPQ-2F)

This questionnaire has a number of questions about your attitudes towards your studies and your usual way of studying.

There is no right way of studying. It depends on what suits your own style and the course you are studying. It is accordingly important that you answer each question as honestly as you can. If you think your answer to a question would depend on the subject being studied, give the answer that would apply to the subject(s) most important to you.

Please fill in the appropriate circle alongside the question number on the 'General Purpose Survey / Answer sheet'. The letters alongside each number stand for the following response.

A - this item is *never* or *only rarely* true of me
B - this item is *sometimes* true of me
C - this item is true of me about *half the time*
D - this item is *frequently* true of me
E - this item is *always* or *almost always* true of me

Please choose the one most appropriate response to each question. Fill the oval on the Answer Sheet that best fits your immediate reaction. Do not spend a long time on each item; your first reaction is probably the best one. Please answer each item.

Do not worry about projecting a good image. Your answers are confidential.

Thank you for your cooperation.

1 I find that at times studying gives me a feeling of deep personal satisfaction.
2 I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.
3 My aim is to pass the course while doing as little work as possible.
4 I only study seriously what's given out in class or in the course outlines.
5 I feel that virtually any topic can be highly interesting once I get into it.
6 I find most new topics interesting and often spend extra time trying to obtain more information about them.
7 I do not find my course very interesting so I keep my work to the minimum.
8 I learn some things by rote, going over and over them until I know them by heart even if I do not understand them.
9 I find that studying academic topics can at times be as exciting as a good novel or movie.
10 I test myself on important topics until I understand them completely.

11 I find I can get by in most assessments by memorizing key sections rather than trying to understand them.
12 I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra.
13 I work hard at my studies because I find the material interesting.
14 I spend a lot of my free time finding out more about interesting topics which have been discussed in different classes.
15 I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics.
16 I believe that lecturers shouldn't expect students to spend significant amounts of time studying material everyone knows won't be examined.
17 I come to most classes with questions in mind that I want answered.
18 I make a point of looking at most of the suggested readings that go with the lectures.
19 I see no point in learning material which is not likely to be in the examination.
20 I find the best way to pass examinations is to try to remember answers to likely questions.

Scoring

The responses to items are scored as follows:

A=1, B=2, C=3, D=4, E=5

To obtain the main scale scores on deep approach (DA) or surface approach (SA) add item scores as follows:

DA = 1 + 2 + 5 + 6 + 9 + 10 + 13 + 14 + 17 + 18

SA = 3 + 4 + 7 + 8 + 11 + 12 + 15 + 16 + 19 + 20

Subscale scores on deep motive (DM), deep strategy (DS), surface motive (SM) and surface strategy (SS) are calculated as follows:

DM = 1 + 5 + 9 + 13 + 17

DS = 2 + 6 + 10 + 14 + 18

SM = 3 + 7 + 11 + 15 + 19

SS = 4 + 8 + 12 + 16 + 20

Appendix F

Contract Learning Questionnaire

This questionnaire has a number of questions about your experience with learning contracts (LCs) this semester.

Please fill in the appropriate circle alongside the question number on the 'General Purpose Survey / Answer sheet'. The letters alongside each number stand for the following response.

A - this item was *never* or *only rarely* true of me
B - this item was true of me about *half the time*
C - this item was *always* or *almost always* true of me

Please choose the one most appropriate response to each question. Fill the oval on the Answer Sheet that best fits your immediate reaction. Do not spend a long time on each item; your first reaction is probably the best one. Please answer each item.

Your answers are confidential.

Thank you for your cooperation.

1 I find that I was more involved in class.

2 I considered my learning needs when selecting assignments.

3 It was easy.

4 I found the use of learning contracts to be fun.

5 I found the use of learning contracts caused me to explore new ideas.

6 I found the use of learning contracts helped me avoid the end of semester rush to complete my work.

7 I liked the use of the LC at the beginning of the semester.

8 I like the use of the LC now.

9 I found that I was more motivated to complete assignments because I selected them.

10 I prefer LCs over a traditional syllabus.

11 I prefer that the instructor make all the decisions.

12 I prefer to have a choice of assignments.

13 I enjoyed the class more because of the LC.

14 I have used LCs before in other college courses.

15 I feel my grades in this course fairly represented my work.

Appendix G

Cognitive Demand Classification System

The following system includes the identification of various skills or schemes commonly required in university accounting examinations. These skills have been separated into two major groups, one labeled concrete-operational and the other labeled formal-operational.

Brief examples of accounting problems involving the specific schemes are given. These examples should be considered indicative only and not exhaustive.

		Concrete-Operational
	Skill	Example
01	Definition	An asset is something of value owned by a firm.
02	Fact memorization	a) SFAS 13 covers accounting for leases. b) State laws govern the accounting for owners' equity transactions. c) Under SFAS 127 an entity with publicly traded shares must present earnings per common share on the income statement.
03	Format memorization	Financial statement construction may be memorized. Conceptual understanding may be necessary for worksheet competence or for cash flow statement.
04	Concept memorization	a) Inventory cost flows such as LIFO and FIFO may be memorized. An algorithm may be used; however, it is not usually shown explicitly. b) Only relevant costs should be considered in decision-making alternatives.
05	Classification	a) Accounts receivable, cash, and inventory are current assets. b) Partnerships, proprietorships and corporations are all forms of business organizations.
06	Serial ordering	Use of the liquidity concept in balance sheet presentations is serial ordering.

07	Simple algorithm, direct application	Beginning inventory + purchases – ending inventory = cost of goods sold.
08	Simple algorithm, new application for the student	A new algorithm might be: beginning cash balance + cash receipts – cash disbursements = ending cash balance.
09	Complex algorithm	a) Requires a change in another item for a given change to continue the equality. A complex algorithm might be: assets = liabilities + beginning shareholders' equity + revenue – expenses – dividends. b) Process cost accounting problem involving equivalent units is usually a complex algorithm.
10	Algorithm derived, generalized and applied	Most accounting computational procedures, where algorithm has not been explicitly presented, such as accounting changes and error correction analysis, requires an algorithm to be derived.
Formal-Operational		
20	Proportional reasoning	a) Where the purchase of land and building is for a single amount and the appraisal value for each is given, the problem is to allocate cost proportionally to each asset. b) Partnership net income distribution, if stated in proportional terms, requires proportional reasoning.
21	Combinatorial reasoning	a) All possible combinations of outcomes are derived and evaluated in a systematic manner; such as what would the optimal credit terms be for a firm, given differing payment options. b) An entity considering multiple alternatives for capital expenditure would analyze each using various models to conclude on which investment would be best for the firm.
22	Probabilistic reasoning	The nature of the world is seen as probabilistic and any conclusion regarding the explanation of a hypothesis

		must be considered in that light. Examples of this skill would be found in auditing applications involving sampling and materiality judgments.
23	Hypothetico-deductive reasoning	Hypotheses are evaluated in a systematic manner by manipulating the variables involved. The key methodological component is the ability to hold all variables constant while manipulating a single variable and then evaluating the result. Specific examples include: a) Given data concerning entries to bad debt expense, accounts receivable and the allowance for uncollectible accounts, determine what method was used to record bad debt expense. b) Given various financial statement ratios and opinions concerning the financial health of and success of given firm, predict the success of a second firm, given financial data for that firm.
24	Correlational reasoning	The relationships or associations between sets of data or concepts are recognized to be significant in some cases, even to the extreme case of causal relationships. Problems such as fixed costs: a) Do not change on a per-unit basis in relation to increases or decreases in sales within the relevant range. b) Change in total in relation to increases or decreases in sale within the relevant range. c) Are always uncontrollable. d) All of the above e) None of the above Require correlational reasoning. Most financial statement analysis involving more than calculations requires this type of reasoning.

		Comparison of concepts such as CVP analysis, direct costing and contribution margin techniques is clearly correlational reasoning.

Appendix H

Results of the Learning Contract Questionnaire (N=28)

Question	% Always or Almost Always True of Me
1 I find that I was more involved in class.	18
2 I considered my learning needs when selecting assignments.	54
3 It was easy.	4
4 I found the use of learning contracts to be fun.	11
5 I found the use of learning contracts caused me to explore new ideas.	29
6 I found the use of learning contracts helped me avoid the end of semester rush to complete my work	54
7 I liked the use of the LC at the beginning of the semester.	50
8 I like the use of the LC now.	61
9 I found that I was more motivated to complete assignments because I selected them.	50
10 I prefer LCs over a traditional syllabus.	57
11 I prefer that the instructor make all the decisions.	7
12 I prefer to have a choice of assignments.	71
13 I enjoyed the class more because of the LC.	29
14 I have used LCs before in other college courses.	7
15 I feel my grades in this course fairly represented my work.	18