

CRITICAL AND REFLECTIVE THINKING IN AN
INTERMEDIATE FINANCIAL ACCOUNTING COURSE:
AN ACTION RESEARCH STUDY

By

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ABSTRACT

Accounting professionals have consistently called for educators to develop curriculum designed to encourage students to develop intellectual skills. The purpose of this action research study was to develop and implement an instructional method that requires intermediate financial accounting (IFA) students to consistently practice higher order thinking. Students completed a semester-long authentic comprehensive project (CP) that required them to consistently practice critical and reflective thinking (Facione, 1990; Mezirow, 1991). Findings led to the resolution of implementation issues associated with using a CP. Most implementation issues originated from students' inability to apply learning obtained from working structured problems to unstructured accounting work. Short reflection papers (RPs) replaced periodic objective tests to encourage deep and meaningful learning. Students' responses to question prompts gave evidence of one of Mezirow's (1991) four stages of professional reflection. The depth of reflection trended with students' understanding of when and how accountants use judgment. Students who consistently practiced higher order thinking also learned to adequately perform routine accounting procedures. This study resulted in an instructional method that requires accounting students to practice using the intellectual skills necessary for success in the accounting profession without sacrificing procedural knowledge. The findings will benefit other instructors working to develop learning materials that require students to practice higher order thinking as they complete authentic professional work.

Keywords: Accounting education, critical thinking, reflective thinking, problem-based learning, experiential learning

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PREFACE

As I look out at the students sitting in my accounting class, I wonder—which of these students I would want to work for me? Which of these students are prepared to do the thinking necessary to successfully perform as an accounting professional? Do they understand that after they graduate they will never again have a situation in which a paragraph of information provides everything they need to know to do the accounting? More importantly, could my students possibly understand the work of a professional accountant by reading the textbook and working structured homework problems? Am I providing my students with the learning experiences that will be valuable after graduation?

Approximately three years ago, I acknowledged my instructional methods, learning material, and use of class time did not prepare students to do the work of an accounting professional. The thought greatly disturbed me. I knew I had to revise my teaching methods to encourage students to practice thinking like an accountant. I began with using more "why" questions and unstructured mini-cases in class and added similar open-ended questions to my objective tests. Next, I *flipped the class* and required students to watch video lectures before class and used class time to discuss unstructured problems and situations. After about two years, I realized that students continued to learn according to their perception of the requirements of the test, regardless of what I discussed in class. I was sending conflicting messages to my students. In class, I asked the students to think like an accountant as they considered unstructured situations. However, students' ability to complete structured homework problems determined their grade in the course. I then replaced the periodic semester tests with short structured reflection papers and found it challenging to design prompts that encouraged students to reflect on their learning. Most students simply wrote the

facts and procedures stated in the textbook. To achieve my learning objectives, I needed to redirect students' efforts away from remembering all the facts, procedures, and calculations and assess their ability to use the intellectual skills necessary to do the work of a professional accountant.

The challenge seemed overwhelming. I needed to simulate a work environment that required students to do the work of a professional accountant for each topic in the course. I would have to convince students that the structured homework they complete outside of class is only the most basic knowledge necessary to complete the professional accountant's work and not the main objective of their learning—contrary to students' previous experience in the introductory accounting course. Knowing when to let students struggle and when to give more help so they can make progress in their work would be challenging. Reasonable and supportable answers would have to replace the *right* answer to ensure students practice the process of critical thinking and reflection. I would have to implement this new approach within the boundaries of limited class time, student perceptions of accounting from the introductory class, concerns about grades, and departmental peer pressure to conform to the traditional method of teaching accounting.

I decided to make significant changes to align all learning activities and assessments with the work of a professional accountant. I began with a junior-level financial accounting course. I developed an authentic comprehensive project that incorporated topics in the course and dedicated the majority of class time for project work. I assigned out-of-class readings, video lectures, and structured homework problems to prepare students to work on the project during class. Short reflection papers with prompts replaced objective assessments during the semester.

I introduced the project on the first day of class and explained to the students how we would learn in this class. The students looked at me in fear. I accepted the course would not be perfect the first time, or maybe even the second time. I gathered data and took time to reflect on the structure of the learning materials and the most appropriate level of student support. The following action research study describes how I aligned instructional methods, learning material, and assessments to encourage my students to practice the intellectual skills necessary for success after graduation.

CHAPTER ONE: INTRODUCTION

Hart Research Associates routinely surveys U.S. employers to determine how well higher education graduates are prepared to meet the needs of the workplace. Surveys conducted over the past few years have consistently indicated over 80% of employers believe college graduates enter the workforce without the ability to effectively communicate orally and in writing, the ability to work effectively with others in teams, ethical judgment and decision making, critical thinking and analytical reasoning skills, and the ability to apply knowledge and skills to real-world settings. In addition, more than half of all employers feel the ability to locate, organize, and evaluate information from multiple sources is lacking in these new graduates (Hart, 2010, 2013, 2015).

Higher education administrators and faculty members endorse the idea that higher education students should experience an increase in their intellectual skills (American Association of Colleges and Universities [AACU], 2005, 2015; Arum & Roksa, 2011; Bok, 2006; Entwistle & Entwistle, 1991; Lawson et al., 2015; Marriott, Tan, & Marriott, 2015; Riggs & Hellyer-Riggs; 2014; Sargent & Borthick, 2013; Stanley & Marsden, 2012; Tsui, 2002; Warren & Young, 2012; Zeigler, 2015). "The premium on lifelong learning just keeps going up ... and the importance of static knowledge is going down. Students have to have knowledge and know how to use it" (AACU, 2015, p. 3). However, despite the recognized importance of students learning adequate thinking skills in their college courses, the amount of growth in intellectual skills that occurs during the college years is much lower than expected (Arum & Roksa, 2011; Hart, 2010, 2013, 2015; Keeley, 1992; Norris, 1985; Terenzini, Springer, Pascarella, & Nora, 1995; Tsui, 1999).

Accounting professionals have consistently advocated for educators to incorporate alternative instructional methods that develop accounting graduates' critical thinking and intellectual skills (American Accounting Association [AAA], 1986; Accounting Education Change Commission [AECC], 1990; Albrecht, Clark, Smith, Stocks, & Woodfield, 1994; Albrecht & Sack, 2000; Baril, Cunningham, Fordham, Gardner, & Wolcott, 1998; Behn et al., 2012; Big Eight White Paper [BEWP], 1989; Black, 2012; Stanley & Marsden, 2012; Warren & Young, 2012; Baril et al. , 2002). The Accounting Education Change Commission (AECC, 1990) specifically called for accounting educators to design and provide curriculum aimed at developing intellectual skills:

The overriding objective of accounting programs should be to teach students to learn on their own. 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 sources of information.

Accounting classes should not focus on accounting knowledge. Teaching methods that expand and reinforce intellectual skills should be used.

Intellectual skills include the ability to locate, obtain and organize information, identify and solve unstructured problems in unfamiliar settings, and exercise judgment based on comprehension of an unfocused set of facts. Education should develop the capacities for inquiry, abstract logical thinking, and critical analysis. (p. 311-312)

The daily responsibilities of the professional accountant have significantly changed since the AAEC (1990) initially called for redesign of accounting curriculum (Black, 2012; Elliott & Jacobson, 2002; Parker, 2001; Sin, Reid, & Jones, 2012; Yu, Churyk, & Chang,

2013). Reliance on *Microsoft Excel* and general ledger software has eliminated the importance of mathematics skills (Ragland & Ramachandran, 2014). Memorizing accounting guidance, formulas, and formats is unnecessary due to the ease of accessing information via the internet. Employees in all areas of a company input data into an integrated computer system that automatically records routine repetitive transactions previously recorded and summarized by the accountant. Perhaps most importantly, professional accountants must understand how to apply accounting guidance to ambiguous business transactions, and analyze and support many estimates and judgments. The need for accounting graduates to develop higher order thinking skills has significantly increased since the profession first began discussing the importance of intellectual skills (Albrecht & Sack, 2000; Behn et al., 2012; Black, 2012; Daigle, Hayes, & Hughes, 2007; Rebele & St. Pierre, 2015).

Purpose of Study and Research Questions

The purpose of this study was to develop an instructional approach that aligns learning activities and assessments to encourage junior-level financial accounting students to use a deep approach to study and practice the intellectual skills professional accountants use in the work place.

I followed action research methodology to conduct this study and addressed the following research questions:

1. How does the completion of an authentic comprehensive problem-based project encourage students to practice the process of critical thinking?
2. How does an instructor address implementation issues related to the use of an authentic comprehensive problem-based project over the course

of a semester?

3. How does students' thinking about the issues professional accountants face change as students complete an authentic comprehensive problem-based project and short reflection papers?
4. What changes in instruction related to short reflection papers encourage students to contemplate decisions made by professional accountants?
5. How does a change in assessment methods from objective periodic tests to an authentic comprehensive problem-based project and reflection papers affect students' ability to complete routine accounting procedures?

I identified necessary changes to instruction, learning materials, and assessments based on data analysis and findings in each of the action research cycles.

Significance of Study

After more than a decade of discussion with higher education professionals and employers, the American Association of Colleges and Universities (AACU) issued a report recommending instructional methods to improve learning and the development of intellectual skills (Kuh, 2008). Kuh's report emphasizes the use of collaborative projects that include extensive practice of intellectual and practical skills of inquiry and analysis. Employers agree with the AACU. According to Hart Research Associates (2015),

The majority of employers continue to say that possessing both field-specific knowledge and a broad range of knowledge and skills is important for recent college graduates to achieve long-term career success. Very few indicate that acquiring knowledge and skills mainly for a specific field or

position is the best path for long-term success...requiring college students to complete a significant applied learning project before graduation would improve the quality of their preparation for careers. (p.1)

Accounting professionals agree that accounting graduates need to develop strong intellectual skills (AECC, 1990; American Institute of Certified Public Accountants [AICPA], 1999; Baril et al., 1998; BEWP, 1989; Black, 2012; Lawson et al., 2015; Milliron, 2012; Sin et al., 2012; Spiceland, Spiceland, & Schaeffer 2015; Yu et al., 2013). After many years of discussion, the American Institute of Certified Professional Accountants (AICPA) revised the national exam students must pass to become Certified Public Accountants (CPAs) and added testing of intellectual skills. Michael Decker, Vice President of Examinations at the AICPA, explained the reasons for the change as follows:

We heard from the profession that newly licensed CPAs not only need to have the knowledge, but they need to have higher-order skills. They need to analyze financial and tax information and they must be able to think critically and problem-solve in their day-to-day jobs. (Tysiac, 2016, p. 2)

Approximately 50% of the questions on the national CPA exam require candidates to demonstrate competent higher order thinking skills (AICPA, 2016).

Accounting textbooks serve as the primary learning material in traditional accounting courses (Apostolou, Dorminey, Hassell, & Rebele, 2016; Catanach, Croll & Grinaker, 2000; Duchac & Amoruso, 2012; Spiceland et al., 2015; Stevens, Clow, McConkey, & Silver, 2010). A study conducted by Davidson and Baldwin (2005) analyzed the end-of-chapter materials (EOCM) in thirteen junior-level financial accounting textbooks. The researchers categorized EOCM according to Bloom et al.'s (1956) taxonomy and found that less than

10% of EOCM required students to perform the two highest levels of thinking processes: synthesis (6%) and evaluation (3%). Further analysis revealed that available EOCM designed to encourage synthesis and evaluation has increased only 16% since the early 1990s (Davidson & Baldwin, 2005).

Davidson and Baldwin's (2005) study is the most recent review of financial accounting textbooks in the literature. An informal review of current editions of some of the same junior-level financial accounting textbooks reveals no notable increase in EOCM that require higher order thinking skills. Junior-level accounting textbooks do not reflect the accounting professions' stance that intellectual skills are just as, or more important than, declarative and procedural knowledge. A review of available syllabi of junior-level financial accounting courses from ranked US undergraduate accounting programs in 2016 revealed that instructors relied on structured exercises and problems provided in textbooks to prepare accounting graduates. The instructors also supplemented textbook materials with structured cases; however, case-work constituted less than 10% of a student's grade. EOCM appears to be helpful for learning to perform structured procedures. Accounting students who complete more than the typical level of structured exercises and problems experience greater success on objective tests and quizzes (Hahn, Fairchild, & Dowis, 2013; Johnson & Slayter, 2012; McNellis, 2015; Shoulders & Hicks, 2008).

The literature includes a significant number of studies that change the approach to learning one topic or add unstructured projects while maintaining the traditional reliance on an accounting textbook. Survey-based findings indicate that students believe they used higher order thinking skills to complete the supplemental assignments and enjoyed the learning experience (Baker, 2011; Craig & McKinney, 2010; Finger, 2010; Grimm, 2015;

Killian, Huber, & Brandon, 2012; Kilpatrick, Savage, & Wilburn, 2013; McGowan, 2012; Phillips & Nagy, 2014; Sargent & Borthick, 2013; Spiceland et al., 2015). Instructors generally believe incorporating short, unstructured cases into accounting curriculum encourages the development of critical thinking skills (Libby, 1991; Milne & McConnell, 2001; Stanley & Marsden, 2013; Wynn-Williams, Beatson, & Anderson, 2016).

Few studies describe a proposed restructuring of accounting curriculum to reorient learning objectives away from declarative and procedural knowledge to the development of intellectual skills. Warren and Young (2012) proposed the consolidation of the first two sophomore-level accounting courses to emphasize project work and reduce the focus on accounting procedures. Instructors re-sequenced topics and designed a series of projects to facilitate deep understanding of concepts and procedures. The researchers presented no findings related to the development of intellectual skills. Albrecht et al. (1994) described Brigham Young University's curriculum redesign that removed reliance on the traditional textbook and incorporated real-world problems to develop competencies. Instructors combined three junior-level accounting courses and organized the content around business cycles. Student assessments included objective examinations, short problems, short writing assignments, and presentations. Survey results indicated students felt better prepared to perform the work of a professional accountant. However, instructors expressed concern over possible loss of declarative and procedural knowledge and a heavy workload. The researchers presented no findings related to implementation issues or the extent that students developed intellectual skills.

Only one study conducted in a junior-level financial accounting course proposes the use of a comprehensive case over the entire semester (Catanach et al., 2000). Instructors

guided students as they analyzed data and performed accounting procedures for a fictitious client. All students worked to achieve consensus on the correct answer to each case situation. Instructors assessed students based on performance on case related assignments (40%) and objective examinations (60%). Instructors noted the use of the textbook for reference, objective testing over accounting procedures, and continuous improvement of the case materials as important for meeting learning objectives. The researchers did not provide a discussion of implementation issues or evaluate the effectiveness of the use of the case for accomplishing learning objectives.

This study is the first to explore implementation issues and the effect of using an authentic comprehensive project that encourages students to consistently apply higher order intellectual skills (Apostolou, Dorminey, Hassell, & Rebele, 2014; Apostolou et al., 2016; Cunningham, 2008; Kimmel, 1995; Rebele & St. Pierre, 2015). The results of this study are useful to instructors in accounting and other disciplines who desire to implement instructional methods that prepare students with the intellectual skills required for professional success without the sacrifice of declarative and procedural knowledge.

Terminology

Declarative knowledge consists of factual information that describes attributes of accounting guidance, concepts, and terminology. **Procedural knowledge** is the understanding of how to compute values and record transactions for the purposes of financial reporting (Bonner & Walker, 1994; Rumelhart & Norman, 1978).

The terms **higher order thinking skills and intellectual skills** refer to the cognitive process of analysis, synthesis, and evaluation included in Bloom et al.'s (1956) taxonomy of educational objectives. Analysis includes the organization of data and the identification of

relationships. Synthesis is the production of a unique plan after organizing a set of relationships. Evaluation is the assessment of the credibility of evidence used to support judgment.

Critical thinking is a six-step process that requires the use of higher order thinking skills. The six-step process includes (Facione, 1990)

- *Interpretation*: the ability to express the meaning of data, transactions, or accounting procedures
- *Analysis*: the organization of data and the identification of relationships
- *Evaluation*: the assessment of the credibility of evidence used to support judgments
- *Inference*: to identify elements needed to draw conclusions; determine consequences of data, evidence, judgments
- *Explanation*: to state and justify the results of one's reasoning
- *Self-regulation*: to monitor, question, and correct one's own inferences

Reflective thinking describes a process used to resolve unstructured problems given one's belief about knowledge and the use of evidence. According to King and Kitchener (1994), reflective thinking progresses through three stages: 1) Pre-reflective thinking (knowledge is certain, do not use evidence), 2) Quasi-reflective thinking (recognize knowledge is uncertain; evidence is not used), and 3) Reflective thinking (construction of knowledge based on evidence; continuous re-evaluation). Mezirow (1991) proposed that professionals think in one of three stages to resolve problems. The stage of non-reflection is content-focused. Professionals who do not reflect make decisions based on previous knowledge or without using evidence. Professionals in the process reflection stage recognize ambiguity and question without using evidence. Premise reflection consists of understanding

why and viewing situations from a different perspective after reassessing knowledge and evidence.

Approach to learning (study) refers to the types of behaviors students demonstrate when studying to learn course material (Laird, Shoup, Kuh, & Schwaez, 2008; Marton & Säljö, 1976). A student's approach to learning directly influences the higher order thinking skills used during the learning process. Students who use a **surface approach to learning** memorize to recognize facts and reproduce procedures. Students who use a **deep approach to learning** search for meaning as they integrate old knowledge with new knowledge, synthesize information, and look for ways to apply knowledge (Biggs, 1987; Entwistle & Ramsden, 1983; Entwistle, Tait, & McCune, 2000; Trigwell & Prosser, 1991).

An **instructional method** is a specifically designed interaction between an instructor, students, and a task to increase learning (Weimer, 2013). **Problem-based learning** is a student-centered instructional method that requires students to work together to investigate unstructured problems (Baeten, Kyndt, Struyven, & Dochy, 2010; Barrows, 1986; Prince, 2004). Problem-based learning often incorporates the use of an authentic project. **Authentic projects** require students to complete work in simulated real-world situations (Gijbels, Dochy, Van den Bossche, & Segers, 2005; Prince, 2004). **Instructional alignment** refers to the theory that suggests all instructional methods and assessments should align to support achievement of learning objectives (Biggs, Kember, & Leung, 2001).

Conceptual Framework

This study rests on Biggs et al.'s (2001) model of teaching and learning that proposes the alignment of the entire learning context to the students' perception of and participation in learning tasks to achieve an instructor's desired learning outcomes (Figure 1.1).

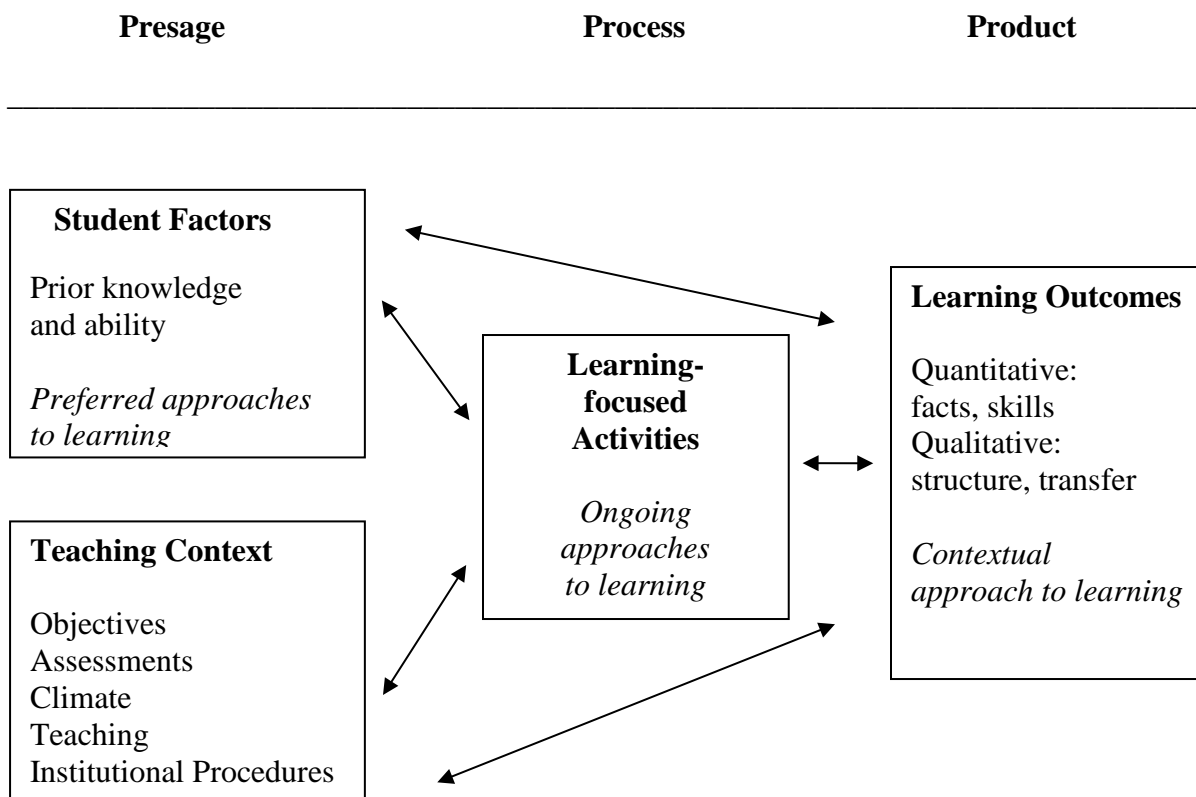


Figure 1.1. Model of teaching and learning (Biggs, Kember, & Leung, 2001).

The students and the instructor influence the learning context (presage). The instructor determines the nature of the content presented, the instructional methods employed, and the types of assessments. Students' prior knowledge and preferred approach to learning affects the students' ability to achieve learning goals. The process consists of the activities students complete for the purpose of learning, including readings, homework, in-class exercises, cases, and projects. Instructors define the learning outcomes (product) of the course in terms of knowledge, facts, procedures, and thinking skills transferrable to other contexts. The arrows in the model illustrate that each component affects all other components. The extent of learning is dependent on how the context and learning activities continuously interact to affect the students' approach to learning. Students will revise their study approach to the requirements of learning activities and assessments (Duff & McKinstry, 2007; Trigwell &

Prosser, 1991). The probability of students achieving learning objectives increases when instructors align the learning environment, activities, and assessments with desired learning goals (Ramsden, 2003).

Students begin the learning process with prior knowledge and a perception of the course requirements. As the course progresses, students will adapt a study approach they believe will best accomplish their learning goals (Laird et al., 2008; Marton & Säljö, 1976). Marton & Säljö (1976) were the first to propose that students employ either a surface or deep approach to study. Students who use a surface approach rely on memorization to recognize facts and repeat procedures. A deep approach requires an attempt to relate prior knowledge with new ideas to achieve meaningful understanding (Biggs, 1987; Entwistle et al., 2000; Prosser & Millar, 1989; Ramsden, 2003). The student's approach to study determines the level of learning (Biggs, 1999; Entwistle et al., 2000; Ramsden, 2003; Trigwell & Prosser, 1991).

Bloom et al. (1956) introduced a hierarchy of learning and proposed that lower order thinking skills of knowledge (remembering), comprehension (understanding), and application are foundational supports for the higher-order thinking skills of analysis, synthesis, and evaluation. Critical thinking is a process that individuals use to apply higher order thinking skills to solve problems. The process of critical thinking includes interpretation, analysis, evaluation, inference, explanation, and self-regulation (Facione, 1990). Individuals use reflective judgment to infer, explain, and perform self-regulation (Ennis, 1993; King & Kitchener, 1994; Resnick, 1987). Higher order thinking is "evoked by problems and questions or by some perplexity, confusion, or doubt" (Dewey, 1933, p. 15). Students do not automatically organize declarative and procedural knowledge learned in specific courses in a

manner useful for critical thinking (Ennis, 1993; Halpern, 1999; Kurfiss, 1988; McPeck, 1981; Paul, 1985).

Biggs et al. (2001) allege, "The heart of the teaching/learning system is at the process level, where the learning related activity produces or does not produce the desired outcomes" (p. 136). Teacher-centered instructional methods that facilitate knowledge transfer encourage students to employ a surface approach to learning to recall facts and procedures (Barr & Tagg, 1995; Booth, Lockett, & Mladenovic, 1999; Davidson, 2002; Entwistle et al., 2000; Tan & Choo, 1990; Thomas & Bain, 1982). Instructors who require students to evaluate and synthesize knowledge—components of higher order thinking—encourage a deep approach to learning (Ash & Clayton, 2004; Barr & Tagg, 1995; Cope, Staehr, & Horan, 2002; English, Lockett, & Mladenovic, 2004; Hassall & Joyce, 2001; Kolb & Kolb, 2005; Phillips & Graeff, 2014; Ramsden, 2003; Young & Warren, 2011). Instructors should design course requirements to encourage all students to develop higher order thinking skills and achieve meaningful long-term learning (Barr & Tagg, 1995; Biggs & Tang, 2011; Entwistle, 2010; Weimer, 2013).

Students' perception of course requirements, known as the hidden curriculum, is the primary influence in their approach to study (Biggs, 1987; Gibbs, 2010; Newble, 2016; Newble & Jaeger, 1983; Ramsden, 1992; Trigwell & Prosser, 1991). The type of assessment is a key determinant of students' perceptions of course requirements (Gibbs & Simpson, 2004; Ramsden, 1992; Struyven, Dochy & Janssens, 2005). Researchers agree that objective testing over declarative and procedural knowledge encourages a surface approach to learning (Biggs, 1996; Entwistle, 2010; Herbert, Joyce, & Hassall, 2009; Joughlin, 2010; Ramsden, 1992; Scouller, 1998). Students who are aware they will have task-based assessments intend

to use a deep approach to learning; however, due to other factors in the learning context, students actually utilize surface approaches with greater frequency (Gijbels, Segers, & Struyf, 2008; Segers, Nijhuis, & Gijsselaers, 2006). Students will use their preferred study approach as long they believe their behavior will achieve their personal learning goals (Biggs, 1999; Gijbels et al., 2008; Jensen, McDaniel, Woodard, & Kummer, 2014; Rust, 2002; Segers & Dochy, 2001; Trigwell, & Prosser, 1991; Watty, Jackson, & Yu, 2010). Research studies support the view of Marton & Säljö (1979) that it is easy for instructors to encourage a surface approach to study; however, instructors have not yet discovered instructional alignment that consistently encourages a deep approach to meaningful learning (Herbert et al., 2009; Segers et al., 2006; Wilson & Fowler, 2005).

A common approach that instructors use to encourage meaningful understanding is problem-based learning (PBL). In PBL, the instructor acts as a facilitator to help students define the issues, discover missing information, evaluate alternatives, and recommend a supportable solution to an authentic unstructured problem (Des Marchais, 1999; Schmidt, Rotgans, & Yew, 2011; Sockalingam, Rotgans, & Schmidt, 2010). Medical education began incorporating PBL into coursework to prepare students for future professional practice in the 1950s (Barrows, 1996). The practice has since spread to the disciplines of nursing, education, and business management (Allen, Donham, & Bernhardt, 2011; Baeten et al., 2010).

Problem-based learning incorporates the process that occurs in Kolb's (1984) experiential learning model (Figure 1.2.). Students begin the learning process with the exposure to new concepts and principles (concrete experimentation). In the next step, the learner analyzes the new content from various perspectives and organizes the new

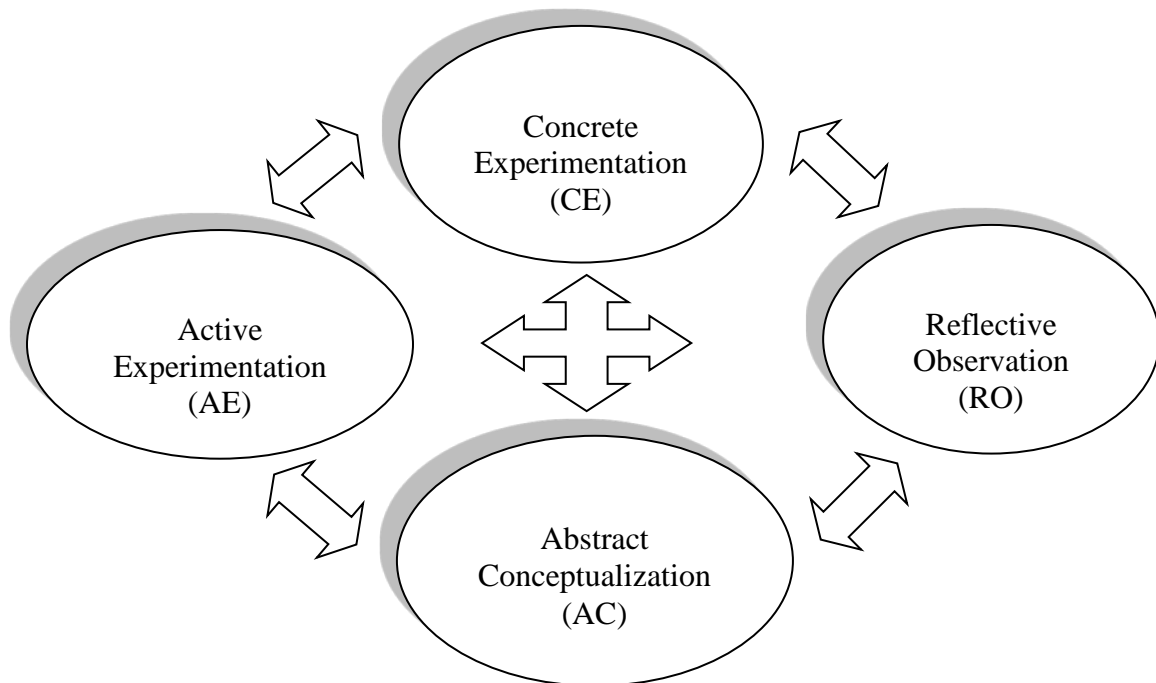


Figure 1.2. Experiential learning model (Kolb, 1984).

information with previous experiences (reflective observation). Students then integrate their new learning into methods useful for practical application (abstract conceptualization). During the last phase, learners apply previous knowledge and new learning to synthesize information, consider the advantages and disadvantages of alternatives, and recommend a solution to an unstructured problem (active experimentation). The process repeats itself each time the learner encounters new information (concrete experimentation).

Kolb's (1984) learning cycle offers an overview of the entire process a student undertakes to achieve learning goals during experiential learning activities. Other researchers believe the model does not address all factors that affect learning. Bergsteiner and Avery (2014) summarized criticism of Kolb's model, noting that the model pays insufficient attention to the learning environment, preferred learning methods, stages of reflection, culture-based differences, and the role of the instructor.

The combination of Biggs et al.'s (2001) model of teaching and learning and Kolb's (1984) experiential learning model (Figure 1.3) illustrates an instructional approach designed to result in a deep approach to learning. Biggs et al.'s model of teaching and learning considers alignment of the context, student approaches to learning, and assessment—factors Kolb's experiential learning model does not address.

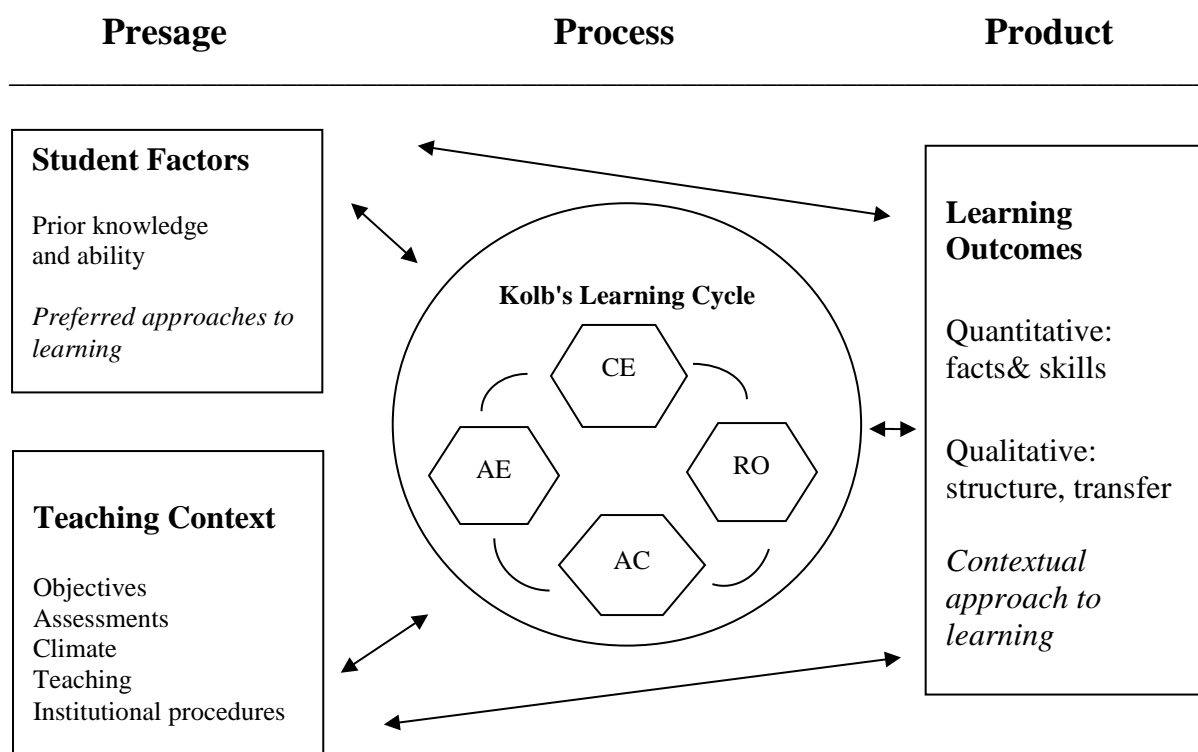


Figure 1.3. Conceptual model of alignment of teaching and learning activities to achieve learning goals. Augmented and adapted from Biggs et al., (2001) and Kolb, (1984).

The primary goal of this study was to use authentic problem-based learning to align the learning environment and assessments in a junior-level accounting course. I used action research methods to identify and implement changes to the authentic comprehensive project and reflection papers to encourage students to use a deep approach to learning and practice higher order thinking skills. The conclusions drawn from this study offer insight into the

issues instructors face as they align instructional methods and assessment to help students develop intellectual skills without sacrificing content knowledge.

Summary

This chapter provides a discussion of the context and importance of this action research study. According to Shuell (1986),

If students are to learn desired out-comes in a reasonably effective manner, then the teacher's fundamental task is to get students to engage in learning activities that are likely to result in their achieving these outcomes, taking into account factors such as prior knowledge, the context in which the material is presented, and the realization that students' interpretation and understanding of new information depend on the availability of appropriate schemata.

(p. 429)

The following chapter is a review of the literature related to learning, critical and reflective thinking, problem-based learning, student approaches to learning, and assessment. Each of the components in the literature review is an important piece of the instructional alignment thought to encourage students to develop higher order thinking skills.

CHAPTER TWO: LITERATURE REVIEW

Learning

Learning occurs when students acquire new knowledge and modify existing knowledge and skills. Meaningful learning results in a long-lasting change in one's ability to do something or solve problems as a result of practice or experience (Dewey, 1933; Golding, 2011; Kolb, 1984; Mayer, 2002; Resnick, 1987; Shuell, 1986).

Constructivist Approach to Learning

Piaget (1950) was one of the first to theorize that learning occurs when one experiences dissonance. One then adds new knowledge to previous experiences to arrive at a solution to the problem that caused the dissonance. Perry (1970) extended Piaget's theory by outlining a trajectory of college students' intellectual growth. Perry's model begins with the student assuming knowledge is certain and held by authorities (dualism). Students then become aware that knowledge is sometimes uncertain and unknown to authorities (multiplicity). At the next stage of development, a learner accepts that knowledge results from evaluating evidence within a context and that he or she can take more than one approach to a problem. The student, finally, comes to view knowledge as contingent on the context. According to Perry (1970), four factors appear to affect students' development: students' experiences and response to diversity; the level of structure in the learning environment; the nature of experiential learning; and the ability to relate content to real-life.

A constructivist theory of learning developed out of the work of Piaget (1950) and Perry (1970). Constructivist learning occurs when students determine and organize new relevant data and integrate new information with previous knowledge. Understanding becomes apparent in a constructivist-learning environment when students can transfer

information from one form to another and interpret new meanings (Gash, 2015; Golding, 2011; Mayer, 2002). Biggs and Tang (2011) suggest that, "Learners construct knowledge with their own activities and they interpret concepts and principles in terms of the schematics they have already developed" (p. 22). Terenzini (1999) identified the characteristics of a constructivist-learning environment that encourages students' cognitive development. He stated that instructors must challenge "current knowledge and belief structures, require learner involvement and active participation, require time for reflection and internalization, ensure learning activities and learning outcomes have meaning for the learner," and integrate social and personal support (p. 36).

Cognitive Learning Models

Cognitive learning results when students collect and relate new information to knowledge and experiences stored in their memory (Ausubel, 1962; Rumelhart & Norman, 1978; Sternberg, 1984; Wittrock, 1974). Researchers have proposed a variety of models to illustrate the cognitive learning process. According to Marton and Säljö (1979), cognitive learning progresses through five different stages of perceptions that include exposure to new knowledge, memorizing, acquiring and using facts and methods, constructing abstract meaning, and interpreting reality for understanding. Shuell (1986) theorized that cognitive learning occurs through the process of encoding a term, relating the new term to another term, mapping and remapping the order of terms to generate solutions, and translating a solution into a response.

Novak and Gowin (1984) proposed a conceptual learning cycle to facilitate understanding of abstract concepts. Their conceptual learning cycle begins with acquiring information from a lecture or book. Next, organizing and reflecting on information generates

meaningful understanding. The learner then applies and experiences the new knowledge (Rogers, Simon, & Gabrielsson, 2016). Kolb (1984) proposed an experiential learning cycle of concrete experience, abstract conceptualization, reflective observation, and active experimentation. In his model, Kolb asserts that a change in thinking occurs when one experiments with and reflects on new ideas (Abdulwahed & Nagy, 2009) in a continuous process of doing, feeling, watching, and thinking (Chmielewski-Raimondo, McKeown, & Brooks, 2016). Kolb's model differs from other models in that the learning process does not begin with exposure to facts from instructors or books. Instead, learning begins when experiencing a problem in a given situation.

Taxonomy of Learning

Researchers suggest that learning begins with declarative knowledge of what and procedural knowledge of how. Knowing the “what” and “how” forms the basis for the learner to identify relationships between different pieces of new information to achieve deeper understanding (Marton & Säljö, 1979; Novak & Gowin, 1984; Shuell, 1986). Bloom et al. (1956) proposed a framework for educators to use to establish learning objectives that encourage students to move through all stages of learning to achieve meaningful understanding. This framework, referred to by researchers as the original taxonomy, includes six categories: knowledge, comprehension, application, analysis, synthesis, and evaluation. The first three categories consist of simple and concrete learning. Students demonstrate knowledge through recall of information. Comprehension is the ability to understand the meaning of facts and information. Application occurs with the use of new knowledge in an unfamiliar situation. The last three categories of analysis, synthesis, and evaluation encourage students to achieve complex abstract learning. Analysis occurs through

the process of identifying and organizing distinct parts of knowledge for understanding. Synthesis occurs as students form parts of knowledge into a new whole and evaluation is making judgments about new knowledge. Bloom et al. believed the original taxonomy could "serve as a common language about learning goals" (Krathwohl, 2002, p. 212).

Krathwohl (2002) renamed the categories in the original taxonomy to describe action related to content. The revised taxonomy classifies learning into the actions of remember, understand, apply, analyze, evaluate, and create. Remembering involves recall of factual knowledge. Understanding is the ability to interpret, summarize, infer, compare, and explain. Applying occurs through implementation of a concept. Analyzing involves determining relationships and differentiating ideas. Evaluating requires a judgment and creating results in an original idea or product. The revised taxonomy allows instructors to determine the "extent to which more complex kinds of knowledge and cognitive processes are involved" (Krathwohl, 2002, p. 216). Analyzing, evaluating, and creating require students to perform complex cognitive thinking processes referred to as higher order thinking (King, Goodson, & Rohani, 1998; Kuhn, 1999; Shuell, 1986).

Higher order thinking occurs with meta-cognition (King et al., 1998; Shuell, 1986). Meta-cognition is "thinking about thinking" (Downing, Kwong, Chan, Lam, & Downing, 2009, p. 610) that includes reflecting, analyzing, drawing conclusions, and knowing how to implement solutions (Kuhn, 1999). Meta-cognition also consists of an understanding of one's own thinking processes and the ability to change and improve thinking processes in other situations (King et al., 1998; Weinert, 1987). Dewey (1933) described higher order thinking as searching and judging. He related searching to reflective thinking and judging to critical thinking.

The literature provides much discussion related to the higher order thinking processes of critical and reflective thinking (e.g., Abrami et al., 2008; Facione, 1990; King & Kitchener, 2004; Rogers, 2001). Researchers frequently debate the processes that occur when students engage in higher order thinking, whether educators must teach higher order thinking skills in a specific subject-matter course or on a stand-alone basis, and which instructional methods are most appropriate for encouraging higher order thinking (Kuhn, 1999). The next two sections of the literature review discuss the current body of research that attempts to address the aforementioned areas of argument related to critical and reflective thinking.

Critical Thinking

The term *critical thinking* describes a process of using cognitive strategies and skills to determine the most appropriate course of action. Scholars generally agree that critical thinking is a process; however, they disagree about the specific steps involved in the thinking process. Paul (1984) believes critical thinking occurs at two levels. The first level incorporates the use of logical and analytical thinking. At the second level, one draws on the perspectives of others to develop a holistic rationality. Critical thinking on both levels requires a broad understanding of a culture's values and consequences. According to Glaser (1984), critical thinking means recognizing assumptions and values, evaluating arguments and evidence, and making inferences and judgments. Ennis (1985) views critical thinking from a more practical perspective and sees the process as "reflective and reasonable thinking that is focused on deciding what to believe or do" (p. 45).

Kurfiss (1988) focuses on the end result of the critical thinking process. She believes the outcome of critical thinking must follow a series of arguments that justify a "rational

response to questions that cannot be answered definitively and for which all relevant information may not be available” (p. 20). Kurfiss discusses four components of critical thinking that lead to a rational response. These four components are informal logic, analysis and construction of arguments, cognitive construction of meaning, and intellectual development. Analyzing and constructing arguments involves the ability to detect and avoid faulty arguments. Furthermore, she believes students use mental models to construct meaning in situations with no verifiable solutions. Using mental models requires “knowing facts and concepts in the discipline, knowing how to present knowledge in the discipline, and determining when additional information is needed” (Kurfiss, 1988, p. 6).

Halpern (1998) proposes that effective critical thinking is a purposeful, reasoned, and goal-directed effort of evaluating one’s own thinking processes. Facione (1986) takes the position that critical thinking must demonstrate "the ability to present well-reasoned arguments and to evaluate correctly the arguments others present" (p. 22). The various approaches to critical thinking in the 1980s made it difficult for instructors to know how to incorporate effective teaching methods to enhance students' thinking abilities.

Delphi Study to Define Critical Thinking

In December of 1989, the American Philosophical Association (APA) asked Peter Facione, a well-known expert on critical thinking, to conduct a systematic inquiry to define and describe critical thinking. An international group of experts on critical thinking participated in the task using the Delphi method. The Delphi method of inquiry assigns a central investigator to organize the group, feed the group questions, disseminate responses, and continue the cycle until members reach a consensus. After two years of dedicated

collaboration and friendly dispute, the experts proposed that the cognitive processes required for critical thinking are as follows (Facione, 1990):

- *Interpretation*: to “comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures, or criteria” (p. 13).
- *Analysis*: to “identify the intended and actual inferential relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express belief, judgment, experiences, reasons, information, or opinions” (p. 14).
- *Evaluation*: to “assess the credibility of statements or other representations which are accounts or descriptions of a person’s perception, experience, situation, judgments, belief or opinion; and to assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions or other forms of representation” (p. 15).
- *Inference*: to “identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses; to consider relevant information and to deduce the consequences flowing from the data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation” (p. 16).
- *Explanation*: to “state the results of one’s reasoning; to justify that reasoning in terms of evidential, conceptual, methodological, criteriological and contextual considerations upon which one’s results were based; and to present one’s reasoning in the form of cogent arguments” (p. 17).

- *Self-regulation*: to “self-consciously monitor one’s cognitive activities, the elements used in those activities and the results, particularly by applying skills in analysis and evaluation to one’s own inferential judgments with a view towards questioning, confirming, validating, or correcting either one’s reasoning or one’s results” (p. 18).

This last process, self-regulation, is one of the most important features because it allows for the improvement of one’s own thinking. Critical thinking is a holistic process and is “not rote, mechanical, unreflective, disconnected execution” (Facione, 1990, p. 11).

The many facets of critical thinking create challenges for faculty members who acknowledge the importance of teaching students the thinking process. Instructors require students to solve problems as a method of encouraging critical thinking (Dochy, Segers, Van den Bossche, & Gijbels, 2003; Schmidt et al., 2011; Strobel & Barneveld, 2009). Problem-solving is a process of analyzing given information with the understanding that there is one, or a limited number of, solutions to a well-defined problem. Structured problem-solving requires understanding of the situation and facts presented to establish criteria to evaluate and judge alternatives within established parameters (Erwin, 2000; Jones, Dougherty, Fantaske, & Hoffman, 1997). Students solve structured problems using the first three of the six cognitive skills identified in the Delphi study: integration, analysis, and evaluation. To complete the full process of critical thinking, students must also complete the processes of inference, explanation, and self-regulation. The last three processes include determining the advantages and disadvantages of alternatives of unlimited potential solutions. The structure of the information provided to students determines the extent to which students use critical thinking skills to resolve the situation (Facione, 1990).

Critical Thinking Instruction

Students do not automatically organize declarative knowledge in a manner useful for problem-solving or critical thinking (Kurfiss, 1988). As a general rule, college graduates make judgments on the basis of unexamined personal preferences (Belenky, 1986; King, Kitchener, Davison, Parker, & Wood, 1983; Welfel, 1982). Encouraging students to practice critical thinking is not an easy feat due to the complexity of the components involved in the thinking process. Models designed to assist with the implementation of critical thinking instruction may be helpful to faculty members who desire to incorporate assignments to enhance students' skills.

Models of critical thinking instruction. Huffman, Vernoy, Williams, and Vernoy (1991) were the first to provide a framework to assist instructors with incorporating instruction aimed at developing students' critical thinking skills. The framework consists of three types of components: affective, cognitive, and behavior. Affective components include valuing truth, welcoming divergent views, tolerating ambiguity, and recognizing personal biases. Defining problems accurately, analyzing data for value and content, synthesizing information, resisting overgeneralization, and using reflective thinking are cognitive components. Behavior components include delaying judgment until adequate data are available, gathering data, distinguishing fact from opinion, encouraging critical discussion, engaging in active listening, and applying knowledge to new situations (Baril et al., 1998). Effective instruction will require students to demonstrate the majority of the components of the framework (Huffman et al., 1991).

Halpern's (1998) model for teaching critical thinking skills includes: 1) disposition and attitudes, 2) instruction in and practice with critical thinking skills, 3) structured

activities designed to transfer across contexts, and 4) a meta-cognitive component used to direct and assess thinking. Halpern encourages instructors to require assignments that ask students to demonstrate verbal reasoning, employ argument analysis, utilize hypothesis testing, judge likelihood in uncertainty, and generate and evaluate alternatives. Halpern based her model on the premise that students must practice and learn to create retrieval cues related to certain structural aspects of a situation, problem, or argument to consistently activate critical thinking. Regrettably, students often abandon the thinking process too soon after making a judgment that a task should be easier to accomplish (Facione & Gittens, 2013; Halpern, 1998).

Lim (2011b) recommends that critical thinking instruction avoid presenting problems in an abstract manner and provide multiple and conflicting perspectives on a given problem. He proposes requiring students to identify why the issue is a problem, whose problem it is, and who benefits from its solution. Students must also recognize that solutions to problems may be both beneficial and harmful to different groups and that one solution for all parties may be less effective than a combination of strategies.

Facione (2011) approaches critical thinking instruction from a practical perspective. He proposes that critical thinking requires students to give evidence of “adroit and clever questioning, clever investigative approaches, people working together to discuss options for solving problems, consideration of all the facts, deciding what is relevant and what is not, and rendering a thoughtful judgment” (p. 3). He also describes traits of strong critical thinking as the ability to devise sensible alternatives to explore, abandon ideas that do not work without becoming defensive, summarize complex ideas clearly with fairness to all sides, and provide coherent and justifiable explanations.

Students' expectation of "being told what to believe" and "being told what to do" (Paul, 1985, p. 39) presents two strong obstacles to instructors who teach critical-thinking skills. A key component of critical thinking instruction is assisting students with understanding the strengths and weaknesses of their own thinking skills (Facione & Gittens, 2013). Researchers agree that instruction is more than information transfer, and instructors can successfully encourage students to practice critical thinking processes (Ennis, 1985; Halpern, 1998; Lim, 2011b; Paul, 1985).

Methods of critical thinking instruction. One of the most cited research studies on critical thinking instruction is a meta-analysis performed by Abrami et al. (2008), which analyzed empirical evidence to determine how different instructional methods affect the development of students' critical thinking skills. The meta-analysis considered 117 independent studies with participants ranging from the age of six to post-graduate adults, including 80 studies related to undergraduate postsecondary students. The researchers in each individual study measured students' critical thinking ability using pre-test and post-test scores on standardized tests or instructor rubrics. The meta-analysis placed each individual study into one of four categories of instruction: general, infusion, immersion, or mixed (Ennis, 1989).

Instructors who use the *general method* explicitly teach critical thinking processes and dispositions without specific subject matter content. Instructors who incorporate written assignments and thought-provoking discussions into subject matter content without stating a learning goal of developing students' critical thinking skills use the *immersion method*. The *infusion method* requires students to apply critical thinking processes to discipline-specific subject matter without explicit instruction on critical thinking. The development of critical

thinking skills is a stated objective when using the infusion method. The *mixed method* of instruction first incorporates teaching about general critical thinking processes and subsequently requires students to apply critical thinking to subject-specific knowledge. The four different approaches to critical-thinking instruction are distinguishable by two factors: the level of explicit discussion about course objectives and instruction provided before students apply critical thinking processes, and the extent of specific subject matter content (Ennis, 1989).

General method. One method for teaching critical thinking is general instruction that explicitly explains cognitive processes. Some universities provide explicit instruction through a freshman introductory course (Facione & Gittens, 2013; Hatcher, 2006; Penningroth, Despain, & Gray, 2007). The goal of the introductory course is to expose students to the complexities and challenges of reasoning and improve thinking skills in subsequent courses. A freshman course typically requires students to identify issues, gather information, identify alternatives, generate and test hypotheses, and evaluate arguments. One primary goal of the introductory course is to encourage students to expand their thinking beyond currently existing biases and intuition (Facione & Gittens, 2013; Hatcher, 2006).

Students in a stand-alone freshman course learn rhetoric along with formal and informal logic. Rhetoric relates to the persuasiveness of the argument. Logic focuses on the structure of the argument, any shortcomings in the argument, and how well the argument defends the conclusion (Facione & Gittens, 2013; Hatcher, 2006). Logic includes deductive and inductive reasoning. Deductive reasoning is a *top-down* logic that assumes if all premises are true, the terms are clear, and thinking follows the rules of deductive logic, then the conclusion must be true. Thinking consists of applying general rules and narrowing the

range of options until only the conclusion remains. The statement *If A, then B, so when A; therefore B* is a formal argument using deductive reasoning. Inductive reasoning is a *bottom-up* approach to reaching a conclusion by generalizing or extrapolating from initial data. Environments of uncertainty often require inductive reasoning based on probability, and conclusions are seldom proven to be absolutely true (Facione & Gittens, 2013; Kurfiss, 1988).

Early implementation of freshman introductory courses produced no significant measurable gains in students' critical thinking abilities (Lyle, 1958; Mentkowski & Strait, 1983; Tomlinson-Keasey et al., 1977). The results of more recent studies indicate freshman introductory courses expose students to the complexity of critical thinking, provide the repetitive practice perceived to build skills, and give students insight into the quality of their own thinking patterns (Hatcher, 2006; Penningroth et al., 2007). Halpern (1999) noted that researchers have found that explicit teaching of critical thinking skills is transferrable across different academic areas (Facione, 1986; Lochhead & Whimbly, 1987; Rubenstein & Firstenberg, 1987; Siegel, 1988; Woods, 1987). The “most fundamental limitation of introductory courses in critical thinking skills is that the questions we ask determine the value of our inquiry, and, without knowledge of the subject of inquiry, it is difficult to ask intelligent questions” (Kurfiss, 1988, p. 41).

Immersion method. Instructors incorporating the immersion method use questions and modeling to provoke thoughtful class discussions. However, under the immersion method, instructors do not stress the development of critical thinking skills as a learning objective. Questions designed to encourage students to go through various steps in the thinking process include: "What are the issues...? What are the reasons ...? How good is

the evidence? What reasonable conclusions are possible?"(Brown & Kelley, 1986, p. 14). Modeling occurs in a discussion setting. Instructors walk students through the thinking processes without explicitly teaching steps involved in critical thinking. Instructors then require students to address other situations and problems in a similar manner. Writing assignments often follow class discussions to encourage students to practice the process of critical thinking (Austin, Gregory, & Chiu, 2008; Matthews & Rittle-Johnson, 2009; Snyder & Snyder, 2008).

Early attempts at the immersion method using argumentation and discussion (Beckman, 1956) and guided questions with modeling (Hancock, 1981; Hayden, 1978; Jones, 1974; Suksringarm, 1976) produced inconsistent results (as cited in Tsui, 1999). More recently, instructors who incorporated writing assignments and high levels of class participation found that students demonstrated an increase in critical thinking ability (Gibson, 1985; Smith, 1995; Tsui, 2002).

Dyck, Walker, Starke, and Uggerslev (2012) compared two different instructional methods to determine which method had a greater impact on students' critical thinking ability in a business management theory course. Specific learning objectives did not include the development of critical thinking skills. Student surveys and interview responses indicated that students who discussed two approaches to management theory demonstrated stronger performance in the philosophical area of critical thinking (recognizing and evaluating assumptions) than students exposed to just one approach. As expected, Dyck et al. (2012) concluded that teaching more than one approach to management theory does improve students' critical thinking skills.

Hall and Tucker (2009) required accounting students to analyze the reporting requirements for stock dividends and stock splits and to critique the authoritative rationale of the accounting guidance. The study provided an example of how instructors can use a series of questions to embed the process of critical thinking about a particular topic in a course. Camp and Schnader (2010) required accounting students to use critical thinking processes to debate tax policy; however, the instructors did not state the development of critical thinking skills as a specific course objective or evaluate changes in critical thinking skills.

Infusion method. Instructors who use the infusion method encourage students to apply critical thinking processes to solve discipline-specific problems without explicit teaching of critical thinking processes. The development of students' critical thinking skills is a stated learning objective in the infusion method. Resnick (1987) and Glaser (1984) encourage the infusion approach, agreeing that students cannot problem solve effectively without content knowledge because thinking requires the possession of accessible and usable declarative and procedural discipline-specific knowledge. McPeck (1981) insists that "it makes no sense to talk about critical thinking as a distinct subject and therefore cannot be profitably taught as such. To the extent critical thinking is not about a specific subject X, it is both conceptually and practically empty" (p. 5). A common approach to implementing the infusion method is to require students to answer questions to resolve real-world cases (Angeli & Valanides, 2009; Braun, 2004; Dudley, Davis & McGrady, 2001; Rippen, Booth, Bowie, & Jordan, 2002).

Lovelace, Eggers, and Dyck (2016) required students to complete a management simulation without explicitly teaching critical thinking processes. Analysis of written cases indicated that students who completed the simulation demonstrated increased critical

thinking skills. Young and Warren (2011) incorporated challenge problems into an introductory accounting course. The challenge problems required students to apply basic accounting principles to a variety of business situations. Students' ability to transfer knowledge of textbook material to unfamiliar business situations improved with consistent practice. Sargent and Borthick (2013) integrated small tasks related to a series of business events into a sophomore accounting course and found completing the tasks in the sophomore-level course led to stronger thinking skills in the junior-level accounting courses. However, the researchers provided no details on the assessments used in the junior-level accounting courses. Finley and Waymire (2013) required students to select a policy topic, perform background research, evaluate cost benefits of related policies, and support and recommend a solution in a senior-level governmental accounting course. Findings indicate that a project of this type encourages students to use critical thinking processes.

Mixed method. Instructors who use the mixed method provide explicit instruction about critical thinking processes within a particular subject matter course before asking students to solve discipline-specific problems. Critical thinking guides are useful for minimizing time required to teach thinking skills and as a tool for subsequent student work. An example of a critical thinking guide is Facione and Gitten's (2013) six step process, referred to as *IDEALS*, that leads students through the steps of identifying the problem, defining the context, enumerating the choices, analyzing options, listing reasons explicitly, and self-correcting.

Heijltjes, Van Gog, and Paas (2014) investigated the effect of different methods of critical thinking instruction on second-year economics students. The researchers

randomly assigned students to either: 1) implicit instruction, 2) implicit instruction with practice, 3) both implicit and explicit instruction along with practice, 4) both implicit and explicit instruction combined with prompts and practice, or 5) both implicit and explicit instruction along with prompts and practice (p. 518).

Students gained practice by completing four tasks in a business case after viewing videos of explicit instruction. All 141 participants completed pre- and post-tests after completion of 16 mini-tasks to determine the change (if any) in students' critical thinking skills. The researchers found that a combination of explicit critical thinking instruction and practice provided the greatest gains in critical thinking. Furthermore, explicit instruction alone or practice alone did not increase critical thinking abilities.

Reid and Anderson (2012) incorporated the mixed method into a senior-level business course. Instructors provided students with two weeks of explicit instruction that followed Halpern's (1997) model prior to requiring the completion of a capstone project. Students who received the instruction performed significantly better on a standardized critical thinking test than students who did not receive the explicit instruction.

Effectiveness of instructional methods. The literature contains several meta-analyses of teaching interventions designed to encourage students to develop strong thinking skills in individual courses. After analyzing 42 studies, Niu, Behar-Horenstein, and Garvan (2013) found that similar teaching interventions do not consistently lead to the same results, and that results heavily depend on implementation procedures. The researchers recommended that instructors use more than one method to evaluate the impact of the intervention on students' critical thinking skills. McMillan (1987) analyzed 27 different studies and found no support

that the use of any one specific instructional method had a more significant positive effect than the other methods.

Abrami et al. (2015) performed a meta-analysis of 341 empirical studies that used standardized tests to determine the change in critical thinking skills resulting from a teaching intervention. The researchers categorized teaching interventions as either dialogue (class discussion), authentic or anchored instruction (applied problem solving, case studies, or simulations), or mentoring (coaching or modeling). Analysis indicated that a combination of all three methods (dialogue, authentic anchored instruction, and mentoring) in the same course produced more than twice the effect (0.57) of authentic instruction (0.25) or dialogue (0.23) alone. The subject matter or length of time of the intervention had no significant effect. McKeachie, Pintrich, Lin, & Smith (1986) found improvements in students' critical thinking to be primarily due to three instructional variables: student discussion, explicit emphasis on problem-solving procedures, and exercises that encouraged meta-cognition.

Bangert-Drowns and Bankert (1990) conducted a meta-analysis of 20 studies (19 doctoral dissertations) that examined the results of instructional interventions using explicit critical thinking instruction compared to those involving implicit instruction. All studies included an assignment designed to require critical thinking and measured the change in critical thinking of each group of students. Fifteen studies measured the change in critical thinking using standardized pre- and post-tests. The researchers found that explicit instruction was more effective in 18 of the 20 studies.

In their meta-analysis of 117 studies, Abrami et al. (2008) found the mixed method of teaching critical thinking processes separately and then applying the process directly to course content produced the greatest improvement. The smallest increase in students' critical

thinking ability occurred with the immersion method, for which instructors listed the intention to improve critical thinking skills among the course objectives with no explicit description as to how students would achieve increased critical thinking skills. The conclusion that all four categories of instruction have a positive overall effect on students' critical thinking skills contradicts the findings of a previous study by McMillan (1987) that suggest instructional interventions have little impact on the development of critical thinking skills.

Critical Thinking Summary

Findings from prior studies suggest experiential instruction methods specifically designed to develop students' critical thinking can have a positive effect. The mixed method of explicit critical thinking instruction followed by application of the thinking processes in discipline-specific courses results in a greater increase in thinking abilities (Abrami et al., 2008; Bangert-Drowns & Bankert, 1990; Heijltjes et al., 2014). Additionally, a combination of course activities may produce stronger improvements in critical thinking skills (Abrami et al., 2015). No studies describe the change in students' critical thinking skills that occurs when completing an authentic comprehensive project throughout the entire course. Furthermore, no studies discuss the implementation issues associated with instructional methods that consistently require students to apply critical thinking processes.

There is no clear consensus as to whether critical thinking skills are applicable only to discipline-specific subject matter (Ennis, 1989; Halliday, 2000; Lauer, 1997; Sa, Stanovich, & West, 1999; Solon, 2003; Van Gelder, 2005). Most scholars do agree that learning to consistently think critically is a lengthy process and requires a great deal of reflective practice with many examples in a variety of situations (Ennis, 1993, Facione, 1990; Halpern,

1998; Kurfiss, 1988; Paul, 1985). Reflective practice includes evaluating evidence that supports judgments and questioning one's own thinking, important components of successful problem solving (Dewey, 1933; Facione & Gittens, 2013; Rogers, 2001; Schön, 1983). The idea that reflection is an essential component of successful critical thinking has led scholars to investigate the processes included in reflective thinking (e.g., Boud, Keogh, & Walker, 1985; King & Kitchener, 1994; Schön, 1983). Additionally, instructors have studied the effectiveness of teaching methods designed to encourage students to practice reflective thinking (e.g., Epp, 2008; Harvey et al., 2016; Hatton & Smith, 1995).

Reflective Thinking

Definition of Reflective Thinking

Dewey (1910) was one of the first to link reflective thinking with higher education in the United States. He proposed that "reflective thought is active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends" (p. 6). To engage in reflective thinking, one must challenge his or her own thinking with respect to recent experiences to achieve a change in perspective (Kember et al., 2000; Kennison & Misselwitz, 2002). Other researchers have associated reflective thinking with a process for determining the best course of action (Boud et al., 1985; Mezirow, 1991; Schön, 1983).

Rogers (2001) summarized various definitions of reflective thinking as a deliberate cognitive process that requires the examination of one's responses in a perplexing situation to integrate new understanding with prior experience to determine the best course of action. Prior experience includes underlying beliefs and emotions associated with action (Harvey, Coulson, & McMaugh, 2016; Hatton & Smith, 1995; King & Kitchener, 1994). Researchers

agree that reflection is a process of deliberate thought that leads to new insights and a change in behavior; however, they disagree on the specific stages involved in the process (Boud et al., 1985; Harvey et al., 2016; Kember et al., 2000; King & Kitchener, 2004; Lim, 2011a; Mezirow, 1991; Schön, 1983). Reflective thinking begins when one encounters dissonance and realizes that current knowledge is not sufficient for explaining a situation or resolving a problem. An examination of feelings, alternatives, and evidence follows the identification of the problem (Boud et al., 1985; Dewey, 1933; Mezirow, 1997; Seibert & Daudelin, 1999). Researchers have developed various models to explain how one goes through the process of reflective thinking.

Models of Reflective Thinking

Schön (1983) proposed that reflective thinking is a "continual interweaving of thinking and doing" (p. 281), which occurs in two distinct stages. The first stage is reflection in action and the second stage is reflection on action. Reflection in action occurs when one has the competence to think about their actions and modify behavior in a professional situation. Looking back on prior actions to improve effectiveness in future situations is reflection on action. Schön (1983) suggests that professionals continuously move between the two stages and reflect on prior and current actions to resolve ambiguous situations. This mental review of action assigns purpose and meaning to unstructured ideas and events (Atkins & Murphy, 1993; Moon, 1999). The result is a new level of awareness to use to improve future decisions (Cowen, 2014; Hatton & Smith, 1995).

Boud et al.'s (1985) model emphasizes the role of feelings in the reflective thinking process. Their model begins with returning to an experience and identifying feelings about the experience. Feelings are then associated and integrated with the events of the experience.

Validation of feelings and identification of an appropriate action follows this integration.

The process results in a new way of doing something, clarification of knowledge, increase in skills, and/or the resolution of an issue.

One of the most cited models is King and Kitchener's (1994) Reflective Judgment Model (RJM). Their model describes the process of reflective thinking with respect to how individuals view knowledge, how individuals accumulate understanding, and how they make judgments. The model rests on other cognitive-development theories that propose individuals construct understanding and meaning through experiences (Kegan, 1982; Loevinger, 1976; Perry, 1970; Piaget, 1950). Frames of references used for reflection "become more complex, integrated, and complete over time" (King & Kitchener, 2004, p. 9). The RJM contains three categories of reflective judgment: pre-reflective, quasi-reflective, and reflective (King & Kitchener, 1994).

In the pre-reflective stage, one assumes knowledge is certain and single, correct answers reside with authority figures. One views all problems as well structured and, therefore, using evidence to support a conclusion or personal opinions is not necessary. Individuals justify beliefs by referencing authority (King & Kitchener, 2004). Individuals in the quasi-reflective stage recognize that uncertainty is part of the knowing process and assume knowledge and beliefs are abstract and internally constructed. One understands evidence to be a key part of the knowing process; however, one chooses evidence that fits an established belief. The individual understands that different approaches or perspectives on controversial issues rely on different types and rules of evidence and that there are different ways to frame issues. The link between gathering evidence and making a conclusion is not clear and beliefs are context-specific (King & Kitchener, 2004).

Those who use reflective thinking consistently and comfortably rely on evidence and reason from a variety of sources to support their judgments. Individuals interpret knowledge in a given context and evaluate evidence for coherence and consistency with other available information. New data or new perspectives may emerge as knowledge is constructed and reconstructed. Individuals in this category obtain knowledge through a process of reasonable inquiry and defend conclusions using the best available evidence (King & Kitchener, 2004).

Reflection in a given situation generally occurs in a dominant stage; however, levels of thought may occur in more than one stage depending on the nature of the unstructured problem. Individuals operate in one primary stage approximately 70% of the time and demonstrate thinking in an adjacent stage at other times. The pace of progress through various categories of development in the RJM is dependent on contextual support and practice that encourages the reorganization of neural networks (King & Kitchener, 2004). Individuals generally operate in one of two levels: a *functional level* or an *optimal level*. The functional level is one's ability to do work without support. One's ability to perform with a proper level of support is the optimal level. The space between the two levels is the *developmental range* (Fischer & Pipp, 1984).

The RJM is useful for assessing an individual's ability to resolve unstructured problems using reasoning strategies. Once an instructor identifies the stage of development, he/she may implement appropriate instructional strategies designed to move students through the developmental range of one stage at the functional level and into the next stage at the optimal level (Wolcott & Lynch, 1997). King and Kitchener (2004) suggest that practice with reflective thinking could provide the contextual support required to move students from a functional level to an optimal level. Data analysis from earlier studies indicated

undergraduate students demonstrated cognitive abilities associated with pre-reflective thinking (Kurfiss, 1988; Pavelich & Fitch, 1988). A more recent study by King and Kitchener (1994) found that college students generally demonstrate minimal quasi-reflective abilities limited to recognizing uncertainty and using evidence to support their own belief about the best alternative.

Mezirow (1991) provided a model of reflective thinking applicable to professional practice. His model presents three categories of reflection: non-reflection, process reflection, and premise reflection. Non-reflection consists of two stages, habitual action and thoughtful action with understanding. Students perform habitual action with no reflective thought based on previous practice. Habitual action is effective when the current requirements are consistent with previous routine experiences (Kember et al., 2000). Schön (1983) describes characteristics of habitual action as *knowing-in-action* that does not require reflection. Habitual action occurs when one uses previous beliefs to interpret a current situation. Behavior is limited to what historically occurs in similar situations (Kreber & Castleden, 2009). Thoughtful action is a cognitive process that uses existing knowledge without attempting to evaluate the basis of that knowledge. Application, analysis, and synthesis (Bloom et al., 1956) without applying knowledge to other unstructured situations occur with thoughtful action (Kember et al., 2000).

Process reflection occurs when one raises questions about the validity of knowledge and assumptions related to a particular problem or experience and critiques assumptions in order to achieve further clarity and understanding (Mezirow, 1991). The individual uses evidence to draw conclusions on the effectiveness of the problem-solving process without questioning core beliefs (Kreber & Castleden, 2009). Premise reflection "involves us

becoming aware of why we perceive, think, feel, or act as we do" (Mezirow, 1991, p. 108). The highest level of premise reflection is demonstrated when one reassesses and revises his/her perspectives, beliefs, and values to view action from a different perspective (Kember et al., 2000; McAlpine et al., 2004; Mezirow, 1991). Dewey (1933) refers to premise reflection as *critical reflection*. McAlpine et al. (2004) identified stages of thinking similar to Mezirow (1991) and referred to them as reflection that draws on existing knowledge, reflection that questions knowledge, and reflection that leads to construction of new knowledge.

Rogers (2001) summarized the common themes prevalent in reflective thinking models as the identification of an unstructured problem in need of a solution, a requirement to gather additional information to identify and evaluate alternatives, and action on a supportable solution. Instructors who desire to develop students' reflective thinking abilities should design learning activities and assessments that require progression through all stages of the aforementioned models (Burrows, 1995; Hatton & Smith, 1995; McGuigan & Kern, 2009; Tsingos, Bosnic-Anticevich, Lonie, & Smith, 2015).

Reflective Thinking Instruction

Researchers have suggested a variety of ways instructors can encourage students to use reflective thinking. However, the various aspects of reflective thinking processes create challenges for instructors who desire to develop and implement effective methods of encouraging reflection (Boud & Walker, 1998; Harrison, Short, & Roberts, 2003; Hatton & Smith, 1995; Rogers, 2001). A simple approach is to require students to describe an event, explore potential responses, and state how they could apply learning to future situations (Burrows, 1995). Highlighting a specific problem allows the instructor to require students to

describe the problem, examine the problem from different perspectives, identify and challenge relationships and assumptions, and consider alternative views and actions (Cowen, 2014; Smyth, 1989; Sein, 2000).

Instructors attempting to implement complex methods of teaching reflective thinking processes may benefit from using one of several models. Tsingos, Bosnic-Anticevich, and Smith (2014) synthesized theories on reflection (Dewey, 1933; Kolb, 1984; Polanyi, 1967; Schön, 1983) and presented a model of teaching that instructors can apply to encourage students to use reflective thinking in situations similar to professional practice. The model proposes that instructors require students to learn by experience, link academic knowledge with complexities of practice, integrate new knowledge and old knowledge, generate alternative solutions, evaluate potential outcomes, acquire new knowledge, and continue the cycle. In a similar manner, Ash and Clayton (2004) recommended the use of reflection papers that require students to describe their experience, analyze the experience, apply critical thinking processes to the experience, and repeat the reflection process. Seibert and Daudelin (1999) believe the learning environment has a significant effect on the level of reflection that occurs. Furthermore, development depends on a context that supports the psychological state of the individual who is reflecting. A supportive context includes opportunities for practice, timely feedback, connection to and stimulation from others, and the appropriate level of challenge and support (Rogers, 2001). King and Kitchener (1994) found that when an environment is not supportive, improvements in performance appear to be slow and gradual. On the other hand, the researchers argue that more development occurs quickly when the environment supports high-level performance.

Specific instructional strategies. Instructors have implemented learning activities designed to encourage reflection in teacher education, nursing, law, medical, and business courses (Rogers, 2001). Medical and nursing educators consistently use reflective writing assignments to promote reflection on clinical experience (Tsingos et al., 2014). Instructors in teacher and business education incorporate questions, self-questions, and concept maps (Day, 1993; Griffith & Frieden, 2000; Samuels & Betts, 2007; Seibert & Daudelin, 1999). Structured reflection papers with question prompts are thought to assist students with developing meaningful understanding and better problem-solving skills in a variety of disciplines (Eyler & Giles, 1999; Menz & Xin, 2016; Ritchhart, Church, & Morrison, 2011). Guided reflection encourages students to examine their experiences critically (Ash & Clayton, 2004). Instructors have used reflection journals in business education to encourage students to relate course content to real-world experiences (Day, Kaidonis, & Perrin, 2003; Samkin & Francis, 2008; Varner & Peck, 2003; Woodward, 1998).

Hatton and Smith (1995) summarized research studies of instructional methods designed to encourage students to employ reflective thinking. Strategies commonly used include reflection on research projects, case studies, supervised practicum experiences, and structured tasks. The researchers did not evaluate the effectiveness of these strategies; however, they did note most instructors briefly mentioned the significant challenges associated with gathering and analyzing data for evidence of reflective thinking. McGuigan and Kern (2009) reviewed the literature related to the use of reflective learning journals and found that journaling enhances student engagement and ownership of learning, encourages self-directed learning, increases reflective thinking skills, and encourages meta-cognition. Their analysis also revealed challenges related to the use of reflective learning journals that

included students' superficial reflection to accomplish the task and write what the instructor wants to see (Boud & Walker, 1998), lack of clarity about instructors' expectations, inability to connect journaling to learning objectives, and challenges with subjective assessment. Lim (2011a) suggests reducing the structure of reflective thinking assignments to encourage students to express their own thoughts. In contrast, Moon (1999) suggests instructors should provide explicit requirements and detailed instructions to minimize students' anxiety over grades.

Effectiveness of reflective thinking instruction. Researchers have conducted a few studies designed to evaluate the effect of instructional interventions on students' ability to think reflectively. Epp (2008) performed a meta-analysis of qualitative studies in undergraduate nursing education that incorporated reflective journaling. Data analysis provided no significant evidence that reflective journaling encourages students to achieve specific learning objectives. However, the researchers noted individual studies consistently endorse the use of reflection due to findings that the ability to perform reflective thinking improves with practice. Ash, Clayton, and Atkinson (2005) assessed a series of paragraphs of reflection on academic, civic, and personal learning objectives. The researchers found that students had difficulty achieving levels of reflective thinking that included analyzing and evaluating; however, reflection papers were useful for gaining insight into what and how students think about content and the learning objectives.

Ash and Clayton (2004) relied on structured reflection papers to assess students' learning while participating in an animal science service-learning project, and Wolcott and Lynch (1997) required students to complete an accounting-related essay assignment. Neither study evaluated students' ability to reflect; however, both found that reflection papers provide

valuable feedback on concepts students misunderstand or have difficulty understanding. Findings were consistent with similar studies that incorporated structured reflection papers (Wessel & Larin, 2006; Williams, Sundelin, Foster-Seargeant, & Norman, 2000).

Hatton and Smith (1995) studied senior-level education students who reflected on their learning while they planned, implemented, and evaluated a unit of study. Analysis of the content of reflection papers found that students reflected in the categories of descriptive writing, descriptive reflection (independent self), dialogic reflection (orally with others), or critical reflection. Descriptive writing is a restatement of events and is not reflective. Students who included descriptive reflection or dialogic reflection provided reasons and justification for their thinking. Critical reflection included a description of the broader context when evaluating situations. Approximately 70 percent of students' thoughts consisted of descriptive writing with no reflection, while approximately 30 percent of the students demonstrated descriptive and dialogic reflection, and less than one percent of students made use of critical reflection. These findings are consistent with later studies that suggest educators need to move students beyond recounting events and actions and develop students' ability to explain, analyze, and improve their actions (O'Connell & Dymont, 2011; Samuels & Betts, 2007).

Song, Grabowski, Koszalka, and Harkness (2006) surveyed students at the end of a 15-week introductory statistics course conducted in a problem-based learning environment. The researchers concluded that the combination of learner-controlled authentic tasks, teacher questions, and concept mapping encouraged reflective thinking. Furthermore, an appropriate level of support is critical when encouraging students to reflect on a problem. Students' comments indicated a belief that responding to teacher questions, completing unstructured

tasks, and reflecting via writing assignments were most effective for developing reflective thinking.

Lim (2011a) surveyed students in a polytechnic program (engineering, information technology, applied sciences) at the beginning of each year of the four-year program to determine their ability to think with reflection. First-year students took five modules designed to develop their critical thinking and problem-solving skills before taking discipline-specific courses. Each class day in a discipline-specific course began with a problem. Students then spent the morning identifying issues, discussing ideas in groups, and performing research. Time in the afternoon was devoted to presenting learning to classmates and writing in reflection journals. Additionally, students took open-book tests to assess comprehension. The researchers found that students' reflective thinking ability increased during the first year and then stabilized for the rest of the program. Students in more content-heavy courses “focused more on following directions” and completing the assignments “than thinking about their own learning” (Lim, 2011a, p. 182). Senior students went through their work following a routine without much thought and resorted to memorizing for tests. These results were consistent with studies performed by Kember et al. (2000) and Boud and Walker (1998), who found that students fixated more on the course requirements than reflection on learning.

Reflective Thinking Summary

Harvey, Coulson, and McMaugh (2016) synthesized a multitude of research studies and consistently found agreement that:

- reflection is a process,

- reflection occurs at different levels, for different purposes, from different perspectives,
- not all reflection is critical,
- reflective thinking and practice may be taught, and
- reflective skills may be developed through strategic teaching interventions (p. 5).

King and Kitchener (1994) reviewed several studies and concluded that "it is reasonable to assume theoretically grounded interventions would yield increases in performance, but probably not in dramatic proportions" (p. 16). Many researchers describe the use of an instructional method designed to encourage students to practice reflective thinking; however, few evaluate the progress students make while completing the process (Kember et al., 2000; King & Kitchener, 1994; Lowe & Kerr, 1998).

Deep levels of reflection require the use of higher-order thinking (Laird, Seifert, Pascarella, Mayhew, & Blaich, 2014); however, students primarily engage in surface-level reflection (Findlay, Dempsey, & Warren-Forward, 2010; King & Kitchener, 1994; O'Connell & Dymont, 2011; Zhu, 2011). Students are likely to only engage in deep reflection when the instructor deliberately implements interventions that require students to do it (Rogers, 2001). Instructors should encourage students to practice the entire process of reflection, which includes examining their assumptions, gathering and evaluating evidence from a variety of perspectives, and making evidence-based conclusions (King & Kitchener, 2004). Instructors have incorporated unstructured discipline-specific problems or situations to encourage students to practice steps in the reflective thinking process, referred to as problem-based learning (PBL) (Ash & Clayton, 2004; Epp, 2008; Hatton & Smith, 1995; Lim, 2011a; Song et al., 2006; Tsingos et al., 2014). Medical educators were the first to incorporate PBL in the

1950s (Barrows, 1996). More recently, instructors in other disciplines have also implemented PBL (Baeten et al., 2010). The increased use of PBL has led to a body of research related to the implementation and effectiveness of PBL (e.g., Baeten et al., 2010; Barrows, 1986; Milne & McConnell, 2001; Walker & Leary, 2009).

Problem-based Learning

Background and Description

PBL occurs in an *active learning* environment. Educators define active learning as the process of students engaging to reflect on and apply ideas in the classroom (Collins & O'Brien, 2011; Michael, 2006; Prince, 2004). Active learning, in turn, encourages meaningful learning (Biggs & Tang, 2011; Michael, 2006; Weimer, 2013). Barr and Tagg (1995) were the first to encourage instructors to replace the traditional *instruction paradigm* with a *learning paradigm* as a means to implement consistent active learning. In the traditional instruction paradigm, the teacher presents knowledge that students passively digest for recall on tests (Barrows, 2002; Prince, 2004). Traditional instruction does not always result in improvement of students' skills. Instructors state learning objectives related to using knowledge; however, "talking about knowledge meaningfully does not necessarily imply that it can be used functionally" (Biggs, 1999, p. 67). Barr and Tagg (1995) advocated for the use of the learning paradigm to urge instructors to encourage students to learn to use knowledge. Instructors who operate in a learning paradigm expect students to actively discover and construct their own knowledge, as well as take responsibility for their learning. The learning paradigm requires instructors to restructure the use of class time and develop innovative learning activities.

Technological advances enabled more frequent implementation of the learning paradigm beginning in the early 2000s. These new advances allowed instructors to require students to watch lectures and complete structured problems online outside of class to free up class time for active learning. Researchers refer to the use of class time for active participatory learning as the *flipped classroom* (Enfield, 2013; McLaughlin et al., 2014). Zainuddin and Halili (2016) completed a meta-analysis of prior studies and found that the use of a flipped classroom results in higher exam scores. Additionally, the flipped classroom format increases student motivation to participate and complete the requirements of the course (Davies, Dean, & Ball, 2013; Enfield, 2013; Galway, Corbett, Takaro, Tairyan, & Frank, 2014; McLaughlin et al., 2014).

In recent studies, researchers replaced the terms “active learning” and “the learning paradigm” with *student-centered learning* (SCL). In a SCL environment, the instructor focuses on what the students are doing, rather than students focusing on what the instructor does and says (Collins & O’Brien, 2011). Most notably, the instructor believes that the students' behavior determines the extent of learning (Michael, 2006). Furthermore, SCL encourages collaboration and communication and promotes self-directed learning (Trigwell, 2011; Weimer, 2013).

Prince (2004) provided a discussion of specific types of SCL activities in a learning paradigm. *Collaborative learning* occurs anytime students work together in small groups. Students who complete individual assignments using input from other students in their group participate in *cooperative learning*. Structured *case-based learning* and unstructured PBL require students to employ self-directed learning to evaluate information and resolve a problem in a given situation (Prince, 2004; Walker & Leary, 2009; Weil, Oyelere, Yeoh, &

Firer, 2001). Overall, simple forms of active learning integrated into the traditional lecture format improve learning (Laws, Sokoloff, & Thornton, 1999; Lewis & Lewis, 2005; Ruhl, Hughes, & Schloss, 1987; Schmidt et al., 2011).

PBL involves the application of discipline-specific knowledge and the use of analytical reasoning and judgment to resolve a complex, ambiguous, and realistic situation with more than one available solution (Bonner, 1999; Wines, Carnegie, Boyce, & Gibson, 1994). Medical educators first incorporated PBL in the 1950s to better prepare students for clinical practice. The practice has since spread to use in the fields of engineering, law, nursing, and business; however, instructors outside of medical education use PBL less frequently (Allen, Donham, & Bernhardt, 2011; Baeten et al., 2010; Barrows, 1996; Savin-Baden, 2000).

Instructional Strategies

PBL begins with an unstructured problem. Students determine the key issues and gather necessary information to resolve the problem. Teachers guide students with questions and serve as facilitators and coaches in the learning process (Barrows, 2002; Hmelo-Silver, 2004). Unstructured problems should be authentic and engaging, appropriate to the students' level of prior knowledge, and directly tied to appropriate learning objectives (Des Marchais, 1999; Schmidt et al., 2011; Sockalingam et al., 2010). Instructors should develop techniques and tools to provide support to students in areas of expected difficulty. The appropriate level of guidance has a direct effect on learning. Too much guidance results in limited learning (Choo, Rotgans, Yew & Schmidt, 2011; Simons & Klein, 2007) and minimal guidance can have a negative influence on achievement (Norman & Schmidt, 2000).

Barrows (1986) was one of the first to propose that instructors in all disciplines should use PBL to encourage deeper learning. He noted that PBL occurs on different levels of "self-directed learning, hypothesis generation, inquiry, data analysis, problem synthesis and decision-making" (Barrows, 1986, p. 481). Next, he developed a taxonomy for the types of problems used to stimulate learning. The taxonomy categorizes PBL activities based on: 1) the degree to which learning is student directed as opposed to teacher directed, 2) the sequence in which problems are given, 3) the extent students have to identify useful information, 4) the number of decisions students have to make, and 5) the degree to which students evaluate their own reasoning.

Milne and McConnell (2001) offered a strategy that accounting instructors could follow to implement PBL to close the gap between content instruction in the classroom and professional skills. The strategy includes describing a problem and prompting students to generate ideas to solve the problem. Students then evaluate their ideas, identify missing information, and propose a plan to gather the missing information. In the following class, students discuss the new information and repeat the process to arrive at a supportable solution. However, only a few studies describe the results of implementing PBL in accounting courses. Stanley and Marsden (2012) replaced traditional textbooks and lecture notes with two PBL activities for each topic covered in a senior accounting capstone course. Instructors responded only to students' questions, and students played the role of an advisor to a client. Students reported that as their understanding of concepts and principles improved, they could apply principles to new situations, and they felt more comfortable addressing unstructured problems. The researchers concluded that PBL was effective for promoting learning. Students using PBL in an accounting theory class (Heagy & Lehmann,

2005) and in an information systems class (Breton, 1999) believed they acquired knowledge useful for their careers; however, researchers collected no data to determine the impact on student achievement of learning objectives. Kern (2002) found that introductory accounting students who completed an active learning exercise on the topic of inventory demonstrated stronger structured problem-solving skills. However, no difference resulted in conceptual recall on objective tests.

Effectiveness of Problem-Based Learning

The popularity of PBL in medical education and increased debate over the effectiveness of PBL compared to traditional instructional methods inspired researchers to conduct several meta-analyses of prior studies. Medical education instructors who incorporated PBL noted a positive effect on clinical skill development (Dochy et al, 2003; Gijbels et al., 2005). Dochy et al. (2003) found that students who learned in PBL environments remembered more knowledge after one year than students in traditional courses. Other medical education studies discovered that PBL does not consistently result in better performance on medical license knowledge examinations; however, students who participate in PBL consistently outperform students in lecture-based courses in clinical practice skills (Albanese & Mitchell, 1993; Vernon & Blake, 1993). Colliver (2000) found no convincing evidence that PBL improves a medical student's knowledge base or clinical performance. He did acknowledge that “PBL might provide a more challenging, motivating and enjoyable approach to medical education” (p. 266); however, he concluded that the educational effectiveness of PBL compared to traditional methods is debatable.

Recent meta-analyses of studies that incorporated various aspects of PBL in a variety of disciplines produced inconsistent findings. Walker and Leary (2009) found PBL that

incorporates multiple solution paths and competing outcomes and combining PBL with applied assessment generate the greatest positive impact on learning. Furthermore, the researchers found that PBL increases skills related to diagnosing a solution to a problem. In contrast to previous medical education meta-analyses, Walker and Leary (2009) found that PBL produced equal or greater results on knowledge-based tests compared to traditional lecture-based instruction. Strobel and Barneveld (2009) found PBL superior to traditional instruction with respect to long-term retention, skill development, and satisfaction of students and teachers. However, the data supported that traditional teaching was more effective for short-term retention on certification exams.

Problem-Based Learning Summary

Effective SCL results from directed and thoughtful student engagement aligned with course objectives to achieve important learning outcomes (Biggs, 1987; Prince, 2004; Trigwell, 2011; Weimer, 2013). PBL is an accepted SCL approach because "it encourages the activation of prior knowledge in a small group setting and provides opportunities for elaboration on that knowledge" (Schmidt et al., 2011, p. 792). Studies designed to determine the effectiveness of PBL have resulted in inconsistent findings (Baeten et al., 2010). After reviewing the diverse characteristics and methods noted in prior studies of PBL, Strobel and Barneveld (2009) determined that the inconsistent findings are due to differences in the definition of effectiveness and inconsistent approaches to measuring effectiveness. Furthermore, the researchers suggest that future research on PBL should shift from determining overall effectiveness to identifying the optimal structure to support student development of skills and abilities through the use of coaching and modeling strategies. Prince (2004) summarized prior studies and concluded that there is

no evidence to prove that PBL enhances academic achievement as measured by exams. There is evidence to suggest that PBL works for achieving other important learning outcomes. Studies suggest that PBL develops more positive student attitudes, fosters a deeper approach to learning and helps students retain knowledge longer than traditional instruction. Studies also suggest that students retain information longer and perhaps develop enhanced critical thinking and problem-solving skills. (p. 7)

An important aspect of PBL is that it encourages students to do more than memorize declarative and procedural knowledge (Barrows, 1986; Stanley & Marsden, 2012; Walker & Leary, 2009). Instructors ask students to identify relationships, evaluate alternatives, and reflect as they solve problems. However, the student's intent to learn and associated behaviors determine the level of learning that occurs (Biggs, 1987; Laird et al, 2008; Marton & Säljö, 1976; Ramsden, 2003).

Baeten et al. (2010) analyzed the results of quantitative studies that used student responses to questionnaires at the beginning and end of a higher-education course to determine the effect of SCL on students' approaches to learning. The analysis produced mixed results. Some studies included in the review found that SCL encouraged a deep approach to learning (Gordon & Debus, 2002; Sivan, Leung, Woon, & Kember, 2000; Tiwari et al., 2006; Waters & Johnson, 2004) whereas other students showed an increase in the use of surface approaches (Baeten, Dochy, & Struyven, 2008; Gijbels, Coertjens, Vanthournout, Struyf, & Van Petegem, 2009; Papinczak, Young, Groves, & Haynes, 2008; Struyven, Dochy, Janssens, & Gielen, 2006). Findings based on survey data collected only after a PBL experience showed students used more deep learning than surface approaches (Gijbels et al.,

2005; Schultz & Christensen, 2004). Baeten et al. (2010) performed additional analysis and identified factors that contributed to the inconsistent findings including differences in assessment formats, the extent of lecture use, student perception of teaching, and student satisfaction with the overall course quality. Different approaches to active PBL make it difficult to determine and compare the effectiveness of PBL methods (Baeten et al., 2010; Dochy et al., 2003; Gijbels et al., 2005; Prince, 2004). The importance of student behavior in the learning process has led researchers to study students' approaches to learning and the effectiveness of instructional methods designed to encourage a deep approach to learning (e.g., Biglan, 1973; Marton & Säljö, 1976; Phillips & Graeff, 2014).

Students' Approach to Learning

The term *approach to learning* refers to the behaviors students demonstrate when studying to learn course material (Biggs, 1987; Entwistle & Ramsden, 1983; Laird et al., 2008; Marton & Säljö, 1976; Trigwell & Prosser, 1991). A student's approach to learning directly influences the type and extent of new meanings created. Marton and Säljö (1976) were the first to categorize approaches to accomplish reading goals as either a *surface* or a *deep* approach. Students who read for comprehension either memorized key words (surface approach) or read for underlying meaning and understanding (deep approach). Subsequently, other researchers have identified goals and philosophies that lead to a surface or deep approach. Memorizing to recognize terms and concepts or to repeat procedures are components of surface learning. Students who use surface level approaches believe there is one answer and knowledge is absolute. Those who take a passive surface learning approach have difficulty making sense of concepts and relating to those concepts (Biggs, 1987; Entwistle & Ramsden, 1983; Trigwell & Prosser, 1991). Ramsden (2003) described surface

learning as "having nothing to do with wisdom and everything to do with aimless accumulation" (p. 59).

In contrast, students who take a deep approach to studying attempt to find meaning through an understanding of how ideas and concepts logically relate to one another (Eizenberg, 1988; Entwistle et al., 2000; Prosser & Millar, 1989; Ramsden, 1979; Trigwell & Prosser, 1991). Characteristics of deep learning include integrating and synthesizing new information with prior learning with the purpose of viewing things from a different perspective (Ramsden, 2003). Additionally, deep learning occurs when students draw on personal experiences and prior knowledge to create new meaning (Entwistle & Ramsden, 1983).

Ramsden (1979) proposed that some students have a primary goal of achieving the highest possible grade—a strategic approach. Students using the strategic approach believe success can be achieved through organizing and managing study time according to expectations of the format and content on the examination. More recently, researchers have included the strategic approach as a component of the surface learning approach (Biggs et al., 2001; Ramsden, 2003). Others believe surface learning tactics are important study behaviors that occur before using deep learning strategies. The combination of both learning strategies begins with acquiring new information. Students then apply knowledge to experiences in effort to develop a deep understanding of the new information (Epp, 2008; Hardy & Tolhurst, 2014; Kember, 1996). Memorizing is the first step in this process of understanding (Entwistle & Entwistle, 1991). Students often strive to both memorize a step-by-step approach and then understand when they are uncertain about the content of assessments (Kember, 1996). The majority of university students use surface approaches to learning

(Cope & Staehr, 2005; Crawford, Gordon, Nicholas, & Prosser, 1998; Hazel, Prosser, & Trigwell, 2002; Prosser & Millar, 1989).

A student's choice of study behaviors may change with the demands of the course and the learning environment (Entwistle & Ramsden, 1983; Laird et al., 2008). Students' use of the surface approach tends to increase as students move from freshman-level courses to junior-level courses and workload increases. Conversely, some students begin with a deep approach and move to a surface approach as a course progresses (Biggs, 1987; Watkins & Hattie, 1981). Eley (1992) surveyed a sample of university students immediately after they completed two courses in significantly different learning environments. One course encouraged reflection and the other course focused on declarative content mastery. Findings indicate that student study behaviors change to match the perception of the teaching environment and learning expectations. Entwistle et al. (2000) surveyed students about their learning goals and study habits. The analysis of student responses resulted in a concept map, which shows the relationships between a student's approach to learning and attitudes about learning (Figure 2.1). The concept map begins on the lower level with students' attitudes about learning goals. Students' attitudes then lead to an approach to achieve their learning goals. The learning goals fall under the categories of deep, strategic, or surface.

Discipline-Specific Learning Approaches

The environment and format of learning tasks have an impact on whether or not students choose to employ a surface or deep approach to learning (Biggs & Tang, 2011; Eley, 1992; Ramsden, 2003). Patterns of students' study habits are fairly consistent within the same discipline (Pascarella & Terenzini, 2005; Ramsden, 2003). Biglan (1973) categorized areas of study as hard or soft, according to scholars' level of consensus about knowledge

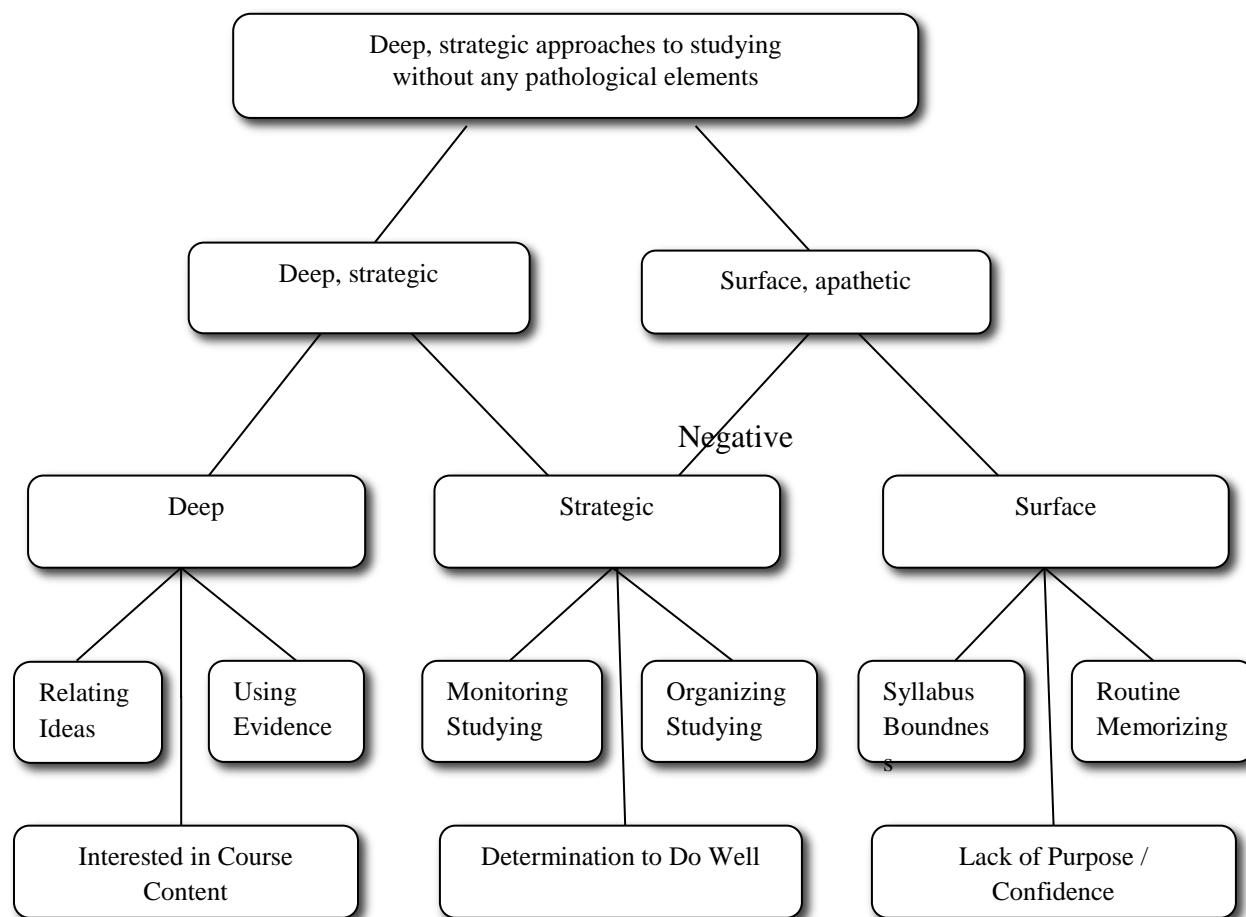


Figure 2.1. Conceptual map of components of studying (Entwistle, Tait, & McCune, 2000, p. 45).

within the discipline (Kuhn, 1962). Areas of study with high consensus about knowledge and procedures fall into the *hard* discipline category. Hard disciplines include biology, physics, mathematics, engineering, and accounting. Students in hard disciplines tend to memorize agreed upon concepts and facts and apply procedures in a repetitious manner, which are surface learning behaviors (Entwistle & Ramsden, 1983). Disciplines with low consensus related to facts and theories fall into the *soft* category. Soft disciplines include history, art, philosophy, and business management. Students in soft fields of study with low

areas of consensus tend to use more deep learning strategies to sort through all the ambiguity and difference of opinion (Laird et al., 2008). Instructors in soft disciplines are more likely to discuss different perspectives and incorporate active learning into the course (Braxton & Nordvall, 1985; Neumann, Parry, & Beecher, 2002; Smart & Umbach, 2007).

Biglan (1973) further categorized disciplines by those that create knowledge (*pure*), apply knowledge to life systems (*applied-life*), or apply knowledge to objects (*non-life*). Mathematics is an example of a pure non-life discipline, whereas biology falls in the category of applied life. Engineering and accounting are applied non-life disciplines. Biglan (1973) found that disciplines within the same category tend to use similar teaching and learning methods. Students in the applied fields are slightly more likely to use deep approaches to learning than students in pure disciplines. Students in life fields are slightly more likely to use deep approaches to learning than students in non-life disciplines. Furthermore, faculty members in applied life fields are slightly more inclined to use pedagogy that encourages deep approaches to learning (Laird et al., 2008). Instructors in applied non-life fields emphasize practical competencies and application in a professional context (Neumann et al., 2002). Learning accounting often rests on understanding concepts, facts, and procedures with little evaluation of conflicting ideas and alternatives (Jackling, 2005).

Accounting students develop their approach to learning and perception of accounting in the introductory accounting course. Sharma (1997) asked sophomore introductory accounting students to define “learning accounting.” Students' responses indicate that the majority view learning accounting as acquiring new factual knowledge and doing accounting procedures. Lucas (2001) interviewed a small group of introductory accounting students and

found a belief that memorizing was very important to learning accounting. Furthermore, students generally had a detachment from the subject, while only a few attempted to engage.

Elias (2005) surveyed approximately 500 students to examine their approach to learning introductory accounting. Approximately half of the students had studied accounting in high school prior to the introductory accounting class. Overall, survey results indicated that lower-level students used a deep approach to study less frequently than upper-level students. Students who had success using a surface learning approach in a previous accounting class were more inclined to continue the same behaviors in their next accounting class.

Accounting student study behaviors also differ across countries. Gow, Kember, and Cooper (1994) found that upper-level U.S. accounting students were slightly more likely to use a deep approach than surface or strategic approaches. In contrast, students in China who were further along in the accounting program were more likely to use a surface approach due to heavier workloads. Booth, Lockett, and Mladenovic (1999) found that Australian accounting students were more likely to employ surface approaches to learning. Furthermore, "accounting students were consistently and significantly higher on surface motive, strategy and approach scores than all other students" (Booth et al., 1999, p. 291).

The Learning Environment

Students' perceptions of the environment influence their approach to learning. Activity, challenge, and a feeling of achievement drive students towards a deep approach to learning (Duff & McKinstry, 2007). Students employ a meaningful deep learning approach most often when instructors provide clear goals, opportunities for independent learning, and timely and appropriate feedback on assignments and assessments. Specific learning activities

that encourage deep learning are active and experiential, use applicable real-world situations, encourage students to reflect on the learning process, and utilize group interactions to expose students to their peers' ways of thinking (Ash & Clayton, 2004; Cope et al., 2002; Kolb & Kolb, 2005; Young & Warren, 2011). Deep understanding occurs when instructors "require students to interact thoughtfully with a novel task, reflect on appropriate feedback, and search to see how they can improve" (Biggs, 1996, p. 351). Furthermore, instructors who provide disorganized lectures that require students to make sense of the material and identify the important information may encourage deeper learning (Entwistle & Entwistle, 1991). Students tend to revert to surface approaches to learning when they have a heavy workload, a high fear of failure, and a belief that memorization of facts will bring success (Trigwell & Prosser, 1991). Structured curriculum, lecture-based classrooms, and objective tests over declarative and procedural knowledge encourage surface approaches to learning (Dart & Clarke, 1991; Entwistle et al., 2000).

Pedagogy to Encourage Deep Approaches to Learning

The design and implementation of curriculum and pedagogy that effectively encourage deep learning is a primary goal of instructors concerned with the quality of student learning. A search for instructional techniques that encourage deep learning began in the early 1980s and continues today. Gordon and Debus (2002) revised the teaching strategies in a three-year teacher education program to include more essays, less objective testing, and more problem-based group projects. Students in the revised courses increased their use of behaviors associated with deeper learning. Jackling (2005) examined the learning approaches of accounting students over the three years of an undergraduate accounting program with the purpose of identifying the impact of various instructional methods on

student perceptions of the learning environment. Students learned basic concepts and procedures in the first-year course; the second-year course focused on recording transactions and reporting the results to meet external reporting regulations; and the third-year course was a less-structured management accounting course oriented towards analysis. An evaluation of survey results indicated that accounting students focused on organizing their time and their work and showed more frequent use of surface strategies than deep strategies during each of the three years. However, students did increase their use of deep strategies as they progressed in the program over the three-year period. One notable finding was that students in the second year felt pressured, believed the courses attempted to include too many topics, and stated they had insufficient time to understand. Differences in learning environments of second- and third-year courses support the idea that the learning environment and course requirements may significantly impact students' approach to learning.

Instructors have implemented specific instructional methods in individual courses to encourage students towards deep learning approaches. Case and Gunstone (2002) reduced the amount of content, added active learning and weekly journals, and decreased quantitative testing in a second-year chemical engineering course. Movement away from surface learning behaviors varied; however, all students integrated more deep learning approaches into their study habits. Eizenberg (1988) revised the traditional teaching methods in anatomy courses to shift focus away from the memorization of facts towards an emphasis on concepts, principles, and application. The change in teaching method resulted in approximately one-third of the students in the revised course using deep learning approaches. Dart and Clarke (1991) changed the learning experience of teacher education students by adding peer discussion and teaching, collaborative assessment, and critical reflection in an educational

psychology course. Student surveys and learning logs indicated students increased their use of deep learning approaches throughout the course.

Phillips and Graeff (2014) used an in-class simulation in an introductory financial accounting class to encourage students to engage in a deep approach to understanding inventory transactions. Participation in the exercise led to increased confidence and a deeper understanding of the accounts involved in the simulation. Hall, Ramsey, and Raven (2004) made changes to the learning environment with respect to instruction on inventory in an introductory accounting course. The instructors considered group work a key aspect of the course. Students' responses to surveys indicate a statistically significant increase in the use of deep learning approaches and decrease in surface learning approaches. English et al. (2004) restructured the two-semester sequence of the introductory accounting course to improve writing and critical thinking skills. Instructors provided “summaries of readings and required students to fill in key concepts and phrases” (English et al., 2004, p. 467). Additionally, students wrote a business letter and a report on financial statements. Students received specific instruction on writing and critical thinking. Approximately half of assessments required written responses after completing the process of analysis and critical thinking. Overall, students in the course demonstrated greater use of deep approaches to study than students in a traditional introductory accounting course.

Students' Approach to Learning Summary

Marton and Säljö (1976) were the first to measure the extent to which students use a surface or deep approach to learning to achieve their learning goals. Since then, a variety of research studies have attempted to determine the interrelationship between instructional methods and students' study behaviors. Researchers consistently agree on student

perceptions and goals within a particular study approach, summarized by Biggs (1987) as follows:

A student using the surface approach to studying:

- views tasks as a demand to be met and necessary to achieve other goals,
- sees the parts of the task as discrete and unrelated,
- worries about the time the task is taking,
- avoids personal or other meanings the task may have, and
- relies on memorization, attempting to reproduce aspects of the task.

A student using the deep approach to study:

- is interested in the academic task and derives enjoyment from carrying it out,
- searches for the meaning inherent in the task,
- personalizes the task, making it meaningful to his own experience and to the real world, and
- integrates aspects or parts of the task into a whole and relates evidence to a conclusion, theorizes about the task, and forms hypotheses. (p. 24)

The majority of U.S. university students gravitate toward surface approaches to learning (Cope & Staehr, 2005; Crawford et al., 1998; Hazel et al., 2002; Prosser & Millar, 1989). Students use an approach to studying they believe will achieve their academic goals (Prosser & Millar, 1989; Ramsden, 1979; Trigwell & Prosser, 1991). The most significant variables that affect students' study behaviors include the student's academic goals in the course, perceptions of the discipline, demands and workload of the course, and type of assessments. The literature does not address how a students' perspective about the usefulness of the learning after graduation impacts their study approach.

The goal of effective teaching is to encourage students towards a deep approach to meaningful learning and away from a surface approach to learning (Biggs, 2003). The majority of sophomore and junior accounting students use surface approaches to learning (Booth et al., 1999; Jackling, 2005; Sharma, 1997). Historically, students who use the surface approach experience success in the introductory financial accounting course, which may lead to the belief that a surface approach will achieve their academic goals in future accounting courses (Elias, 2005). Accounting instructors who add a requirement designed to encourage deep learning with minimal impact on the overall grade in the course have experienced a small effect size on students' approach to learning (English et al., 2004; Hall et al., 2004). Meaningful learning is not likely to occur if instructors do not intentionally align learning activities and assessments to encourage a deep approach to learning (Biggs & Tang, 2011; Elias, 2005; Jackling, 2005; Trigwell & Prosser, 1991). A student's approach to learning is determined by his/her perception of the learning requirements and perceptions of the learning requirements are formed by the content and format of assessments (Joughlin, 2010; Sambell, McDowell, & Brown, 1997; Snyder, 1971). Therefore, it is important for instructors to be aware of research findings related to how various types of assessments impact students' approach to learning.

Assessment

The purpose of assessment is to enhance learning and evaluate how well students achieve stated learning goals (Healy, McCutcheon, & Doran, 2014; Herbert, Joyce, & Hassall, 2009; Newble, 2016). Assessments commonly consist of objective questions, structured problems, open-ended questions, essay questions, writing assignments, and task-based problems. Multiple-choice, matching, fill-in-the-blank, and structured problems are

examples of objective questions. Open-ended and short-answer questions, essays, and task-based problems are subjective assessment techniques that allow instructors to evaluate students' understanding from more than one perspective (Entwistle & Entwistle, 1991; Sambell et al., 1997). Pollitt, Hutchinson, Entwistle, and De Luca (1985) questioned the validity of assessment questions that assist students with the answer and proposed that only open-ended and task-based responses are useful for evaluating student learning. Furthermore, Pollitt et al. emphasized the belief that the "ability to reproduce the lecturer's own framework of understanding is rather poor evidence of the form of the students' own understanding" (p. 224).

Assessment and Perception of Learning Requirements

Researchers use the term *hidden curriculum* to describe students' perception of the requirements to achieve learning goals. When instructors do not align assessments with stated learning objectives, the hidden curriculum is different from the instructors' stated goals for the course (Gibbs & Dunbar-Goddett, 2007; Gibbs & Simpson, 2004; Healy et al., 2014; Joughlin, 2010; Miller & Parlett, 1974; Newble, 2016; Ramsden, 1992; Sambell & McDowell, 1998; Snyder, 1971; Struyven et al., 2005; Watty et al., 2010). The *backwash* effect occurs as students align their approach to learning with the hidden curriculum. Backwash negatively influences learning when course assessments do not reflect the instructors' goals for meaningful learning (Cohen, 1987; Gibbs, 1999; Segers et al., 2006). Writing assignments and unstructured problems that require students to apply, reflect on, and synthesize knowledge are effective for encouraging meaningful understanding (Gibbs & Dunbar-Goddett, 2007; Gibbs & Simpson, 2004; Hassall & Joyce, 2001; Ramsden 1992; Van Gaal & De Ridder, 2013; Watty et al., 2010). Instructors who assess recall of factual

knowledge have little success encouraging students to develop higher order thinking skills (Biggs, 1996; Entwistle & Entwistle, 1991; Herbert et al., 2009).

Students perceive that objective questions require only recognition from memory and lower-level thinking (Herbert et al., 2009; Joughlin, 2010; Rust, 2002; Sambell et al., 1997; Thomas & Bain, 1984). In contrast, students believe subjective assessments require higher-level thinking (Scouller, 1998; Scouller & Prosser, 1994; Tang, 1992; Thomas & Bain, 1982). Healy et al. (2014) surveyed accounting students using open-ended questions to determine their views on assessment. Analysis of results indicated students who view the purpose of assessment as an evaluation and reward for individual effort prefer the use of surface approaches on objective tests. On the other hand, students who think assessment should be valuable for enhancing learning favored real-world, task-based evaluations.

Application of knowledge to authentic tasks, reasonable demands, and assessment of a range of skills useful over the long-term appear to positively move students towards a deeper learning approach (Sambell et al., 1997). Struyven et al. (2005) reviewed 36 empirical studies on the relationship between students' perception of assessments and students' approaches to study and found that objective assessments appear to encourage surface approaches, students believe they use more higher order thinking skills on task-based assessments, and varying the format of questions may not be enough to influence students to adapt a deep approach to learning.

Studies of interventions in individual courses are useful for understanding students' perceptions of the relationship between assessments and learning approaches. Scouller (1996) varied the format of the final exam. First-year sociology students in one section of a course completed an essay final exam, while students in another section completed an open-

ended short-answer final exam. Analysis of student open-ended questionnaires indicated that students who completed short-answer exam questions were more inclined to use a surface approach. Furthermore, students completing the short-answer exam perceived they would use more lower level thinking abilities than students preparing for the essay. These findings were consistent with a study conducted by Thomas and Bain (1984) who found students rely on memorized pre-determined answer structures to respond to expected objective and open-ended essay questions.

Gijbels et al. (2005) studied the effect of assessment tasks integrated into a PBL environment at a public law school. The researchers gave students the option to complete six essay assessment tasks spread throughout the course to earn bonus points on a multiple-choice final exam. The multiple-choice exam tested lower-level thinking skills of knowledge, comprehension, and application. The researchers found that time spent on essay assessments may have reduced available study time, resulting in slightly lower grades on the final exam. However, students who completed the essay assessments believed they developed critical thinking skills and gained a deeper understanding of course material.

Segers, Nijhuis, and Gijsselaers (2006) compared second-year business students' approaches to learning in a traditional course and a redesigned course. Students in the traditional course received knowledge-based instruction and completed objective tests. The redesigned course integrated problem-based tasks into course work and required students to define, analyze, and solve a set of interrelated problems on a case-based final exam. The researchers gathered data related to students' intended and actual approaches to study using the revised study process questionnaire (R-SPQ) (Biggs et al., 2001). Survey results indicated that both groups of students initially intended to employ a similar approach to

learning and students in the case-based course actually employed less deep and more surface approaches to learning. The researchers acknowledged that a higher workload (Jackling, 2005; Trigwell & Prosser, 1991) and lack of familiarity with a deep approach to study (Case & Gunstone, 2002) could have encouraged students in the case-based class to use more surface level approaches.

Gijbels et al. (2008) gave education students assessments that consisted of two group case assignments, one individual case assignment, and a self-reflection paper. Students completed the R-SPQ (Biggs et al., 2001) on the first and last day of the course. Analysis of survey results indicated that students perceived the assessment tasks would require a deep approach to learning; however, the change toward more use of deep learning approaches was negligible. In general, students seemed to use more surface approaches to learning. Further analysis revealed that the students' approach to learning closely followed a previous inclination towards a surface-level approach. The researchers concluded that the design of assessments does not actually change the students' approach to learning.

Assessment and Learning Achievement

Researchers have conducted studies to determine the relationship between various assessment techniques and the achievement of learning objectives. Newble and Jaeger (1983) were the first to study how assessment affected medical students' learning. Learning goals consisted of both the development of a wide range of clinical skills and fundamental knowledge included in the course. A final exam consisting of multiple-choice questions over factual knowledge determined the students' grades in the course. Analysis of survey results indicated students directed little attention to learning clinical practices. In a subsequent course, the researchers added a practical clinical final examination and found students

changed their study approach to emphasize a deep understanding and demonstrated stronger performance on assessments of clinical skills.

Jensen, McDaniel, Woodard, and Kummer (2014) compared biology students' performances in two different testing environments. The instructors periodically tested students in one course using lower-level questions on quizzes and exams and higher-order questions in the other course. Lower-level questions were factual and required memorization, while higher-level questions required application, analysis, and evaluation (Bloom et al., 1956). Instructors assessed both groups using the same final exam, which consisted of half lower-level questions and half higher-level questions. Students tested with higher-level questions during the course outperformed the other students tested on both types of questions on the final exam. The researchers concluded that using higher-level questions on assessments during the course results in a deeper conceptual understanding and better short-term memory of declarative knowledge. Other studies have found that students achieve higher levels of success on both objective tests and essays when using deep approaches to study. However, surface learners perform just as well as deep learners on less complex questions (Booth et al., 1999; Davidson, 2002; Tan & Choo, 1990; Thomas & Bain, 1982).

Timing and Frequency of Assessment

Higher performance on objective tests, referred to by researchers as the *testing effect*, occurs more often when instructors give students frequent tests over limited content (Cull, 2000; Leeming, 2002; Murphy & Stanga, 1994; Roediger & Karpicke, 2006; Sly, 1999). Researchers have also found that testing students affects retention. Students given a test immediately after a reading assignment (Roediger & Karpicke, 2006) and students given two tests over the same material (Glover, 1989) demonstrated stronger retention compared to

students who read over the assignment repeatedly. Additionally, students demonstrated stronger recall when tested initially and then tested again one month later (Foriska, 1993; Hall, 1989). The use of periodic interim tests results in higher performance on final exams (Glover, 1989). However, the testing effect may not hold long-term. Students who performed well on repeated objective tests demonstrated the same level of recall after nine weeks as students tested less frequently who performed at a lower level on the same initial tests (Rohrer, Taylor, Pashler, Wixted & Cepeda, 2005). Researchers have not adequately studied the long-term benefits of the testing effect (Karpicke & Aue, 2015; Roediger & Karpicke, 2006).

Researchers question whether the testing effect applies to learning of complex content that requires synthesis. According to a summary provided by Karpicke and Aue (2015), some researchers have found that testing helps students master content that requires understanding of relationships between various aspects of the material (Carpenter, 2012; Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013; Karpicke, 2012). Other researchers have found that the testing effect appears to decrease when students must understand relationships and solve problems or make inferences (Tran, Rohrer, & Pashler, 2015; Van Gog & Kester, 2012; Van Gog & Sweller, 2015). Inconsistent findings in the few studies designed to determine how testing helps students master complex material appear to be due to differences in instructional methods and formats used to assess students (Karpicke & Aue, 2015).

Assessment Summary

The literature supports the belief that "assessment makes more difference to the way students spend their time, focus their effort, and perform, than any other aspect of the courses

they study, including the teaching" (Gibbs, 2010, p. 3). Students direct their efforts to their perception of the hidden curriculum, regardless of the stated learning objectives (Gibbs & Dunbar-Goddett, 2007; Healy et al., 2014; Joughlin, 2010; Newble, 2016; Ramsden, 1992; Sambell & McDowell, 1998; Snyder, 1971; Struyven et al., 2005; Watty et al., 2010). Objective testing encourages a surface approach to learning (Entwistle & Entwistle, 1991; Scouller, 1998; Segers et al., 2006; Thomas & Bain, 1982) while subjective assessments may encourage students to achieve deeper understanding (Biggs & Tang, 2011; Hassall & Joyce, 2001; Ramsden, 1992). The relationship between students' approach to learning and task-based assessments is open for debate and in need of further research (Newble, 2016; Ramsden, 2003).

Accounting instructors typically evaluate students using objective assessments over declarative and procedural knowledge (Hahn et al., 2013; Johnson & Slayter, 2012; McNellis, 2015; Shoulders & Hicks, 2008). Objective tests tend to encourage a surface approach to learning, which may explain why the majority of accounting students use a surface approach to learning (Booth et al., 1999; Elias, 2005; Sharma, 1997). Few accounting education studies attempt to determine the effect of completely replacing periodic objective assessments with alternative types of assessment on students' approach to learning (Watson, Apostolou, Hassell, & Webber, 2007; Van Gaal & De Ridder, 2013).

Conclusion

Biggs et al.'s (2001) model of the teaching and learning context suggests instructors should align learning activities with assessments that require students to use a deep approach to learning in order to achieve stated learning objectives. The development of students' critical thinking skills is a primary objective of higher education (AACU, 2015; Arum &

Roksa, 2011; Bok, 2006; Entwistle & Entwistle, 1991; Lawson et al., 2015; Riggs & Hellyer-Riggs, 2014). Explicit instruction of critical thinking processes mixed with consistent practice produces the strongest increases in students thinking skills (Abrami et al., 2008, 2015; Bangert-Drowns & Bankert, 1990; Heijltjes et al., 2014). Instructors who desire to increase students' thinking ability should require learning activities that encourage more advanced stages of reflective thinking (Epp, 2008; Hatton & Smith, 1995; King & Kitchener, 2004; Rogers, 2001).

The use of PBL in an active learning environment encourages students to engage in the processes of critical and reflective thinking (Michael, 2006; Walker & Leary, 2009; Weimer, 2013). Some, but not all, students who participate in PBL use more deep approaches to learning (Baeten et al., 2010; Gijbels et al., 2005; Schultz & Christensen, 2004; Struyven et al., 2008). Researchers predominately agree that PBL results in greater skill development, stronger retention, and a positive motivation towards learning (Baeten et al., 2010; Prince, 2004; Strobel & Barneveld, 2009). Students use a learning approach that allows them to achieve their goals on assessments regardless of the instructor's requirements (Joughlin, 2010; Sambell et al., 1997; Snyder, 1971).

Subjective, open-ended assessment may encourage a deep approach to study (Gibbs & Dunbar-Goddet, 2007; Ramsden, 1992; Watty et al., 2010). However, attempts to determine the relationship between task-based assessments and students' use of a deep or surface approach to learning have experienced inconsistent results (Gijbels et al., 2008; Newble, 2016; Segers et al., 2006). The effectiveness of task-based assessments appears to depend on the structure and format of the task, as well as the other learning activities in the course (Baeten et al, 2010; Newble, 2016; Ramsden, 2003; Strobel & Barneveld, 2009).

Students perceive it is possible to achieve success on objective assessments through memorization, a surface-level approach (Herbert et al., 2009; Sambell et al., 1997; Thomas & Bain, 1984). Studies designed to determine whether PBL results in stronger performance on knowledge-based tests have produced inconsistent results (Albanese & Mitchell, 1993; Dochy et al., 2003; Vernon & Blake, 1993; Walker & Leary, 2009).

Few studies have empirically investigated the relationship between deep approaches to study and change in critical thinking skills. Findings from a study conducted by Reason, Cox, McIntosh, and Terenzini (2010) suggest the use of a deep or surface approach to learning does not explain variations in critical thinking scores. Laird et al. (2014) measured the relationship between a deep approach to study and a change in the critical thinking skills of approximately 4,500 first-year students and found no statistically significant effect. Chapman (2001) found that thinking skills do increase when students use a deep approach to learning and participate in a task designed to encourage critical thinking. Integrating PBL activities with reflective writing appears to develop students' critical and reflective thinking abilities; however, evidence is insufficient for determining best instructional practices (Boud & Walker, 1998; Epp, 2008; Hatton & Smith, 1995). Therefore, the relationship between integrated PBL and cognitive development warrants further investigation (Laird et al., 2014).

Inconsistent findings from prior studies related to the effectiveness of instructional methods designed to encourage students to use a deep approach to learning and develop stronger thinking skills may be a result of improper alignment of the teaching and learning context (Baeten et al., 2010; Biggs et al., 2001; Entwistle, 2009; Healy et al., 2014; Jackling, 2005; McGuigan & Kern, 2009; Strobel & Barneveld, 2009). Many researchers have studied the individual components of the teaching and learning context described by Biggs et al.

(2001); however, scholars have not yet determined a combination of instructional methods and assessments that consistently results in a deep approach to learning and improved higher order thinking skills. Furthermore, no studies in the literature provide a detailed discussion of how to overcome implementation issues that occur when aligning PBL activities that consistently require students to practice critical thinking with subjective assessments.

CHAPTER THREE: METHODOLOGY

The purpose of this study was to develop an instructional approach that aligned learning activities and assessments to encourage junior-level financial accounting students to use a deep approach to study and practice the intellectual skills professional accountants use in the work place.

I followed action research methodology to conduct this study. I used students' work on an authentic comprehensive project (CP) and narrative data in my researcher's reflection journals (RRJ) to address the following research questions:

1. How does the completion of an authentic comprehensive problem-based project encourage students to practice the process of critical thinking?
2. How does an instructor address implementation issues related to the use of an authentic comprehensive problem-based project over the course of a semester?

I used narrative data from students' RPs and in my RRJs to address the following research questions:

3. How does students' thinking about the issues professional accountants face change as students complete an authentic comprehensive problem-based project and short reflection papers?
4. What changes in instruction related to short reflection papers encourage students to contemplate decisions made by professional accountants?

I used evidence from students' CP work and comprehensive final examination to address the following research question:

5. How does a change in assessment methods from objective periodic tests to an authentic comprehensive problem-based project and reflection papers affect students' ability to complete routine accounting procedures?

Context

I conducted this action research study while teaching Intermediate I Financial Accounting (IFA) in a mid-size private liberal arts university located in the southwest portion of the United States. At the time of this study, the university had an enrollment of approximately 8,500 undergraduate students and 1,500 graduate students. Approximately 40% of the students enrolled in the university were male and 60% were female. Student ethnicity was approximately 70% Caucasian, 25% minority and other, and 5% international. The university is a residential community with approximately 50% of undergraduates living on campus. The average faculty-to-student ratio at the university was 13:1.

The business school ranks among the top fifty in the United States and has approximately 2,000 undergraduate students. Students apply to the business school in their sophomore year after completing a business foundations course and an introductory financial accounting course. Performance in the introductory accounting class is one of the primary determinants of acceptance into the business school.

I conducted the study while teaching IFA courses over two 16-week semesters during the spring of 2015 and the spring of 2016. Two distinct groups of students participated in the study. The overall grade point average (GPA) of the students who are admitted to the business school at this university historically ranges between 2.75 and 3.0 on a 4.0 scale. The consistency in students' prior knowledge allowed the two action research cycles to continue over two semesters with two different groups of students without damaging the

integrity of the findings. I discuss the structure of the IFA course after a description of participant characteristics.

Participant Characteristics

I conducted this study over two 16-week semesters during the spring of 2015 (primary action research cycle one) and the spring of 2016 (primary action research cycle two). The participants in this study were a convenience sample of students who chose to enroll in one of my IFA courses during each semester. Students who enrolled in the course were unaware of the requirements of the course prior to the first day of class. The business school requires students who major or minor in accounting and finance to take the IFA course. Most accounting majors at this university enroll in the IFA course during the fall semester of their junior year. I included data from all students who participated in the course in my study. The university's internal review board granted an exemption from student consent because the focus of the study was consistent with my normal teaching practices.

In the 2015 semester, 35 students enrolled and three students dropped during the first two weeks of class. Students who dropped the course provided no explanation. The remaining 32 students participated in the study and completed all course requirements. The purpose of the first primary action research cycle was to gather and use data to make informed changes to develop the instructional method. I noted implementation issues that hindered students' ability to learn as they completed the course requirements in my RRJ and made data-informed changes to improve the learning environment. I did not include data related to individual students' performance during the spring of 2015 in the study. As such, I did not ask the spring 2015 participants for a self-reported overall grade average. However, acceptance into the business school is competitive and the academic ability of students taking

courses in the business school is generally consistent from year-to-year. Table 3.1 provides students' self-reported ethnicity along with other demographic data gathered from the registrar's office for spring 2015 participants.

In the 2016 spring semester, 32 students enrolled and three students dropped during the first four weeks of class. Students who dropped the course stated they felt overwhelmed by the requirements in all courses and needed to reduce their overall workload.

Table 3.1

Demographics of Study Participants in the First Primary Action Research Cycle (2015).

Demographic	Categories	Number of Participants	Percentage of Participants
Classification	Junior	24	75.0%
	Senior	8	25.0%
Major	Accounting	11	34.4%
	Economics	7	21.9%
	Finance	11	34.4%
	Management	1	3.1%
	Marketing	1	3.1%
	Other	1	3.1%
Minor	Accounting	2	6.3%
	Finance	9	28.1%
	Management	1	3.1%
	Marketing	4	12.5%
Gender	Female	12	37.5%
	Male	20	62.5%
Ethnicity	African American	2	6.3%
	Asian	1	3.1%
	Caucasian	27	84.4%
	Hispanic/Latino	2	6.3%

The remaining 29 students participated in the study and completed the requirements of the course. Participating students self-reported their ethnicity and cumulative grade average (GPA) for prior semesters. The university registrar provided other demographic data. Table 3.2 provides the demographics of the participants in the spring of 2016.

Table 3.2

Demographics of Study Participants in the Second Primary Action Research Cycle (2016).

Demographic	Categories	Number of Participants	Percentage of Students
Classification	Junior	19	65.5%
	Senior	10	34.5%
Major	Accounting	4	13.8%
	Economics	8	27.6%
	Finance	11	37.9%
	Management	3	10.3%
	Marketing	1	3.4%
	Other	2	6.9%
	Minor	Accounting	4
Economics		1	3.4%
Energy		5	17.2%
Finance		9	31.0%
Gender	Female	9	31.0%
	Male	20	69.0%
Ethnicity	African American	2	6.9%
	Asian	1	3.4%
	Caucasian	25	86.2%
	Hispanic/Latino	1	3.4%
Cumulative Grade Average (Self-reported)	3.66 to 4.0	6	20.7%
	3.0 to 3.65	17	58.6%
	2.75 to 2.99	2	6.9%
	2.5 to 2.74	1	3.4%
	Not Reported	3	10.3%

Classes in spring 2015 occurred twice each week in the early afternoon on Tuesdays and Thursdays for one hour and twenty minutes. In the spring 2016 cycle, students attended class once each week on Wednesday evenings for two hours and forty minutes. Fewer accounting majors enrolled in the IFA course in the spring 2016 than in 2015. Accounting majors may have preferred a class with more than one weekly session of instruction due to the perceived importance of high grades in the IFA course.

The minimum requirement for entry into the business school after completing sophomore courses was 2.5 GPA. Students attending this University earn letter grades in some courses with plus and minus. Approximately 20% of the participants reported a GPA equal to or higher than an A-, with 80% reporting an overall GPA of B or better. The cumulative GPA for all students who self-reported was approximately 3.18 on a scale of 4.0. Ten percent of participants (three students) in the spring 2016 semester chose not to provide their cumulative GPA.

Structure of the Course

My learning objectives for the students in the IFA course included obtaining the ability to perform the following tasks:

- complete the accounting cycle and prepare financial statements for a given set of business transactions,
- record business transactions related to the topics of the course,
- determine and support accounting estimates appropriate for a given business transaction,
- identify the impact of a recorded transaction on the four financial statements,

- compare accounting methods for a given topic and evaluate the impact of different accounting methods on reported financial information, and
- develop the thinking skills necessary for success as a professional accountant.

Approximately 60% of the content in the IFA class consisted of material students should have learned in a previous sophomore introductory accounting class. A grade of C or better in the introductory accounting course was a prerequisite for enrollment in the IFA course. I gave students an objective test to assess their understanding of prerequisite material during the first week of class (Appendix A). The results of the test informed me and the students about weaknesses in understanding of declarative and procedural foundational knowledge.

Figure 3.1 illustrates the design of the IFA course and the instructional methods I employed in this study. Students began the course with prior knowledge and a preferred approach to learning. I required students to view online video lectures, complete readings, and work structured homework problems before class to prepare them to do authentic project work during class. Students had access to answers and explanations for all online homework problems, which eliminated the need to review answers to structured problems in class. I conducted short discussions at the beginning of most classes to ensure students understood how to perform routine accounting procedures. Additionally, I encouraged students to think about the issues accountants consider when recording and reporting business transactions. Minimizing lecture time allowed me to dedicate more class time to facilitating students' project work. Task-based and written assessments required critical and reflective thinking and encouraged students to use a deep approach to learning.

Students worked in pairs to complete the accounting cycle project (ACP) and the comprehensive project (CP). I paired the first name on an alphabetized list with the last

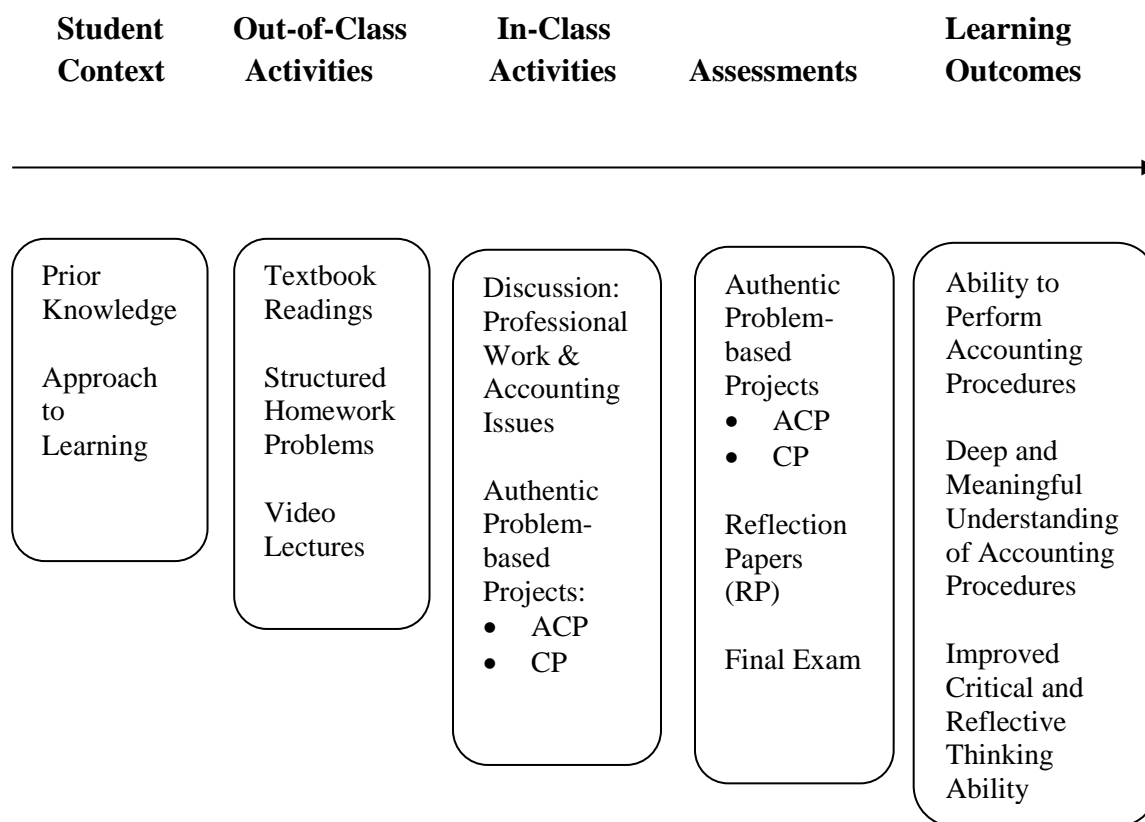


Figure 3.1. Design of the revised intermediate financial accounting course.

student on the list. The second name partnered with the second from the last name on the list and this process of matching the next name on the top with the name next to the last continued until all students had an assigned partner. I provide and discuss the course schedule I followed during each semester in the findings to research question two in chapter four.

Accounting Cycle Project (ACP)

Students completed the ACP during the first three weeks of the spring 2015 semester. The purpose of the ACP was to review pre-requisite declarative and procedural accounting knowledge and increase students' comfort level in a student-centered learning environment. Students used facsimile sales orders, shipping documents, checks received from customers, checks written by the company, payroll reports, and other documentation to manually record

transactions. After recording transactions, students made month-end adjustments and prepared financial statements for the small business. The ACP required students to practice routine accounting procedures in a structured situation. Students did not use higher order thinking skills to complete the ACP. Appendix B provides the initial information and instructions for the ACP. After completing the first research cycle, I determined that work on the ACP repeated tasks performed on the CP. Furthermore, the ACP did not substantially enhance students' learning. Therefore, I eliminated the ACP in the 2016 semester to increase the amount of time for CP tasks.

Comprehensive Project

The purpose of incorporating the CP was to encourage students to perform the work of a professional accountant. Students worked in pairs to complete the following tasks related to each topic in the course:

- record journal entries for December transactions using facsimile documents (sales orders, shipping documents, checks received from customers, checks written by the company, reports, and agreements),
- record all amounts in the general ledger,
- record year-end adjustments to all accounts,
- make reasonable estimates and judgments considering the company's situation,
- compute values and prepare schedules for alternative accounting methods under generally accepted accounting principles (GAAP),
- evaluate alternative accounting methods and select the most appropriate method given the company context,

- support the recommended accounting method,
- prepare schedules to verify ending general ledger balances, and
- prepare financial statements and evaluate how well the information reflects the economic situation of the company.

Students completed all work on the CP (except some work related to long-term assets) in class manually (or using Excel spreadsheets) in the following four phases: 1) sales and accounts receivable, 2) inventory, 3) long-term assets, and 4) investments and financial statements. Appendices C and D contain the company information and instructions for the CP for the 2015 and 2016 cycles, respectively. I assessed students' work based on the accuracy of accounting procedures and the reasonableness of support for judgments and decisions using a rubric for each phase of the project. Appendix E provides the rubrics I used for each phase of the CP.

Reflection Papers

After completing each phase of the CP, students responded to question prompts for short reflection papers (RP). I designed the question prompts to encourage students to demonstrate deep understanding of the work of a professional accountant. Chapter four provides a detailed discussion of revisions made to question prompts during both research cycles.

Comprehensive Final Exam

Students completed a comprehensive final exam that consisted primarily of multiple-choice questions from previous national certified public accountant exams (Gleim, 2012). Students also answered a few open-ended questions with one correct answer. Chapter four provides a detailed discussion of the format of the final exam.

Homework and Class Contribution

I randomly collected before-class practice problems and gave students full credit for complete work. Students earned class contribution points for demonstrating a positive work ethic, asking thoughtful questions, and working collaboratively with peers.

Overall Grade

I assessed students' performance in the course using the aforementioned assignments. Table 3.3 provides the points assigned to each assessment. The use of critical and reflective thinking reflected approximately two-thirds of students' grade. I eliminated the accounting cycle project in the spring 2016 cycle to allocate more class time to work on the CP.

Additionally, I gave students a quiz to assess their understanding of revenue recognition principles related to long-term contracts and multiple deliverables (not included in CP tasks).

Table 3.3

Course Assignments

Assignment	Spring 2015		Spring 2016	
	Points	Percentage	Points	Percentage
Pre-requisite Test	50	5%	50	5%
Revenue Quiz	0	0%	60	6%
Accounting Cycle Project (ACP)	100	10%	0	0%
Comprehensive Project (CP)	270	27%	300	30%
Reflection Papers (RP)	250	25%	300	30%
Homework and Class Contribution	130	13%	90	9%
Comprehensive Final Exam	200	20%	200	20%
Total	1,000	100%	1,000	100%

Research Design

I used action research methodology to conduct this study. Action research is a personally owned and conducted solution-oriented investigation characterized by continuous

cycles of problem identification, data collection, data analysis, reflection, data-driven action, and problem redefinition (Cunningham, 2008; Herr & Anderson, 2015; Kemmis & McTaggart, 1982). Carr and Kemmis (1986) define educational action research as “a form of self-reflective inquiry undertaken by participants (faculty) in social situations (the classroom) in order to improve their understanding of practices and the situation in which practices are carried out” (p. 162). Cunningham (2008) stated that the action researcher interacts with the situation studied, plans and initiates change in his or her own setting, observes, documents the effects of the change, and then reflects upon phenomena in the setting. The researcher then takes appropriate action and repeats the cycle. Action research in education involves incorporating data-driven changes to instructional methods and transforming practice to improve teaching and learning (Carr & Kemmis, 1986; Mills, 2007; Norton, 2014).

The use of action research is fairly new to accounting education, and scholars have performed relatively few action research studies to improve practice. In one of the first studies, Kaplan (1998) used action research to work with accounting professionals to develop, test, and implement new approaches to allocating costs and reporting operating information to improve practice. Paisey and Paisey (2005) implemented action research in a senior-level accounting course and successfully developed an instructional approach to improve students' research skills. Action research conducted by Baker and Logan (2006) improved teaching methods and increased the academic success rates of educationally disadvantaged students in an introductory accounting course. Overall, action research is an effective method for discovering and sharing successful practices with other instructors (Anderson, Herr, & Nihlen, 2007).

Baker and Logan (2006) followed Paisey and Paisey's (2005) suggested cyclical model of action research for accounting education. The model consists of the following five steps:

1. Define the problem and frame the research question.
2. Collect data and decide how teaching can be changed.
3. Implement the selected changes to teaching.
4. Monitor and evaluate the changes made.
5. Review and reflect on the changes. Repeat cycle if necessary. (p. 2)

I also followed Paisey and Paisey's (2005) model of action research for this study. I defined the problem and the research questions and designed the course materials and assessments to encourage students to develop higher order thinking skills. I then implemented the initial instructional method and repeated steps three through five in each action research cycle.

The study occurred over the course of two primary action research cycles, one in the spring of 2015 and the other in the spring of 2016. A primary cycle included four secondary research cycles that coincided with the four phases of the CP. I revised the structure of the CP and the question prompts on RPs and adjusted class discussion and additional instruction based on data analysis and findings in each secondary action research cycle. Figure 3.2 presents a diagram of the flow of my action research study.

Data Collection

I collected data during each of the four secondary action research cycles that occurred within the two primary action research cycles. I used data collected in the spring of 2015 and spring of 2016 to address research questions associated with implementation issues that occurred in both primary cycles. I used data collected in the spring of 2016 to answer

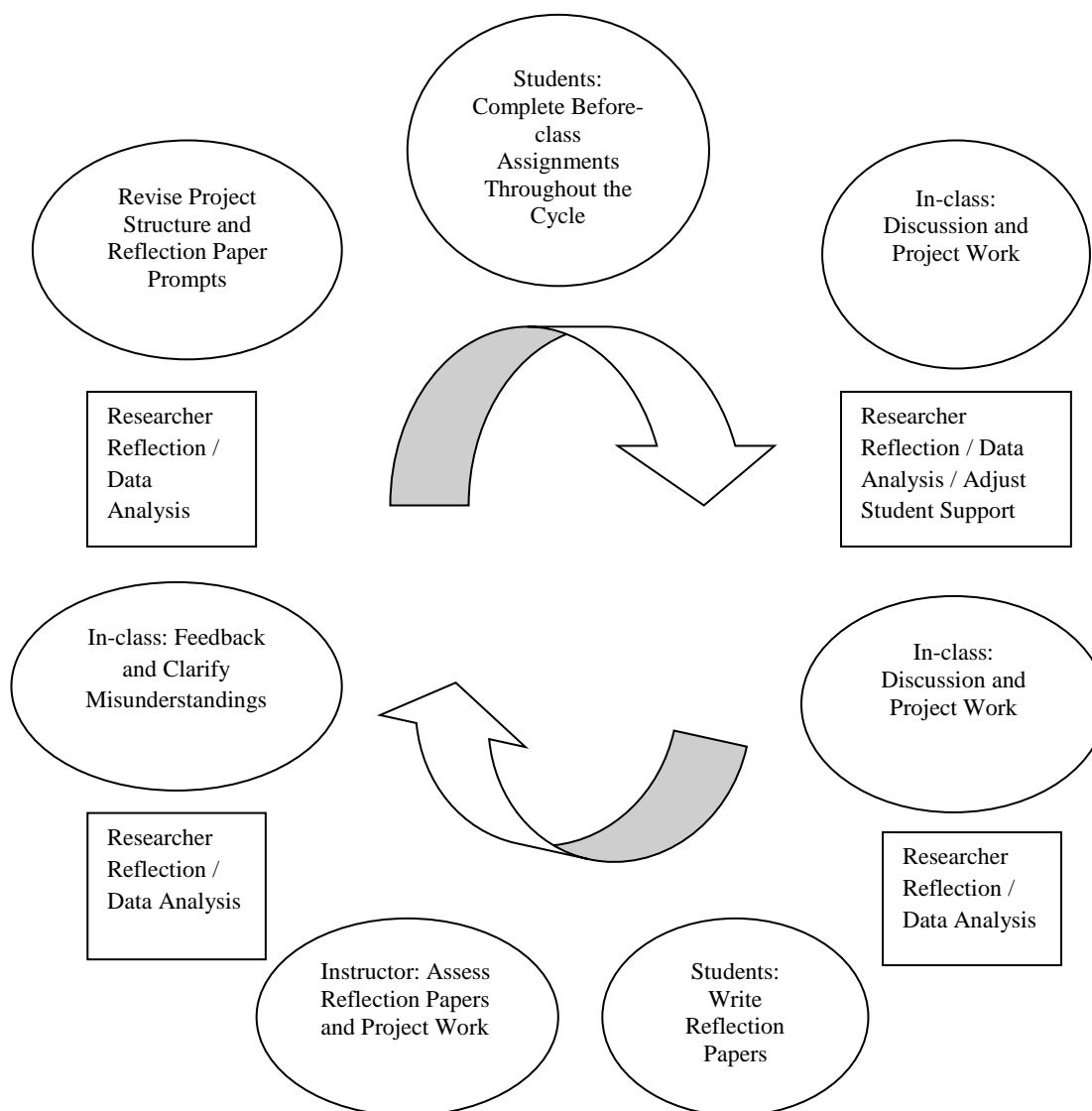
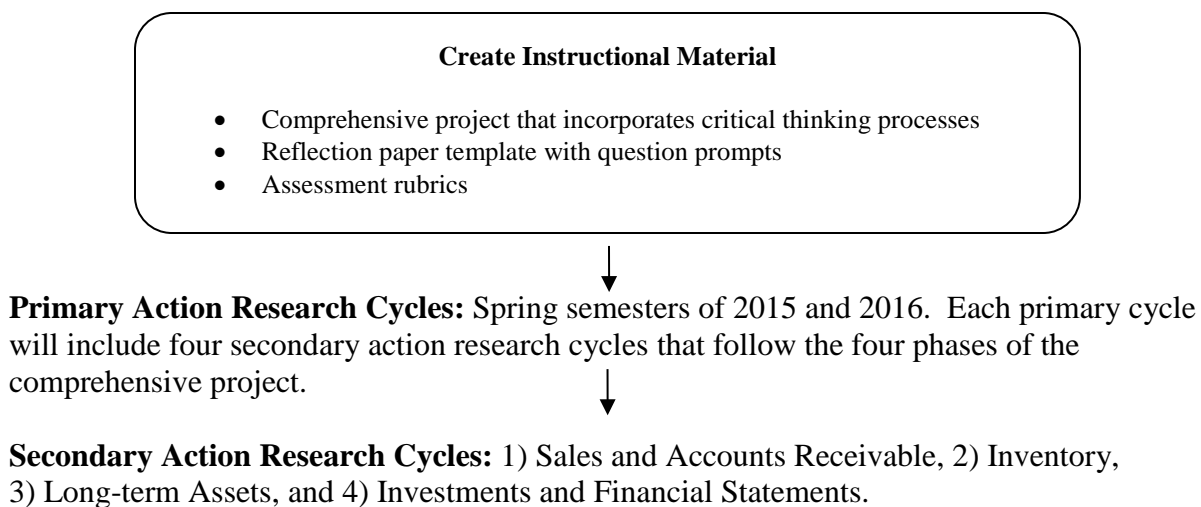


Figure 3.2. Action research flow.

research questions related to students' practice of critical thinking skills, the depth of students' reflections, and students' ability to perform accounting procedures.

Comprehensive project. Students completed the CP in four phases: 1) sales and accounts receivable, 2) inventory, 3) long-term assets, and 4) investments and financial statements. Written work on the CP served as evidence of students' ability to practice critical thinking processes and perform the work of the professional accountant. Refer to the discussion presented previously in the structure of the IFA course section for a detailed description of the comprehensive project.

Reflection papers. Students wrote RPs that correlated to the topics learned on the CP. I revised the question prompts on the RP during each cycle. Chapter four provides a detailed discussion of students' responses to question prompts on each RP.

Comprehensive final exam. Students completed a comprehensive final exam at the end of the semester. Answers to questions on the final exam served as evidence of students' ability to perform accounting procedures. Chapter four provides detailed information about the format and content of the comprehensive final exam.

Researcher reflection journal. I documented events that occurred during class and my reflections about learning activities in my RRJ to inform my research decisions, including: 1) questions consistently asked by students, 2) project structure issues, 3) students' technical accounting ability, 4) areas of confusion and misunderstanding, and 5) time-constraint issues. Additionally, I reflected on project work and the nature of writing in each RP to inform decisions to revise in-class discussions and RP question prompts. I reflected on the general learning and abilities of all students without recording individual students' names

or verbal quotes. I wrote in the RRJs immediately after each class period and after assessing students' CP work and RPs.

Data Analysis

An instructor's reflection on teaching practices and student learning is an important aspect of improving instructional methods (Kreber & Castleden, 2009; Kreber & Cranton, 2000; McAlpine, Weston, Berthiaume, & Fairbank-Roch, 2006). I used my analysis of observations and reflections about the course structure and students' work to inform actions to improve student learning. In particular, I used the constant comparative method (Strauss & Corbin, 1998) to analyze narrative data in the RRJs and students' RPs after the 2016 cycle ended. I read each sentence and assigned a code that described the idea in the sentence or group of sentences to analyze narrative data related to CP implementation issues (research question two) and reflection paper question prompts (research question four). Sentences that did not fit into previously assigned codes received a new code. After assigning codes to each sentence in the narrative data, I summarized the codes to identify themes (Patton, 2002). I used pre-determined themes and a priori codes described later in this section to address the other three research questions. (Patton, 2002). I used *Dedoose*, a computer-assisted qualitative data analysis software program, to code the RRJs and RPs. A professional peer verified the coding on about 10% of all students' responses on RPs. Approximately 95% of all codes (a priori and other) that I assigned agreed with the codes designated by the professional peer.

Research question one. I determined how the completion of CP work encouraged students to practice the process of critical thinking by coding CP tasks according to a priori codes (Patton, 2002) that follow the six steps in the critical thinking process (Facione, 1990).

I then determined if students completed the CP work that required practice of steps in the critical thinking process. Table 3.4 relates various types of accounting tasks to the six steps in the critical thinking process.

Research question two. I addressed how to solve implementation issues related to CP work using narrative data collected in my RRJs. I used the constant comparative method (Strauss & Corbin, 1998) previously discussed and identified codes and themes that related to Table 3.4

Correlation of Critical Thinking Steps with Professional Accounting Work

Critical Thinking Step	Activity	Accounting Work
Interpretation	Clarify meaning of available information	Identify relevant documents Understand the information on documents
Analysis	Select and use appropriate information	Identify relevant accounting methods and procedures Use appropriate data Record transactions
Evaluation	Examine ideas Identify arguments Analyze data	Perform relevant computations Identify issues related to accounting procedures Record adjustments to accounts
Inference	Query evidence Identify alternatives Draw conclusions	Identify alternative accounting methods Determine the results of accounting methods on financial reporting
Explanation	State results Justify procedures Present results	State advantages and disadvantages of alternative accounting methods Justify and support recommendation
Self-regulation	Self-examination of conclusions Identify weaknesses in thinking	Reconsider judgments and conclusions Reconcile account balances to work schedules

implementation issues and the students' perception of project work. Additionally, I triangulated findings from the RRJs to students' CP work and responses on RPs. Chapter four presents a detailed discussion of the codes and themes that emerged when analyzing the data related to research question two.

Research question three. I used Mezirow's (1991) model of reflective thinking to identify the change in students' thinking about issues professional accountants face. I coded students' written responses on RPs according to the a priori codes (Patton, 2002) of non-reflection habitual, non-reflection thoughtful action, process reflection, or premise reflection. Table 3.5 shows the characteristics and evidence of each of the four stages of reflection. I then determined the number of student responses that fell within each stage of reflection and analyzed trends in students' reflective thinking from the first to the last RP.

Research question four. I addressed how to use short RPs to encourage students to contemplate the decisions made by professional accountants using narrative data collected in my RRJs and students' RPs. I initially used a priori codes for RPs and then generated additional codes using the constant comparative method (Strauss & Corbin, 1998) discussed previously. Chapter four provides a detailed discussion of changes made to question prompts and the change in students' ability to demonstrate reflection as the semester progressed. Data analysis related to research question three triangulated my findings for research question four.

Research question five. I determined students' ability to complete routine accounting procedures by analyzing the percent of correct tasks on the CP and correct answers to questions on the comprehensive final exam. Routine accounting procedures

Table 3.5

Stages, Characteristics, and Evidence of Reflective Thinking (Mezirow (1991), Augmented and Adapted to Accounting Education.

Stage of Reflection	Characteristics	Evidence
1 Non-reflection: Habitual Action	Content focus	States declarative knowledge: definitions, formulas, and facts
	Relies on previous knowledge	Refers to structured, routine procedures
2 Non-reflection: Thoughtful Action	Uses knowledge without evaluating the basis for the knowledge	Describes accounting concepts and rules Applies concepts and rules to unstructured procedures Describes the impact of procedures on financial reporting
3 Process Reflection	Questions assumptions and recognizes ambiguity	Recognizes the accountant has alternative choices and uses judgment Describes the impact of alternatives on financial reporting Recognizes the use of estimates Describes the results of estimates on financial statements
4 Premise Reflection	Understands why	Gives evidence of why one alternative may be better than another, or acknowledges contextual factors and relationships

consist of recording transactions, recording adjustments to account balances, and preparing financial statements. Overall, I considered a score of 70% or higher as evidence that students adequately learned to complete the routine accounting procedures included in a traditional lecture-based IFA course. A passing grade for the course is 70%. Furthermore, a score of 70 to 75% is a passing grade on the Certified Public Accountant (CPA) examination. I further analyzed the data on both the CP and the final exam by topic to determine the areas in which students had difficulty performing accounting procedures. A professional peer agreed (100%) with my classification of tasks on the CP and questions on the final exam.

Researcher Positionality

I performed the roles of the researcher and the instructor of the course. Herr and Anderson (2015) refer to my position as an *insider*. As an insider, I was in a unique position to "generate important knowledge to be shared among practitioners ... a knowledge base that is otherwise unavailable" (Herr & Anderson, 2015, p. 44). My dual role as researcher and instructor presented the opportunity for bias in my perceptions when writing about the study and the results. I attempted to eliminate any bias by keeping timely and detailed RRJs and using the results of students' written work to support my findings and conclusions. A professional peer reviewed the coding on a sample of data used in the study to ensure consistency and check for bias.

The students in the course were active respondents in the study as they worked to complete the course requirements that provided data for the study (Fielding, 2011). Students experienced a greater increase in knowledge and skills as I made changes to improve learning. Data collection occurred through the normal requirements of the course and I made entries in the RRJ outside of class. Therefore, my dual role as the researcher and the

instructor did not lead to an increase in my expectations of the students beyond the course requirements.

The study took place in the normal course of my teaching responsibilities and my department chair welcomed the use of non-traditional teaching methods. The University Institutional Review Board approved the study as exempt. Therefore, students did not sign a consent document to participate and I used the work of all students in the course as data. I informed the students about my intent to analyze the results of their work to improve instruction and student learning on the first day of class. Additionally, I provided students with the name and email of a professional peer who was familiar with the study as a source to discuss any concerns that arose over the course of the semester. Students did not contact the professional peer during the study.

I began this study with expectations based on prior teaching experiences that students would be unfamiliar with critical and reflective thinking techniques. I also expected that some students would respond unfavorably to the student-centered learning environment and the ambiguity of the unstructured tasks, which differed from their experiences in the introductory financial accounting course. The study occurred during two primary action research cycles. I expect future use of the teaching methods employed in this study to reveal additional changes to the structure of the course, learning material, and assessments that will enhance the development of students' higher order thinking skills.

Validity and Trustworthiness

Pelto and Pelto (1978) state that "validity refers to the degree to which scientific observations actually measure or record what they purport to measure" (p. 33). Reliability is "the degree to which a test consistently measures whatever it measures" (Mills, 2007, p. 94).

Generalizability is the degree to which findings are applicable to other settings (Maxwell, 1992). According to Mills (2007), the traditional measures of research quality based on validity, reliability, and generalizability do not apply to educational action research due to the qualitative and subjective nature of the study. Guba (1981) proposed that qualitative researchers evaluate quality in terms of trustworthiness rather than validity and reliability. He suggested the characteristics of credibility and dependability to replace validity and that confirmability is more applicable to qualitative research than reliability due to the subjective nature of data. Furthermore, transferability is an appropriate substitute for generalizability due to the specific characteristics of the setting and context of a qualitative research study (Herr & Anderson, 2015). Table 3.6 presents a summary of each of Guba's proposed characteristics of trustworthiness as provided by Mills (2007, p. 87).

I employed the strategies suggested by Guba (1981) that have a checkmark next to the strategy to ensure I met the criteria for trustworthiness and transferability. I continuously observed and reflected over approximately eight months, in two primary and eight secondary action research cycles. A professional peer reviewed coding on a sample basis. I triangulated data collected from CP work, RPs, final exams, and RRJs. Students provided member checks through the process of reviewing assessment feedback. A thick description of the context and procedures allows other educators to apply findings and implement similar instructional methods to develop students' thinking abilities in their particular setting.

Guba (1981) provided criteria for validity and trustworthiness for qualitative researchers. Educational practitioner action research is a qualitative approach; however, the research process is unique in that the researcher studies his or her own practice within a specific setting to implement positive change (Anderson et al., 2007). To address the unique

Table 3.6

Criteria for Assessing the Trustworthiness of Naturalistic Inquiries (Guba, 1981) as Provided by Mills (2007, p.87)

Criteria	Definition	Strategies Implemented in this Study	Occurs in this Study
Credibility	The researcher's ability to take into account the complexities that present themselves in a study and to deal with themes not easily explained	Researcher's participation at study site.	√
		Do persistent observation	√
		Do peer debriefing	√
		Practice triangulation	√
		Collect "slice-of-life" data items	√
		Do member checks	√
		Establish structural collaboration and coherence	√
Establish referential adequacy	√		
Transferability	The researcher's belief that everything is context bound	Collect detailed descriptive data	√
		Develop detailed descriptions of context	√
Dependability	The stability of the data	Overlap methods	√
		Establish an audit trail	√
Confirmability	The neutrality or objectivity of the data collected	Practice triangulation	√
		Practice reflexivity	√

aspects of the research process, Anderson and Herr (1999) suggest that researchers evaluate educational action research according to five aspects of validity: outcome, process, democratic, dialogic, and catalytic. A researcher achieves outcome validity when action occurs that solves the problem identified in the context of the study (Anderson et al., 2007). Achieving outcome validity also includes reframing the problem in a way that leads to new questions and problems to be solved (Herr & Anderson, 2015). "Outcome validity is

dependent on process validity" (Herr & Anderson, 2015, p. 68). Process validity occurs when the researcher applies learning in one cycle to the next cycle in a continuous process of using data analysis to reframe and reevaluate findings over an extended period (Anderson et al., 2007; Mills, 2007). Triangulation, the consideration and evaluation of multiple perspectives to prevent self-serving biases and preserve the integrity of findings, enhances both process and outcome validity (Anderson et al., 2007; Herr & Anderson, 2015; Mills, 2007). Democratic validity occurs when all stakeholders collaborate to solve the problem investigated (Anderson et al., 2007) and "multiple perspectives of all participants ... have been accurately represented" (Mills, 2007, p. 90). Discussion of research findings with other teachers to "critically examine experiences and beliefs" (Anderson et al., 2007, p. 43) and participation in a peer review process provide dialogic validity (Mills, 2007). Dialogic validity takes place when the "methods, evidence and findings resonate with a community of practice" (Herr & Anderson, 2015, p. 70). A researcher obtains catalytic validity when participants experience a change in understanding and embrace the importance of implementing findings (Herr & Anderson, 2015), and are motivated to implement change that results in improvement (Anderson et al., 2007).

The methodology I employed in this educational action research study met Anderson and Herr's (1999) five criteria for validity. I set the study in an IFA course that does not currently provide students with the practice required to develop higher order thinking skills required by the accounting profession. I maintained a research journal and monitored the result of changes made to instructional methods based on data analysis in each cycle and documented new questions that emerged. Changes made resulted in a workable instructional

method that requires students to practice higher order thinking skills throughout the IFA course.

To achieve process validity, I continuously reframed and analyzed the problem as I made data-driven decisions during a series of eight cycles over approximately eight months. I collected data from multiple sources and triangulated findings from my RRJs with the results of students' written RPs, work on the CP, and the final exam. My study considered the perspectives of students and professional peers who reviewed the methodology, data analysis, and findings to meet the criteria for democratic and dialogic validity, respectively. Students' reaction to data-driven decisions and feedback on written work served as an indirect method of member checking. Furthermore, students directly provided their perspective on the learning experience on the last RP. A professional peer familiar with the context of the study reviewed a sample of the data analysis to mitigate bias. The problem addressed in the study is relevant to other educators.

To attain catalytic validity, I incorporated continuous cycles of the action research process (two primary and eight secondary) until I found a workable instructional method that requires students to practice higher order thinking skills. My understanding of instructional methods that encourage critical and reflective thinking increased as I made changes based on the findings of each cycle. The findings of the study should encourage other instructors to design and implement innovative teaching methods that require students to practice higher order thinking skills.

CHAPTER FOUR: FINDINGS

The purpose of this study was to develop an instructional approach that aligns learning activities and assessments to encourage junior-level financial accounting students to use a deep approach to study and practice the intellectual skills that professional accountants use in the work place. I implemented new instructional methods into a junior-level intermediate financial accounting (IFA) course to require students to perform and reflect on the work of a professional accountant. The new instructional methods centered around a comprehensive project (CP) and short reflection papers (RP). The research questions address implementation issues and student learning that occurred as I developed the new instructional method.

I followed the action research methodology described in chapter three and used students' work on the CP and narrative data in my reflection journal to address the following research questions:

1. How does the completion of an authentic comprehensive problem-based project encourage students to practice the process of critical thinking?
2. How does an instructor address implementation issues related to the use of an authentic comprehensive problem-based project over the course of a semester?

I used students' RPs and narrative data in my researcher's reflection journals (RRJs), to address the following research questions:

3. How does students' thinking about the issues professional accountants face change as students complete an authentic comprehensive problem-based project and short reflection papers?

4. What changes in instruction related to short reflection papers encourage students to contemplate decisions made by professional accountants?

I used evidence from students' CP work and the results on a comprehensive final examination to address the following research question:

5. How does a change in assessment methods from objective periodic tests to an authentic comprehensive problem-based project and reflection papers affect students' ability to complete accounting procedures?

The first section presents findings related to the incorporation of the CP into the IFA course. A discussion of students' reflections about the work of the professional accountant follows. The last section presents findings related to how the new instructional method and assessments affected students' ability to perform routine accounting procedures.

Research Question One

I integrated the CP into the IFA course to encourage students to practice the six steps in the critical thinking process (Facione, 1990). Documentation of work completed on the CP served as evidence to address the following research question:

- How does the completion of an authentic comprehensive problem-based project encourage students to practice the process of critical thinking?

The literature review in chapter two provides a complete discussion of the conceptual model of critical thinking used in this study. A summarized description of the six steps in the critical thinking process follows (Facione, 1990):

- *Interpretation*: to “comprehend and express the meaning or significance of” (p. 13).
- *Analysis*: to “identify the intended and actual inferential relationships among statements, questions, concepts, descriptions” (p. 14).

- *Evaluation*: to “assess the credibility of statements or other representations ... or intended inferential relationships among statements” (p. 15).
- *Inference*: to “identify and secure elements needed to draw reasonable conclusions ... to consider relevant information and to deduce the consequences” (p. 16).
- *Explanation*: to “state the results of one’s reasoning; to justify” (p. 17).
- *Self-regulation*: to “self-consciously monitor one’s cognitive activities ... evaluation of one’s own inferential judgments ... correcting either one’s reasoning or one’s results” (p. 18).

The six steps in the critical thinking process serve as a general framework applicable to any discipline. Table 4.1 associates the type of activity in each of the steps in the critical thinking process with the tasks an accountant completes. Accounting work does not always follow the same order (top to bottom) of the critical thinking steps presented on Table 4.1.

However, successfully completing accounting work requires the type of thinking that occurs in each of the six steps. The accountant’s responsibility is to record and report transactions in a manner that represents the financial position and results of operations. As transactions occur, the first step is to identify and interpret information related to each transaction. The accountant must then determine and evaluate the results of alternative accounting methods and procedures. The accountant uses judgment to estimate unknown amounts and evaluate alternative methods. The last step in the process is supporting, explaining, and reevaluating decisions and judgments.

Appendices C and D contain the instructions students followed, as well as formats used, when completing CP work during the 2015 and 2016 semesters, respectively. I discuss changes to written instructions to the CP in findings related to research question two.

Table 4.1

Correlation of Critical Thinking Steps with Professional Accounting Work

Critical Thinking Step	Activity	Accounting Work
Interpretation	Clarify meaning of available information	Identify relevant documents Understand the information on documents
Analysis	Select and use appropriate information	Identify relevant accounting methods and procedures Use appropriate data Record transactions
Evaluation	Examine ideas Identify arguments Analyze data	Perform relevant computations Identify issues related to accounting procedures Record adjusting journal entries
Inference	Query evidence Identify alternatives Draw conclusions	Identify alternative accounting methods Determine the results of accounting methods on financial reporting
Explanation	State results Justify procedures Present results	State advantages and disadvantages of alternatives Justify and support recommendation
Self-regulation	Self-examination of conclusions Identify weaknesses in thinking	Reconsider judgments and conclusions Reconcile account balances to work schedules

Students in both semesters completed CP work in four separate phases, as follows:

- 1) Sales and Accounts Receivable
- 2) Inventory
- 3) Long-term Assets
- 4) Investments and Financial Statements

Table 4.2 provides a detailed list of the tasks students performed while completing the CP.

Each task students performed while completing the CP falls within one of the six steps of the critical thinking process. Interpretation and analysis occur together as students use documents to identify necessary information and record business transactions. Identifying necessary adjustments and determining the appropriate amount takes place in the evaluation step. Inference includes evaluating alternative accounting methods and estimating unknown amounts. Evaluating the impact of alternative accounting methods includes preparing work schedules. Selecting and supporting appropriate accounting methods and estimated amounts occur in the explanation step. Self-regulation takes place as the students review their work and the results of their work. Reviewing work includes reconciling account balances to work schedules and examining the reasonableness of results given the company's contextual situation.

Tasks completed in each phase of the CP involve each of the six steps of the critical thinking process. Table 4.3 presents the steps in each phase of the critical thinking process each group of students completed. The table does not include work performed by students who did not complete the course. Students in groups two and 16 dropped the course before completing phase one. All groups of students who did not drop the course completed all the

Table 4.2

Tasks Students Performed Completing the Comprehensive Project Correlated to the Six Steps in the Critical Thinking Process

Step in the Critical Thinking Process	Accounting Task Completed
Phase 1: Sales and Accounts Receivable	
Interpretation and Analysis	Record sales and accounts receivable using shipping documents Record payment received from customers (using checks) Record credit card sales and related accounts receivable Record cash received from credit card banks Balance the cash account
Evaluation	Identify and adjust January sales initially recorded in December using sales invoices Identify and record unearned revenue adjustments Enter sales and collections on the accounts receivable aging report Record write-offs of uncollectible accounts Determine if bad debt expense estimated during the year using the percent of sales method is correct through November Record the year-end adjustment for bad debt expense
Inference	Identify uncollectible accounts using the aging report (write-offs) Estimate bad debt expense using the percent of sales and the percent of accounts receivable methods Consider customers' payment history and estimate the amount of future uncollectible accounts from three perspectives: low, medium, and high
Explanation	Provide reasonable support for 3 different estimates of future uncollectible accounts: low, medium, and high Select and support a reasonable estimate of future uncollectible accounts
Self-Regulation	Reconcile the accounts receivable account balance to the detail accounts receivable aging report Agree the allowance for uncollectible accounts balance to the schedule of estimated future uncollectible accounts Review the reasonableness of the estimate for future uncollectible accounts Review the reasonableness of the current year bad debt expense

(continued)

Step in the Critical Thinking Process	Accounting Task Completed
<u>Phase 2: Inventory</u>	
Interpretation and Analysis	Record inventory purchases using inventory purchase and receipt documents
Evaluation and Inference	<p>Compute the historical cost of ending inventory using the periodic and perpetual system for three different alternative methods: First in first out (FIFO), Last in first out (LIFO), Average cost (Average)</p> <p>Prepare ending inventory reports using all six methods</p> <p>Adjust the previous ending inventory balance to agree with the historical cost of the selected method</p> <p>Adjust the ending inventory balance for lost inventory (given)</p> <p>Adjust the ending inventory balance for obsolete inventory (given)</p> <p>Analyze the results of the six alternative inventory methods</p>
Explanation	<p>Identify advantages and disadvantages of using either the periodic or the perpetual method given the business situation</p> <p>Identify advantages and disadvantages of using the FIFO, LIFO or Average method given the business situation</p> <p>Select and support the appropriate inventory method</p>
Self-Regulation	<p>Agree the inventory summary schedule to the balance in the inventory account after making all adjustments</p> <p>Agree the cost of goods sold account balance to the inventory report</p> <p>Review the impact of the selected method on the financial statements</p>
<u>Phase 3: Long-term Assets</u>	
Interpretation and Analysis	<p>Obtain checks written during December for goods and services</p> <p>Use the description written on the memo line of each check to determine the account name used to record the purchase of the goods or services</p> <p>Obtain and interpret the amortization schedule for notes payable</p> <p>Record the December principal payment on the notes payable</p>
Evaluation	<p>Compute depreciation expense using straight-line</p> <p>Compute depreciation expense using double-declining balance</p> <p>Record depreciation expense for the selected method</p> <p>Reclassify the current portion of the principal of the note</p> <p>Determine and record accrued interest</p>

(continued)

Step in the Critical Thinking Process	Accounting Task Completed
Inference	Estimate a useful life for each long-term asset Estimate a residual value for each long-term asset Select the most appropriate method of depreciation Prepare walk-forwards of fixed assets and accumulated depreciation
Explanation	Identify advantages and disadvantages of each alternative depreciation method given the business situation Provide reasonable support for the selected method of depreciation Provide reasonable support for the estimated useful life of each asset
Self-Regulation	Agree asset and depreciation account balances to the walk-forward of long-term assets and accumulated depreciation Agree the annual interest expense to the amortization schedule Agree the amortization schedule to current and noncurrent notes payable amounts Review reasoning and support for the selected useful lives and depreciation method Review the impact of estimates on the financial statements
<hr/> Phase 4: Investments and Financial Statements <hr/>	
Interpretation and Analysis	Record transactions related to three different investments using the cost method, fair market value method, and equity method Determine the fair market value of each investment Record treasury stock purchases Record dividends paid to shareholders Identify information necessary for year-end adjustments
Evaluation	Record the adjusting entry for insurance expense Record the adjusting entry for rent expense Record the adjusting entry for professional fees Record the adjusting entry for supplies expense Record an adjustment for December invoices for services received Compute and record income tax expense Prepare the four financial statements using summary and detail general ledger accounts (includes preparing closing entries)

(continued)

Step in the Critical Thinking Process	Accounting Task Completed
Inference	Identify reasonable alternative accounting methods for each investment Determine the year-end adjustments for each alternative method for each investment
Explanation	Identify advantages and disadvantages of using alternative methods for each investment Provide reasonable support for the selected accounting method for each investment
Self-Regulation	Agree summary general ledger (GL) account balances to the detail GL account balances Agree closing entries to the detail GL account balances Review transactions posted to the retained earnings account Ensure balance sheet amounts agree to the GL Ensure income statement amounts agree to the GL Agree the ending cash balance on the cash flow statement to the ending cash account balance

requirements of each phase of the CP and consistently practiced all six steps in the critical thinking process.

Table 4.4 presents a summary of students' ability to correctly complete each step in the critical thinking process for each phase of the CP. The percentage represents the average number of points students earned out of the total possible points on tasks that fell within the related step in the critical thinking process. I considered an average score of 70% or higher to be evidence that students demonstrated the skills required to perform steps in the critical thinking process because 70% or above is a passing grade for the course. I had to provide additional class discussion and answer many questions to help students achieve adequate performance on tasks in the interpretation and analysis steps in each phase of the CP.

Table 4.3

Groups of Students Who Performed the Six Steps in the Critical Thinking Process

Step in the Critical Thinking Process	Groups of Students														
	1	3	4	5	6	7	8	9	10	11	12	13	14	15	17
Phase 1: Sales and Accounts Receivable:															
Interpretation and Analysis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Evaluation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inference	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Explanation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Self-regulation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Phase 2: Inventory															
Interpretation and Analysis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Evaluation and Inference	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Explanation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Self-regulation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Phase 3: Long-term Assets															
Interpretation and Analysis	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Evaluation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Inference	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Explanation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Self-regulation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

(continued)

Table 4.4

Students' Performance on Steps in the Critical Thinking Process

Step in the Critical Thinking Process	Sales & Accounts Receivable (Phase 1)	Inventory (Phase 2)	Long-term Assets and Notes Payable (Phase 3)	Investments and Financial Statements (Phase 4)
Interpretation and Analysis	85%	70%	87%	82%
Evaluation	54%	83%	87%	83%
Inference	60%	*	94%	79%
Explanation	27%	57%	25%	82%
Self-regulation	48%	79%	73%	96%

Note. Students completed the evaluation and inference steps in phase two simultaneously.

After performing poorly in the steps of evaluation, analysis, and self-regulation during phase one, students learned from their mistakes and adequately completed the related tasks on the other three phases of the CP. Students lost points in the explanation step for justifying judgments with textbook explanations without considering the company's specific context. However, students considered the company's financial situation and intent for making the investment when selecting the appropriate method for accounting for investments in phase four. Overall, the level of students' understanding of how accountants perform procedures and when accountants use judgment were the greatest influence on their ability to adequately perform tasks in each step in the critical thinking process. The discussion of findings related to research question two provides additional information related to students' performance on each task in each step in the critical thinking process.

Research Question Two

Instructors of traditional junior-level IFA courses use class time to discuss accounting concepts and demonstrate how to perform accounting procedures. Learning materials focus on concepts and structured procedures that do not require students to use judgment (Davidson & Baldwin, 2005). Learning to perform structured accounting procedures is the most prominent objective in a traditional IFA course. The number of accounting topics and procedures students learn in the IFA course leaves little time for instructors to facilitate critical thinking practice. Adding unstructured accounting work to the IFA course without eliminating content expands the learning objectives and magnifies the time constraints faced by instructors. However, accounting professionals believe the ability to apply critical thinking to unstructured situations is one of the more important skills students need for success (Albrect & Sack, 2000; Behn et al., 2012; Yu, Churyk, & Chang, 2013).

I integrated the CP into my IFA course to require students to practice critical thinking skills as they learn to perform accounting procedures. Chapter three provides a description of the revised course requirements. I collected narrative data in my RRJs while facilitating and grading students' work on the CP to address the following research question:

How does an instructor address implementation issues related to the use of an authentic comprehensive problem-based project over the course of a semester?

I then coded and analyzed the narrative data in my RRJs, using the constant comparative method (Strauss & Corbin, 1998) described in chapter three. My review and analysis of the

codes applied to the narrative in my RRJs uncovered four primary themes. Table 4.5 presents the four primary themes along with corresponding codes that emerged using the constant comparative method.

Table 4.5

Comprehensive Project Implementation Issues

Themes	Codes
Basic Accounting Procedures	The accounting cycle The general ledger
Students' lack of understanding	Before class preparation Using documents, work schedules, and reports Acceptance of ambiguity Using judgment to select and support accounting methods and make estimates
Structure of the comprehensive project	Format Written instructions
Time Constraints	Allocation of limited class time

Basic accounting procedures consist of declarative knowledge and routine accounting procedures students learn in their previous sophomore financial accounting course. To pass the sophomore course, students must demonstrate an understanding of financial statement terminology and the ability to record and summarize common business transactions. Accountants refer to the process of recording and summarizing transactions to prepare financial statements as the *accounting cycle*. Students must record transactions in the *general ledger* as they complete each step in the accounting cycle to successfully complete the CP. I discuss the process of recording and summarizing transactions in the general ledger later in this chapter.

To *prepare students* for class and free up class time for CP work, I provided online video lectures and fully explained answers to homework. However, students were unable to transfer *before-class learning* to CP work. Students' had difficulty *using authentic documents and work schedules* to identify and interpret information when completing accounting procedures. Furthermore, students did not understand how *to estimate amounts and evaluate alternative accounting methods*. Students were uncomfortable with the *ambiguity* of unstructured accounting work and constantly asked for verification that their work was correct.

The *structure of the CP* differed from the homework problems, causing confusion about how to complete the requirements of most tasks. Initial *written instructions* designed to guide students' work proved insufficient. Students' inability to complete basic accounting procedures and *unfamiliarity with documents and work schedules* slowed students' progress. Identifying the appropriate level of support, along with properly *allocating class time* between instruction and work on the CP, continued to be significant challenges.

I designed and wrote the CP prior to the spring 2015 semester. The CP required students to perform work related to all major topics in the IFA course. I made data-driven changes to improve the learning process as we progressed through the 2015 semester. After considering implementation issues in the 2015 semester, I changed the format of the CP and significantly increased the amount of written instructions. I then incorporated the revised CP into the spring 2016 semester and made changes to class discussions to enhance learning. The following is a discussion of the implementation issues as well as actions taken to resolve the issues that occurred as students completed the CP during each semester.

Basic Accounting Procedures

The accounting cycle. Traditional IFA instructors dedicate the first two to three weeks of the semester to a review of basic accounting procedures. Accountants use the term *accounting cycle* to describe basic accounting procedures. The accounting cycle includes recording common business transactions, adjusting account balances at the end of the period, and preparing financial statements. A review of the accounting cycle also serves to provide an overview of declarative knowledge. To introduce students to authentic accounting work, I replaced traditional in-class lectures about the accounting cycle with an accounting cycle project (ACP). Appendix B presents the instructions students followed to complete the ACP.

Spring 2015 cycle. On the first day of class, I asked students to watch video lectures and do homework problems outside of class to review the accounting cycle and prepare them to do work on the ACP. The ACP required students to perform the accounting cycle for a small business. Students began work on the ACP the second day of class.

Work on the ACP occurred during the first three weeks of the semester. Students quickly recorded the most common transactions from check copies; however, they had difficulty selecting the proper account name to use to record unfamiliar assets and services received. Furthermore, students did not realize that a check represents a decrease to cash. Students seemed unaware that difficulty completing the ACP was due to a lack of basic accounting knowledge (RRJ, 1/15/2015). During the third class, I gave students an unannounced test to provide feedback about their ability to complete basic accounting procedures. Table 4.6 presents the results of the first diagnostic test, along with scores on a similar test during the third week of the course. On the first test, only four students

Table 4.6

Foundational Knowledge Test Scores (2015)

Grade Range	1 st Test: Day One		2 nd Test: Three Weeks Later	
	Number of Students	Percentage of Students	Number of Students	Percentage of Students
90% to 100%	0	0.0%	0	0.0%
80% to 89%	0	0.0%	8	22.2%
70% to 79%	4	11.1%	9	25.0%
60% to 69%	4	11.1%	11	30.6%
50% to 59%	9	25.0%	3	8.3%
40% to 49%	7	19.5%	2	5.6%
30% to 39%	7	19.5%	3	8.3%
Below 30%	5	13.8%	0	0.0%
Total	36	100%	36	100%

demonstrated an adequate understanding of accounting procedures. The other students who scored less than 70% were unprepared to do the work required to complete the ACP.

During the next class period, I talked with each student to identify weaknesses and offer individual help. Most students confessed they had not done any homework prior to the test and promised to study immediately (RRJ, 1/22/2017). Seven students came for help outside of class. During the following class, I used time planned for ACP work to review adjusting entries and various documents and reports accountants use to record transactions (RRJ, 01/27/2015). I recorded the following in my RRJ, after students worked for two weeks on the ACP:

I noticed that students said they understood the purpose of the adjusting entries; however, they did not seem to know procedurally what to do. I found myself consistently asking the question “when an asset is used up, what does that create?” I also spent a lot of time discussing the payroll entries ... Students had great trouble conceptually understanding that the amount

employees worked during January were January expenses, the amount paid to employees was the only credit to cash. ... They kept saying they understood the reports; however, could not translate ... to the proper journal entry until I provided the explanation two or three more times. (RRJ, 1/26/2015)

The questions students asked ... indicated they had done some homework ... and were trying to relate what they were doing in their homework. ... It seemed as if ... homework problems outside of class ... blocked their understanding that ... the purpose of the adjusting entry was to adjust what had previously been done ... they seemed to have no idea where to even begin to make an adjustment. (RRJ, 1/26/2015)

I gave students a second test (Appendix A) over basic accounting procedures during the third week of the course as students completed the ACP. Table 4.6 presents the scores on the second test compared to the first test. Approximately 53% of students failed the second test (19 students), and no student scored higher than 89%. Students who scored 70% or better demonstrated the ability to perform accounting procedures similar to structured practice problems. More importantly, students who scored lower than 80 percent were unable to apply basic accounting knowledge to unfamiliar situations (RRJ, 1/29/2015).

Test results indicated that relying on students to adequately review and learn basic accounting procedures through viewing video lectures and completing homework problems outside of class was not effective. I noted the following changes to make for the 2016 cycle:

I should spend the first week of the course going over the accounting cycle and making sure the students who do not understand get help immediately. I should give the pre-requisite test the first day of the second week to force students to spend the weekend studying and learning. Due to limited class time, the review will most likely have to occur during additional lab times or study/review sessions. (RRJ, 1/29/2015)

Students used almost all class time during the first three weeks of the semester, along with eight to 10 hours in additional work sessions, to complete the ACP. Given the test results and other implementation issues discussed in this chapter, I decided to allocate class time

spent working on the ACP for work on the CP and removed the ACP from the course during the 2016 semester.

Spring 2016 cycle. Based on the findings in the spring 2015 cycle, I began the spring 2016 semester with the assumption that students lacked foundational accounting knowledge. I gave students the test over basic accounting procedures (Appendix A) during the first part of the first night of class to give students immediate feedback on weaknesses. My goal was to encourage students to begin additional study of foundational material during the first week. I then provided the following review of foundational knowledge:

I explained the debit/credit and T account rules used to record journal entries and we talked about how to read journal entries. ... I talked about the purpose of adjusting journal entries, emphasizing the point was to change the unadjusted balance to the correct balance at the end of the period. I quickly discussed closing entries and then talked through the entire cycle. Most students left saying they knew they had a lot of review to do before next week and making comments that indicated they were overwhelmed with what they had forgotten from their previous accounting class. (RRJ, 1/13/2016)

Table 4.7 presents the results of the initial test over foundational knowledge on the first day of class, along with a re-take of the test three weeks later. Consistent with the prior semester, a score of 70% or better demonstrated the ability to perform routine accounting procedures. A score of 80% indicated the ability to apply basic accounting knowledge to unfamiliar situations. On the initial test, approximately one-third of the students demonstrated basic accounting knowledge, while approximately 14% of students could correctly apply knowledge to unfamiliar situations.

To encourage further study, I offered the students the option to re-take the test outside of class during the third week. One student enrolled after the first day of class and did not take either test and three students dropped the class before the second test. Twenty-five students took the test a second time. The second test data includes the first score for students

Table 4.7

Foundational Knowledge Test Scores (2016)

Grade Range	1 st Test: Day One		2 nd Test: Three Weeks Later	
	Number of Students	Percentage of Students	Number of Students	Percentage of Students
90% to 100%	1	3.6%	5	17.9%
80% to 89%	3	10.7%	3	10.7%
70% to 79%	5	17.9%	5	17.9%
60% to 69%	2	7.1%	2	7.1%
50% to 59%	5	17.9%	6	21.4%
40% to 49%	5	17.9%	2	7.1%
30% to 39%	3	10.7%	4	14.3%
Below 30%	4	14.2%	1	3.6%
Total	28	100%	28	100%

who continued in the class but did not take the second test. By the end of the third week, slightly more than one third of the students demonstrated the ability to apply knowledge to unfamiliar situations and only about half of the students (46.2%) could correctly perform routine accounting procedures.

On the second test, most students correctly recorded transactions and adjusting entries like those presented in homework problems. Overall, students were unable to correctly record unusual transactions and make adjustments using current account balances. Completing the CP requires the application of foundational knowledge to unstructured situations. As such, I expected students who scored below 70% to have difficulty completing the CP and encouraged additional study.

Moving the test over foundational knowledge to the first day of class provided the necessary immediate feedback to students. However, most students did not obtain an

adequate level of foundational knowledge after one instructor-led review session and independent study. Other findings discussed later in this chapter indicate the ability to repeat structured procedures performed when doing practice problems is not sufficient to successfully complete the CP.

The general ledger. The professional accountant's work revolves around recording transactions, adjusting accounts, and summarizing account balances to prepare financial statements. Accountants use individual accounts to record journal entries. Each account has a name that describes an item that changes as a transaction occurs. Accountants then place each journal entry amount into the proper account and summarize amounts. The *detail general ledger* reports the changes to each account along with the final account balance. The *summary general ledger* reports each account's final amount.

For example, an accountant writes a *journal entry* to record a cash sale to a customer with a debit (increase) to the cash account and a credit (increase) to the sales account. The accountant then writes the related amount to the right of the account name, as follows:

Cash	2,409.23
Sales	2,409.23

To record (post) the amount, the accountant places 2,409.23 in the debit column (left) in the cash account and the same amount in the credit column (right) of the sales account. Figure 4.1 presents an example of the sales account in a detail general ledger. For a sales account, debits represent a decrease and credits represent an increase. Note the credit amount of 2,409.23 for the sales entry recorded above. The larger amount (395,168.23) nets against the smaller amount (6,897.62) to determine the account balance (388,270.61).

Figure 4.2 presents a summary general ledger report of account balances. When the accountant correctly enters all amounts to all accounts, the total amount of all debit amounts

31100 Sales		Debits	Credits
Beginning Balance: November 30			346,233.31
5-Dec	Customer Order 212		2,409.23
6-Dec	Customer Order 213		4,298.55
8-Dec	Customer Order 214		2,949.05
	Other Transactions...		35,729.24
26-Dec	Customer Order 226		899.70
31-Dec	Customer Order 227		2,649.15
	Adjustment Inventory		
31-Dec	222: Unearned Rev	849.75	
31-Dec	Adjustment Inv 223 January Sales	3,398.72	
31-Dec	Adjustment Inv 227 January Sales	2,649.15	
		6,897.62	395,168.23
Balance: December 31		388,270.61	

Figure 4.1. Example partial detail general ledger.

Account Name	Debit	Credit
3-1100 Sales		388,270.61
3-1300 Sales – Counseling		33,440.00
3-2000 Unrealized Gain/Loss	8,172.00	
3-2500 Investment Revenue/Expense	11,000.00	
3-2700 Gain / Loss on Sale of Assets	1,023.49	
3-3000 Dividends and Interest		234.00
Other Accounts....	526,925.14	125,176.02
Total of All Accounts	547,120.63	547,120.63

Figure 4.2. Example summary general ledger.

(left column) will equal the total amount of all credit amounts (right column). A professional accountant uses both the detail and summary general ledger reports to complete daily work.

Traditional learning materials require students to record amounts in separate *T accounts* and then summarize each account to determine a final amount. Each account name has its own T account. Similar to the general ledger, students write amounts that increase the account on one side of the T and amounts that decrease the account on the other side of the T. Students then total each side of the T and net the total amount of increases with the total amount of decreases to obtain the account balance. Figure 4.3 presents an example of students' work after completing a practice problem. In this problem, the company began with \$25,000 cash, paid \$10,000 for inventory, sold \$4,000 of the inventory to customers for \$8,000, and customers paid the company \$8,000 for the inventory received. The four accounts that changed with the related transactions are cash, inventory, cost of goods sold, and sales. For cash, inventory, and cost of goods sold, the amounts on the left represent increases and the amounts on the right represent decreases to each account. The right side of the sales account represents an increase. The net of all decreases and increases gives the balance for each account. The left side total balances (33,000) do not equal the right side total balances (8,000) because the practice problem considers only a few of the company's many transactions.

Spring 2015 cycle. Students in the spring 2015 cycle completed the ACP prior to completing the CP. Work on the ACP required students to use a general ledger for the first time. I consistently reminded students of the importance of recording each amount in each account. However, failing to record amounts did not cause problems until students attempted to prepare financial statements during the third week of

Cash		Inventory	
25,000	10,000	10,000	
8,000			4,000
<hr/>		<hr/>	
23,000		6,000	
<hr/>		<hr/>	
Sales		Cost of Goods Sold	
	8,000	4,000	
<hr/>		<hr/>	
	8,000	4,000	
<hr/>		<hr/>	

Figure 4.3. Example of students' work after recording amounts to T accounts.

class (RRJ, 1/15/2015; 1/26/2015; 1/27/2015; 1/28/2015; 2/5/2015). Given the problems students experienced working on the ACP, I expected them to exercise more care and post all recorded amounts when performing work on the CP. However, students failed to record many amounts in the proper account in the general ledger and worked with incorrect account balances in all phases of the CP (RRJ, 2/24/2015; 3/5/2015; 3/31/2015; 4/13/2015; 4/22/2015; 4/28/2015). I noted the need to continuously emphasize the importance of posting amounts in the correct general ledger account. Furthermore, I decided that providing some accounts in the general ledger in an Excel spreadsheet would create computational efficiencies and encourage students to correctly post amounts (RRJ, 4/29/2015).

Spring 2016 cycle. In response to spring 2015 findings, I made the following changes before 2016 students began work on the CP:

- 1) I emphasized the importance of completing each step in the accounting process during the first week of class,
- 2) I explained how accountants record all entries into the general ledger and use the general ledger to complete their work,
- 3) I added step-by-step directions that included comparing account balances to reports and other work schedules to written instructions, and
- 4) I provided Excel spreadsheets for accounts with many transactions.

(RRJ, 1/13/2016).

During the first phase of the project, students failed to post all recorded amounts into accounts. Failure to record one amount caused students the same problem as forgetting to record many amounts. Students used additional time to find and correct errors discovered when comparing account balances to work schedules (RRJ, 2/17/2016). To encourage more attention to detail, I clearly marked errors on the grade rubric and required students to revise incorrect account balances prior to working on the next phase of the CP (RRJ, 3/2/2016; 3/30/2016; 4/13/2016). Before moving onto phase four, I had the students compare the total of all debit amounts to the total of all credit amounts for all accounts. All students had incorrectly recorded amounts to accounts and discovered total debits did not equal total credits (out-of-balance). I took the following action to address out-of-balance situations:

I spent the evening spot checking the accounts and helping the students identify the balances on the trial balance that did not look correct. I showed them how to check the amounts to their work that stated what the accounts should be. When all accounts looked reasonable and the difference in debits and credits was less than a thousand I allowed the students to plug the amount

to miscellaneous expense or income. There came a point where it was not worth the time to find the error (RRJ, 4/13/2016).

After balancing all accounts, students made adjusting and closing entries. Most students failed to properly record amounts and found themselves out-of-balance once again. I noticed that students were simply changing final amounts on the summary general ledger without correcting their errors in the detail general ledger. I reminded students that the amounts in the detail general ledger must agree to the amounts in the summary general ledger and the financial statements (RRJ, 4/27/2016).

Students' inability to carefully record amounts in the detail general ledger caused about half of the procedural errors made when completing the CP. Additionally, constantly correcting procedural errors significantly slowed progress and created the need for additional work sessions.

Students' Lack of Understanding

Students learn at least 60% of the content and accounting procedures included in the IFA course in a previous sophomore financial accounting course. I expected students to be able to review the repetitive material before class, and I focused in-class discussions on new or more complex accounting procedures and how to do the work of the accountant. Students' lack of understanding of how accountants perform basic accounting procedures hindered progress on the CP. The previous section discussed students' inability to perform the accounting cycle and the instructional changes made to enhance learning. A discussion of the implementation issues and actions taken to resolve issues related to students' lack of understanding about other accounting procedures follows.

Before class preparation. I required students to view online video lectures about each topic and complete related homework problems prior to coming to class. Online video

lectures explained terminology and provided step-by-step demonstrations of accounting procedures. Homework contained questions that emphasized key concepts and required students to practice completing accounting procedures. I expected students to become familiar with the basic steps in each accounting procedure prior to class. The purpose of the before-class assignments was to decrease the class time required for students to obtain a working knowledge of accounting procedures.

Spring 2015 cycle. During the first part of CP work, students seemed to complete the before-class requirements. I noted the following as we discussed the first topics of sales and accounts receivable (phase one) and inventory (phase two):

Phase one: Students had watched the videos and completed homework and seemed to be able to follow along with class discussion very well. It seems to me that the students are realizing the connection between the project and the homework and understand the importance of studying and learning before coming to work on the project. This is a significant step of improvement over the student behavior and attitudes on the first accounting cycle project when students were not doing homework weekly and were attempting to learn the procedures as they worked on the project. (RRJ, 2/19/2015)

Phase two: I discussed the periodic and perpetual methods of computing FIFO, LIFO, and Weighted Average. Students worked a problem in class that required them to do all six methods. We discussed the purpose of having six different ways available to the accountant and why companies may use one method or another. Students were able to do the computations fairly easily and asked no questions. (RRJ, 3/2/2015)

I noted nothing in my reflection journal that indicated students had failed to learn the accounting rules related to property, plant, and equipment (phase three) and investments (phases four) prior to class (RRJ, 3/19/2015; RRJ, 4/02/2015).

Students' work before class had prepared them with the skills to repeat structured homework problems; however, students had difficulty applying their knowledge of

accounting procedures to CP work. I noted the following as I assisted students with work on phases one and two:

Phase one: The students are asking questions that they could answer if they would relate their homework procedures to the procedures required to complete the project. It seems as if they are not connecting what they do in the homework problem to the project or they are simply not remembering what they did in their homework. (RRJ, 03/18/2015)

Phase two: Common questions were “did we pay for the inventory purchased in December?” “What account do I adjust when I change the inventory account?” ... The questions asked indicate that the students are not relating the procedures they do in the homework to the work on the project. This was evident for some groups as they computed FIFO/FIFO/Ave under both methods also. ... The students seemed to be able to do the math once I walked them through the specific steps and calculations using the first product as an example. They did not seem to recognize that the project required them to do the same thing as the homework. (RRJ, 3/26/2015)

Questions students asked as they completed phase three also indicated a lack of understanding about how the professional accountant applies accounting guidance to perform accounting procedures (RRJ, 4/02/2015; 4/09/2015). Students completed the accounting cycle during phase four of the CP. Once again, students were unable to apply learning from working structured homework problems to the requirements of the CP. Furthermore, students seemed to forget any learning from the experience of completing the accounting cycle in the ACP. I noted the following about students’ inability to perform accounting procedures:

Students asked some pretty basic questions that indicated that they did not really remember how to do ... I reminded them that the purpose of doing adjusting entries was to ... and they needed to determine what the account balances are currently and what they should be before they can make the adjusting entries. I generally told the students which questions on this section of the project to study ... before they come back to class next time. (RRJ, 04/14/2015)

Homework problems required students to record closing entries and prepare financial statements. However, I noted the following that indicated students did not understand the purpose of closing entries:

I noticed that I need to teach/explain more about how the closing entries bridge the gap between the trial balance and the financial statements, as well, as give more explanation ... before asking the students to do the final steps of preparing the financial statements in the project. (RRJ, 4/29/2015)

Throughout the semester, students watched the video lectures, completed assigned homework, and correctly performed structured in-class exercises. However, the work did not adequately prepare students to do the work of the accountant on the CP. To address the lack of understanding, I gave step-by-step verbal instructions to each group as they worked throughout the semester (RRJ, 02/17/2015; 02/26/2015; 03/17/2015; 03/24/2015; 03/31/2015; 04/07/2015; 04/22/2015).

Students spent a significant amount of time outside of class learning and practicing structured accounting procedures. The textbook did not explain how the accountant uses documents and work schedules to perform accounting procedures. Additionally, practice problems did not involve business documents. As such, the out-of-class assignments did not adequately prepare students for the in-class CP work. The students' lack of understanding created the need for additional in-class discussions and slowed work on the CP. At the end of the 2015 semester, I noted the need to adjust in-class discussions to incorporate the following during the 2016 cycle to better prepare students for CP work:

Correlate the homework problems to what they are doing in the project and document the connection for them. After they have had a chance to do the work and after grading that section of the project, spend time with them to discuss the correct way to do the procedures and correlate it to their homework. (RRJ, 4/29/2015)

Spring 2016 cycle. Given the findings during the spring 2015 cycle, I redesigned in-class lectures for the spring 2016 cycle. I replaced the less challenging in-class exercises with additional lectures about how to apply understanding gained performing practice problems to work on the CP. For example, during the second week, I discussed the following:

I ... wrote on the board: "The company shipped goods that cost \$X for a price of \$X to the customer" and "The company received \$X from the customer" and explained the similarity between the shipping documents and checks and the simple journal entries they recorded in their homework. That seemed to help and most students were able to finish recording the shipments to customers on credit and checks received from customers before the end of class. (RRJ, 1/20/2016)

Two weeks later, I provided an "overview of the basic sales and accounts receivables transactions and the relationship to the accounts receivable aging report" (RRJ, 2/3/2016).

In a later class, "I drew T accounts for the accounts receivable and allowance accounts on the board and correlated it to what they are doing on their projects" (RRJ, 2/24/2016). The revised lectures seemed to increase students' understanding of CP work; however, these lectures also may have encouraged students to put less effort into learning prior to class.

Before beginning phase two work, I discussed related accounting procedures and noted the following:

I used the first 45 minutes of class to lecture on the periodic and perpetual methods of recording inventory transactions and the FIFO, LIFO, Average methods of determining the cost of inventory and cost of goods sold. We worked through an in-class exercise together on each of those topics. Only a few students were prepared enough to work the in-class exercise before we went over it together. (RRJ, 3/2/2016)

I used class time to repeat material provided on the video lectures and homework problems and had no time to explain how to complete the inventory schedules in the CP. I once again provided step-by-step explanations to each individual group. Using valuable class time for

lectures that students could listen to outside of class put students behind schedule and seemed to encourage students to better prepare for the next class, as noted:

I asked the students if they had prepared for class and told them I needed to know the truth so that I would know how much lecture to provide on inventory. All students unanimously told me they had done the reading and worked the homework problems and they felt they did not need much lecture. I gave a brief explanation of the difference in the periodic and perpetual methods ... I led a very high-level discussion of the reason for lower-of-cost or market without going through the calculations. I could tell the students were anxious to get to work on the projects. (RRJ, 3/16/2016)

The questions students asked indicated they were familiar with the computations and accounting procedures related to inventory work.

Prior to beginning work on phase three of the CP, I discussed both the detail accounting procedures and the work students would perform on the CP, as follows:

I began the class discussing the purpose of depreciation expense and how this procedure allocates the cost of assets to future periods. We discussed the importance of matching the costs to revenue generated in the period and the reasons for using each method. The students then worked through the in-class exercises and seemed to have no issues doing the depreciation calculations. We talked through the change in an estimate and the sale of an asset exercise together. The students seemed anxious to get to the project work. It feels like they are sensing that they could do some of the lecture related things outside of class and that would give them more time for project work. They are doing their homework timely, with few exceptions. I discussed the project and made sure that they understood that the accountant had recorded all of the purchases to the account "property, plant, equipment" which is not an account and is a category. We talked about how to reclass the costs out of this account and into the proper account. (RRJ, 3/30/2016)

I provided students with an overview of the procedures used to account for investments (phase four), along with specific steps to take to complete the CP (RRJ, 4/13/2016). As students worked on phase four, "I consistently had to tell them that they could work this section just like a homework problem and they looked at me blank and started looking it up in the book" (RRJ, 4/13/2016). Providing students with a detail

overview of the accounting procedures related to long-term assets prior to beginning CP work seemed to have once again sent the message they could get away with less before-class preparation. Students' before-class preparation seemed to vary depending on students' expectation of the depth of instruction I would provide before they began work on the CP.

After completing the first cycle in spring 2015, I noted the need for quizzes to ensure students had viewed video lectures and worked practice problems prior to class (RRJ, 4/28/2015). After further reflection, I decided to forego quizzes during the spring 2016 cycle because I did not want to encourage students to memorize concepts and accounting procedures to achieve a grade. Overall, students did complete practice problems timely and had little difficulty performing structured accounting procedures. Furthermore, as previously discussed, work on the CP required a deeper understanding than working practice problems provided.

Findings from this study indicate students will struggle with the accounting tasks required on the CP even when they practice accounting procedures while doing structured problems. As such, instructors should correlate accounting procedures learned doing practice problems to the tasks required on the CP. Eliminating the ACP in the spring 2016 cycle provided additional class time to discuss the relationship between the accounting procedures students learned doing homework and tasks required on the CP. I noted that requiring students to complete specific tasks within a phase by the end of class, rather than all work in a phase at the end of one class, may encourage students to better prepare for class (04/27/2016). I will further discuss changes made to the structure of the project later in chapter four.

Using documents, work schedules, and reports. Professional accountants obtain all information needed to record transactions from documents that include invoices, purchase orders, shipping documents, checks, and agreements. Homework problems provide all necessary amounts, negating the need for students to interpret documents to obtain amounts. Students in the 2015 semester used business documents to a limited extent while working on the ACP; however, the ACP did not require students to prepare work schedules. Students' first experience preparing work schedules occurred while completing CP work. A lack of understanding about how to use documents to obtain information to record transactions and how to prepare and use work schedules hindered students' ability to complete the work on the CP.

Using documents. I explained all the information presented in the CP before my 2015 students began working on this project. The explanation included an overview of the structure of the CP and the purpose of each document (RRJ, 2/12/2015). After the first day students worked on the CP, I noted the following:

Students did not seem intimidated by the project, which was much different compared to the high level of intimidation they showed when beginning the first project [ACP]. I think this is because they had worked with sales invoices, shipping documents, and checks in the first project and seemed to be very comfortable using those types of source documents to do procedures they had previously done. (RRJ, 2/12/2015)

Throughout the semester, students could understand information provided on business documents; however, they could not determine how to use documents to complete accounting procedures. I had to continuously provide step-by-step explanations to each group in order for students to continue working (RRJ, 2/12/2015; 2/17/2015; 3/17/2015).

Students in the 2016 semester cycle did not complete the ACP. As such, phase one of the CP was the 2016 students' first experience using sales invoices, shipping documents, and

checks. I explained how to read and use each document prior to students beginning work (RRJ, 1/20/2016). As students worked on phase one, I noted the following:

Students did not seem to make the connection between the documents and how to use them to record the amounts in the journal entries with the debit and credit accounts already typed on the journal entry pages. I stopped and wrote on the board: "The company shipped goods that cost \$X for a price of \$X to the customer." and "The company received \$X from the customer" and explained the similarity between the shipping documents and checks and the simple journal entries they recorded in their homework. That seemed to help and most students finished recording the shipments to customers on credit and checks received from customers before the end of class. (RRJ, 1/20/2016)

I also noted the need to add similar examples to the written instructions to relate procedures learned doing practice problems with tasks on the CP in future semesters (RRJ, 1/20/2016).

Students in the 2015 cycle also used the documents necessary to record inventory transactions (phase two) while working on the ACP. As such, most students understood how to use the documents to prepare work schedules after one explanation (RRJ, 3/19/2015).

Spring 2016 students did not complete the ACP, and therefore had no previous experience using invoices and shipping documents to record inventory transactions. I noted the following after facilitating 2016 students' work on phase two:

I also had to remind about half the groups that the invoices for inventory purchases had the detail for purchase quantities and costs, and the invoices to customers for shipments had the detail for sales quantities. Once they were clear on where to get the data the work went fairly well. (RRJ, 3/16/2016)

In future semesters, a detailed in-class discussion about the information provided on sales invoices and shipping documents, as well as the importance of noticing dates, should provide students with the understanding needed to complete phase two (RRJ, 3/16/2016).

Phase three required students to use checks to obtain information to record purchases of long-term assets and services. Students in both the 2015 and 2016 cycles had used checks

to perform work during phase one of the CP and had no issues understanding information provided on checks. Phase four work did not involve the use of authentic documents.

Using work schedules and reports. After using documents to record transactions, students prepared work schedules and reports to use when selecting an accounting method or estimating amounts. Homework problems did not require students to prepare work schedules and reports. Students' lack of understanding about the relationship between amounts recorded in the general ledger and amounts on work schedules created implementation issues throughout both the spring 2015 and 2016 cycles. For example, I noted the following as 2015 students worked to complete phase one:

As I walked around and talked with students I could tell that students were beginning to understand that the aging changed with additional sales on credit and with collections from customers; however, I still had lots of questions about how the aging report related to the accounts receivable account, which indicated they were not making the connection. (RRJ, 2/24/2015)

About a fourth of the groups asked questions related to why the aging and the accounts receivable balance did not agree and seem surprised when I told them it was because they had put a number on the aging report that is different from what they put in the A/R T account. (RRJ, 3/17/2015)

The results of phase one work provided evidence students did not understand how to correctly prepare and use the accounts receivable aging report. The aging report is the tool accountants use to estimate the amount customers will not pay the company (uncollectible amounts). Therefore, I provided the following overview of the entire process during the next class period:

I started with the A/R T account and showed the transactions that change this account. I then related the changes to the entries placed on the aging report and showed them that the total of the A/R aging report must agree to the A/R T account. (RRJ, 3/24/2015)

I also showed students how to identify and record uncollectible accounts using the aging report, revise the aging report, and estimate a reasonable bad debt expense (RRJ, 3/24/2015).

Given the findings in the spring 2015 cycle, I gave the overview described above prior to students beginning work on phase one in the spring 2016 cycle (RRJ, 02/03/2016). I also provided a completed aging report for several customers to give students an example of a correct aging report. I noted the following after incorporating additional in-class discussion and examples:

Students were very slow at understanding the purpose of the detail aging report and the information it provided. Most groups did not agree [totals to the general ledger] and I told them to check and make sure they had all entries posted correctly in the accounts receivable T account and then to compare the T account to the aging report. I explained that they were both tracking the same thing. Students had a very difficult time understanding this concept. (RRJ, 2/3/2016)

Preparing the aging report required the use of several documents and an understanding of how various transactions change the accounts receivable account. Additional in-class discussion and completed examples did not improve students' understanding to the point that they could prepare the aging report without additional step-by-step verbal instructions. I noted the need to facilitate an in-class exercise that requires students to complete the same tasks the CP requires for one customer with a limited number of transactions. The exercise should include the requirement to estimate the uncollectible amount related to the customer (RRJ, 1/20/2016).

Phase two of the CP required students to compute ending inventory values and complete detail schedules of inventory remaining in the warehouse for six different accounting methods using Excel spreadsheets. Students then subtracted the inventory amount from available inventory to determine the cost of goods sold. Homework problems

required students to use given information to compute cost of goods sold and then subtract cost of goods sold from the total inventory available to determine the value of ending inventory. The different approaches to determining ending inventory values caused confusion, and I noted the following as students worked:

They [students] did not seem to recognize that the project required them to do the same thing as the homework. I think this has to do with the fact that the project requires them to compute inventory values and the homework requires them to compute cost of goods sold values, from the opposite perspective. This lack of understanding is evidence that students don't really understand how available inventory breaks down into inventory reported on the balance sheet and cost of goods sold reported on the income statement. (RRJ, 3/26/2015)

I responded to students' questions and explained the process of computing ending inventory values on work schedules as students worked through the tasks at hand. During the following class period, I once again explained the overall process to all students before beginning work on the CP. Students seemed to understand how to compute values; however, they continued to ask questions as they worked slowly and inefficiently (RRJ, 3/26/2015).

In response to these findings, I began phase two during the spring 2016 cycle with an in-class discussion consisting of an overview of each computation and the format of the different Excel schedules. The additional explanations eliminated some student questions; however, most groups were unable to complete the inventory schedules without further step-by-step instructions. I noted the need to compute the ending value of inventory using all six methods for one product, together as a class, prior to beginning inventory work (RRJ, 3/16/2016).

Phase three of the CP required students to record purchases of long-term assets, list each long-term asset on a schedule, and compute depreciation expense. Students then recorded depreciation expense and prepared a work schedule detailing the change in

depreciation expense and accumulated depreciation (walk-forward). Depreciation expense computations and work schedules followed the same format as homework problems. By this time in the 2015 semester, students were approximately a week behind in their work. To recover lost class time, I provided a brief overview of the work required on the CP and asked students to complete phase three work outside of class (RRJ, 3/31/2015). Homework did not require students to complete a walk-forward of accounts. As such, I had to explain how to prepare the report to each group along with the purpose of the walk-forward during class (RRJ, 4/7/2015). I noted the need to include an explanation of how to prepare the walk-forward schedule as part of the written instructions for phase three (RRJ, 4/7/2015).

During the spring 2016 cycle, I discussed the work related to long-term assets, including the purpose of the walk-forward schedule in class (RRJ, 3/30/2016). Furthermore, I added written instructions to explain steps required to complete the work-forward. Students completed phase three work with minimal questions (RRJ, 4/6/2016; 4/13/2016).

Phase four of the CP required students to record transactions related to investments, complete the accounting cycle, and prepare financial statements. Students did not use work schedules to record investments or complete the accounting cycle. I provided formatted Excel spreadsheets for students to use to prepare financial statements. I noted no implementation issues related to using the Excel spreadsheets to prepare financial statements during the 2015 and 2016 cycles (RRJ, 4/14/2015; 4/14/2016).

Additional in-class discussion, answering students' questions, and more detailed written instructions resolved most implementation issues related to using work schedules and reports to complete accounting procedures. I discuss changes to written instructions to clear up confusion in more detail later in chapter four.

Acceptance of ambiguity. Practice problems require students to perform calculations and record transactions using given information. After working practice problems, students agree their work to the one correct answer. The professional accountant records transactions, posts each amount to the general ledger, and prepares work schedules and reports without verification that their work is correct. Furthermore, accountants use the information they prepare to make and support decisions that require the use of judgment. I wanted students to experience the ambiguous work of the professional accountant. As such, I planned to avoid confirming the correctness of students' work.

All students initially resisted working on the next task without verification that they had correctly performed work on the current task. Delays in moving to the next task while students waited for confirmation consumed valuable class time. I consistently told students they had to question the accuracy of their own work, make necessary corrections, and continue working. Students eventually learned accountants do not have answer keys, and their ability to deal with uncertainty increased as they completed more tasks on the CP (RRJ, 2/24/2015; 3/17/2015; 3/26/2016; 4/2/2015; 4/9/2015; 4/14/2015; 1/27/2016; 2/10/2016; 3/23/2016; 4/13/2016; 4/27/2016).

As 2015 students worked on phase one, I noticed that errors made in the cash and accounts receivable account would result in errors on the aging report that may cause incorrect estimates of uncollectible amounts. To prevent the compounding of errors and increase efficiency, I provided correct answers for the cash and accounts receivable account balances, along with aging report totals (RRJ, 2/24/2015; 4/29/2015). I also checked students' work related to inventory using the average method to prevent similar errors when using the other five methods (RRJ, 3/26/2015). All other account balances and report totals

varied with the decisions students made. I did not confirm the reasonableness of students' judgments because I wanted to encourage critical thinking and avoid sending the message to students that all accounting work has a correct answer.

Given the 2015 findings, I provided check figures for the cash and accounts receivable account balances and the aging report totals during the spring 2016 cycle. Additionally, I checked students' computations of ending inventory using the periodic average cost method for accuracy to prevent future computation errors on other methods using the same information (RRJ, 3/23/2016). I provided no answer checks for work on phases three and four, as results varied based on students' decisions.

Many students requested check figures so they would know when they were doing it right. Other students asked for the grade rubric before beginning the work so they could maximize the points they earn (RRJ, 4/27/2016). Providing check figures for all procedures would eliminate the need for students to work with ambiguity, an important element of a professional accountant's work. Giving the grade rubric for each step in the CP shifts the focus from understanding the work of the accountant to earning a grade. I noted providing check figures for tasks that are repetitive and do not require judgment may achieve a better balance of challenge and support in future semesters (RRJ, 4/27/2016).

Using judgment to select and support accounting methods and estimates.

Generally accepted accounting principles (GAAP) provide alternative methods for recording transactions and determining reported amounts. Furthermore, some reported amounts are unknown at the time an accountant prepares financial statements. Professional accountants use judgment to select and justify an appropriate method and estimate amounts. Practice problems did not ask students to use judgment. Therefore, students were unfamiliar with

tasks on the CP that required the use of judgment and had difficulty accepting that a correct answer is a supportable answer. Issues related to students' lack of understanding about how to make and support judgments occurred during both semesters.

Selecting an accounting method. Practice problems required students to determine amounts and record transactions using each alternative accounting method. However, practice problems did not ask students to select and support an appropriate method. Students had to evaluate the impact of alternative methods and then support the selection of the most appropriate method to complete the CP. To prepare 2015 students for CP work, I led the class through a discussion on the advantages and disadvantages of each method as well as the method most appropriate for various situations. Practice problems demonstrated the impact of each method on the financial statements (RRJ, 2/26/2015; 3/26/2015; 4/9/2015; 4/14/2015). When completing CP work, students supported their chosen method with general explanations provided in the textbook without regard to the company's situation. For example, I noted the following while grading inventory work:

Students recommended the perpetual system because it was "more accurate and better tracking" and overlooked the fact that the company is too small to benefit ... [from an investment in a system]. Additionally, students mentioned that they should do LIFO in order to reduce income and save taxes and increase cash flow, which would be the case if inflation; however, the company is not experiencing inflation or deflation and the rationale given generally did not really apply to this company. Students tended to give a textbook answer without consideration ... of the company. (RRJ, 4/13/2015)

Additionally, I noted students did not consider the company's situation when selecting and supporting their choice of depreciation method (phase three), as follows:

Students did not make a statement that their chosen method was the best correlation of the expense to the revenue ... Students tended to support their method, typically, straight-line, with "it is easier to compute." (RRJ, 4/13/2015)

I graded students' work on phase two and three after I provided in-class discussion on how to select a method related to each topic. As such, during the spring 2015 semester, I had no data to support changes in the approach to instruction as students worked. To enhance learning, I provided detailed feedback on phase two and three work and once again discussed the reasons a company in a particular situation may or may not select the various methods (RRJ, 4/14/2015). As I reviewed students' work on phase four, I noted that students demonstrated improvements in their ability to select and support an appropriate method for accounting for investments.

Given the results during the 2015 cycle, I determined the in-class discussions did help students gain a better understanding of how the alternative methods impact financial statements. However, students did not adequately evaluate the company's situation when supporting their chosen method. The instructions for the 2015 CP did not require students to explain the advantages and disadvantages of each method with respect to the company. For the 2016 cycle, I facilitated in-class discussions as noted above and added the requirement for students to state the advantages and disadvantages of each method (RRJ, 3/2/2016; 3/30/2016). Students identified advantages and disadvantages of each alternative and provided support for their selected method; however, students incorrectly evaluated the company's specific situation. For instance, I noted the following after grading students work on phases two and three of the CP:

Phase two: Students struggled with explaining why. ... Answers were very general and did not directly apply to Holistic Health [the Company]. ... Students tended to go with the higher income or the lower taxes justification and did not address the value of inventory. Most students selected a method unsupported by their thoughts. ... For instance, they selected a perpetual method when they said that it was too expensive to have a computer system and there were too many transactions [not true]. Additionally, they talked

about future investors without considering this is a small family owned business. (RRJ, 3/23/2016)

Phase three: Most students selected the straight-line method of accounting because it was "easier" and would "make income look better" for investors and lenders. Most students mentioned that [assets with] maintenance ... should be depreciated using DDB to even out the expense without realizing the company had no assets that required a lot of maintenance expense. ... Students did not refer to Holistic [case company] when supporting which method to use and generally stated reasons out of the textbook. (RRJ, 4/13/2016)

Students' work provided evidence they understood the impact of each alternative method on the financial statements, learning they achieved while working practice problems and participating in class discussions. Despite additional written and verbal instructions, most students were unable to correctly evaluate a given situation and select and support the most appropriate method. Students who practice selecting a method for a given situation as part of the class discussion should better understand how to select the most appropriate method for a specific company.

Estimated Amounts. Financial statements report the economic results of activity for a given period of time or point in time. Most transactions have already occurred, and accountants know the related amounts when preparing financial statements. However, accountants must estimate unknown amounts at the end of the period. The cost of using assets to conduct business during each period is an example of a cost accountants commonly estimate. Practice problems either give amounts accountants estimate or provide information to compute an estimate. As such, students first experienced using judgment to estimate unknown amounts while working on the CP.

The Company in the CP sold goods to customers on account with payment due in thirty days. Not all customers will pay all amounts owed on account. Phase one required

students to estimate the amount of uncollectible accounts using the customer's payment history (aging report) and agreements to pay past due amounts. Practice problems required students to multiply given amounts by given percentages to determine the amount of uncollectible accounts. The 2015 written instructions provided the average percent of historical uncollectible accounts receivable for the Company's industry. Therefore, students followed the procedures to work practice problems and used the industry average percentages to compute a correct answer without considering customers' payment history. To correct this oversight, I explained the following to individual groups:

I explained that using given [industry] amounts without thinking [about the Company] was not sufficient ... they needed to look at the detail of how old the accounts were and the payment history to account for the situations that were different now than what the company or industry experienced in the past ... be able to support what the amount should be using more thought than a standard calculation. (RRJ, 2/26/2015).

As students worked to estimate and record an amount for estimated uncollectible accounts, I noted the following:

Students had a very hard time accepting that there is not just one right answer for the estimated uncollectible amount and there is an acceptable/supportable range and that accountants ... use their judgments to support assumptions. (RRJ, 2/24/2015)

Every group wanted me to confirm that their estimate of bad debt expense was correct. I did not confirm and simply asked them if they could support their answer and told them that accountants don't get their decisions confirmed when they make them; however, they have to be able to support them, and if they can, they are generally considered correct. (RRJ, 3/17/2015)

Access to the industry average percentages misled students into thinking they could estimate the uncollectible accounts expense with a calculation without applying judgment.

Furthermore, during the spring 2015 cycle, the written instructions did not require students to

document their justification for their estimate. As such, students believed a calculated amount was sufficient.

In response to the above findings, I changed the information provided in the instructions during the spring 2016 cycle. I removed the industry average percentages, which encouraged students to compute an amount. Furthermore, I expanded customer payment history information to provide additional ambiguity and required students to first use judgment to determine write-offs. I offered the following assistance to students making their first decision:

Students seemed to have trouble grasping that they were responsible for using what they knew about the customers and accounts to decide which accounts to write off. Most asked if what they were doing "was OK" and I answered with the question of "Do you know why you are not giving up on collecting it or you are giving up on collecting it and writing it off?" I tried to get them to think about what they would say to someone who questioned their decisions. (RRJ, 2/10/2016)

After determining accounts to write-off, students estimated a high, medium, and low amount for future uncollectible accounts using an Excel template. Students then selected and supported the most appropriate of the three estimates. Discussing the decision with their partner helped students realize the ambiguity of the task (RRJ, 2/26/2015). I noted the following as students documented their estimated amount of uncollectible accounts:

Some students seemed to rush through their explanations of the reasons for their chosen estimate. I could tell they did not really know how to support their thoughts. I noticed students were not asking me to tell them if they were making the right choice. They seem to understand now that it is up to them to make a decision and support their decision. (RRJ, 2/24/2016)

After grading students' work on phase one, I noted the following:

Only one group (group 16), was able to do a good job of supporting their high, med, low rationale that considered the payment patterns of their customers. All other groups gave general explanations that could have applied to any

company and ... were incorrect with respect to this company's situation. (RRJ, 2/24/2016)

The change in instructions helped students understand that the work of the accountant requires the use of judgment; however, students did not comprehend how to support their judgments. I noted the need to facilitate a class discussion using a simple in-class exercise with information on two customers and an aging report. The in-class exercise should require students to estimate uncollectible accounts expense in a similar manner to the approach used on the CP (RRJ, 2/24/2016). A demonstration of the thought processes involved in making judgments is necessary for students who have previously only relied on computations to estimate amounts.

Phases two and four did not require students to make estimates. Work on phase three required students to estimate the useful life of long-term assets. Homework problems provided the useful life necessary for computing depreciation expense. As such, work on phase three of the CP was the first phase that prompted students to think about how the accountant determines the useful life of long-term assets. I noted the following as I explained how to determine an estimated useful life to individual groups of students:

The questions they are asking leads me to believe they originally thought those estimates have a right and a wrong amount [time] rather than dependent on the situation of the company. It seems to me that they often overlook the fact that accountants' judgments are dependent on the business situation of the company and how the assets are used to produce revenues. (RRJ, 4/2/2015)

Questions from individual groups also indicated a lack of understanding about how to support an estimated useful life. I consistently explained that the useful life is a judgment backed up by what the accountant knows about the asset. I further clarified that more than one answer is possible; however, the estimate must be reasonable and supported (RRJ, 4/7/2015).

The 2015 instructions for the CP required students to compute depreciation expense without mentioning the need to estimate useful lives of assets or provide support for each useful life. I changed the 2016 instructions and added space for students to list each asset and assign an estimated useful life. Furthermore, students had to provide the primary reason for the length of time selected for each type of asset.

Prior to work on phase three in spring 2016, I led students in a discussion about how a shorter or longer useful life impacts net income. While grading phase three work, I noted that most students supported their estimate of useful lives with a reference to the effect on income taxes and net income. Students overlooked the primary purpose of allocating the cost over the time assets generate revenues (RRJ, 4/13/2016). I noted the need to include discussion and practice about matching the expense with the revenue that assets generate as part of the class discussion. Furthermore, instructors should emphasize a reasonable range of acceptable amounts rather than the one correct answer when discussing the decision-making process with students (RRJ, 4/27/2016).

During both the 2015 and 2016 cycles, I provided the correct answers for transactions recorded using information provided on documents and related computations. Additionally, I wrote detailed comments about the reasonableness of each estimated amount. Lack of time prevented a class discussion about the thought processes that result in reasonable and supportable answers. In future semesters, instructors should allocate class time to a discussion of the process that leads to reasonable judgments.

Structure of the Comprehensive Project

The CP required students to complete all accounting work for the month of December and prepare financial statements for the first year of operations for Holistic Health, a company that purchased and sold five organic health care products from China.

I created all information and structured the work requirements for the CP to mirror a similar business owned by a friend. Students followed written instructions to guide their work.

Written instructions. The written instructions for the 2015 CP began with a general description of the Company, the Company's five products, and the students' role as the accountant. A list of information to use and the tasks to perform for each topic followed the general description. For example, the 2015 instructions for computing the value of ending inventory stated the following:

Information to use:

- 1) Invoice/Shipping documents for sales to customers
- 2) Invoice/Receiving documents for purchases of inventory
- 3) Inventory reports for each method (to be completed)

Determine the value of inventory and cost of goods sold under each of the six methods provided under GAAP. Complete the computation of the inventory and cost of goods sold values for the each of the following methods as of December 31, 2014:

Periodic: FIFO, LIFO, and Average
Perpetual: FIFO, LIFO, and Moving Average

The spring 2015 instructions informed students about which documents to use for the required tasks; however, the instructions did not explain how to do the work or where to document work. As previously discussed, students were unable to complete the CP work without consistent step-by-step verbal instructions and additional in-class discussion (RRJ, 2/17/2015; 2/24/2015; 3/18/2015; 3/24/2015; 3/26/2015; 3/31/2015; 4/2/2015; 4/7/2015; 4/14/2015; 4/21/2015). Students' lack of foundational knowledge and lack of understanding

related to unstructured accounting procedures resulted in the need for more detailed instructions than I had anticipated.

Prior to the 2016 semester, I significantly revised the written instructions to incorporate step-by-step guidance to address questions students commonly asked during the 2015 cycle. For example, the revised instructions for computing the value of ending inventory using one of the six alternative methods stated the following:

Excel Workbook: Complete the inventory schedule for the periodic average cost method for products 4 and 5. Products 1, 2, and 3 are complete.

Important: The company records inventory quantities received on the receipt date noted on the inventory purchase document.

The company records inventory quantities sold on the shipping date noted on the customer invoice.

Step 1: Determine the quantity of purchases and sales for each week and enter the quantity for each week on the average cost report (in Excel). Use the purchase documents and the sales invoices to customers (A/R).

Step 2: Compute the average cost of one unit (round to dollars and cents in Excel).

Step 3: Value the inventory held per the inventory report on 12/31/2015 in Excel:

Units in inventory per the schedule:	_____
x Average cost for 1 unit	\$ _____
= Total value of inventory	\$ _____

Step 4: Compute the value of cost of goods sold in Excel:

Total Available \$ less Value of Inventory = Cost of Goods sold

Step-by-step instructions allowed the students to more efficiently complete inventory reports, a procedure typically performed by the accounting system without input from the accountant.

Additionally, the step-by-step instructions in other areas seemed to eliminate some of the

confusion caused when accounting procedures on the CP followed a different format than homework problems (RRJ, 3/16/2016; 4/13/2016).

The revised written instructions also included steps for evaluating and documenting advantages and disadvantages of accounting methods, as well as directions to compare amounts on work schedules to general ledger account balances. The instructions continuously reminded students to post amounts into accounts and balance the accounts before moving to the next task. Furthermore, I reviewed the work of spring 2015 students and specifically added instructions to explain steps students incorrectly performed. Appendix D provides the expanded spring 2016 written instructions.

The revised written instructions used in 2016 proved more useful to students than the 2015 written instructions (Appendix C). However, students' lack of understanding (as previously described) necessitated many one-on-one explanations and hindered progress. While facilitating the 2016 students' work, I noted additional changes to make when I revise the written instructions in future semesters. A few examples of future changes to make to written instructions follows:

Add a good explanation of how the accounts receivable T account and the cash T account mirror the entries on the aging report. Also, briefly explain the aging report. (RRJ, 1/20/2016)

Add an explanation of probability of collection in the instructions to help students understand how to estimate a reasonable range for bad debt expense. (RRJ, 2/17/2016)

Give some examples of how to support an estimate. (RRJ, 2/24/2016)

In step 9, [inventory] add: What should this company's owners consider when determining the inventory method? Consider the goals of the owners. (RRJ, 3/23/2016)

Add a list of things to check when the balance sheet does not balance. (RRJ, 4/27/2016)

Students have no previous experience working on many of the tasks required to complete the CP. Therefore, instructors must provide additional support to enable students to complete unfamiliar tasks. Written instructions should not eliminate the thinking required to complete the accountant's work. However, step-by-step guidance on some procedures with examples of thought processes should allow students to make progress with fewer questions.

Organization. The spring 2015 students received an envelope of information that included the following:

- 1) written instructions (Appendix C),
- 2) authentic documents: sales orders, checks, shipping documents, etc.,
- 3) pages formatted for students to write journal entries,
- 4) a summary general ledger listing all accounts with balances as of November 30,
- 5) a detail general ledger with December 1 beginning balances for students to post December amounts to accounts and determine December 31 balances, and
- 6) a summary general ledger listing all accounts without amounts as of December 31.

I provided all information on white paper with page numbers by topic. Students removed pages related to each task from the envelope as they worked on the CP. At the end of class, students sorted the pages by topic and placed all pages back in the envelope. I noticed that students spent unproductive time finding pages and organizing their work on their desktops (RRJ, 4/29/2015).

During the spring 2016 cycle, students received the same types of documents and reports previously listed. However, I placed all pages in a three-ring binder to minimize unproductive time managing papers. Furthermore, pages related to each task had a distinct color to make it easier for students to find pages necessary to do their work. The use of a three-ring binder and color-coding reduced the time students spent finding and managing paper. At the end of the 2016 cycle, students suggested that I combine the pages used to write journal entries with the written instructions (RRJ, 4/27/2016). Integrating the journal entries into the instructions should make it more efficient for students to review work related to each task (RRJ, 4/27/2016).

Excel spreadsheets. Students performed all accounting procedures manually during the spring 2015 cycle. Manual work included the posting of amounts into the detail general ledger, summing amounts, and determining the balance for each account. Students posted only a few amounts to most accounts, creating no computational inefficiencies. However, some accounts (such as cash, accounts receivable, and sales) had many amounts, which caused students to spend unproductive time re-computing account balances. Furthermore, students wasted time correcting errors that caused total debits to not equal total credits when preparing financial statements (RRJ, 2/24/2015; 3/26/2015; 4/14/2015; 4/22/2015).

In the spring 2016 cycle, I provided pre-formatted Excel spreadsheets for students to use to record amounts into accounts effected by many transactions. Students continued to manually record amounts into all accounts used infrequently. The Excel spreadsheet eliminated unproductive time summing recorded amounts during each phase of the CP. However, writing some amounts on the detail general ledger and entering other amounts into Excel spreadsheets did not provide students with an efficient method of determining if total

debit amounts equaled total credit amounts (balanced) as they progressed through each task. Failure to balance at the end of each task resulted in students spending three to five hours at the end of the semester balancing the general ledger to obtain amounts used to prepare financial statements (RRJ, 4/22/2016).

As previously discussed, I believe it was important for students to manually post each recorded amount into the proper account so students would see how each transaction changes the account balances. However, I do not believe there is benefit to re-computing account balances and total amounts each time students post a new amount to an account. To save time in future semesters, I will place all accounts on one Excel spreadsheet and format the spreadsheet to automatically compute totals for all debits and credits. The use of an Excel spreadsheet to sum all accounts will give students a tool to easily check to determine if debits equal credits for all accounts as they complete each task on the CP (RRJ, 4/27/2016).

Order of tasks. The IFA course typically begins with a review of the accounting cycle, followed by revenue recognition (sales). The instructor then progresses through the major asset categories reported on the balance sheet. I ordered work on the CP in the spring 2015 semester by the sequence of topics learned in a traditional IFA course. The work naturally fell into four phases: sales and accounts receivable, inventory, long-term assets, and the accounting cycle. Work related to sales and accounts receivable required students to use a variety of documents to record transactions, make estimates, post amounts, balance accounts, and prepare an aging report. Inventory-related work centered around computing ending inventory using six different methods. After determining the effect of each accounting method, students selected and supported the appropriate method to use to record inventory transactions. Work related to long-term assets began with students interpreting

accounting guidance to determine if a cost was an asset or an expense and ended with estimating useful lives and selecting a depreciation method. To complete the CP, students recorded year-end adjustments for three different investments, adjusted other account balances as required, and then used the general ledger to prepare financial statements. At the end of the 2015 semester, I noted no implementation issues related to the order of work on the CP (RRJ, 4/29/2015).

During the 2016 semester, I grouped the topics into the same phases as the 2015 cycle and established a completion date for each phase. While reviewing the project requirements at the end of the 2016 cycle, I noted that the first phase of the CP (sales and accounts receivable) required students to record more transactions, use more documents, and perform more complex tasks than any other phase of the CP. Furthermore, students had to use judgment to make one of the most subjective estimates. The requirements of phase one overwhelmed students who lacked foundational understanding of the work of the accountant, as previously discussed. Inventory work was familiar to students and less complex than other tasks. Work related to long-term assets required students to use judgment and select an alternative accounting method in a familiar context. Accounting for investments involved no documents, fewer steps to complete the work, and unfamiliar accounting alternatives. I noted that ordering the work according to familiarity and complexity of tasks would allow students to build on prior knowledge as they completed CP work (RRJ, 4/29/2016). The recommended order of topics, from the least to most complex tasks, follows:

Phase 1: inventory

Phase 2: long-term assets

Phase 3: investments

Phase 4: sales and accounts receivable

Phase 5: financial reporting

The revised order also provides time and opportunities for instructors to provide additional instruction about how accountants use judgment.

Time Constraints

An instructor of an IFA course has approximately 40 hours of class time to help students achieve learning objectives. Lectures about accounting concepts and procedures and practice of structured problems typically consumes most available class time. Due to the number of accounting procedures students learn in the traditional IFA course, it is challenging for instructors to achieve current course objectives without including critical thinking practice. As previously discussed in the findings to research question one, the CP requires students to consistently practice critical thinking skills. Giving students consistent practice of all steps in the critical thinking process requires time and instruction. As such, one of the most important implementation issues that occurred during the study concerned effectively allocating limited class time to discussion, practice problems, and CP work.

Students prepared to perform the work of the accountant on the CP through three primary activities that included online video lectures, structured practice problems, and in-class discussion. To provide class time for CP work, students viewed online lectures and completed practice problems outside of class. During class, I facilitated discussion on the more difficult accounting procedures. The initial 2015 plan allocated five class periods for work on the ACP, about half of the total class time to work on the CP, and the remaining time to discussions and practice problems. I planned for students to work on the CP during six full class periods and thirteen partial class periods. Due to uncertainty about the time

required to complete different tasks, I did not assign due dates for each topic of work on the CP.

I began the 2015 semester cycle with the general schedule provided in Table 4.8. Students began work on the ACP during the first day of class, and I immediately noted the following about the pace of work:

It seemed to me that students acted as if they were unsure of most decisions they were making. The uncertainty along with a lack of understanding appeared to be what was causing students to take twice as long to accomplish the first part of the project (making journal entries and posting to T accounts) than I anticipated. (RRJ, 1/13/2015)

During the second week of class, I noted the following related to students' progress:

I am concerned about how long it took the students to do 25 journal entries from checks where the debit is easy to determine and the credit is cash, 5 entries for cash sales, and 1 entry for credit card sales on account owed and collected. I expected that students would be half way finished with adjusting entries by the end of the second week. I believe that students were so slow because they really didn't understand how to make journal entries from a simple list of transactions. (RRJ, 1/22/2015)

A lack of foundational knowledge and unfamiliarity with documents (as previously discussed) caused students to complete ACP work slower than I expected (RRJ, 1/27/2015).

To avoid using class time allocated to the CP, I asked students to attend additional evening work sessions during the second and third weeks. Less than half of the students came to the first extra session, and all students attended the second extra work session (RRJ, 1/26/2015).

All groups finished the ACP by the end of the third week according to plan (RRJ, 1/28/2015).

Students began work on the CP towards the end of the fifth week of class as planned. During phase one, I became concerned that students were not adequately learning the related material outside of class, and I used more class time than expected to lecture on accounting

Table 4.8

2015 Assignment Schedule

Week	Day	Topic of Discussion/Course Assignments
1	T	Goals of the Course / Prerequisite Test
	TH	Accounting Cycle Project
2	T	Accounting Cycle Project
	TH	Accounting Cycle Project
3	T	Accounting Cycle Project
	TH	Complete Accounting Cycle Project
4	T	Accounting Guidance / Revenue Recognition
	TH	Revenue Recognition
5	T	Revenue – Installment / Long-term Contracts
	TH	Cash - Bank Reconciliation / Begin Comprehensive Project Work
6	T	Comprehensive Project Work
	TH	Accounts Receivable / Comprehensive Project Work
7	T	Comprehensive Project Work
	TH	Inventory / Comprehensive Project Work Reflection Paper 1 Due: Revenue and Account Receivable
8	T	Inventory: FIFO, LIFO, Ave / Comprehensive Project Work
	TH	Comprehensive Project Work
9	T	Inventory: LCM / Errors /Comprehensive Project Work
	TH	Long-term Assets /Comprehensive Project Work Reflection Paper 2 Due: Inventory
10	T	Use of Long-term Assets: Depreciation / Comp. Project Work
	TH	L/T Assets: Sale/Impairment /Comprehensive Project Work
11	T	Liabilities and Investments/Comprehensive Project Work Reflection Paper 3 Due: Long-term Assets
	TH	Investments: Equity/Comprehensive Project Work
12	T	Comprehensive Project Work
	TH	Income Statements /Comprehensive Project Work Reflection Paper 4 Due: Investments
13	T	Comprehensive Project Work
	TH	Cash Flow Statements/Comprehensive Project Work
14	T	Comprehensive Project Work Reflection Paper 5 Due: Financial Statements / Overall Thoughts
	TH	Complete Comprehensive Project Work
15	T	Review of Comprehensive Project and Course Objectives

procedures. The following notes in my RRJ provide an example of unexpected and time-consuming instruction needed in class:

I provided an overview of accounts receivable and how the accounts receivable aging ties into the four transactions that impact the reporting of accounts receivable. We worked together as a class through a quick example of the net and gross method of recording sales and an example of estimating bad debt expense using the income statement approach and the balance sheet approach and then the two together. I explained when each is used and why each approach is used. (RRJ, 2/19/2015)

The lecture repeated the material provided by the online video lectures. Students' lack of understanding (as previously discussed) created the need to continue unplanned in-class discussions to prepare students for work on the CP throughout the semester.

I replaced objective tests with short reflection papers. The initial schedule reflected my plan for students to complete reflection papers outside of class with little explanation. However, encouraging students to reflect on the work of the accountant consumed considerable class time. (See findings related to research question four.) Furthermore, I used class time to discuss feedback to students on CP work and required students to make corrections to their work (RRJ, 2/26/2015; 3/2/2015; 3/17/2015; 3/24/2015; 3/31/2015; 4/14/2015; 4/21/2015).

At the halfway point in the 2015 semester, students were working at different paces on different tasks and topics. All students were progressing slower than I had anticipated. Students working on one topic during a class period where I discussed another topic were not able to timely apply in-class discussion to work (RRJ, 3/17/2015). I offered an extra evening work session and extended the due date for the work on the first topic by one week to allow all students to finish phase one and make up lost time on phase two (RRJ, 3/18/2015).

As the semester continued, groups of students continued to work at different paces and used more time to complete tasks than I expected. I noted the slow pace was due to students' lack of understanding or careless recording of amounts into accounts as previously discussed (RRJ, 4/10/2015; 4/22/2015; 4/29/2015). I added three additional evening work sessions and required students to perform accounting procedures related to long-term assets outside of class (RRJ, 3/31/2015). Work on long-term assets outside of class, along with the extra evening work sessions, provided students time to complete all CP work by the end of the semester.

To address the time issues that occurred in in the 2015 cycle, I made the following previously discussed changes prior to beginning the spring 2016 cycle:

- 1) eliminated the ACP,
- 2) added step-by-step written instructions,
- 3) changed the structure of the CP (three-ring binder and color coding), and
- 4) added Excel spreadsheets.

Furthermore, I changed the number of times the class met from twice each week to one evening each week to eliminate unproductive time starting and stopping work (RRJ, 4/29/2015). Table 4.9 presents the schedule I followed for the spring 2015 and spring 2016 cycles. The table shows the number of minutes I allocated to lectures (class discussion and exercises) and work on the CP each week. All weeks consisted of 160 minutes of class time, except weeks eight and 15 during 2015, which had only one class period due to inclement weather and the end of the semester, respectively.

Table 4.9

Allocation of Class Time: 2015 and 2016 Cycles

Week	Topic of Discussion / Work	Lecture 2015	Project 2015	Lecture 2016	Project 2016
1	Course Introduction	40		30	
	Overview: Accounting Cycle				
	Project (ACP)	30			
	Work on ACP		90		
	Pre-requisites Test			60	
	Overview of Accounting Cycle			70	
2	1 st Pre-requisite Test	40			
	ACP Work		120		
	ACP Work (Extra Session)		60		
	Revenue Recognition Principles			90	
	Comprehensive Project (CP): Overview and Introduction				30
	CP Work: Phase 1 (Sales and Accounts Receivable)				40
3	2 nd Pre-requisites Test	60			
	Overview of Adjusting Entries	45			
	ACP Work		55		
	ACP Work (Extra Session)		90		
	Revenue: L/T Contracts			75	
	CP Work: Phase 1				85
4	Feedback on ACP Work	30			
	Revenue Recognition Principles	130			
	Sales and Accounts Receivable: Procedures/Documents/Aging			30	
	CP Work: Phase 1				130
5	Revenue Recognition - Long-term Contracts	80			
	Cash / Bank Reconciliation	30		30	
	Accounts Receivable Procedures: Gross and Net Methods/Estimates			40	
	CP Work: Phase 1		50		90

(continued)

Week	Topic of Discussion / Work	Lecture 2015	Project 2015	Lecture 2016	Project 2016
6	CP Work: Phase 1		80		70
	Estimating Bad Debt / Gross and Net Methods	80		30	
	Revenue Recognition Test (Topics not on CP)			60	
7	CP Work: Phase 1		120		130
	Estimating Bad Expense			30	
	Inventory: Periodic/Perpetual	40			
8	Inventory: Periodic and Perpetual/ FIFO, LIFO, Average	80		45	
	Discussion/Feedback: CP Phase 1			20	
	Correct Errors on CP: Phase1				40
	CP Work: Phase 2 (Inventory)				55
9	Discussion/Feedback: Reflection Paper	30		30	
	Lower of Cost or Market	15			
	Long-term Assets Purchases	40			
	Inventory Methods			25	
	CP Work: Phase 1 and 2		35		
	CP Work: Phase 2		40		105
	CP Work: Phase 1 and 2 (Extra Work Session)		120		
10	Discussion/Feedback: CP Phase 1	20			
	Discussion/Feedback: Reflection Paper	25			
	Long-term Assets: Depreciation	20			
	Long-term Assets: Impairment	25			
	CP Work: Phase 2		70		
	Lower of Cost or Market / Inventory Adjustments			20	
	CP Work: Phase 2 and Phase 3				140
11	Discussion/Feedback: Reflection Paper	10		20	
	Feedback/Correction: CP Phase 2	20		20	20

(continued)

Week	Topic of Discussion / Work	Lecture	Project	Lecture	Project
		2015	2015	2016	2016
11	Accounting for Investments	40			
	Long-term Assets: Depreciation			30	
	CP work: Phase 3 (L/T Assets)		60		70
	CP Work: Phase 4 (Investments and Accounting Cycle)		30		
	CP Work: Phase 3 (Out-of-class work)		90		90
12	Discussion/Feedback: Reflection Paper	35			
	CP Work: Phase 3 and 4		125		
	CP Work: Phase 3 and 4 (Extra Session)		120		
	Long-term Assets: Impairment			40	
	Accounting for Investments			90	
	CP work: Phase 3				30
13	Feedback/Correction: CP Phase 3				30
	CP Work: Phase 4		85		50
	Accounting for Investments	35			
	Cash Flow Statement	40		60	
	Discontinued Operations			20	
14	Discussion/Feedback: Reflection Paper			20	
	CP Work: Phase 4		110		120
	Adjusting Entries	20			
	Cash Flow Statement	30		20	
	CP Work: Phase 4 (Extra Session)		90		
15	Discussion/Feedback: CP Phase 3 & 4	30			
	Review for Final Exam	50			
	CP Work: Phase 4				160
	CP Work: Phase 4 (Extra Session)				180
	Total Class Time: Minutes	1,170	1,070	1,005	1,395
	Total Class Time: Hours	19.50	17.83	16.75	23.25
	Extra Work Sessions: Hours		9.50		4.50
	Total CP Hours (Class and Extra)		20.42		27.75
	Total ACP Hours (Class and Extra)		6.91		0.00

Significant changes I made to the use of class time during the 2016 cycle included the following:

- the initial test over foundational knowledge and accounting procedures occurred during the first class,
- elimination of ACP work,
- increased in-class discussions about the relationships between homework and CP work,
- students completed depreciations expense work schedules and walk-forwards in phase three outside of class (planned),
- established due dates for each of the four phases of the CP, and
- added time for students to correct CP work.

Eliminating the use of the ACP to review the accounting cycle and giving the pre-requisite test on the first class meeting did not result in a noticeable increase in 2016 students' foundational knowledge compared to 2015 students (see previous discussion). However, discontinuing the use of the ACP provided approximately 5 hours of additional class time for students to work on the CP. Students used the additional class time to document decisions made and correct their work on the CP. Overall, 2016 students worked approximately seven more total hours on the CP than 2015 students. The number of hours students worked in extra sessions decreased by about half in 2016 compared to 2015.

After incorporating findings from the 2015 cycle, I adjusted 2016 class discussions to compensate for students' lack of foundational knowledge and better prepare 2016 students to complete specific tasks on the CP. I purposely provided class discussion directly applicable

to the work most students performed during the same class period. Overall, I facilitated approximately two fewer hours of class discussion during 2016 than during 2015.

Implementation issues related to students' lack of foundational knowledge, unfamiliarity with documents and work schedules, and careless recording of amounts to accounts (as previously discussed) caused students to take more time to complete CP work than I expected during both cycles. I implemented the 2016 schedule according to plan during the semester; however, incorrect recording of amounts to accounts created the need for extra work sessions at the end of the semester to provide time to balance accounts (RRJ, 4/22/2016; 4/29/2016). Without careless recording errors, students in the 2016 cycle would have completed all CP work during class.

Research Question Three

I integrated the CP into the IFA course to require students to perform the work of a professional accountant. Accounting work involves using judgment and making decisions in addition to computing amounts and recording transactions. I replaced periodic objective tests over concepts and structured accounting procedures with short reflection papers (RP) to encourage students to contemplate accounting judgments and decisions. Students responded to question prompts as they wrote each RP. I discuss changes to question prompts with the findings for research question four.

I coded students' written responses to question prompts during the 2016 semester using the constant comparative method (Strauss & Corbin, 1998) described in chapter three. I began the coding process with a priori codes related to Mezirow's (1991) model of reflective thinking about professional practice and added other codes as needed. I found that all responses fell within the a priori codes, except for responses that contained incorrect

statements related to accounting procedures. I then summarized the results of the coding process and addressed the following research question:

How does students' thinking about the issues professional accountants face change as students complete an authentic comprehensive problem-based project and short reflection papers?

Mezirow's (1991) four-stage model of reflection includes habitual action non-reflection, thoughtful action non-reflection, process reflection, and premise reflection. Habitual action occurs as one interprets a current situation based on previous experiences with no reflective thought. Thoughtful action is a cognitive process that uses existing knowledge without evaluating the basis of the knowledge. The third stage, process reflection, involves recognizing and questioning knowledge and assumptions to achieve further understanding. Individuals who seek to understand why or revise their thoughts and perspectives about a situation or experience practice premise reflection (Kember et al., 2000; McAlpine et al., 2004; Mezirow, 1991). Premise reflection "involves us becoming aware of why we perceive, think, feel, or act as we do" (Mezirow, 1991, p. 108).

Table 4.10 presents the four stages of reflection, along with the corresponding application of knowledge (characteristics) and types of thoughts that occur as one performs accounting work (evidence). Characteristics describe one's approach to using new knowledge. Evidence describes the content and focus of the thought. The far-right column presents an example student response that contains evidence coded to the related stage of reflection. Bolded italic words indicate the thoughts that gave evidence of the stage of reflection.

Table 4.10

Stages, Characteristics, and Evidence of Reflective Thinking (Mezirow, 1991), Augmented and Adapted to Accounting Work

Stage of Reflection	Characteristics	Evidence	Example Student Reflection
1 Non-reflection: Habitual Action	Content focus	States declarative knowledge: definitions, formulas, and facts	<i>The weighted average method will render cost of goods sold and net income values between those reported by FIFO and LIFO, and are fairly easy to compute.</i> (RP2, S20, 2016).
1 Non-reflection: Habitual Action	Relies on previous knowledge	Refers to structured, routine procedures	One thing that accountants need to be aware of is when a discount is offered to a customer. ... The company will determine what that discount rate is and it is the accountant's job to record it appropriately . This is done by either using the gross method (when the company does not expect the customer to use the discount) or the net method (used when customers typically) (RP1, S17, 2016).
2 Non-reflection: Thoughtful Action	Uses knowledge without evaluating the basis for the knowledge	Describes accounting concepts and rules	Accountants have to determine whether or not certain expenditures are expensed or capitalized with the cost of an asset. In order to be capitalized, the costs must provide a probable future economic benefit to the company. If they do not provide any future benefit beyond a year, then they will be expensed. In order for costs to be capitalized after the asset has already been in use, they must make the asset more efficient or extend its useful life; otherwise, these costs will be expensed (RP3, S28, 2016).

(continued)

Stage of Reflection	Characteristics	Evidence	Example Student Reflection
2 Non-reflection: Thoughtful Action	Uses knowledge without evaluating the basis for the knowledge	Applies concepts and rules to unstructured procedures	The accountant must also decide whether to report an asset at historical cost or fair market value. This is hard because the accountant's goal is to report numbers that best represent the company but may have a hard time finding a reliable fair market value of their assets. <i>If they cannot find reliable and objective fair market value estimates they must report it at historical cost</i> (RP3, S29, 2016).
2 Non-reflection: Thoughtful Action	Uses knowledge without evaluating the basis for the knowledge	Describes the impact of procedures on financial reporting	I previously thought ... when it came to contractual revenues, the revenues would just be split up equally between the number of years the contract occurred. ... Now think ... that the <i>revenues for a contract are split up based on the amount of work that occurs in the year</i> . One must analyze the amount of expenses that occurred during that period compared to the overall expenses and after finding a percentage, <i>use that percentage to determine the amount of revenue that can be recorded. Because ... of the matching principle, it must be done this way. The expenses incurred during the period must directly correlate with the revenue</i> (RP1, S23, 2016).
3 Process Reflection	Questions assumptions and recognizes ambiguity	Recognizes the accountant has alternative choices and uses judgment; Describes the impact of alternatives on financial reporting	I previously thought ... FIFO was the only way to account for inventory. Now think ... depending on how the firm wants to allocate costs, <i>they choose between a few methods</i> in order to calculate their inventory costs. For example, <i>FIFO, LIFO, or Weighted Average</i> . Because ... I learned that depending on inflation or deflation, certain methods will help <i>show a higher net income</i> , which are the goals of some companies (RP4, S21, 2016).

(continued)

Stage of Reflection	Characteristics	Evidence	Example Student Reflection
3 Process Reflection	Questions assumptions and recognizes ambiguity	Recognizes the use of estimates; Describes the results of estimates on financial statements	I previously thought that the asset comes with the useful life. I never thought <i>the accountant is the one to decide and estimate the amount of time that he/she thinks the asset will last. Now think that it is the accountant job to estimate the useful life of any purchased asset and even estimate the amount the company will be able to sell the asset at</i> , by the end of its useful life. Because <i>if the accountant doesn't estimate ... he/she won't be able to find the depreciation expenses to match the revenues ...</i> my partner and I were so surprised that we have to estimate it by ourselves. ... But now we know that it is an accountant's responsibility (RP3, S16, 2016).
4 Premise Reflection	Understands why	Gives evidence of why one alternative may be better than another, or acknowledges contextual factors and relationships	When accounting for inventory ... decide whether the company is going to use FIFO [first in first out] LIFO [last in first out] or the weighted average method. <i>Each ... will have a different impact on the financial statements ... depending on what the economic trend is and what their end goal for the periods might be. If the prices of goods a company are buying are generally inflating a company that wants to see higher profits will choose FIFO, this will cause cost of goods sold to be lower increasing their gross profit. Usually be chosen by public companies who want to make profits look good and taxes are not a huge concern. Smaller companies that do not have large cash flows may choose LIFO which would ... result in less taxes. ... The weighted average method ... if something is very seasonally cost dependent and the prices always changing</i> (RP2, S11, 2016).

(continued)

Stage of Reflection	Characteristics	Evidence	Example Student Reflection
4 Premise Reflection	Views things from a different perspective after reassessing knowledge and beliefs	Provides evidence of a change in perspective	<i>I previously thought accountants had roles that could easily have been replaced by computers and that they just plugged in numbers. I know now that accountants must make many important decisions for the company and have to be familiar with the individual financial state of the company in order to make these decisions</i> (RP4, S28, 2016).

Students who wrote about declarative knowledge and structured routine accounting procedures demonstrated habitual action (non-reflection). Describing accounting concepts or rules and using documents and work schedules to perform accounting procedures indicate thoughtful action (non-reflection). Additionally, thoughts about the results of accounting procedures on financial statements serve as evidence of thoughtful action (non-reflection). Students who demonstrated process reflection recognized that professional accountants have alternatives and must use judgment when performing accounting procedures. Furthermore, process reflection acknowledged the impact of various alternatives and estimates on financial reporting. Responses coded as premise reflection discussed why one alternative may be better than another given the context or the impact on financial reporting. Premise reflection also included a change in perspective about accounting work. I assigned codes based on the type of evidence noted in students' reflections.

During the 2015 and 2016 semesters, I made changes to question prompts and related instruction to encourage deeper reflection. I reviewed students' responses as they completed all RPs to inform my changes; however, I did not code students' responses on each RP until after the 2016 semester ended. I discuss all changes to question prompts and instruction in the findings related to research question four. I resolved most implementation issues associated with using RPs for assessment during 2015 and then coded 2016 students' responses to question prompts. The findings below relate only to students' responses during the 2016 semester.

Reflection about Issues and AHA Moments

Two of the question prompts on the RPs asked students to reflect about their general understanding of the accountant's work. The first question prompt required students to

reflect on the issues accountants consider as they record transactions and prepare financial statements. The last question prompt encouraged students to reflect on significant moments in the learning process (AHA moments). Responses to the last prompt primarily related to accounting procedures and the issues accountants resolve. As such, I discuss the results of the two question prompts together.

Table 4.10 presents excerpts of students' responses to both the first (issues) and the last (AHA moments) question prompts. The excerpts in Table 4.10 show the progression of thought from the lowest to the highest stage of reflection, as previously discussed.

Table 4.11 presents the number and percentage of student responses to the issues and AHA moments question prompts that give evidence of one of Mezirow's (1991) four stages of professional reflection. Students' answers to a question prompt often contained more than one response. A response contained a group of sentences that described one primary thought. I assigned each response only one code.

Students' understanding of the difference between a routine accounting procedure and a decision made by the accountant directly affected the depth of reflection. I discuss changes to instruction and question prompts to clarify the distinction in findings related to research question four. Additionally, the work students performed in each phase of the CP heavily influenced the nature of students' reflections. A discussion of the students' perception of the work of the accountant follows.

Table 4.11

Students' Reflection about Issues and AHA Moments

Stage of Reflection	RP 1: Sales and Accounts Receivable		RP 2: Inventory		RP 3: Long-term Assets		RP 4: Overall Learning		Total	
	QTY	%	QTY	%	QTY	%	QTY	%	QTY	%
Stage 1: Non-reflection: Habitual Action	86	35.6%	89	50.9%	35	17.0%	33	30.0%	243	33.2%
Stage 2: Non-reflection Thoughtful Action	55	22.7%	23	13.1%	57	27.7%	25	22.7%	160	21.8%
Stage 3: Process	79	32.6%	52	29.7%	86	41.7%	24	21.8%	241	32.9%
Stage 4: Premise	22	9.1%	11	6.3%	28	13.6%	28	25.5%	89	12.1%
Total	242	100%	175	100%	206	100%	110	100%	733	100%

Reflection paper one. Students wrote the first RP after completing phase one of the CP. The time-consuming and more challenging tasks in phase one consisted of the following:

- 1) recording transactions using sales invoices and customers checks (15%),
- 2) preparing an aging report using sales invoices and customer checks (20%),
- 3) agreeing the aging report to general ledger account balances (15%), and
- 4) estimating, supporting, and recording uncollectible accounts and bad debt expense (50%).

The percentages in parentheses is the portion of the total time required to complete each task in phase one. Reflection that only described account names used to record transactions fell in stage one, whereas thoughts about using sales invoices and checks to record transactions and prepare the aging report fell within stage two. Students who described judgments required to determine write-offs and estimate bad debt expense demonstrated process reflection. Reflection about how accountants support the bad debt expense estimate provided evidence of premise reflection.

The first half of the work in phase one of the CP did not require students to use judgment. Students tended to write about easier-to-describe repetitive procedures (stage one) or their struggle to agree the amounts on the aging report to the account balance after making incorrect entries (stage two). As such, more than half (58.3%) of the students' responses to question prompts demonstrated non-reflection. Determining accounts to write-off and estimating the annual bad debt expense was the students' first experience using their own judgment to perform accounting procedures. The challenge captured the students' attention and almost a third of students included a description of making estimates (stage three) in

response to the question prompts. Few students (9.1%) described supporting judgments (stage four). Students struggled to explain their estimate of uncollectible accounts on the CP, which may have led to an unwillingness to describe the process on the RP.

Reflection paper two. Approximately 70% of the work in phase two of the CP consisted of using Excel worksheets to compute the value for ending inventory using six alternative methods. Students then determined and supported an appropriate method and adjusted the inventory balance to agree to the computed historical cost. As such, approximately half of the students' responses reflected about computing ending inventory (stage one). Almost 30% of students' responses recognized the accountant has a choice of one of the six alternatives (stage three.) Evidence of thoughtful action non-reflection (stage two) described using shipping and receiving documents to find information necessary to complete the inventory schedules. The few students who showed evidence of premise reflection (stage four) primarily discussed contextual factors that made one method more appropriate than another method.

Reflection paper three. Students began work in phase three of the CP with applying accounting guidance to decide if they should record purchases of goods or services as an asset or an expense (stage two reflection). The next decision entailed estimating a reasonable residual value and useful life for each of the company's long-term assets (stage three reflection), followed by providing contextual support for estimated amounts (stage four reflection). About half of the work in phase three required students to use their own judgment to obtain information necessary to record transactions. Computations on Excel spreadsheets and recording routine transactions (stage one reflection) constituted a minimal part of the work on phase three.

The number of responses in each stage of reflection followed the time spent completing phase three of the CP. Students' responses discussed the challenge of applying accounting rules to a variety of purchased goods and services (stage two) or the estimates made prior to computing depreciation expense (stage three). Almost 70% of responses to question prompts provided evidence of stage two or stage three reflection. By the third RP, students had achieved an understanding of the difference in accounting procedures and the judgments and decisions accountants make when performing their work. As such, students responded with fewer stage one reflections that merely stated accounting procedures with no thoughts about the use of judgment. The experience of selecting and supporting estimated useful lives and the appropriate depreciation method resulted in an increase in stage four thoughts compared to previous RPs.

Reflection paper four. The prompts on RP four asked students to describe significant points of learning throughout the entire course. Approximately 30% of reflection described accounting procedures students believed were critical to their understanding of the work of the accountant (stage one). Thoughtful non-reflection primarily discussed the challenge of applying accountant guidance or using documents (stage two). Students who noted the significant amount of judgments and estimates accountants make demonstrated process reflection (stage three). Most reflection in stage four discussed a change in perspective about the type of work accountants perform. Over the semester, students learned to do work that ranged from routine procedures that require little thought to making and supporting estimates and judgments. Students' descriptions of learning about the different types of work resulted in responses spread fairly-equally across the stages of reflection.

Total responses. More than half (55%) of the students' responses gave evidence of stages one and two, habitual action and thoughtful action non-reflection. Students recognized that recording transactions and computing amounts is foundational to an accountant's work. Non-reflective responses on each RP closely followed closely to the amount of computations required in each phase of the CP. The number of responses in stage two on each RP relate closely with the proportion of time spent using documents to determine amounts. Process reflection occurred in approximately one-third of students' responses. Students gained a better understanding of how accountants select an accounting method and estimate amounts as they progressed through the CP tasks. As understanding increased, students were more willing to describe factors that influence judgments and estimates (stage four).

Reflection About Homework and Comprehensive Project Work

Question prompt two asked students to reflect on the accounting work performed when doing homework (practice problems) and completing the CP. After coding students' responses according to Mezirow's (1991) four stages of reflection, I further associated each reflection as a thought related to doing homework or CP work. Students' reflections about homework and CP work were distinctly different. As such, I present and discuss the findings related to homework and CP work separately.

Comprehensive project work. The series of reflections that follow illustrate a progression of thinking about CP work from stage one to stage four. Evidence of a stage one reflection follows:

The easy part of the case work is just *transferring numbers from table into other tables. Its just simple busy work that doesn't require much thought.* Much like the homework, I enjoyed working with the periodic methods more. Everything together makes more sense to me as opposed to separating the

transactions into individual sales each time there is a transaction. I also found it much easier to get the concepts down when there were *examples to look at* for the different methods. (RP2, S8, 2016)

Student 8 refers to using Excel to compute ending inventory under the six different methods.

Students inputted the same quantity of goods purchased and sold on different formats of

Excel suitable for each method. Student 21 refers to the use of documents and schedules to perform the same accounting work:

In the case, *we are forced to make our own formulas and inventory schedules*. For example, *instead of being told when and how much* of inventory was sold, we *have to look at the invoices* to figure out quantity and timing of the sale. From there, we derive from which of the company's inventory purchases we take and use from depending on the time of the sale. (RP2, S21, 2016)

In this stage two reflection, Student 21 noted the requirement to find and interpret information to input into different formats of Excel. He notes the unstructured nature of the work. In the following excerpt, the same student then recognizes in another reflection that the accountant must select and support the most appropriate method and determine the cost of inventory:

Additionally, instead of being told which inventory method to use, *we are tasked with the responsibility of choosing which method* is best for the company using our own reasoning and justification. (RP2, S21, 2016)

Acknowledging that GAAP provides a choice of alternative accounting methods is a stage three reflection. Student 5 moves into stage four reflection as he describes the process of estimating an asset's useful life:

We had to come up with reasonable useful lives for the capitalized costs *by considering our line of business, how often the assets would be used, and what they would be used for*. For example, my partner and I concluded that costs classified as *furniture and fixtures used for employees in the office would likely have a longer useful life than those used in the warehouse, which are constantly under wear as products are being moved*. (RP3, S5, 2016)

Student 5 explains why he gave a longer estimated useful life to furniture and fixtures after considering the company's operations.

Table 4.12 provides the number of students' responses about CP work that fell within each stage of Mezirow's (1991) model of professional reflection. The percent column contains the percent of the total number of responses to question prompts on each RP that fell within each stage. As previously discussed, students wrote RPs that correlated with work on the CP. The previous section provides a description of the tasks in each phase.

Reflection paper one. The question prompt asked students to compare the type of thinking required to complete work performed on homework and on the CP. Responses suggest students did not view the work of accounting procedures related to sales and accounts receivable as routine and repetitive (stage one). Approximately 27% of the students' responses described the challenge of using sales invoices, checks, and reports to determine amounts or line items on the financial statements (stage two). Thoughts about using the same documents to prepare the accounts receivable aging report also gave evidence of stage two reflection.

Approximately 61% of the students' reflections discussed the time-consuming and challenging task of using the aging report and customer history to estimate uncollectible accounts and bad debt expense (stage three). Eight responses noted reasons to support an estimated amount of bad debt expense or a new revelation that accounting is more than mathematics, giving evidence of premise reflection. All students described the challenge of considering a variety of factors to estimate bad debt expense. As such, slightly more than 70% of students' responses described judgments and decisions made by the accountant.

Table 4.12

Students' Reflection about Comprehensive Project (CP) Work

Stage of Reflection	RP 1: Sales and Accounts Receivable		RP 2: Inventory		RP 3: Long-term Assets		RP 4: Overall Learning		Total	
	QTY	%	QTY	%	QTY	%	QTY	%	QTY	%
Stage 1: Habitual	0	0.0%	37	48.7%	9	16.1%	31	24.0%	77	23.3%
Stage 2: Thoughtful	19	27.1%	23	30.3%	8	14.3%	20	15.5%	70	21.1%
Stage 3: Process	43	61.5%	9	11.8%	25	44.6%	33	25.6%	110	33.2%
Stage 4: Premise	8	11.4%	7	9.2%	14	25.0%	45	34.9%	74	22.4%
Total	70	100%	76	100%	56	100%	129	100%	331	100%

Reflection paper two. The question prompt asked students to reflect on the easy and challenging parts of CP work. Students spent approximately 75% of their time working on phase two of the CP computing ending inventory six different ways using Excel spreadsheets. All mention of computations fall into stage one reflection. Students who discussed the use of documents to find the numbers to enter on different formats of Excel spreadsheets or reporting amounts on financial statements provided evidence of stage two reflection. Approximately 80% of students' responses were non-reflective. The nine responses that demonstrated process reflection followed a discussion of computing amounts with thoughts about the differences in amounts reported on the financial statements under various methods. The few students who showed evidence of premise reflection (stage four) described why one method may be more appropriate than another method. Work related to inventory was heavily dependent on calculating the value of ending inventory. As such, most student responses described calculations and the impact of computed amounts on financial statements, even though CP work also required selection and support of a method.

Reflection paper three. The question prompt asked students to discuss the differences and similarities in homework and CP work. Responses to the prompt that fell in stage one or two (30.4%) discussed the process of applying accounting rules to determine whether to report goods or service as an asset or an expense. Students in stage two described interpreting descriptions on checks as they applied accounting rules. Slightly less than half (44.6%) of students' responses discussed estimating how long the company would use the asset and recognized that GAAP provides alternative methods for determining depreciation expense (stage three). Evidence of stage four reflection (25%) included a discussion of why the accountant would select one method over another. The challenging work in phase three

of the CP required students to determine and support estimated amounts, an element missing from homework problems. Three months into the semester, students understood the difference in accounting procedures and decisions accountants make. This understanding reduced the number of responses that only described accounting rules and procedures and increased discussion related to work that requires judgment.

Reflection paper four. The question prompt asked students to identify learning from completing the CP that did not occur when doing homework. Each student discussed three or four specific instances. Approximately 40% of reflections described how work on the CP enhanced their understanding of specific accounting procedures (stages one and two). Discussing the use of authentic documents and unstructured formats to perform accounting procedures fell into stage two, rather than stage one. One-fourth of students' responses described the importance of making estimates and selecting an appropriate alternative. Reflections that discussed the contextual factors considered when making estimates and decisions gave evidence of higher-level premise reflection. Responses that previously stopped with acknowledging accountants make judgments (stage three) shifted to premise reflection when students added explanations of why an accountant would make a decision. The most common response noted a change in thinking about the processes accountants experience as they complete their work.

Homework. Homework began with multiple-choice questions over declarative knowledge and the amounts reported on the financial statements under alternative accounting methods. After completing multiple-choice questions, students worked problems using a paragraph of given information. The homework system provided answers and complete explanations for all multiple-choice questions and problems.

An example of evidence of reflection about homework in each of the four stages, beginning with stage one follows:

Instead of problem solving we just had to ***multiply the amount in each account by the corresponding percentage and that would give us the amount*** that is considered uncollectible. In order to find the net accounts receivable we need ***to subtract accounts receivable from the total estimated uncollectible.*** (RP1, S17, 2016)

Student 17 noted that completing homework requires multiplying and subtracting. His thoughts about computations fell in habitual action non-reflection (stage one). Student 29 noted homework helped him understand how accounting procedures impact the financial statements:

The thinking required for the multiple choice portion of the homework was similar to the project work. This is because it was critical thinking about how ***each method changes net income*** and taxes paid. (RP2, S29, 2016)

Reflection about the impact of accounting procedures on financial reporting falls in stage two, thoughtful action non-reflection. A stage three reflection would have discussed the fact that the accountant uses judgment to select an alternative accounting method or make an estimate. Explaining contextual factors that influence judgment or a change in thoughts about the accountant's work is evidence of stage four premise reflection. Students' responses provided no evidence of stage three or four reflection. Table 4.13 provides the number of students' responses to question prompts that demonstrated each stage in Mezirow's (1991) model of professional reflection.

Students computed amounts, recorded transactions, and identified the impact of transactions on financial statements when completing homework problems. Homework problems have one correct answer and did not require students to estimate reasonable amounts or select a method appropriate to a given situation. As such, over two-thirds of

Table 4.13

Students' Reflection about Homework

Stage of Reflection	RP 1: Sales and Accounts Receivable		RP 2: Inventory		RP 3: Long-term Assets		RP 4: Overall Learning		Total	
	QTY	%	QTY	%	QTY	%	QTY	%	QTY	%
Stage 1: Habitual	40	88.9%	43	71.7%	34	72.3%	1	12.5%	118	73.7%
Stage 2: Thoughtful	5	11.1%	17	28.3%	13	27.7%	7	87.5%	42	26.3%
Stage 3: Process	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Stage 4: Premise	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	45	100%	60	100%	47	100%	8	100%	160	100%

reflections on each of the first three RPs related only to computations and recording transactions, which is habitual action non-reflective (stage one). Students' responses that gave evidence of thoughtful action non-reflection (stage two) discussed the effect of alternative methods on the financial statements. Sales and accounts receivable homework (RP 1) required students to compute bad debt expense using two different approaches. Students who reflected in stage two primarily discussed accounting rules related to the two approaches. Inventory homework (RP 2) required students to determine and compare inventory and cost of goods sold amounts using three different methods. Long-term assets homework (RP 3) asked students to compute and compare depreciation expense using four different methods. Most students who reflected in stage two on RP 2 and RP 3 compared the amount of expense reported on the income statement using different accounting methods. The question prompt on the last RP asked students to describe learning on the CP that did not occur when doing homework. Therefore, the few responses related to homework described gaining a declarative knowledge they applied to CP work.

The trend in students' responses followed the demands of the homework. Homework required students to compute amounts using different alternative accounting methods; however, students used given information and did not use judgment to select alternatives or estimate amounts. As such, no responses related to learning from homework gave evidence of stage three or four reflection.

Reflection About Public Company Accounting Procedures

The prompt asking about a public company's accounting procedures in spring 2016 required students to begin their reflection by stating one of the company's accounting methods in their own words. The next part of the prompt asked students to discuss related

judgments and decisions. The responses presented below illustrate the differences in each stage of reflection. Student 21 reflects only on the information provided in the footnotes:

PepsiCo accounts for long-term assets on a straight-line basis. **They do not** depreciate land or construction in process until the asset is being used in service. *PepsiCo* adjusts for impairment upon significant changes in the operating environment. **They do this** by writing the asset down to its estimated fair value using discounted cash flows. *PepsiCo* periodically revises useful lives due to significant occurrences or events that have taken place. (RP3, S21, 2016)

He added words (bolded) to the information provided in the footnote (not bolded) and did not reflect on the impact of the accounting procedures on the financial statements. Responses limited to restating the footnote fell in stage one. Student 4 describes the accounting methods used by the company:

During the first half of their assets useful life Lockheed Martin used a **“accelerated methods”** and then once the asset has reached the halfway point they then **switch to using the straight-line method of accounting**. (RP3, S4, 2016)

Responses that stated accounting methods without an explanation of the impact on the financial statements also gave evidence of stage one reflection. Student 22 reflects in stage two:

By testing for impairment instead of amortizing their intangibles, it prevents the **yearly expense** on these assets. Instead, they **record a loss on their income statement** only when the probable benefit of the asset significantly decreases. (RP3, S22, 2016)

She recognizes the accounting procedure of testing for impairment along with the impact on the financial statements. The last sentence refers to the accounting rule that requires the procedure.

The following reflection by Student 25 recognizes that the accountant must use judgment to make a decision:

Also, similar to Samsung, Schlumberger reduces a stable depreciation expense each period through straight-line method, but this expense changes depending on the asset, *because the asset's useful life is subject to the accountants' discretion.* (RP3, S25, 2016)

Recognizing the accountant decides the useful life gave evidence of stage three reflection.

Student 13 demonstrates the highest level of premise reflection (stage four):

The use of straight-line depreciation means McDonalds *will have steady depreciation expenses* over the life of its assets. The balance sheet will also reflect the steady rate of accumulated depreciation. This is the simplest method, and it *enables McDonalds to forecast earnings more accurately.* McDonalds could *more accurately match revenues and expenses* if useful lives of equipment were *determined by the amount of items they processed or produced*, i.e., by using the units of production method. *Although, the cost to implement such a process may outweigh the benefits.* (RP3, S13, 2016)

He reflects about McDonalds' rationale behind selecting the accounting method. Explaining why is evidence of stage four reflection. Some students interpreted the information in the footnote incorrectly. The following response by Student 10 is an example of an incorrect interpretation:

Straight-line also causes a lower depreciation expense amount for the first year, showing higher operating income on the income statement and higher asset value on the balance sheet. *Unfortunately, this will create a higher income taxes and less capital investment cash flows.* A company like Home Depot, since it is a retailer for home improvement and construction products and services, would benefit from using straight-line because *the higher operating income could be used to support its construction services and large amount of inventory.* (RP3, S10, 2016)

He avoided restating the footnote information; however, Student 10 incorrectly assumes the amount of depreciation expense using straight-line is the same for income taxes.

Furthermore, Student 10's thoughts about lower depreciation expense resulting in higher cash flows to support operations is incorrect. The company pays the same amount of cash to purchase the asset regardless of when the company reports depreciation expense on the income statement.

The aforementioned progression in the reflections illustrates the difference in the four stages of students' responses to the question prompt about the public company's footnotes.

Table 4.14 presents the number and percentage of student responses coded to each stage of reflection, along with the number of "other" codes given to responses that interpreted the information provided in the footnote incorrectly. The question prompt instructed students to

Table 4.14

Students' Reflection about Public Company Accounting Policies

Stage of Reflection	RP 1: Sales and Accounts Receivable		RP 2: Inventory		RP 3: Long-term Assets		Total	
	QTY	%	QTY	%	QTY	%	QTY	%
Stage 1: Habitual Action	69	58.5%	66	61.1%	57	55.9%	192	58.6%
Stage 2: Thoughtful Action	3	2.5%	4	3.7%	18	17.6%	25	7.6%
Stage 3: Process	34	28.8%	22	20.4%	2	2.0%	58	17.7%
Stage 4: Premise	0	0.0%	0	0.0%	9	8.8%	9	2.7%
Other: Incorrect Statements	12	10.2%	16	14.8%	16	15.7%	44	13.4%
Total	118	100%	108	100%	102	100%	328	100%

briefly state the company's accounting methods before reflecting on how the accountant used judgment to apply the method. On the first and second RPs, approximately 60% of students' responses restated the footnote (stage one) or described accounting procedures (stage two) without mention of the use of judgments or estimates. Companies must discuss the process of estimating bad debt expense and the methods used to value inventory in a footnote.

Reading discussions of using judgment in the footnotes triggered some students (28.8% and

20.4%, respectively) to write about estimates and the impact of estimates and alternative methods on the financial statements (stage three).

Footnotes related to long-term assets present the useful lives of assets the accountant estimates as given information that requires no judgment. As such, students discussed the differences in the amount of calculated depreciation expense without noting that the accountant must estimate some variables that influence those amounts. Reflections about reporting calculated amounts fell into stage two rather than stage three. Explanations as to why a company would select a specific method, evidence of premise reflection, did not occur until the third RP. The greater number of premise reflections on RP 3 is most likely due to the type of work on phase three of the CP and students' increased awareness that accountants must support decisions. Most incorrect statements related to explanations of why a company would select one accounting method over another.

Summary of All Responses

Table 4.15 summarizes the number of students' responses in each stage of professional reflection (Mezirow, 1991) for each question prompt. Thoughts that discussed routine accounting procedures (computations and recording transactions) in response to issues and AHA moments prompts constitute the highest number (38.6%) of habitual action non-reflection. Students who restated footnotes without discussion of judgments gave evidence for 30.5% of the habitual action responses. Describing the use of documents to perform accounting procedures and the change to financial statements in response to AHA moments and CP work question prompts is the subject of 77.5% of thoughtful action

Table 4.15

Students' Reflection about the Work of the Professional Accountant

Stage of Reflection	Issues and AHA Moments		CP Work		Homework		Public Company		Total	
	QTY	%	QTY	%	QTY	%	QTY	%	QTY	%
Stage1: Habitual	243	38.6%	77	12.2%	118	18.7%	192	30.5%	630	100%
Stage 2: Thoughtful	160	53.9%	70	23.6%	42	14.1%	25	8.4%	297	100%
Stage 3: Process	241	58.9%	110	26.9%	0	0.0%	58	14.2%	409	100%
Stage 4: Premise	89	51.8%	74	43.0%	0	0.0%	9	5.2%	172	100%

non-reflection. Responses describing homework all fell in non-reflective stages one and two. Reflective thoughts about public company accounting policies acknowledged the accountant must select a method or estimate unknown amounts (stage three). Responses to the issues, AHA moments, and CP work question prompts that described CP work provided evidence for approximately 86% of process and 95% of premise reflection.

Work on the CP and changes to instructions and question prompts influenced the depth of students' reflections. I discussed work performed on the CP in this section and in the findings to research questions one and two. The next section discusses findings related to the influence of changes in instruction and changes to RP question prompts on students' responses.

Research Question Four

I incorporated RPs into the IFA course to encourage students to reflect on the judgments and decisions made by the professional accountant. Students completed four (2015) and three (2016) short RPs related to specific accounting topics. A final reflection paper captured students' overall reflection on their learning throughout the semester.

Students addressed question prompts related to the following topics:

- 1) issues considered by a professional accountant,
- 2) the impact of accounting procedures on financial statements (2015 only),
- 3) significant learning (AHA moments),
- 4) unanswered questions (2015 only),
- 5) learning while doing homework problems and CP work (2016 only), and
- 6) accounting policies of public company (in the footnotes).

I wrote in my RRJs about the nature of students' reflections, changes to in-class discussions, and written instructions provided to students during each semester. I used narrative data recorded in my RRJs and students' RPs to address research question four:

What changes in instruction related to short reflection papers encourage students to contemplate decisions made by professional accountants?

Notes in my RRJs about students' reflections on the work of the professional accountant and the nature of students' written responses informed periodic changes to question prompts and in-class instruction. I changed the question prompts as needed to encourage deeper reflection throughout both the spring 2015 and 2016 semesters.

In the previous section, I presented and discussed the depth of students' responses according to the four stages of professional reflection defined by Mezirow (1991). I coded students' responses at the end of the second major research cycle (2016). As a result, I did not know or consider the exact number of students' responses in each stage of reflection when I made changes to instruction and question prompts. I implemented instructional changes based on the more common responses to question prompts noted while grading the RPs. Therefore, in the findings to research question four, I discuss the number of students who reflected using general terms such as few, some, many, and most. I use the words "few" and "some" when less than 20% and 50% of students, respectively, responded in that manner. I describe instances where 50% to 75% of the students' responded in that way with the word "many." When more than 75% of the students responded with similar reflections I use the word "most." In this section, I present question prompts in italics. I also provide excerpts from students' RPs to illustrate the nature of common students' responses. Bold italics indicate reflection in the excerpt that depicts the nature of the response.

Question Prompts: Issues Considered by a Professional Accountant and the Impact on Financial Statements

My goal with the first question prompt was to encourage students to think about the issues resolved by a professional accountant prior to performing accounting procedures. Issues are situations that require a judgment or decision. I also wanted students to reflect on questions the accountant must answer and how to obtain the necessary information to answer the questions. Question prompt two encouraged students to consider the impact of the accountant's decisions on financial statements. The question prompts for the first RP (2015) are as follows:

1) For the assigned topics: Discuss important issues that the accountant must consider when performing accounting procedures. Consider the questions that the accountant must answer and the common sources of information used to answer these questions. Reflect on and demonstrate what you have learned in this course.

*2) For the assigned topics: Describe how accountants determine the amounts reported on each of the following financial statements and the issues to consider when reporting amounts/information on the financial statements. Additionally, explain the relationship between the two statements -
Balance Sheet: Income Statement:*

The students used authentic information, addressed similar questions, and noted the impact of transactions on financial statements as they completed the CP. Students wrote reflection papers after finishing each phase of the CP. Both the first RP and the first phase of the CP related to the topic of sales and accounts receivable.

I graded the first 10 students' reflection papers and stopped grading (RRJ, 2/27/2015). Students did not answer the first two question prompts. Instead, some students described specific accounting rules, similar to the following response:

Revenue is recorded when the earnings process is complete and there is a reasonable certainty that payment can and will be collected. There are two

main guidelines that companies use, FOB Shipping and FOB Destination.

This distinction is important to accountants because those who follow FOB Shipping are owed money even if the products don't reach their final destination. These guideline policies are important for companies in times of customer disputes. (RP1, S5, 2015)

She described the rules that determine when accountants record and report revenue. Other students wrote about general accounting guidance unrelated to the assigned topic of sales and accounts receivable:

For public companies, ***accountants must follow GAAP*** because these are the legal guidelines for reporting transactions and creating financial statements so that companies report their financials in an honest manor. ***GAAP usually has several acceptable methods*** so that the accountant has the ability to use his or her experience and discretion in order to reflect the performance of their company as they see most appropriate to represent performance. (RP1, S7, 2015)

Student 7 defined generally accepted accounting principles (GAAP) and noted that accountants have alternatives with no reference to the assigned topic. Most students who reflected on the assigned topic referred to accounting procedures, similar to the following reflection:

The accountant must consider many things in order to decide how to handle revenue and accounts receivable. Many sales are made on credit, so the ***accountant must record sales as the same time as he/she records accounts receivable for that sale.*** The accountant must consider how and when the company decides to ***record revenue and accounts receivable.*** The company can ***record revenue when the goods are shipped to the buyer or when the buyer receives the goods.*** (RP1, S20, 2015)

The term "record" refers to making journal entries, a common accounting procedure.

Student 20 finished her reflection with thoughts about rules regarding when to recognize revenue. Overall, students did not describe issues the accountant must resolve and did not answer the follow-up questions included in the prompt.

First change in instruction: Issues. I gave all students the option to revise their first reflection paper. Furthermore, I provided additional written instructions to explain what students should and should not do (RRJ, 02/27/2015). The instructions included examples from students' RPs with comments on why the excerpt did not address the question prompt. Figure 4.4 presents a portion of the additional instructions provided to students.

After grading students' second attempt at the first RP, I noted the following:

Students as a whole did not discuss any issues associated with accounting for and reporting revenue and accounts receivable. Instead, students stated and spent a lot of time describing accounting rules and procedures. Only two students discussed the sources of information the accountant must use to do the accounting and reporting. Most students seemed to write about the procedures that were not complex and they felt confident they understood. Many students wrote extensively on the gross and net method of accounting for sales discounts, which is very insignificant to the reported amounts and there are no significant accounting issues related to this topic. Students wrote this section like it was a research paper and wasted space on lead in sentences and transition sentences between paragraphs. No students explained WHY the accounting issue is an issue or the impact to users of financial statements. (RRJ, 3/02/2015)

Approximately two-thirds of the students chose to submit a revision to the first RP.

Students wrote about the assigned topic of sales and accounts receivable on the revised RP; however, they demonstrated no reflection about the decisions made by the accountant. Some students' responses primarily described accounting procedures:

Accounts receivable *is recorded when* a good or service is provided to a customer and payment is expected on a later date. However, when a sale is made *it is recorded* as the full sales price regardless if it was sold at a discount, rebate, or etc. This means that when the customer eventually pays, the cash the company receives may not be the full sales price. The accountant must therefore remember to *take the discount out of accounts receivable* so that the account accurately reflects the *current amount expected to be collected form customers*. (RP1, S12, 2015)

Make sure that you:

Do not write me a research paper. Do not put in extra sentences to lead into a topic. Just say what you understand that addresses the questions and issues in that particular section.

Discuss the questions the accountant has to answer to even decide when and how to record revenue.

Do not limit yourself to one area of the topic, for instance the gross and net method or FOB shipping/destination, which are both very insignificant.

Relate accounts receivable to revenue and discuss how the issues related to revenue impact accounts receivable.

Here are some examples of what NOT to do in the 1st section.

Example 1 turned in by a student:

Accounting is not just memorization of processes, it is not just adding and subtracting, and it is not just performing the same tireless duties over and over again, Accounting is an art. Business and proper practice are it inspiration, figures, checks, cash, deposit slips, accounts... Accounting is not just taking numbers and “plugging and chugging” as they say, it is much more. As we have learned accountants get tons of information slapped on their desk Thus, it is the Job of the accountant to determine exactly what will be done with each and every cent that passes through a business... It is this process of determination that is unique for every single accountant, and has come to thoroughly fascinate me.

This is general rambling about accounting. There is no specific mention of accounts receivable or revenue. You must be specific to accounts receivable and revenue only!

Example 2 turned in by a student:

The most prioritized issue the account must consider most overall are decisions that will lead up to making the financial statements look as healthy as possible so it will look more attractive to the public and potential investors so more people are confident to invest in the company to help continue its growth.

The first sentence ... has no direct relationship to A/R or Revenue. You are not writing a research paper and there is no need to find a fancy way to begin your paragraph.

(continued)

Figure 4.4. Instructions for the first reflection paper (2015).

Example 3 turned in by a student:

For example, if a company is in need of immediate cash the company will offer sales discounts. A sales discount changes the overall price of the sale of goods or services hopefully causing more to be sold to customers for an immediate gain of cash to the provider. Also, things like gross method and net method should be considered by an accountant. ... An accountant should use the gross method when their company doesn't usually offer discounts or customers usually do not take the discounted price offered, and the opposite scenario applies net method.

This section above is just a statement of facts. It has no relationship to the requirements of considering the questions the accountant must answer and the sources of information used to answer these questions.

Example 4 turned in by a student:

The 4 key transactions for accounts receivable

1) Sale on Credit

2) Collection of cash to reduce A/R

3) The estimate of bad debt expense: You don't know how much won't be collected from customers, but you know from past history. You must estimate the expense at the end of the period to match with current sales.

4) The write off of an accounts receivable when you know who won't pay you and exactly how much won't be collected.

The different ways to measure bad debt expense (% of sales and % of A/R). The difference is in % of sales you are calculating total bad debt for the period compared to using history of what customers did prior.

The above are just facts about the topic. There is no reflection here.

Figure 4.4. Instructions for the first reflection paper (2015).

Student 12 refers to making journal entries to record transactions, a common accounting procedure. She then noted the meaning of accounts receivable on the financial statements. Other students wrote as if they were writing a research paper on their declarative knowledge like the following response by Student 10:

In relation to revenue and accounts receivable, there are many things that accountants must consider when performing these accounting procedures and many questions they must answer. Using their knowledge of specific guidelines, such as the ones I have just learned in this course, these accountants are able to accurately report revenue and accounts receivable.

There are specific ways that accountants record and report transactions related to these topics. It is important for us students to truly understand and reflect these ways in order to be successful in our future careers. (RP1, S10, 2015)

Student 10's reflection reads like a general introduction to the assigned topic, with no reflection about estimates made or contextual factors that influence decisions.

Students reflected on questions accountants must answer as if selecting and performing accounting procedures answers the question. For instance, Student 3 reflected about these questions:

To do this, accountants must first answer the *question of what method they are going to use* to estimate it. The two most common approaches are *% of sales and % of A/R aging*, but they can also be used together with % of sales being performed each month and % of A/R aging being used to adjust at the end of the period. (RP1, S3, 2015)

She presented the names of alternative approaches used to calculate amounts. Almost all students limited their reflections to accounting guidance and procedures, failing to recognize the distinction between issues that require a decision and procedures. Furthermore, responses indicated confusion about the difference in operational decisions and accounting issues.

I noted the following additional misunderstandings:

Students wrote things that indicate they think that the accounting drives the business, which is generally not true. Students do not seem to understand that transactions are determined by company strategy, and the management team, and not by the accountant. Students missed the point that the accounting methods are chosen based on which method gives the best representation of the economic position and results of the business. (RRJ, 03/02/2015)

Overall, students reflected on accounting procedures but did not reflect on the decisions made by the accounting professional. I had hoped students would describe the judgment necessary to determine write-offs and estimate future uncollectible accounts they experienced while doing project work.

Second change in instruction: Issues. In response to the aforementioned findings, I used class time to provide instruction about the differences in accounting procedures, judgments, and decisions:

I started the class by asking the students to tell me the facts about revenue and receivable. I was met with blank stares, so I rephrased and said, “Tell me what you know about revenue and receivable.” After a few minutes, we had a list of facts about the two topics. I then started asking why accountants follow the procedures and methods we had listed, followed by why does it matter and how does it impact the financial statements, along with relationships between the facts. I then told the students that I expected to see their thinking about why, why does it matter, and how it impacts financial information, and relationships, in the reflection papers. I then suggested that students make a list of everything they know about inventory and then reflect on the why, why it matters, how is it reported, and the relationships between the facts. I told the students my expectation is that they will write their thinking and they should not write the facts in the paper. (RRJ, 03/17/2015)

Additionally, for the second reflection paper, I adjusted the first question prompt to be specific to the topic and clarified that students must answer multiple questions. I combined the first and second question prompts to encourage connected reflection about the issues accountants consider and the impact on the financial statements. I hoped to discourage repeating thoughts written in response to the first prompt in the follow-on prompts. The revised first question prompt on RP two (2015) was

Discuss important issues an accountant must consider when accounting for inventory. Make sure you explain why it is an issue.

Discuss the questions the accountant must answer to address the issues noted above and properly account for inventory.

Discuss the information the accountant must gather to answer the questions related to accounting for inventory noted above.

Discuss how the amounts reported on the balance sheet and income statement are impacted by the decisions an accountant makes related to inventory.

Students reflected on the assigned topic of inventory; however, they continued to write declarative knowledge stated in the textbook or describe routine procedures that do not require judgment. GAAP provides specific rules that apply to routine procedures related to repetitive transactions. For example, Student 18 wrote:

When *recording your journal entries* and doing the ending total *FIFO do the same process for both* periodic and perpetual, while *LIFO* changes in each method. The *perpetual method is easier* to find because you don't have to worry about if you sold any items during a certain period or not. *Larger companies use this method in order to easily keep an idea of the inventory* they should be using over a certain amount of time. *When using LIFO in the periodic method you must start in the beginning of each period* for smaller companies to keep a closer eye on the amount of inventory being used. (RP2, S18, 2015)

He referred to accounting procedures and calculations related to recording inventory transactions (periodic, perpetual, FIFO, LIFO). His response did not acknowledge that the accountant must select the appropriate method.

All students repeated accounting procedures when responding to the follow-on questions in the prompt. For example, the same student (S18) responded to the last part of the question prompt about financial reporting by once again referring to and explaining accounting procedures:

When the accountant decides to *use the perpetual method in order to count inventory they use less accounts* on the balance sheet and on the income statement as if they were to use the *periodic*. With the periodic method the accountant *must account for the Freight-In and Purchases accounts* on the income statement. This allows a smaller company to go back and easily find a record if there was a mess up. They do this instead of *using the Inventory account* of the balance sheet like the *perpetual* method does. (RP2, S18, 2015)

The perpetual method and the periodic method are alternative ways to account for inventory purchases and sales. The difference in the two ways to record inventory consists of the account names used and when the accountant records transactions. His response consistently

refers to the accounts used to perform procedures and makes no reference about how to decide which procedure to use.

Poor flow of thought, unrelated ideas, and repeating ideas from one part of the first question to the next were common responses to the various parts of the question prompt.

Many students responded like Student 6:

Important Issues: One issue that accountants must consider is the ***current economic situation*** that their company is in. This is an issue because accountants must ***use the method(s) that display the present and true economic*** situation of that particular company. These ***methods must remain consistent*** from year to year unless there is a legitimate business reason for switching methods that is approved. Another issue accountants have when dealing with inventory is ***what to do with lost, stolen, or damaged inventory***. Accountants have to count the remaining inventory at the end of each period, then compare it to what they have in their records. They must then make an ***adjusting entry to account for the lost, stolen, or damaged inventory***. As you can imagine this is a ***very tedious process*** for all accountants.

Questions to Answer: This question then leads us to another question, what is ***FASB's goal?*** FASB's goal is that companies remain consistent and comparable from one year to another. They do not necessarily care if companies are comparable to each other, but a ***particular company must remain consistent and comparable from one year to another***. Companies ***have the multiple methods to account for inventory to choose from***, but they should choose the method(s) that present the ***company's true economic situation*** from period to period within that company.

Information to answer the question: An accountant must ask, what is more important to my company right now, ***higher income, or lower taxes?*** The company's accountant must understand or learn about the company's current situation in regards to what is important. For example, when costs are increasing, LIFO displays ***lower net income, which leads to lower taxes***. When costs are decreasing, ***LIFO displays higher income than FIFO***.

Financial Statements: When costs are increasing, ***LIFO displays lower net income, which then leads to lower taxes***. When costs are decreasing, ***LIFO displays higher income than FIFO***, which leads to stronger financial statements and happier investors. The decisions accountants make affect change inventory levels along with COGS, ***net income, and income taxes***. (RP2, S6, 2015)

Student 6 indirectly discussed the issue of selecting a method to determine the cost of inventory and then adequately identified the issue of lost or stolen inventory. However, he did not reflect on how the economic situation affects the decisions made by the accountant. He then proceeded to reflect on one unrelated question to answer (FASB's goal) and then noted the accountant has alternatives. The reflection about information required to answer the question included initial thoughts about the impact on reported income. However, in his reflection on the impact on financial statements, he repeated previous thoughts about financial reporting (net income) using different words.

Third change in instruction: Issues. In response to the aforementioned concerns, I adjusted the format of the first question prompt to help students specifically address each part of question one in an orderly manner. I added numbers one through four to encourage students to answer all four prompts with continuous and logical thought about four different issues. Furthermore, I explained to the class that students should label reflection related to the same issue with the same number. The last prompt required an overall perspective, rather than reflection about each issue, to eliminate redundant writing about the impact of the accounting procedures on financial reporting. The revised question prompts for the third RP (2015) were

State 4 important issues an accountant must consider when accounting for long-term assets. Explain why each is an issue.

1) 2) 3) 4)

Discuss the questions the accountant must answer to address the issues you discussed above.

1) 2) 3) 4)

*Keep 1) related to 1) above so it is easy for me to see the correlation
2) related to 2) above and so forth....*

Discuss the information the accountant must gather to answer the questions and make the decisions you discussed above.

1) 2) 3) 4)

*Keep 1) related to 1) above so it is easy for me to see the correlation
2) related to 2) above and so forth....*

Discuss how the amounts reported on the balance sheet and income statement are impacted by the decisions an accountant makes related to long-term assets. (Overall, not point by point.)

Most students identified issues that require the accountant to use judgment when accounting for long-term assets. However, some students continued to repeat similar reflection for all parts of question one or directed their thinking towards accounting rules. Student 4 provides an example of a typical student's response:

Issue: Another important issue an accountant must consider is ***whether or not a cost being incurred is going to provide future economic benefit (PFEB)*** or not.

Questions: An accountant must ask which costs are ***expenses and which costs are to be included in the cost of the asset***. These costs vary from asset to asset.

Information: Costs after purchase that are ***expensed is software development before economic feasibility, R&D before a product is launched, advertising before a product is launched, and maintenance***. Costs that are normally ***capitalized are software costs after economic feasibility, R&D on existing products, and cost of improved efficiencies of assets***.

Financial Reporting; ***Expenses incurred on assets are recorded on the Income Statement***. Something is considered an ***expense if the cost does not increase the PFEB*** of whatever asset the cost was related to. (RP3, S4, 2015)

Student 4 correctly identified the issue of whether to classify costs as an asset or an expense and noted the answer depends on the presence of probable future economic benefit.

However, he repeated the issue using different words, and identified no questions to ask to resolve the issue or information necessary to determine the answer. He went on to provide

examples of proper classification mixed with accounting rules. However, his response to the impact on financial reporting contained declarative knowledge that could also apply to other topics.

Fourth change in instruction: Issues. Most students identified at least one or two issues; however, students did not directly answer each prompt for each issue identified. To help students understand how to address each prompt, I facilitated an in-class discussion using examples of student reflection and illustrated how to address follow-on prompts in question one. The following passage details a part of the class discussion:

I gave several examples of how the students were stating the issue 3 different ways in each section and were being much too general as they wrote their thoughts. For example: I then addressed the issue of useful lives with questions “how long will it be used” and the source was “how long is it expected to produce probable future economic benefit.” We talked through some very specific questions the accountant must ask to determine the useful life and what/who would provide the answers to those questions.

Three students mentioned that the instructions that asked them to state the question and discuss/explain it led them to think they should restate the issue again. I told the students I noticed that and I had made a change to eliminate the “discuss” the question on the revised reflection paper format. (RRJ, 04/02/2015)

For the fourth reflection paper, I revised my wording to clarify the question prompts according to the class discussion. The prompt emphasized different significant issues to encourage students to identify more than one major issue and avoid stating minor accounting procedures as if they required judgement. I clarified that I did want students to only state questions in the form of a question and reflect about how the accountant would answer the question in the next part. The numbering system and the wording on the last prompt remained the same. The revised question prompt for the fourth reflection paper (2015) was

Discuss 4 different significant issues (not a part of another issue) the accountant must consider when accounting for investments. Explain each issue and the related judgments made by accountants to properly address the issue and account for investments.

1) 2) 3) 4)

State the questions the accountant must answer to address the issues you discussed above and make supportable judgments. Do not write sentences that are not in the form of a question.

1) 2) 3) 4)

Keep 1) related to 1) above so it is easy for me to see the correlation

2) related to 2) above and so forth.....

Discuss the sources of information the accountant must use to answer the questions stated above. Do not explain why the source is important to use. It is assumed the information will answer the questions to address the issues stated above. Do not restate the questions.

1) 2) 3) 4)

Keep 1) related to 1) above so it is easy for me to see the correlation

2) related to 2) above and so forth.....

Discuss how decisions made by the accountant impacts the amounts reported on the balance sheet and income statement. (Related to investments, overall, not point by point.)

Most students identified the major issues and posed related questions to address the issue; however, students struggled to identify the sources of information to answer the questions. Student 16's response exemplifies a typical student's reflection:

Issue: The accountant must use the *facts about purchasing the investment in order to decide which method should be best used for calculations*. The *method that fits the information* will give owners and investors a good idea about the company's plans for these investments. If the accountant uses the cost method or fair market value method it can be assumed the investment was made for income purposes, and if the accountant uses the equity method it can be assumed the company invested with the purpose of influence and control. (RP4, S16, 2015)

Questions: *What is my reason* for making this investment? Do I *have significant influence or control* in my investment? If I *own less than 20%* am I still involved enough that *I can reasonably argue that I have significant influence*?

Information: Talk to management or whoever is in control of the investment. The accountant must learn *what percentage their investment* makes up of the company they invested in. Their answers to the questions determine whether the

gains or losses will be reported on the income statement or balance sheet. Stock prices will be reliable, but FMV of other investments will be less reliable and the accountant must figure out market prices for these investments.

Financial Reporting: *If the investment is reported as trading, the income on the income statement will be different than if it was reported as available-for-sale.* Some companies choose to report short-term investments as long-term because they do not want the *gains and losses to be reported on the income statement.* (RP4, S16, 2015)

He correctly identified the issue of selecting the proper method to account for investments and appropriate questions to guide the accountant's selection of the appropriate method. His reflection on information included the same questions worded differently, briefly mentioned the impact of accounting procedures on financial reporting, and stated declarative knowledge about investments. He finished by stating the impact of the accounting rules on the financial statements along with an opinion on why a company may select one of the alternative methods.

Other students who struggled to address each part of the question defaulted to describing declarative knowledge and accounting guidance related to accounting procedures. Student 5 responded to the follow-on prompts related to accounting for the subsequent change in fair market value (FMV):

Issue: Fair market value change after investment purchase.

Questions: What *type of investment* do we have? What needs to be done when FMV change based on different method? What accounts need to be use to record the FMV change? *Where the change in fair market value is reported?*

Information: Ask the management team to determine if the classification of the investment needs to be changed. There is no adjustment is necessary for prior amounts when change *Trading to AFS*. However, *when change AFS to Trading, the previous accumulated gain or loss needs to be realized.* From *FMV to Equity* only need to record an *adjustment to retained earning* without change anything from prior years.

Financial Reporting: Different methods used by accountant will have *different accounts to record the investments*. (RP4, S5, 2015)

She correctly identified a significant issue and questions to answer. However, she repeated the issue in the question section and then reverted to describing rules and accounts used to perform accounting procedures in the last two parts of the question prompt. The terms *trading*, *AFS*, and *equity* describe different purposes for an investment.

On the last topical reflection paper of the semester, a few students demonstrated a continuous train of thought when reflecting on the various parts of the prompt. Continuous reflection began with identifying the issue, stating related questions and sources of information, and ending with the impact on the financial statements. Student 28 adequately addressed each of the question prompts:

Issue: Determining the amount to report an investment at on the financial statements. This is an issue because the accountant must evaluate the investment to *determine if the cost method, fair market or equity method* is used. This is important because it determines if any adjustments to the investments can be made and how.

Questions: What was the cost of the investment? *Can market price of the investment be reliably identified* and is that price verifiable? Does the *investor have significant influence*?

Information: Look at any *purchase orders/invoices/receipts* the investor has for the security or investment. Look for *stock price on major exchange* or reputable market. *Talk to finance dept.*, if working for a large company, to determine if any executives or members of the company have impact making *decision authority, seat on the board, or privileged to exclusive financial information*.

Financial Reporting: If the intent to hold the security is classified as a trading security changes then *changes in FMV are reported as unrealized gain loss on the IS vs being reported on the BS in accumulated gain/loss if reported as available for sale security*. If significant influence is determined and the **Equity method is used dividend income does not get reported on the IS and decreases the value of the investment**. (RP4, S28, 2015)

He stated the issue of selecting a method that represents the purpose of the investment, identified questions that have answers and will lead to an appropriate decision, and discussed sources that would provide answers to the questions. Additionally, he properly discussed the change to the income statement (IS) and balance sheet (BS) that results when one accounts for investments under three alternative methods.

During the first half of the 2015 semester, students had difficulty determining the difference in accounting decisions and routine accounting procedures that do not require a decision. On the second RP, students began to identify the existence of more than one alternative method and the results of different alternative methods on the financial statements. Most students could not logically answer all parts to the question prompt on the first three RPs. Towards the end of the semester, a few students began to link an issue to questions to answer and the effect of the accountant's judgment on financial statements.

Fifth change in instruction: Issues. Before setting the initial question prompts for the spring 2016 cycle, I reviewed changes in students' responses to the question prompts during the spring 2015 cycle. I noted that few students responded to the follow-on prompts designed to encourage thought about asking and answering appropriate questions. The follow-on prompts seemed to encourage students to repeat accounting rules and procedures and distract students from identifying and reflecting on the use of judgment to make decisions. I added a new question prompt related to homework and CP work (discussed later) to encourage students to reflect on how they identified and used information to complete accounting work. I then removed the follow-up questions to focus students' attention on the decisions and judgments made by the professional accountant. The condensed first question prompt (2016) was

State 4 different significant issues the accountant must consider when accounting for sales and accounts receivable. Explain each issue and the related decisions and judgments made by accountants to properly account for sales and accounts receivable. Be very specific and to the point.

1) 2) 3) 4)

I discussed my overall expectations for the reflection papers in class and noticed no students taking notes as we talked. To help students remember the discussion when writing the RP, I provided a written summary of the discussion in an email to the students (RRJ, 02/24/2016). Figure 4.5 presents the email sent to students.

My hope was to discourage students from writing about declarative knowledge and accounting rules and procedures. After grading and reviewing students' reflections on the first RP, I noted most students could not distinguish between an accounting procedure (calculations and recording transactions) and an accounting issue (requires a decision) (RRJ, 03/02/2016). In the following excerpt, Student 17 states two available methods for recording a transaction and reflects about the procedures to write off an account.

*Another issue accountants face is that the company needs to determine **how it will report the money it will not collect. Companies use either the direct write-off method or the allowance method** to record defaulted sales. The direct write-off method involves writing off the balance only when the company knows a customer will default. The allowance method involves recording a portion of the total accounts receivable that the company believes will not be collected. **This reduces the net value of accounts receivable.***
(RP1, S17, 2016)

He finishes his reflection without mention of how to determine when to write off an account or the factors that affect the accountant's decision to use one method or the other.

Furthermore, he fails to understand that the direct write-off method is not in accordance with GAAP. In the following reflection, Student 19 describes a contractual term (FOB shipping or destination) that determines when to report revenue:

The accountant *must record for the sale of goods with recognition to the accounts receivables, along with recording a reduction to inventory*. The issue facing the accountant comes *when the revenue recognition takes place*. This all depends on whether the company established a *contract using FOB shipping or FOB destination*. The accountant will *record the recognition* based upon the notion of *when the transfer occurs between the customer and the company*. This may not always occur once the shipment has left the warehouse. (RP1, S19, 2016)

Recording sales and the related change in accounts receivable and inventory is an accounting procedure. Furthermore, recording transactions according to the terms of a contract requires no judgment or decision-making.

Overall, students' reflections demonstrated a lack of understanding that the accountant must first identify the alternatives, select a method, and then perform related accounting procedures. I wrote about an example of this lack of understanding in my research journal:

The students wrote things that indicated they did not clearly understand that estimating bad debt expense comes first and then write-offs follow, and then the prior period bad debt estimate is adjusted when it is different than actual write-offs and a projection is made for future write-offs. Students seemed to be confused about the order of the events and the difference in the estimate and the write-off. (RRJ, 03/02/2016)

Furthermore, students seemed to have difficulty distinguishing between an operational decision and a decision the accountant makes to adequately report the results of transactions.

I recorded the following specific example:

Students wrote about the issue of deciding when to use the gross method and when to use the net method. They did not seem to understand that the operational decision of offering the discount happens first (a cash flow issue) and the accounting follows based on if customers typically take the discount. (RRJ, 03/02/2016)

Hi Students,

I want to pass on a few thoughts on the reflection paper and what I am expecting. First, I do not expect that your reflections will be a bunch of facts that are stated in the book. I expect your reflections will be about the relationships of the facts and how each of the different decisions impact reporting on the financial statements.

For the first section: I would suggest that you first make a list of all the "facts" that you know are important for the topic of sales and accounts receivable. Then, do not write about the facts. On the next list, you should match up the facts based on their relationships to each other. Then, you should reflect on (and write about) how the relationships impact what is reported on the financial statements. You should not state the facts in your paper. I already know them and will pick up on what you are talking about. The exception to that is if you really need to say it to explain, which should be rare. The relationships and how things are reported on the financial statements are the "issues" the accountant needs to consider.

After you have written your first draft. You should look at each sentence and if it is a statement of fact, you should put an "F" by the sentence. The more "F"s that are on your paper, the closer you are getting to a very poor grade. I am not looking for the content that you know, I am looking for your thoughts about the content that you know, related to the issues. Do not discuss calculations or debits and credits in this paper!

You should give a lot of thought to the "I used to think" and "I now think" section. I am not looking for just the first thing off the top of your head or what you looked through the book to find. I can tell when you do that. So please don't do that.

After you get your facts out of the paper and replace it with reflections and thoughts about the issues, you should rewrite it at least 3 or more times so that you get rid of the "sloppiness" in your writing. I do expect your writing to be clean and you will lose points (up to 25%) if it is not. I am not an English teacher; however, I can recognize a sloppy sentence and bad grammar. You can too, so fix it before you turn it in.

The reflection paper is a replacement for a test grade. You should be telling me what you understand about accounts receivable and sales. My expectations are high and you are very capable!

Let me know if you have questions. Enjoy a great blessed weekend.

Figure 4.5. Instructions for the first reflection paper (2016).

In the following response, Student 3 confused the sequence associated with recording sales revenue:

For software sales, there is a significant amount of judgment trying to decide ***what the obligations of a sale are*** and if they are large enough to be accounted for separately. The ***accountant also has to use judgment to decide if or when the company has fulfilled the obligation***. The relationship between properly valuing the performance obligation is related to ***how much of the revenue you can recognize and what period*** it can be recorded in. (RP1, S3, 2016)

Student 3's reflection indicates she believes the accountant decides the obligations and when the company fulfills the obligation; however, business policy determines when the obligation ends. She then finished with a general statement about when the accountant reports revenue on the financial statements.

Many students provided general reflections about financial statement line items increasing and decreasing in different periods of time in response to the prompt about the impact of an accountant's judgments. The following excerpt written by Student 15 illustrates an example of reflection about accounting procedures that ignores the accountant's use of judgment:

Uncollectible accounts need to be considered by accounts because ***not all accounts receivable will be paid due*** to either due to disputes of a receipt or prices, a lack of cash, or a company's bankruptcy. By using the allowance method, ***allowance for uncollectible accounts reduces accounts receivable on the balance sheet***, and this allowance for uncollectible accounts can be correlated with the estimated bad debt expense. The actual uncollectible accounts which are written off because a company will not pay ***will reduce both accounts receivable and allowance for uncollectible accounts***. ***Decreasing accounts receivable AND allowance for uncollectible accounts will not change net accounts receivable***. (RP1, S15, 2016)

He discussed the inability to collect from all customers who owe the company, an operational issue. After correctly identifying the procedures to record uncollectible accounts, he

reflected on various accounts used to record the uncollectible account activity using the allowance method. He demonstrated an understanding of an operational issue; however, he provided no thoughts related to the accountant's decisions and judgments required to properly account for the operational issue.

Sixth change in instruction: Issues. Given the findings related to the first RP (2016), I determined that students needed additional instruction about situations that require accountants to exercise judgment (RRJ, 03/16/2016). I began with an explanation of the differences in operational decisions, accounting decisions, and accounting procedures to record transactions. As we talked, I wrote the diagram provided in Figure 4.6 on the board.

Figure 4.6 begins on the top left side with business decisions to produce a desired economic result. Transactions, exchanges of one item for another, occur as the business operates. The accountant's responsibility is to record and report the economic results of transactions that occur as the business operates. The accountant must either follow specific rules or select a method provided by GAAP. No issue occurs when only one alternative applies to the transaction. An issue occurs when the accountant must make a decision before performing accounting procedures. Additionally, accountants often must estimate unknown amounts related to a transaction. The shaded boxes illustrate situations that require the accountant to use judgment to estimate unknown amounts or select an accounting method. The diagram illustrates how operating decisions lead to situations that require the accountant to make an estimate or a decision.

I revised the question prompt to coincide with our class discussion about the diagram in Figure 4.6. The revised first question prompt on the second RP (2016) was:

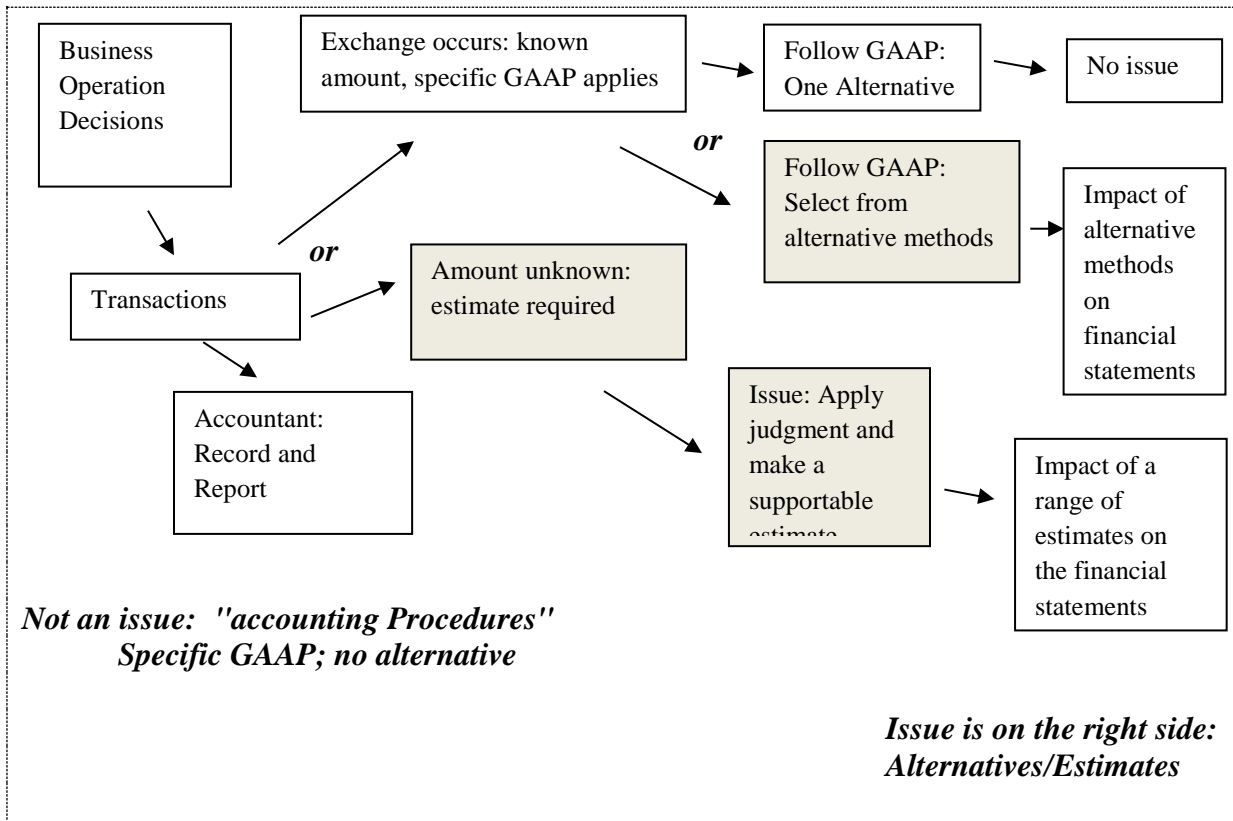


Figure 4.6. Accounting decision diagram.

1) State 3 different significant issues the accountant must consider when accounting for inventory. Do not state GAAP rules, calculations, or journal entries. Relate operational issues to the decision the accountant makes concerning reporting the financial position and the results of operations. Be very specific and to the point. 1) 2) 3)

As I read the second RPs (2016), I noted that most students did reflect on the accountant's choice of alternative methods and the impact of the alternatives on the financial statements (RRJ, 03/23/2016). For example, Student 13 discussed the three alternative methods used to determine the historical cost of inventory:

Accountants must estimate the value of inventory. An estimation is required because items may be purchased at different prices over a period. Accountants can use **FIFO, LIFO, or the weighted average method**. Companies reporting the first year of business should weigh the pros and cons of each methods'

effect on the income statement since the same method has to be used in following cycles unless change can be reasonably justified. During inflationary periods, ***LIFO results in higher costs of goods sold and lower income; inventory available to sell will have a lower value under FIFO, and weighted average will result in lower costs of goods sold and higher income during inflationary periods; inventory available to sell will have a higher value.*** (RP2, S13, 2016)

He also reflected about the result of each alternative (FIFO, LIFO, and average) on the financial statements in a given economic situation (inflation). However, his thoughts about the effect on the financial statements echo declarative knowledge found in the textbook. A deeper reflection would have discussed why the accountant may select a particular method.

Accountants use one of two approaches to account for the purchase and sale of inventory: periodic and perpetual. Technology available and the size of the company determine the accountant's approach. Most students discussed the accounting procedures for recording inventory as if the accountant determines the approach used. The following excerpt, written by Student 2, provides an example:

The accountant must also consider the most efficient method of keeping track of the company's inventory. Thus, ***accountants must determine when it is appropriate to use the periodic method or the perpetual method.*** Companies, such as mom and pop shops, which utilize the periodic method value, their inventory with a physical count at the conclusion of a period. Companies that periodically count their inventory tend to do so ***because it is a means of cost effectiveness.*** The periodic method can be riskier than the perpetual method because if inventory is disappearing, the accountant does not know about it until the end of the period. Today, most companies use the perpetual method ***through computer systems***, so that they can account for their inventory constantly throughout the accounting period. ***This method tends to be more costly than using the periodic method.*** Most companies that use the perpetual method also do some sort of periodic technique at the end of the accounting period via a physical count in order to account for theft of their inventory. By doing this, the accountant can correctly record the proper amount of inventory. (RP2, S2, 2016)

His reflection considers the cost and availability of computer systems that influence business decisions, followed by the erroneous thought that the accountant makes this decision. Most

of his reflection merely describes declarative knowledge about the periodic and perpetual methods used to inventory purchases and sales.

While grading the second reflection paper (2016), I noted for the first time that some students reflected on accounting issues without stating accounting rules and procedures (RRJ, 03/23/2016). Student 7 provides the following example of reflection focused on accounting decisions and judgments:

Accountants *have to estimate write-downs* when accounting for inventory. Write-downs must be made whenever *inventory becomes obsolete, which can happen for a variety of reasons*. When an accountant is examining inventory, they have to look out for inventory that is *aged, damaged, slow moving, at the end of its life cycle, etc.* (RP2, S7, 2016)

He noted that accountants support their estimates related to obsolete inventory with contextual factors and did not describe the accounting procedures used to record the write-down of inventory.

Seventh change in instruction: Issues. Students continued to reflect more about accounting procedures than about decisions and judgments. I provided written feedback to students on their second RP, noting opportunities to replace declarative knowledge with reflection about judgment and decisions. To focus students' responses on the use of judgment to perform accounting procedures, I eliminated the reference to operational decisions and added a sentence directly related to decisions accountants make. I changed the prompt to relate to the new topic, removed the requirement for a specific number of ideas, and specifically required students to put each idea into a separate paragraph. The sentence that forbids writing about accounting procedures remained. The first question prompt for the third RP (2016) stated:

Write about the most important things an accountant must consider when accounting for long-term assets (both property, plant, & equipment and

intangibles) and the use of long-term assets. Do not provide detail of accounting procedures, calculations or journal entries. Consider the decisions the accountant must make when preparing financial statements. Be very specific. Put each idea into a separate paragraph. Use proper grammar and correct sentence structure.

In response to the question prompt, all students discussed at least two of the three primary decisions related to long-term assets that require judgment: 1) estimating useful life, 2) selecting a depreciation method, and 3) estimating impairment. Most reflections acknowledged the types of judgments and decisions accountants make (RRJ, 04/20/2016).

Student 5 provides an example of a typical reflection:

If a cost is capitalized as an asset, *determining its useful life* is another major issue. The accountant *must estimate the years the company expects to use* the asset. Some considerations for this include how long the asset is usually considered to be used for, *how heavily it will be used* by the company, and the manufacturing *quality of the asset*. This useful life is important for determining how much of the asset will be expensed each year as depreciation expense. For example, if a firm anticipates an asset to be used for a longer period of time, it will allocate less depreciation expense across the years that the asset is in use. This thereby *affects expenses on the income statement* each year, *resulting in a higher gross profit*. The accountant must accurately determine this useful life in order to *match the proper amount of expenses to revenues being generated*. (RP3, S5, 2016)

He reflected on the accountant's responsibility to estimate useful life and the contextual factors that affect how long the company is able to use the asset. Additionally, he ended the reflection with thoughts about the impact of the estimated amounts on the financial statements. Student 12 wrote a similar reflection about decisions associated with impairment (loss of permanent value):

Accountants also have to *watch for impairments*. They have to consider if there is significant change in the business environment, *significant decrease in the market price of goods or services provided, change in how the asset is used or the assets physical condition, decrease in the useful life and if there is current period losses and expected future losses*. Any of these can indicate probable future economic benefit is decreasing and there is an impairment loss. Accountants also have to consider how often the company should test for

impairments because it is not cost beneficial to always be testing for it. After the accountant has determined that there is an impairment, they have to consider how much they are going to report. An impairment will cause the *operating income to decrease* because impairment loss is recorded under operating expenses. (RP4, S12, 2016)

Her reflection included the contextual factors the accountant considers to identify impairment. She avoided describing the calculations required to determine the impaired amount.

During the 2016 semester, students initially focused their reflections on accounting procedures. Evidence that students understood the difference in an accounting procedure and an accounting issue began to appear in RP 2; however, students described procedures along with their thoughts about the issues. Students provided evidence of an overall understanding that the issues accountants resolve requires selecting and supporting alternatives and estimating on RP 3. The fourth reflection paper related to overall learning and did not have a question prompt directly related to issues accountants address using judgments.

Question Prompt: AHA Moments

The purpose of this question prompt was to encourage students to reflect on significant moments in their learning process. I hoped students would recognize that learning calls for a change in thinking. The initial question prompt stated:

Three significant “AHA Moments” related to the assigned topics during the learning process. State this in terms of “Previously thought/Now think/Because ...”

I did not change the question prompt during the first major action research cycle in 2015. However, students did receive detailed written feedback related to their responses on each of the three sections of the prompt. Most feedback addressed an incomplete response to the “because” section. The following excerpts from students’ RPs illustrate the progression of

students' responses to the question prompt during the 2015 semester. On the first RP,

Student 22 noted:

I previously thought that *basic and diluted earnings per share* were two separate and distinct types of shares that didn't have a significant relationship to each other, but now after reading Apple Inc.'s footnotes on earnings per share I see that the dilutive effect of the shares is by application of the treasury method, *which could cause the fair market value of a company's common stock to affect the price of diluted stock. Essentially the two types of stock* are related and not as distinct as I had previously believed. (RP1, S22, 2015)

She incorrectly interpreted Apple Inc.'s footnotes. Earnings per share is not a type of stock.

Furthermore, she chose a topic unrelated to the assigned topic of sales and accounts receivable. Student 16 reflected:

I previously thought all *revenue was recorded when delivered* and I now know that there is *FOB shipping and delivery*. I understand how it can shift liability between the company and the customer. (RP1, S16, 2015)

Her reflection is a direct statement of the rules related to when to record revenue and the definition of shipping terms, and she does not answer the "because" prompt.

I noted in my reflection journal that many students did not attempt to directly answer the "because" section. After giving students their papers, I explained that I expected students to separately address each part of the question and demonstrate the learning process (RRJ, 03/02/2015). On the second RP, students gave thought to all three parts of the prompt and reflected similar to Student 9:

I previously thought *inventory was recorded each time it was bought, sold, or returned*. Now I think *the way to record inventory depends on the type of company* it is because *only companies with a system to track inventory* wherever it goes records by the perpetual method. Smaller companies record inventory at the end (periodic). (RP2, S9, 2015)

His reflection focused on the accounting procedures related to recording inventory transactions, while indirectly noting more than one way to record inventory (the way ...

depends). By the third reflection paper, students began to directly state alternative methods.

Student 9 provides the following example of the most common type of reflection:

I previously thought there was *only one way to record the cost of an asset* being used over time (straight-line). Now I think that *there are three common ways and an even more ways to calculate that cost* because the company can use whichever way they think best calculates the usage of the asset. Whether it's by units of production, assets with significant maintenance costs, or just to record an equal [amount]. (RP3, S9, 2015)

She acknowledged her previous belief that the accountant had no choice and now understands the accountant has alternative methods (whether it's by ...) to estimate depreciation expense. Students' responses on the fourth RP acknowledged alternative methods and attempted to explain in general terms why the accountant would select one method over another method. The following excerpts demonstrate common thoughts about alternative accounting methods:

I previously thought that *all investments were reported the same way*, but now I know that *there are different methods depending on the company's intentions* for that investment. (RP4, S12, 2015)

I previously thought that short-term and long-term investments were *recorded the same way*. Now I think that they are recorded and reported *using different methods because each method provides a better representation of the investment account for the intent to hold or sell the investment*. (RP4, S30, 2015)

On the last paper in 2015, students began to acknowledge that the accountant should consider contextual factors when determining the most appropriate accounting method. Although students continued to reflect on declarative knowledge and accounting procedures, at least one thought about new learning followed the aforementioned pattern.

First change in instruction: AHA moments. Prior to beginning the Spring 2016 semester, I reviewed the progression of students' responses previously discussed. To encourage responses to all three parts of the prompt, I led students through an in-class

discussion that included a critique of prior students' responses (RRJ, 03/02/2016). The following excerpt, written during the 2015, semester served as one example:

I previously thought that *investments were recorded at cost and didn't change until they were sold* and taken of the balance sheet. Now I know that there are *actually three different ways* to record investments *because not every situation calls for the cost method*, and sometimes the accountant has to *adjust for FMV*. (RP4, S20, 2015)

In discussing this example with the class, I told the students the “previously thought” and “now think” were both properly addressed; however, the “because” inadequately referred to accounting rules. I explained the “because” should refer to a specific in-class exercise, homework problem, or work on the CP that helped change the student's way of thinking. My goal was to encourage students to reflect on their learning process as opposed to stating declarative knowledge. I added “fully explain your thoughts” to the question prompt to discourage statements of fact. The question prompt on the first reflection paper (2016) stated:

Three significant “AHA Moments” related to the assigned topics during the learning process. State this in terms of “Previously thought /Now think / Because ...” Fully explain your thoughts.

After grading the first reflection paper in 2016, I noted the following:

Students generally stated very insightful comments to the AHA moments question prompt. A few comments seemed to come from a review of the book and some students explained the because incorrectly or with reference to an accounting rule. I had hoped students would reflect on experiences that caused a change in thought. (RRJ, 03/02/2016)

The following reflection by Student 24 is typical of students' reflection on RP1:

I previously thought ... very little about the idea of a *customer not paying their dues* to the company from which they purchased from. I always thought it was just subtracted from an account or just stayed forever in accounts receivable. Now think That these unpaid accounts have a place to *be added and subtracted from*. Accountants prepare for situations such as this. They decide upon a budget for unpaid accounts called allowance for

uncollected accounts. Because ... everything has a place in the company's financials. *The accountant will write-off certain accounts after a period of time or write-off a percentage of the total that they do not think they will ever get back.* This is where bad debt expense, write-offs, and allowance for uncollectible accounts come into play. This ensures that expenses and revenues match. (RP1, S24, 2016)

She noted new thinking about the relationship between an operational issue (not collecting from customers) and accounting procedures (recording the expected unpaid accounts). The “because” response is a general explanation of accounting procedures, rather than a reflection about how she acquired new understanding.

Second change in instruction: AHA moments. In response to the students' reflections, I changed the wording of the last question prompt to clarify that the “because” in the AHA moments section is a description of the experience that changed their thinking (what were you doing and when). Additionally, I told the students to show the three parts separately. The question prompt on the second reflection paper (2016) was:

Three significant “AHA Moments” related to the assigned topics during the learning process. State this in terms of “Previously thought /Now think / Because ...” The because section should describe the situation (what were you doing and when) of how you discovered your thinking was incorrect. Fully explain your thoughts. 1) I previously thought ... Now think Because ...

Separating the three parts encouraged students to reflect on each piece of the learning process. However, students consistently struggled with the “because” aspect of the question. Some students discussed the learning process, while others continued to provide declarative knowledge or procedures to support new learning (RRJ, 03/23/2016). Student 21 stated declarative knowledge to support his new way of thinking:

I previously thought... that the person who buys a product would become the owner when it was shipped to them (FOB Shipping). This thought process was based off of the fact that once I purchase something online, I assume the risk that it will get delivered to me.

Now think.... that a company can also become the owner of inventory only when it is received. That is the main difference between FOB destination and shipping

Because.... *the legal owner of inventory in transit is determined by a contract. Companies will negotiate the terms of shipment* prior to doing business in order to negate any unknown liability. Whoever obtains the risk while the inventory is in transit will most likely have that risk incorporated into the price of the goods. *Recent exposure to FOB Destination made this apparent to me.* (RP2, S21, 2016)

He discussed when ownership of inventory changes and credited exposure to new content for his new learning. Student 25 finished her reflection with the following thoughts about experiences doing homework and completing the CP:

I previously thought... perpetual method requires recording movement of large shipments or categories of items.

Now think.... That perpetual method actually requires recording the movements of *every piece of inventory*. I did not previously realize the extent that the perpetual method tracks every piece of inventory. This provides safer inventory tracking, but also is very time consuming so inventory must be a large aspect of a company's business model as with Amazon and Walmart. Because.... *The project opened my eyes to the detailed reports that are required for the perpetual method. On the homework, this process seems simple enough, but a large company could not create the report we did without an extensive computer tracking system.* This method is safer to ensure inventory tracking, but *highly* involved and only necessary for a company with the resources and drive to track inventory this extensively. (RP2, S25, 2016)

The perpetual method is an accounting procedure that records every purchase and sale of inventory as it occurs. She discussed her understanding of the complexity of the procedures gained from completing CP work.

Third change in instruction: AHA moments. Given that some students were responding to all three parts of the prompt, I made no change to the question prompt. However, I did provide written feedback to students who failed to answer the "because" with reflection about the experience that resulted in the change in thinking. On the third RP, more students managed to show continuity of thought through all three parts of the question

prompt. The following is a response by Student 6 that demonstrates a change in thought through a learning experience:

I previously thought...I thought there was no strategy in selecting how to depreciate an asset.

Now think...I now know that *depending on revenue streams and types of unambiguous expenses that an asset will undoubtedly incur, an accountant can try to strategically align costs* to be steady overtime instead of front-loaded or back loaded during the life of an asset.

Because...I know this because of the *research I did before starting the casework and during our time completing it.* (RP3, S6, 2016)

He reflected on why an accountant may select a certain accounting method and noted the source of his new understanding.

Fourth change in instruction: AHA moments. On the last reflection paper (2016), which was unrelated to a specific topic, I changed the question prompt to encourage students to think about takeaways they thought were important enough to remember into the future.

The question prompt stated:

Discuss the 4 MOST significant "AHA Moments" you experienced during this class. State this in terms of "Previously thought/Now think/Because..." These instances should be general things that you expect to remember for a long time (not detail accounting procedures). Please give a lot of thought to the "because" and describe what happened to cause you to think differently.
I previously thought... Now think.... Because...

I did not constrain students' reflections to a specific accounting topic. Each student wrote at least one reflection about his or her overall perception of the work of the accountant, along with insights gained related to specific content topics. Student 5's response is an example of a perception related to the overall work of the accountant:

I previously thought...That there was always a right answer for every situation in accounting. I believed that there was a procedure laid out for every situation. I figured every accountant would always come up with the same answer for how to account for a situation. Now think ... That this is simply

not true at all. Going deeper into each account made me realize all of the considerations that need to be made, and just how subjective the accounting process truly is. Because ... *Choosing a method for inventory revealed subjective considerations* such as whether the accountant believes prices will be rising or falling in the future. Additionally, the accountant needs to choose what he believes to be a reasonable way of accounting for inventory. This requires *consideration of economic trends, which I thought had little or nothing to do with accounting. These economic trends also apply when considering whether to test for impairment of assets.* If the economy is weak, the accountant needs to assess whether the assets on the balance sheet are not stated above probable future economic benefit. (RP3, S5, 2016)

He noted a previous belief that accountants just followed the rules and made no decisions.

Furthermore, he gave evidence that the work on the CP helped him understand that accountants consider contextual factors when making decisions. Student 2 reflected about accounting work:

I previously thought... using accrual based accounting was not much different than cash based accounting, except for the cash balance.
Now think... accrual based accounting has significant differences than cash based accounting, including the integration of various estimations. Cash based accounting has few estimations.
Because... *accrual based accounting requires estimations for useful life, bad debt, and decisions on how to account for depreciation,* all of which cash based accounting does not require. (RP3, S2, 2016)

He noted that accountants must make many estimates when performing work. Overall, with few exceptions, students moved away from declarative knowledge and reflected on at least two judgments made by professional accountants on the last reflection paper.

Question Prompt: Thoughtful Questions

The purpose of the thoughtful questions prompt was to encourage students to think about accounting issues they did not yet understand. I did not change the question prompt and provided no specific instructions throughout 2015. The question prompt follows:

State one very thoughtful question you still have on the assigned topics.

The following are sample excerpts from students' reflection papers that demonstrate the typical progression of thoughts about unanswered questions during the 2015 semester. On the first reflection paper, students stated questions they expected would have a correct answer, for example:

How do you address revenue for long term contracts when they are broken or when they discontinue due to financial reasons or other various company situations? (RP1, S10, 2015)

GAAP provides specific rules on how to account for revenues and expenses when a contract discontinues and work ceases. The following question prompt gives an example of a question Student 14 thought would have a correct answer:

Do managers and investors typically look more heavily into revenue or accounts receivable when making investment and business decisions? (RP1, S14, 2015)

The above question does not actually have a correct answer. In practice, the two accounts interrelate and generally managers and investors look at both.

On the second RP, students began to wonder what a company or accountant may do in situations that are exceptions to normal occurrences. Two examples include:

What does the company do with inventory that has been there *setting for many years and has not been sold simply because* nobody picks it up even on discount and cannot be return to manufacture. (RP2, S11, 2015)

FOB Shipping – *what if the shipment is lost who is responsible* for the items? I understand that ownership is transferred at shipping but this seems like a technicality since the buyer could argue the items were never shipped. (RP2, S17, 2015)

The two reflections relate to accounting for inventory unsold or lost in transit, rather than sold and delivered to a customer. Students were more apt to contemplate reasons for selecting certain alternative accounting procedures on the third RP, demonstrated by the following:

I know that the Sum of the Year's Digits is not a widely used method to calculate depreciation, **but what type of company would use this method**, and if no companies are using this method why does FASB still allow it? (RP3, S25, 2015)

Student 25 is questioning what type of situation would encourage a company to use the sum-of-the-years-digits method to compute depreciation expense, assuming incorrectly that no companies use the method. Other responses, like the following, show thought about how to apply accounting rules:

I do not understand **why repairs and maintenance on an asset isn't an asset itself?** The repair could be extending the useful life of the asset or increasing its functionality **adding to probable future economic benefit of the asset. Isn't something providing future economic benefit an asset?** (RP3, 27, 2015)

Student 27 questions why and then answers her own question by stating the general accounting guidance related to the situation.

As illustrated by the following excerpts, students wondered about the purpose of accounting rules on the fourth RP:

For the equity method, **why are changes in Fair Market value not reported**, it seems like a very necessary adjustment, even if we won't use it. (RP4, S1, 2015)

At the end of every term, management can decide to change their intent behind an investment. **Why is this not more regulated?** Clearly companies manipulate where the investments will show up on their financial statements. (RP4, S14, 2015)

Both students recognize the fact that various methods affect the items reported on the financial statements in different ways. Furthermore, they question if the accounting accurately portrays the economic results of the business.

Most students showed a similar pattern of deeper reflection as they progressed through the semester. On the first and second RPs, I provided answers to the students'

questions in the margins of the paper. The feedback discouraged most students from stating questions with an answer stated in the textbook or previously discussed in class (RRJ, 03/26/2015). The content of the responses to this question followed closely with reflection stated in the answers to other question prompts. No prompt seemed to encourage thoughts about the practical work of the accountant performed on the CP. To broaden reflection, I replaced this question prompt at the beginning of 2016 with one that required students to reflect on learning while doing homework and completing the CP.

Question Prompt: Homework and CP Work

I reviewed students' reflections during 2015, and noted responses primarily focused on accounting procedures and often ignored work on the CP. Students overlooked the work of the professional accountant and focused on the easier-to-describe calculations and journal entries (procedures). I limited the students' reflections to two pages and did not feel students could adequately address another question prompt without removing one. For this reason, I replaced the question prompt related to unanswered questions with a prompt related to learning while completing CP work. My goal was to encourage reflection about the decisions and judgments accountants make prior to completing accounting procedures. I added the following question prompt to the first reflection paper (2016):

Compare the work you completed on the project to the homework problems you completed for sales and accounts receivable. Compare and contrast the work and the type of thinking required to complete the work for each. (Be very specific and demonstrate thought; general, surface answers will get no credit.) Homework: Comprehensive Case Work:

After grading the RPs, I noted that a few students wrote about general differences between the homework and the CP and did not reflect specifically on work related to the topic of sales

and accounts receivable (RRJ, 03/02/2016). The following is a response written by Student 28 that illustrates the typical student reflection:

The *homework problems tend to be straightforward and structured* in comparison to those of the project. They are very *direct in that they specifically ask you to do something for each problem*. This creates a checklist of sorts so that it is very easy to see what you have and have not done. Moreover, the homework has *very structured questions*. They normally go *step by step* so that you do not have to make any significant logical leaps to solve the different problems. (RP1, S28, 2016)

He focused this reflection on the fact that homework problems provide all necessary information and the order of questions in each problem provide step-by-step directions. The second part of his reflection contained the following thoughts about CP work:

The casework requires a greater understanding of the material than the homework because the *information needed to do it is not explicitly given and there is not a detailed outline* for how to go about doing it. This vagueness forces you to go through the entire process in your head and to *actually search for the needed information, instead of having it presented to you*. This is more representative of what it will be like in the business world where you will not be walked through every step and the information is vast and scattered. (RP1, S28, 2016)

Student 28 reflected on the challenge of finding the needed information and deciding how to do the work as he completed the CP. Neither of his reflections mentioned the topic of sales and accounts receivable. Most students did write about their experiences with estimating uncollectible accounts.

First change in instruction: Homework and CP work. I provided specific written feedback on each student's RP to discourage general reflection about characteristics of practice problems and CP work and encourage thoughts about accounting work. I also noted that a requirement to think about the work that seems easy and more challenging may encourage specific reflection on the topic of study and added the requirement to the question prompt (RRJ, 03/02/2016). The revised question prompt in the second RP (2016) stated:

Discuss the inventory work you completed on the case project and the inventory homework problems you completed. Compare and contrast the work and the type of thinking required to complete the work for each. Then comment on the parts of each that come easy to you and the things that challenge you for each type of work. (Be very specific and demonstrate thought; general, surface answers will get no credit.)

Type of thinking required to complete the homework: Easy: Challenging:

Type of thinking required to complete the case work: Easy: Challenging:

The revised question prompt encouraged some students to reflect about the topic of inventory; however, many students continued to reflect about general characteristics of the homework and the CP (RRJ, 30/23/2016). Student 28 provided the following example of the nature of the reflection of many students:

Easy: The homework problems are easier for me in that they are **very straightforward: the question is given, and then the information to solve the problem is right below**. Because of this, I do not have to second-guess myself or go searching to find any information, which can be frustrating and time-consuming. The *homework is also good at teaching me the basics* before I move on to the project work, which can often be overwhelming. The *repetition of the homework really helps the information stick*. Also, having the *answers there to check my work* after I finish is really helpful because I *can get instant feedback* on what I did wrong and how to improve upon my mistakes.

Challenging: The most challenging part of the homework is that the problems *are just bits and pieces of the whole accounting process. I do not have to think about how I reached the point that I am at now, or how what I am currently solving affects* the rest of the accounting process.

Easy: The easiest part of the casework is that I am able to collaborate with my partner. It is very beneficial to be able to *ask each other questions and to go through the process together so that we are more confident in our decisions*. Although the project is difficult, I like how it *challenges my critical thinking abilities and requires me to think in more depth* about the material that I am learning.

Challenging: The most *challenging part about the project is the ambiguity*. There is so much information and so many tasks that we have to complete, it can be confusing as to what we have to do and how to do it. Having examples done beforehand is really helpful because it enables me to go through the process in my head and really furthers my understanding of the material before I have to do it on my own. When there are no examples, I often just get

confused and make mistakes even though I understand the concepts because I am so *caught up in the format and sheer size of the questions*. (RP2, S28, 2016)

Like many students, Student 28 did not mention the procedures he learned related to inventory or the difference in work to complete inventory practice problems and CP inventory tasks. Many students continued to recognize that structured homework problems were straight-forward and CP tasks were ambiguous.

Some students limited their reflections to the specific accounting procedures performed while doing both the homework and CP work. Student 20 illustrates this type of reflection:

The homework did not require a lot of thinking; it was more straightforward than the project. If you *follow the steps* on how to do each part, it was for the most part easy. The easiest part of the homework would be *doing the basic LIFO and FIFO*. The most challenging part would be doing the correct *journal entries and moving average*. The moving average has room for error, if you don't know how to *calculate* the moving average cost. As for the *journal entries*, its making sure you *do the correct entry* for periodic or perpetual. *Calculating the amounts* is easy, but making sure that you do not include an amount that belongs with perpetual and periodic was a bit troubling.

For the project on the other hand, because it is more like the real world on how you have to do each step, *you have to really know how each part works*. *A basic understanding of how LIFO and FIFO work will not help*. One of the challenging parts was for the LIFO and FIFO for the periodic. At first, I had *switched the numbers, basically doing it backwards*, and did not realize that it was done wrong until I had started on another section. Another challenging part was the moving average again. *Trying to figure out the cost of sales and the moving average cost*. I averaged the previous purchase price and the new purchase price. There was not really an easy part of the project. *While some parts did not require much deep thinking, like the periodic average section, it was not as straightforward as the homework had been*. (RP2, S20, 2016)

Her thoughts on the homework focused on step-by-step calculations to determine the value of inventory. Thoughts about CP work also referred to determining the value of inventory;

however, she noted the difficulty of completing work schedules using information on documents. I noted that most students did not reflect on the importance of supporting selected alternatives and estimates or the impact of decisions on financial statements (RRJ, 30/23/2016).

Second Change in Instruction: Homework and CP Work. The question prompt on the first two RPs seemed to encourage general statements about the nature of practice problems and CP tasks. Furthermore, most students did not reflect on the impact of judgments and decisions accountants make on the second RP. I wanted students to reflect at a deeper level about the accountant's use of judgment without specific directions to do so. As such, I left the question prompt open, maintained the requirement to think about work related to the topic, and specifically stated that students should not make general statements. The revised question prompt on the third RP (2016) was:

Discuss the differences and similarities in the thinking required to complete the case work and the online homework related to long-term assets and using long-term assets. Be very specific and demonstrate thought; general, surface answers will get no credit.

The revised question prompt proved more effective at encouraging the students to reflect on the judgments and estimates an accountant must make prior to performing routine accounting procedures (RRJ, 04/20/2016). The following reflection by Student 6 illustrates a common perspective on the work of the accountant:

What the case provides that the homework cannot offer is the *experience of having to make decisions* that construct how much depreciation/amortization to expense. Like *deciding the useful life* of an asset. What the *homework did well is help us understand the format of the equations and how to execute the math* once we had made all of the decisions.

The thinking that the case work provided was deep in the sense that we spent more time *thinking about the strategy behind our work rather than the actual math that it took to find the numbers*. There was a lot of time spent

on how to account for different transactions and *how to evaluate the useful life*, which was never the case in the homework. The homework gave us the tools to construct it, whereas the casework gave us the blue prints to complete it. (RP3, S6, 2016)

Student 6 noted that the homework was useful for learning formats and calculations; however, the case work exposed him to thinking about how to estimate amounts and the importance of the company's strategy on the accountant's decisions. Student 16 reflected in a slightly different manner:

During the online *homework, most of the background and decision-making process is done for you*. Then you are given the result of the decisions sorted out for you and *your job is to apply the formula and provide numbers*. Unlike during casework, the useful life of the long-term asset is given as well as the amount of money the company expects to get from selling the asset at the end of its useful life are given when doing the online homework and you *don't have to worry about the reasons why the choose to them*.

On the other hand, during the casework most of the information that are given to us in online homework are not given and *you have to make reasonable and supportable reasons to why you decided* to choose 7 years of useful life for a machine for instance. I remember when we were doing the project, we had a hard time giving reasons to support our choice of useful life, just because we have never thought that it is part of the accountant's responsibility and we have never had to do it before as *it is always given to us in the homework* problems. (RP3, S16, 2016)

She noted that homework problems provide all the information needed to perform the routine accounting procedures; whereas, the accountant must make and support judgments and estimates. In general, students' reflections on the third RP (2016) acknowledged the ambiguity and judgment associated with the work of the professional accountant.

Third change in instruction: Homework and CP work. The fourth reflection paper (2016) called for reflection on overall learning during the course, rather than thoughts about a specific topic. On previous RPs, students noted the homework consisted of structured procedures that require no judgment. In hopes of encouraging students to stop reflecting

about declarative knowledge and structured procedures, I revised the question prompt to focus on CP work:

1) Discuss the most important things (or types of things) that you learned while doing the comprehensive project that you did not learn by doing homework problems or watching the lecture videos. This should be big picture things as well as specific accounting procedures. Discuss means to describe "how" working the project helped you learn.

1) 2) 3) 4) 5)

Student 28 wrote responses from three different perspectives that summarized most other students' reflections:

Having to make adjustments based off what was done earlier in the year was something that the project definitely helped me to understand. In the homework, most of the problems we had to do started from the beginning, in that no entries had been posted yet. ***For the project, we had to account for past decisions made between January and November in every section.*** This was very difficult because it was something that I have not really been accustomed to doing through the homework or the online videos. By ***completing the project, I now feel much more comfortable making these adjusting entries and being able to recognize situations*** in which they must be made. (RP4, S28, 2016)

He first references end-of-period adjustments, a procedure that students generally struggle to understand. He then explains how he achieved a stronger understanding of accounting procedures as he adjusted previous entries. His second reflection takes a different approach:

The project also demonstrated the ***importance of posting all journal entries into T-accounts.*** On the homework problems, it did not seem as necessary to do because the problems were relatively short and less complex than those of the project. When it got to a point in which we had hundreds of entries to account for, ***the need to post everything became much more apparent.*** After spending a few, unsuccessful hours trying to find our errors and experiencing first-hand what that process was like, I will definitely be much more vigilant in the future when making T-accounts. (RP4, S28, 2016)

In this excerpt, he reflects on his understanding of the importance of each step in the accounting process and notes the complexity of the accountant's work not obvious in homework problems. Posting amounts in T-accounts is a procedure used to determine

amounts reported on the financial statements. Incorrect posting procedures lead to wrong amounts. His last response refers to a broad understanding of how each decision made in the accounting process impacts the financial statements:

The project really *brought everything we have learned together* into one cohesive unit. Often times, when I was doing the homework problems or looking at the videos, it was hard to get a sense of how the different lessons related to each other. *Through the project, I have been able to see how everything is connected and that one decision can affect so many other things.* At the beginning of the year, I never would have guessed that our write-off amount would affect our cash flow statement. This *comprehensive look has really furthered my understanding of the learning material and enhanced my ability to make decisions that will affect the rest of the accounting procedures.* (RP4, S28, 2016)

He reflected about the relationships between accounting procedures and the effect on financial statements (cash flow statement). He also expressed an understanding of the decisions accountants make before performing accounting procedures. Most students' reflections about learning while completing the CP related to one of the aforementioned three themes (RRJ, 04/27/2016). Redirecting the focus of the question prompt away from homework and towards CP work encouraged students to reflect more about estimates and judgments and less about routine procedures.

Question Prompt: Public Companies

The question prompt required students to read the footnotes of public companies and reflect on how the accountant's decisions impact the interpretation of the financial statements. I explained the goal in class and provided no additional instructions (RRJ, 01/12/2015). The initial question prompt in the first RP (2015) stated:

Look at the financial statements and footnotes for 3 different public companies and describe the judgments that you made about each company related to the assigned topic.

1) Company name: 2) Company name: 3) Company name:

Students did not answer the question prompt and instead restated footnotes or accounting rules. The following reflection by Student 10 is an example of restating the footnote:

Raytheon Company *shows in their footnotes* the use of the percentage of completion method to account for their long-term contracts *because* they are able to reasonably estimate the total contract price and total contract costs. It *can be shown* that their revenue is recognized based on the extent of progress towards completion of the long-term contract. Contract costs for this company include material, labor, and subcontracting costs as well as indirect costs. Their footnotes state that revenues are recorded as costs are incurred. *You can also see* that a significant change in estimates of net sales, cost of sales, and related operating income could affect the profitability of their contracts, which is why they implemented to recognize these changes quarterly. Raytheon *also mentions* the transactions where revenue is recognized upon delivery or as services are rendered once evidence of arrangement exists, price is fixed or determinable, and collectability is reasonably assured. We can assume that they have taken on these guidelines in accordance with FASB because they are a public company. (RP1, S10, 2015)

He attempted to show his ability to interpret the meaning of the footnote by adding words such as “because,” “you can also see,” and “also mentions.” However, the explanations that follow the added words are merely a repeat of the company’s accounting procedures stated in the footnotes. Other students reflected solely about the general operations of the business:

Community Health System: CYH is one of the largest hospitals company in the US they operate more than 200 hospitals. I notice that the company receives money from different types of sources, 24.9% is from Medicare, 9.7% from Medicaid, 51.7% from mange care and 13.7% is from self-pay which *I believe is still high due* to all the government laws. I believe that now with Obama care in effect, there should be increase in the number of insured patients, which, in turn, should reduce revenues from self-pay patients and reduce provision for bad debts since they don’t have insurance. The company has solid revenues more than 15 billions a year, CYH forecast that revenue will increase due to health care act, *but I believe that the company accounts receivable will increase* due to government regulations. I notice that the company struggles a lot with insurance companies over their collectibles since the insurance companies are the ones who pay for most of it. (RP1, S11, 2015)

Student 11 restated operational information provided in the footnotes along with an opinion about how operations may impact the amounts customers owe. His reflection did not include thoughts about the impact of accounting procedures on the financial statements.

First change in instruction: Public company. As discussed, students responded to the previous reflection prompt by restating footnotes or describing operations (RRJ, 02/27/2015). To redirect students' reflections to the requirements of the question prompt, I provided the following written instructions in an email to students:

The requirement is that you describe the judgments that you made about each company as you looked at the financial statements and footnotes, related to revenue and receivables only. State things you noted that were important and how this shaped your thinking. (RRJ, 02/27/2016)

I gave students the opportunity to revise their first RP (2015), as previously discussed. The following reflection by Student 3 provides an example of the most common type of revised response:

T-Mobile offers new customers a reimbursement for their early termination fee with another carrier if they switch to T-Mobile. According to their footnotes, this *reimbursement is recorded as a reduction of equipment sales revenue.* In reference to T-Mobile's allowance for uncollectible accounts, they make sure to include, *"to the extent that actual loss experience differs significantly from historical trends or assumptions, the required allowance amounts could differ from the estimate"* in their footnotes to justify any skewing of the numbers that happens when estimating. (RP1, S3, 2015)

Student 3 restated and quoted the footnote, including a few of her own words with no reflection on the impact to the user of the financial statements. She did not reflect about the relationship between accounting procedures and the financial statements. Student 22 took a similar approach and changed some of the wording; however, she primarily restated accounting rules provided in the footnote:

On the Monster Balance Sheet accounts receivable net shows the amount of revenue not yet received from the company's customers. The company bases

collectability of its accounts based on a number of factors. First if the company becomes aware of a specific customer's inability to pay it will reserve an estimated bad debts account to reduce accounts receivable. Second the company looks at historical loss and overall assessment of past due trade accounts, like what we are currently doing in our project and make a judgment. The rest of the accounts receivable and related allowances are shown on a gross basis. *Monster recognizes revenue* of their income statement *when persuasive evidence of an arrangement exists, delivery has occurred, the sales price is fixed or determinable and collectability is reasonably assured.* With distributors they let Monster know they have taken transfer or possession of the finished goods and revenue is recognized. (RP1, S22, 2015)

Overall, she did not provide her own thoughts about how the accounting decisions impact the financial statements. Most students restated information in the footnotes and did not reflect on any of their own judgments about the company. Additionally, I noted students selected footnotes provided in the textbook, rather than identifying companies with significant transactions related to the assigned topic (RRJ, 02/27/2015).

Second change in instruction: Public company. While reviewing students' responses, I noticed the question prompt did not contain a reference to accounting. As discussed above, some students wrote general statements about the company from an investor's perspective. To clarify the question prompt, I specifically said to briefly state the company's accounting methods and emphasized that students must reflect on the impact of the accounting policy on the financial statements. The question prompt on the second RP (2015) was

Look at the financial statements and footnotes for 3 public companies IN DIFFERENT INDUSTRIES (not in your course pack). VERY BRIEFLY state the method the company uses to account for inventory and then explain how the company's method of accounting for inventory impacts the amounts reported on the financial statements.

Most students continued to restate the footnotes in their own words (sometimes incorrectly) and did not reflect on the impact of the accounting on the financial statements. Student 12 illustrates this manner of reflection:

Home Depot uses the FIFO method to calculate inventory. *They also state* that they estimate shrink or swell on a store by store basis which *leads me to believe* that it is one of the bigger determinates of a change in inventory as they also said that valuing their inventory under a cost method was “not material” in their financial statements. (RP2, S12, 2015)

He repeated the footnote and added words such as “they also state” and “they also said.”

Reflection that follows “leads me to believe” leaves out key words and becomes an incorrect summary of the information provided in the footnotes. Only a few students answered the question prompt and stated the accounting method followed by their own thoughts about the impact of the accounting procedures on the financial statement. Student 9 reflected appropriately:

General Motors *records their inventory at the lower of cost of market, using LIFO for 21% of the inventory and FIFO for all other inventories*. By choosing to use 21% of LIFO, *General Motors might have believed prices would be decreasing over time due to deflation, therefore by focusing FIFO on the rest of the inventory, the result would be a lower income and lower income taxes to pay*. They also mentioned their LIFO eligible inventory was reduced resulting in lower income on the income statement (i.e. lower taxes on the balance sheet). Therefore General Motors *may be more concerned about illustrating higher income of the company regardless of the taxes* to stockholders. (RP2, S9, 2015)

Her reflection began with the information stated in the footnote about the accounting methods used (LIFO and FIFO) and then continued to speculate incorrectly, stating a goal of both higher and lower income using textbook reasons. I noted other students were stating similar faulty assumptions in effort to explain why the company selected a method (RRJ, 03/26/2015).

Third change in instruction: Public company. As previously discussed, most students identified the accounting method described in the footnotes. However, they did not correctly address the impact to the financial statements. The change to the question prompt seemed to lead students away from reflecting on the use of judgments. To focus reflection on the impact of the accountant's decisions and estimates, I changed the question prompt to add a specific requirement to identify and discuss one area that required judgment. I also restricted reflection to encourage students to expand their thoughts beyond the obvious selection of a depreciation expense method. The question prompt on the third reflection paper (2015) stated:

Look at the financial statements and footnotes for 3 public companies IN DIFFERENT INDUSTRIES (not in your course pack). VERY BRIEFLY state the methods the company uses to account for long-term assets (discuss more than just depreciation methods) and then specifically explain one instance specific to the company, unrelated to depreciation expense, that the accountant applied judgment to account for long-term assets and how it impacted the amounts reported on the financial statements.

After reviewing the reflection papers, I noted that many students discussed depreciation expense even though the instructions clearly stated to avoid this topic (RRJ, 04/04/2015). Students avoided reflection about the more complex aspects of long-term assets. Additionally, students restated the footnote with no discussion of how the accountant's judgment may have impacted the financial statements. For example, Student 18 reflected:

Dillard's uses the straight-line method for evaluating its depreciation expenses on equipment. **When it comes to evaluating for fair value and future benefits of long-term assets, the company estimates its anticipated future net cash flows of the related long-term assets. This analysis is performed at the store unit level upon the management's judgment at the time that the carrying value and useful lives continue to be appropriate. If the carrying value of the related asset exceeds the undiscounted cash flows, the carrying value is reduced to its fair value.** Various factors including

future sales growth and profit margins are included in this estimate. (RP3, S18, 2015)

He first stated the depreciation method (straight-line) and then restates the accounting procedures (provided in the footnotes) related to a different topic of testing for impairment. The reflection included no thoughts about the impact of the estimates and judgments on the financial statements. The revision of the question prompt had no effect on most students' reflection.

Fourth change in instruction: Public company. I provided detailed feedback on each student's RP, which specifically identified reflection that restated information provided in the footnotes without thought about the impact on financial statements. I changed the wording of the question prompt to relate to the new topic of investments. The language to encourage students to reflect on one instance that requires the accountants to apply judgement remained. The question prompt on the fourth reflection paper (2015) required students to do the following:

Look at the financial statements and footnotes for 3 public companies IN DIFFERENT INDUSTRIES (not in your course pack) THAT HAVE SIGNIFICANT INVESTMENTS. VERY BRIEFLY state the methods the company uses to account for investments. Then discuss ONE important instance the accountant used judgment to do the accounting for investments and the impact on the amounts reported on the financial statements.

After grading students' fourth RPs, I noted that students continued to repeat the information provided in the footnotes (RRJ, 04/13/2015). Reflections were similar to the examples provided from the third reflection papers. Students did not reflect on the decisions and judgments made by the company's accountants or the impact of decisions on the financial statements.

Fifth change in instruction: Public company. As evidenced by the previous excerpts, students continued to restate the footnote regardless of the wording in the question prompt during the first cycle (2015). Furthermore, few students followed the restatement of footnote information with a discussion about the accountant's judgments and decisions (RRJ, 04/13/2015). To encourage thoughts beyond information the company provides, I changed the wording of the question prompt to require an explanation of one important estimate or judgment rather than a discussion. Otherwise, the question remained substantially the same. The question prompt on the first reflection paper (2016) required students to do the following:

Look at the financial statements and footnotes for 2 public companies, one service company and one manufacturing company (not in your course pack). VERY BRIEFLY state the accounting methods the company uses to account for revenues IN YOUR OWN words. Then explain ONE important instance their accountant would use estimates and judgments when determining how to report revenues and the impact the estimates and judgments have on the amounts reported on the balance sheet and the income statement.

Students' reflections primarily restated the footnotes and attempted a description of the accounting procedures, much like the examples provided by 2015 students on the last RP (RRJ, 03/20/2016).

Sixth change in instruction: Public company. I provided detailed feedback on each student's first RP, pointing out mere restatements of the footnote and incorrect interpretations. I added the requirement to explain why the accountant selected the method to encourage thought about support for a chosen alternative. The question prompt in the second RP (2016) was

Look at the financial statements and footnotes for 2 public companies. You must use one retail company and one manufacturing company that are not in your course pack. VERY BRIEFLY state the accounting methods the company uses to account for inventory and how the company determines the value of

inventory and cost of goods sold IN YOUR OWN words. Then explain the significant reasons why you believe this company uses the chosen method to determine the cost of inventory and how the company would test for LCM. Do not make general statements; be specific to the Company.

All students identified the accounting method that resulted in the estimated amount for inventory and cost of goods sold. Some incorrectly speculated as to why the selected method was most appropriate for the company (RRJ, 03/23/2016). The following reflection by Student 13 provides an example of the nature of the typical student reflection:

Intel uses FIFO to determine the cost of goods sold. FIFO is used because of the short product life cycles experienced in the high technology industry and FIFO's favorable effect on income during inflationary periods. While calculating inventory, Intel estimates the amount of inventory that is obsolete, excess, or not of saleable quality. Intel carries a high risk that their inventory will become obsolete. As a result, they continuously compare their demand forecasts to actual customer demand in order to maintain an updated net realizable value estimate. If demand forecasts are wrong, LCM could be impacted. (RP2, S13, 2016)

He correctly identified the selected accounting method, and attempted to support the decisions made by Intel's accountant and note the impact on financial statements with a reference to net income. His reflection about obsolescence and LCM is a restatement of the information in the footnote. After reading students' responses, I noted that most students did not explain why a large public company would select an alternative method without restating the footnote information in some manner (RRJ, 03/23/2016).

Seventh change in instruction: Public company. As discussed, students' reflections about why the company's accountant chose a method continued to primarily restate the footnotes. The long sentence that described the requirement to explain did not encourage students to reflect on the decisions made by the accountant. The impact on financial reporting is a common factor considered by the accountant when selecting an accounting method. As such, I simplified the question to focus students' reflection on the

impact of the selected method on financial reporting. The question prompt in the third and last topical reflection paper (2016) asked students to do the following:

Look at the financial statements and footnotes for 2 public companies in very different industries (not in your course pack). VERY BRIEFLY state the accounting methods the company uses to account for long-term assets IN YOUR OWN words. Then explain (specific to the company) the impact of the accounting methods used on the financial statements.

After a review of students' third RPs (2016), I noted that their reflections did not describe how the company's accounting impacts the financial statements (RRJ, 04/20/2016). The reflections continued to restate the footnote and add declarative knowledge. Student 5 provided an example of reflection that restates the footnote and adds general declarative knowledge:

McDonalds Corporation. (MCD) *includes property plant and equipment at cost on under long term assets. Goodwill for its acquisitions is also included as well as investments in affiliates. This category is by far the largest on its balance sheet. Buildings, improvements on owned land, improvement on leased land, and equipment/signs are included underneath this category. This PPE is depreciated under the straight-line method. The company assumes a building useful life of 40 years, and improvements 12 years. Trademarks, patents, and other intangible assets are included under miscellaneous long-term assets and are also amortized using the straight-line method.* This use of the straight results in a very consistent depreciation/amortization expense over the life of the assets. (RP3, S5, 2016)

His entire reflection, except the last sentence, is a restatement of the information provided in the footnotes. The last sentence indirectly reflects on the amount of expense reported on the income statement. Student 15 reflected in a similar manner; however, he directly describes the impact to the income statement:

Tesla uses the straight-line depreciation method when accounting for long-term assets. They use estimated use of life of 3 to 12 years for machinery and office furniture, 30 years for building and building improvements, and 3 years for computer equipment. The company has decided to use the unit of production method for tooling vehicles, in which they estimate a tooling life of 250,000 vehicles. This straight-line method would is used for these three

things because the items being depreciated are being used consistently over their life span. This *impacts the financial statement, more specifically net income and the balance sheet by reducing net income by the same amount each year due to depreciation. The unit of production method impacts net income more or less depending on how much production* takes place in a given year for Tesla. (RP3, S15, 2016)

The first part of his reflection restates accounting procedures described in the footnotes. He then notes the expense will reduce net income by the same amount each year when using the straight-line method and at different amounts correlated with production when using the unit of production method. Most students reflected in a similar manner about the impact of depreciation methods on the financial statements. A few students correctly reflected about the reasons the company would choose a method.

The footnotes state the company's accounting procedures and give information about how the company determines amounts and where the company reports the transaction on the financial statements. Students limited their reflection to a restatement of the footnotes and did not describe the impact of accounting decisions. Changes to the prompt to highlight that students should briefly state the method and explain judgments the company's accountants made had no effect on the nature of students' responses. Towards the end of the 2015 cycle and during the 2016 cycle, I added the requirement to discuss the information presented "in your own words" and continued to require students to explain the impact on financial statements. By the second half of the 2016 semester, most students had used judgment to select an appropriate accounting method. However, only some students described the impact of the chosen accounting method. No public company question prompt seemed to encourage deep reflection about the accountants' use of judgment. Most students consistently rewrote the information the company presented in the footnote during both cycles.

Research Question Five

Students in a traditional IFA course learn to record business transactions, adjust account balances, and prepare financial statements. Faculty use objective tests consisting of multiple-choice questions and problems to assess students' ability to perform routine accounting procedures. In this study, I assessed students' learning using work on the CP and RPs and did not give periodic objective tests during the semester. I then assessed students' learning at the end of the semester using an objective comprehensive final exam.

I changed the assessments in the IFA course in this study to focus students' attention on the intellectual skills required to perform professional accounting work. However, students need both intellectual and procedural skills for success in the accounting profession (Tysiac, 2016). Research questions one and three presented findings related to the practice of intellectual skills in the course. The following research question addresses students' ability to perform routine accounting procedures:

How does a change in assessment methods from objective periodic tests to an authentic comprehensive problem-based project and reflection papers affect students' ability to complete routine accounting procedures?

For purposes of the present study, routine accounting procedures consist of recording common business transactions, adjusting account balances, and preparing financial statements in accordance with GAAP. The CP and the final exam required students to perform routine accounting procedures from two different perspectives. A discussion of findings related to students' ability to perform routine accounting procedures under the two different scenarios follows.

Comprehensive Project Work

I categorized tasks on the CP into one of the following six types of accounting work:

- 1) record transactions,
- 2) record adjustments,
- 3) prepare work schedules and financial statements,
- 4) make and support estimates,
- 5) select and support an appropriate accounting method, and
- 6) review judgments and reconcile accounts.

Declarative knowledge is an overall requirement for accurately completing tasks in each category. The first three categories include routine accounting procedures learned in a traditional junior-level IFA course. Table 4.16 presents the routine accounting procedures students completed for each phase of the CP, along with the total percentage of points students earned for correctly performing the related procedure. I graded students' work for each step in the CP using the custom rubrics presented in Appendix E.

Table 4.17 provides a summary of the percent of routine accounting procedures the students correctly performed in each of the three categories on each phase of the CP. Students often compute amounts required to record transactions. Therefore, I included tasks that involve computing amounts in the category of recording transactions. Using documents and work schedules to perform accounting procedures is more challenging than using given amounts. I considered a score of 70% as evidence that students can adequately perform routine accounting procedures. Students must demonstrate knowledge of 70% of course content to pass the class. A discussion of the findings for each phase of the CP follows.

Table 4.16

Routine Accounting Procedures Students Performed While Completing the Comprehensive Project

Procedure Type	Routine Accounting Procedure	Percent Correct
<u>Phase One: Sales and Accounts Receivable</u>		
Record Transactions	Record sales and accounts receivable using shipping documents	98%
	Record credit card sales and related accounts receivable	100%
	Record checks received from customers	97%
	Record cash received from credit card banks using a report	84%
	Record write-offs for uncollectible accounts	88%
	Record amounts in the general ledger	50%
	Record Adjustments	Identify and adjust January sales initially recorded in December
	Identify and record unearned revenue adjustments	44%
	Estimate bad debt expense using the percent of sales method from January through November	44%
	Estimate bad debt expense for December using percent of sales method	19%
	Estimate bad debt expense using the percent of accounts receivable method	44%
Prepare Work Schedules	Prepare the accounts receivable aging report using sales invoices, customer checks and write-offs of uncollectible accounts	69%
<u>Phase 2: Inventory</u>		
Record Transactions	Record inventory purchases using inventory purchase and receipt documents	70%

(continued)

Procedure Type	Routine Accounting Procedure	Percent Correct
Record Adjustments	Adjust the ending inventory balance to agree with historical cost under the selected method	76%
	Adjust the ending inventory balance for obsolete and lost inventory	71%
Prepare Work Schedules	Compute the historical cost of ending inventory using the periodic and perpetual system for three different alternative methods: First in first out (FIFO), Last in first out (LIFO), and Average cost (Average)	86%
	Prepare a summary inventory report to compare results of all six methods	98%
<hr/>		
Phase 3: Long-term Assets		
<hr/>		
Record Transactions	Obtain checks written during December and use the description written on the memo line of the check to determine the account name to record the purchase of the goods or services	85%
	Record the December principal payment on the notes payable	100%
Record Adjustments	Compute depreciation expense using straight-line	91%
	Compute depreciation expense using double-declining balance	97%
	Record depreciation expense for the selected method	73%
	Reclassify the short-term portion of the principal of the note	80%
	Determine and record accrued interest	67%
Prepare Work Schedules	Prepare walk-forwards of long-term assets and accumulated depreciation	62%

(continued)

Procedure Type	Routine Accounting Procedure	Percent Correct
<u>Phase 4: Investments and Financial Statements</u>		
Record Transactions	Record transactions related to three different types of investments using the cost method, fair market value method, and equity method	86%
	Record purchase of treasury stock	93%
	Record dividends paid to shareholders	77%
	Record invoices received after year-end	53%
	Record closing entries	93%
	Compute and record income tax expense	80%
Record Adjustments	Record the adjusting entry for insurance	92%
	Record the adjusting entry for rent	55%
	Record the adjusting entry for professional fees	70%
	Record the adjusting entry for supplies	93%
	Record an adjustment for December invoices for services received	98%
Prepare Financial Statements	Prepare Income Statement from General Ledger	100%
	Prepare Balance Sheet from General Ledger	89%
	Prepare Cash Flow Statement	81%
	Prepare Statement of Stockholders' Equity	69%

Phase one: Sales and accounts receivable. Students used sales invoices, check copies, and reports to record transactions. Documents provided easily recognizable amounts and the work was repetitive. Therefore, students recorded transactions correctly 85% of the time. The most common mistake related to recording January invoices in December, which also led to low performance on adjusting January sales. Students had difficulty identifying previously recorded unearned revenue amounts and knowing when to make related adjustments. Recording the bad debt expense adjustment required students to identify and use amounts from the accounts receivable aging report, the general ledger, and the work

Table 4.17

Summary of the Percentage of Accounting Procedures Performed Correctly on the Comprehensive Project

Accounting Procedures	Accounts Receivable and Sales (Phase One)	Inventory (Phase Two)	Long-term Assets (Phase Three)	Investments and Financial Statements (Phase Four)	Total
Record Transactions	85%	81%	87%	82%	84%
Record Adjustments	42%	73%	73%	86%	68%
Prepare Work Schedules	69%	86%	94%	NA	81%
Financial Reporting	NA	NA	NA	81%	81%
Total	67%	82%	85%	84%	81%

schedule used to identify uncollectible accounts. Confusion about which amount to use for each step in the procedure resulted in the inability to properly record estimated bad debt expense.

Students successfully prepared the aging report by using sales documents and checks, and agreed the total on the report to the general ledger account balance. However, inconsistencies related to writing off accounts, posting amounts into the general ledger, and removing balances from the aging report caused errors when students completed the accounts receivable aging report. In practice, the accounting system automatically generates the

accounts receivable aging report from recorded transactions. Therefore, the errors that caused most of the confusion will not occur in practice (RRJ, 2/24/2016).

Phase two: Inventory. Students used invoices with receiving dates and properly recorded purchases of inventory to the purchases account. The next procedure entailed moving the purchase account balance to the inventory account. Failure to post recorded amounts into the purchases account in the general ledger led to improperly recording amounts in the inventory account. Students successfully computed the ending inventory balance for all six alternative methods. Errors occurred while students computed the value of inventory using the moving average method. Students generally used the correct accounts to adjust for obsolete and lost inventory; however, some students failed to recognize that accountants value the missing inventory using the selected accounting method. The error resulted in an incorrect value of ending inventory (RRJ, 3/23/2016).

Phase three: Long-term assets. Students successfully recorded purchases of goods and services to the proper asset or expense account. Errors occurred with purchases that were unusual and not included in practice problems. Students used Excel spreadsheets to compute depreciation expense. Incorrect amounts resulted from using an erroneous number of months the company used each asset during the year. The walk-forward did not agree to general ledger balances when students failed to post all recorded transactions to the general ledger. The adjustment for accrued interest expense required more than computing and recording the amount. Students had to adjust an incorrect amount through November and then use the amortization schedule to determine the final year-to-date adjustment amount. The number of steps and lack of familiarity with an amortization schedule caused students to

make errors adjusting the current portion of the note and accrued interest (67% correct) (RRJ, 4/13/2016).

Phase four: Investments and financial statements. Overall, students successfully recorded investment transactions. Errors occurred when students recorded a full year of dividends in addition to the nine months of dividends already recorded in the general ledger. I did not discuss paying dividends to owners during class. As such, some students incorrectly recorded dividends paid, leading to errors performing a relatively simple procedure. Students correctly interpreted documents and invoices and adjusted most accounts properly at the end of the year. Many students misinterpreted the rental terms and adjusted the rent expense and prepaid rent accounts incorrectly.

Students prepared the income statement and the balance sheet by using accounts and amounts in the general ledger. Failure to post all entries led to incorrect account balances in the general ledger. I had students add an amount for miscellaneous income or expense to balance the general ledger (debits equal to credits). Approximately 10% of the balance sheets did not balance due to incorrect closing entries or failure to account for the miscellaneous income or expense account. Overall, students successfully determined line items and amounts on the cash flow statement, a challenging task. Failure to include the issuance of stock at the beginning of the year and incorrect amounts for retained earnings caused errors on the statement of stockholders' equity.

Overall performance. Students correctly performed accounting procedures in CP tasks 81% of the time. Requirements to use interrelated sources of information to perform accounting procedures resulted in the lowest success rates. Students struggled when using previously recorded amounts to make adjustments to account balances. Furthermore, failure

to notice missing amounts in general ledger accounts led to incorrect adjustments.

Approximately 20% of the total points students earned for performing accounting procedures on the CP related to adjustments to account balances. Therefore, difficulty making adjustments to accounts did not prevent students from demonstrating an overall ability to perform accounting procedures in CP work.

Comprehensive Final Exam

The comprehensive final exam consisted of 36 multiple-choice questions over accounting concepts and routine procedures, along with six multi-part questions that required students to:

- 1) determine whether a cost is an asset or an expense (10 costs),
- 2) determine line items and amounts reported on the cash flow statement using a balance sheet, income statement, and additional information (eight items and amounts),
- 3) interpret a set of public company financial statements (10 line-items), and
- 4) three different questions (situations) that required students to determine and support estimated amounts or select and support an accounting method (2 to 3 parts each).

All multiple-choice questions over routine accounting procedures appeared on previous national Certified Public Accountants (CPA) exams (Gleim, 2012). I varied the order of the questions on three different versions of the exam. All questions related to performing routine accounting procedures, except for questions that asked students to interpret a set of financial statements and determine and support alternative methods and estimates. I present a sample of questions on the final exam in Figure 4.7.

1) On January 1, 2015, Sage Corp purchased 40% of the common stock of Adams Co. for \$400,000. Adams Co. reported net income of \$120,000 and paid cash dividends of \$20,000. The amounts and accounts that Sage should report on their 2015 year-end financial statements related to the investment in Adams Co. should be:

	<u>Investment</u>	<u>Investment Revenue</u>
a.	\$456,000	\$56,000
b.	\$440,000	\$48,000
c.	\$392,000	\$ 8,000
d.	\$448,000	\$48,000

2) On January 1, Sydney Co. purchased and installed a machine placed in service at a cost of \$480,000. The machine's residual value is estimated to be \$80,000. The company is depreciating the machine over 10 years using the double declining balance method. The amount of depreciation expense Sydney Co. will report for the machine for the second full year of use is

- a. \$96,000 c. \$64,000
b. \$76,800 d. \$61,440

3) The following is Eire Co.'s final accounts receivable aging as of December 31, 2015:

<u>Days Outstanding</u>	<u>Amount</u>	<u>Estimated Uncollectible</u>
0-60 days	\$240,000	1%
61-120 days	\$180,000	2%
Over 120 days	<u>\$200,000</u>	6%
Total	\$620,000	

During 2015, Eire wrote off \$6,000 in accounts receivable. The "allowance for uncollectible accounts" reported on the December 31, 2014 balance sheet was \$44,000. The amount that will be reported for Accounts Receivable, Net on the balance sheet using the aging method will be:

- a. \$602,000 c. \$600,000
b. \$638,000 d. \$582,000

4) Place an X by beside each of the following costs that are capitalized and initially reported on the balance sheet (according to GAAP).

- _____ a. Installation costs related to the purchase of a new machine
_____ b. Research and development costs related to a new product

5) Students were given a comparative balance sheet along with information about other transactions and asked to place an X beside **ALL** of the following that Baldwin's would correctly report on the year ended 2015 cash flow statement.

	<u>Description</u>	<u>Amount</u>	<u>Section</u>
_____	a. Accounts receivable	(\$12,500)	Operating
_____	b. Amortization expense	(\$500)	Operating
_____	c. Purchase of equipment	(\$20,000)	Investing
_____	d. Dividends paid	(\$18,500)	Investing

Figure 4.7. Sample final exam questions.

All questions relating to routine accounting procedures on the final exam included in this study were objective with one right answer and did not allow students to earn partial credit. Students typically earn partial credit on objective tests over structured problems that require students to work through a series of steps to record transactions. Therefore, students who had mathematical errors or incorrectly performed one step in a sequence of steps required to answer the multiple-choice question lost 100% of the points. Students probably would have earned higher scores on a test that allowed for partial credit. I included the results of final exam questions that assessed students' knowledge about routine accounting procedures in this study. Table 4.18 provides a summary of the percentage of correct answers to questions over routine accounting procedures on the final exam by topic. Passing the CPA exam requires a score of 70-75%. Furthermore, students passed the course with an overall grade of 70%. Therefore, I considered a score of 70% or higher on each topic to be evidence that students successfully performed routine accounting procedures. A discussion of students' ability to perform specific accounting procedures on the final exam follows.

Accounting cycle. Students answered four multiple-choice questions related to recording sales and inventory purchases and year-end adjustments for prepaid insurance and supplies. A fifth multiple-choice question asked students to identify the purpose of closing entries. Only one third of the students answered the question related to prepaid insurance correctly. The prepaid insurance question described two different policies and related payments. Students who answered incorrectly confused the prepaid amount with the amount paid monthly. Approximately 75% of students answered the other four questions correctly. The low performance on the prepaid insurance question reduced the overall performance on questions related to the accounting cycle to below 70%.

Table 4.18

Students' Performance on Routine Accounting Procedures on the Final Exam

Topic	Percentage Students Answered Correctly	Percentage of Total Points by Topic
Accounting Cycle	68%	13%
Accounts Receivable	57%	5%
Revenue Recognition (Sales)	71%	10%
Cash: Bank Reconciliation	17%	3%
Financial Reporting (Cash Flow Statement)	75%	15%
Financial Reporting (Other Statements)	61%	7%
Inventory	74%	10%
Investments	48%	14%
Long-term Assets: Acquisition	75%	13%
Long-term Assets: Depreciation	73%	10%
Total	66%	100%

Accounts receivable. Students answered three multiple-choice questions related to accounts receivable. The first question required students to use the percent of sales method to estimate reported bad debt expense (52% answered correctly). The second question required students to use the percent of accounts receivable (aging) method to estimate the reported amount of net accounts receivable (62% answered correctly). The third question asked students to determine the most appropriate method for estimating uncollectible

accounts (28% correct). Each question required students to consider the current balance of the allowance account and accounts written-off. A review of students' written work beside the question on the test revealed that students who missed the percent of sales question often combined the percent of sales method with steps related to the percent of accounts receivable method. Students who incorrectly answered the percent of accounts receivable question either 1) failed to correctly record write-offs in the allowance account, or 2) incorrectly identified the ending allowance account balance as the amount reported for net accounts receivable on the balance sheet.

Cash. Students answered one multiple-choice question that required students to consider six different items and determine the ending cash balance. Few students considered all amounts correctly (17%); however, a review of students' work beside the test question revealed that almost all students correctly considered at least four of the six items in the question. The item students consistently answered incorrectly related to a bank error.

Financial reporting. Students answered seven multiple-choice questions related to financial reporting and presentation. Two questions related to the requirements for reporting an asset on the balance sheet (71% correct). Three questions related to the presentation of contingencies, discontinued operations, and comprehensive income. Students did not work with the three topics on the CP, and I spent minimal or no class time discussing the topics. As such, only 49% of students correctly answered the three questions. The next two questions presented a list of six transactions and asked students to determine the amount of sales (86% correct) and the amount of operating expenses (52% correct) reported on the income statement. Students who incorrectly determined the amount of operating expenses

included cash amounts along with incurred amounts. Students who considered only one of the six transactions answered the question incorrectly.

Investments. Students answered five multiple-choice questions related to investments. Questions required students to use three different methods and determine amounts reported on the financial statements. Approximately 52% and 48% of students determined the correct amount reported on the financial statements using the fair market value method and the equity method, respectively. Only 38% of students demonstrated an understanding of how to determine the gain on the sale of an investment. Students did not record the sale of an investment on the CP. Overall, students were unable to correctly perform accounting procedures related to investments using information given on the final exam.

Cash flow statement, inventory, long-term assets, and revenue recognition.

Students demonstrated an adequate ability to perform accounting procedures related to the cash flow statement, inventory, long-term assets, and revenue recognition. However, I noted less than 70% of students correctly answered questions related to the following specific accounting topics (% correct):

- Research and development costs related to new products (66%),
- The increase in fair market value over cost for a trademark (59%),
- Interest costs related to construction (62%),
- Amounts reported on the cash flow statement in the investing and financing sections (57%),
- The lower of cost or market method for inventory (41%)

- The amount of depreciation expense for the second year using the double-declining balance method (59%), and
- Reporting net sales using the gross and net methods (52%).

The CP required students to determine the second-year amount of depreciation expense using an Excel spreadsheet. Students also prepared a complete cash flow statement as part of CP work. Homework provided practice on all procedures listed above.

Nature of accounting work. Students in a traditional IFA course learn to perform accounting procedures that consist of: 1) recording business transactions, 2) recording period-end adjustments to account balances, and 3) preparing financial statements.

Table 4.19 presents the percentage of points students earned on the final exam on questions related to the three major types of tasks accountants perform. Overall, students demonstrated adequate ability to record transactions and compute related amounts. Students had difficulty recording end-of-period adjustments for bad debt expense (two questions related to accounts receivable) and lower of cost or market (one question related to inventory). Questions related to investments required students to determine the change to financial statements due to purchases, sales, and period-end adjustments. Due to time constraints at the end of the semester, I provided minimal class discussion related to accounting for investments. I included questions related to the accounting cycle (previously discussed) in the “prepare financial statements” category. The prepare financial statements category also includes questions related to financial statement presentation. Approximately half of the students incorrectly answered questions related to reporting comprehensive income, discontinued operations, and contingencies, topics I minimally discussed in class. Without the

Table 4.19

Students' Scores on the Final Exam by Topic and Type of Accounting Procedure

Topic	Record Transactions	Record Adjustments	Prepare Financial Statements
Sales and Accounts Receivable	74%	47%	NA
Inventory	85%	41%	NA
Long-term Assets	75%	72%	NA
Investments	47%	48%	NA
Accounting Cycle	77%	55%	NA
Prepare Financial Statements	NA	NA	70%
All Topics	74%	54%	70%

aforementioned three questions, students earned 73% of the points related to preparing financial statements.

Overall Ability to Perform Accounting Procedures

I considered a score of 70% on each major topic as evidence that most students learned to perform related routine accounting procedures. Overall, students demonstrated the ability to successfully compute amounts and perform routine accounting procedures on the CP. Additionally, except for end-of-period adjustments and a few other areas previously discussed, students successfully completed routine accounting procedures on the final exam. Students had difficulty performing procedures related to the key areas of accounts receivable and investments on the CP and on the final exam. The complexity of using multiple

computations and steps to arrive at one correct answer may have negatively affected students' scores on both the CP and the final exam. Students performed some steps in accounts receivable related procedures correctly; however, they completed other parts of the procedure incorrectly and received no partial credit on the final exam. Students were unable to correctly perform procedures related to investments on the final exam; however, successfully recorded investment related transactions on the CP. Students successfully performed accounting procedures related to all other topics learned in a traditional IFA course.

Summary of Chapter Four

In this study, I developed and implemented new instructional methods to encourage students to practice intellectual skills required for success in the accounting profession. Students completed a CP and performed the work of the accountant. In response to research question one, I presented evidence that students practiced all six steps in the critical thinking process as they completed the CP. A discussion of implementation issues and actions taken to improve learning on the CP followed as I presented findings related to research question two. In the IFA course, I replaced periodic objective tests with short RPs to encourage students to contemplate decisions made by professional accountants and their overall learning process. To address research questions three and four, I discussed changes to the students' level of reflection as they progressed through the course along with changes made to instruction and question prompts to encourage deeper reflection. Findings related to research question five supported that the new instructional method resulted in students learning to adequately perform routine accounting procedures related to most types of business transactions. In the next chapter, I will discuss the findings as they relate to the

current literature. Additionally, I will discuss the overall results of implementing the CP and RPs, along with suggestions for incorporating the new method of instruction into future junior-level IFA courses.

CHAPTER FIVE: DISCUSSION AND IMPLICATIONS FOR ACCOUNTING INSTRUCTION

As early as 1990, the Accounting Education Change Commission (AECC) recognized a deficiency in accounting graduates' intellectual skills. The committee of accounting educators and professionals specifically called for accounting educators to design and implement curriculum that incorporates the intellectual skills accountants use in the professional setting (AECC, 1990). Since the initial request by the AECC, some accounting educators have reiterated the need for accounting students to develop strong intellectual skills (Baril et al., 1998; Black, 2012; Lawson et al., 2015; Milliron, 2012; Sin et al., 2012; Spiceland et al., 2015; Yu et al., 2013). Other educators may wonder what type of changes accounting instructors should make to current instructional methods to meet this need.

Accounting instructors traditionally rely on textbook readings and end-of-chapter materials (EOCM) as primary learning tools to achieve course objectives (Apostolou, Dorminey, Hassell, & Rebele, 2016; Catanach, Croll & Grinaker, 2000; Duchac & Amoruso, 2012; Spiceland et al., 2015; Stevens, Clow, McConkey, & Silver, 2010). A study conducted by Davidson and Baldwin (2005) found that the use of EOCM most likely develops inadequate intellectual skills.

Despite recognition that current learning materials do not fully prepare students for accounting work, few accounting instructors have published studies that describe attempts to develop instructional methods that require students to practice critical and reflective thinking. The studies that discuss findings related to experimental instructional methods do not substantiate how the new learning materials provide the practice students need to develop intellectual skills (Warren & Young, 2012; Albrecht et al., 1994). Furthermore, prior studies

do not provide sufficient detail about methods to employ to resolve implementation issues. Accounting instructors who have confidence that smooth implementation is possible may incorporate more activities that include practice of intellectual skills.

The purpose of the present study was to develop an instructional approach that aligns learning activities and assessments to encourage junior-level financial accounting students to use a deep approach to study and practice the intellectual skills professional accountants use in the work place. The learning tools, teaching context, and assessments in this study differed significantly from traditional accounting instruction centered around textbook explanations and EOCM (Davidson & Baldwin, 2005; Spiceland et al., 2015). I implemented action research methods during two 16-week semesters (Spring 2015 and Spring 2016) to gather and analyze data to address the following research questions:

1. How does the completion of an authentic comprehensive problem-based project encourage students to practice the process of critical thinking?
2. How does an instructor address implementation issues related to the use of an authentic comprehensive problem-based project over the course of a semester?
3. How does students' thinking about the issues professional accountants face change as students complete an authentic comprehensive problem-based project and short reflection papers?
4. What changes in instruction related to short reflection papers encourage students to contemplate decisions made by professional accountants?
5. How does a change in assessment methods from objective periodic tests to an authentic comprehensive problem-based project and reflection papers

affect students' ability to complete accounting procedures?

The new instructional method used in this study centered on an authentic CP that required students to practice critical thinking as they completed authentic professional accounting work. Additionally, I replaced periodic objective tests with short reflection papers (RPs) to encourage thought about the decisions accountants make as they perform accounting procedures and prepare financial information. In this chapter, I will first discuss how incorporating the CP into the IFA course encouraged students to practice the critical thinking process. Next, I will discuss how I resolved implementation issues related to changing the learning environment and adding critical thinking practice as a primary learning objective. Third, I will consider the nature of students' reflections about the work of the professional accountant and how CP tasks and changes to instruction influenced students' perspective. Finally, I will conclude with a discussion over how replacing objective tests with RPs and using class time to practice critical thinking skills while performing unstructured accounting work in the CP affected students' ability to perform accounting procedures.

The Comprehensive Project

This study rests on Biggs et al.'s (2001) model of teaching and learning that proposes instructors should align activities and assessments to encourage students to use a deep approach to studying to achieve the instructor's desired learning outcomes (see Figure 1.1). The learning objective for students in the IFA course in this study was to practice using critical thinking skills while learning to perform professional accounting work related to topics in the course. I structured the learning environment to encourage deep approaches to study (Barr & Tagg, 1995; Biggs & Tang, 2011; Entwistle, 2010; Weimer, 2013). During

class, students followed Kolb's (1984) experiential learning model as they completed the CP. Furthermore, I intentionally replaced structured lectures and periodic objective quizzes and tests over declarative and procedural knowledge to discourage surface approaches to learning (Dart & Clarke, 1991; Entwistle et al., 2000).

Practice of Critical Thinking Skills

The primary purpose of incorporating the CP into the IFA course was to encourage students to practice critical thinking skills as they learned to perform accounting work. Students began the learning process on each topic by watching video lectures that described accounting concepts and procedures and reading the textbook before class. Students then completed practice problems similar to EOCM, also before class. The purpose of the before-class activities was to familiarize students with the basic concepts and accounting procedures they would use to complete the CP. I relied on the materials students used outside of class to facilitate the learning process. Therefore, comparing the accounting work students perform using before-class materials to the tasks students completed on the CP gives insight into factors related to implementation issues.

The findings in chapter four classified the CP tasks students performed according to each of the six steps in the critical thinking process (see Table 4.2). Table 5.1 repeats the tasks presented in Table 4.2 and highlights procedures students typically perform when using EOCM in bold. I reviewed the materials students used to prepare for class and referred to my 20 years of experience using textbooks to identify procedures students typically perform using EOCM. Additionally, three other experienced IFA instructors confirmed EOCM require students to complete the bolded tasks.

Table 5.1

Comprehensive Project Tasks Compared to Textbook End-of-Chapter Requirements (in bold)

Step in the Critical Thinking Process	Accounting Task Completed
<u>Phase 1: Sales and Accounts Receivable</u>	
Interpretation and Analysis	<p>Record sales and accounts receivable using shipping documents</p> <p>Record payment received from customers (using checks)</p> <p>Record credit card sales and related accounts receivable</p> <p>Record cash received from credit card banks using reports</p> <p>Balance the cash account</p>
Evaluation	<p>Identify and adjust January sales initially recorded in December (using sales invoices)</p> <p>Identify and record unearned revenue adjustments</p> <p>Enter sales and collections on the accounts receivable aging report</p> <p>Record an adjustment for write-offs of uncollectible accounts</p> <p>Determine if bad debt expense estimated during the year using the percent of sales method is correct through November in the GL</p> <p>Record the year-end adjustment for bad debt expense</p>
Inference	<p>Identify uncollectible accounts using the aging report</p> <p>Estimate bad debt expense using the percent of sales and the percent of accounts receivable methods</p> <p>Consider customers' payment history and estimate the amount of future uncollectible accounts from three perspectives: low, medium, and high</p>
Explanation	<p>Provide reasonable support for three different estimates of future uncollectible accounts: low, medium, and high</p> <p>Select and support a reasonable estimate of future uncollectible accounts</p>
Self-Regulation	<p>Reconcile the accounts receivable account balance to the detail accounts receivable aging report (computed in EOCM)</p> <p>Agree the allowance for uncollectible accounts balance to the schedule of estimated future uncollectible accounts</p> <p>Review the reasonableness of the estimate for future uncollectible accounts</p> <p>Review the reasonableness of the current year bad debt expense</p>

(continued)

Step in the Critical Thinking Process	Accounting Task Completed
<hr/> Phase 2: Inventory <hr/>	
Interpretation and Analysis	Record inventory purchases using inventory purchase and receipt documents
Evaluation and Inference	<p>Compute the historical cost of ending inventory using the periodic and perpetual system for three different alternative methods: First in first out (FIFO), Last in first out (LIFO), Average cost (Average)</p> <p>Prepare ending inventory reports using all six methods</p> <p>Adjust the previous ending inventory balance to agree with the historical cost of the selected method</p> <p>Adjust the ending inventory balance for lost inventory (given)</p> <p>Adjust the ending inventory balance for obsolete inventory (given)</p> <p>Analyze the results of the six alternative inventory methods</p>
Explanation	<p>Identify advantages and disadvantages of using either the periodic or the perpetual method given the business situation</p> <p>Identify advantages and disadvantages of using the FIFO, LIFO or Average method given the business situation</p> <p>Select and support the appropriate inventory method</p>
Self-Regulation	<p>Agree the inventory summary schedule to the balance in the inventory account after making all adjustments</p> <p>Agree the cost of goods sold account balance to the inventory report</p> <p>Review the impact of the selected method on the financial statements</p>
<hr/> Phase 3: Long-term Assets <hr/>	
Interpretation and Analysis	<p>Obtain checks written during December for goods and services</p> <p>Use the description written on the memo line of each check to determine the account name used to record the purchase of the goods or services</p> <p>Obtain and interpret the amortization schedule for notes payable</p> <p>Record the December principal payment on the notes payable</p>

(continued)

Step in the Critical Thinking Process	Accounting Task Completed
Evaluation	<p>Compute depreciation expense using straight-line Compute depreciation expense using double-declining balance Record depreciation expense for the selected method Reclassify the current portion of the principal of the note Determine and record accrued interest</p>
Inference	<p>Estimate a useful life for each long-term asset Estimate a residual value for each long-term asset Select the most appropriate method of depreciation Prepare walk-forwards of fixed assets and accumulated depreciation</p>
Explanation	<p>Identify advantages and disadvantages of each alternative depreciation method given the business situation Provide reasonable support for the selected method of depreciation Provide reasonable support for the estimated useful life of each asset</p>
Self-Regulation	<p>Agree asset and depreciation account balances to the walk-forward of long-term assets and accumulated depreciation Agree the annual interest expense to the amortization schedule Agree the amortization schedule to current and noncurrent notes payable amounts Review reasoning and support for estimated useful lives and residual values and the depreciation method Review the impact of estimates on the financial statements</p>
<hr/> Phase 4: Investments and Financial Statements <hr/>	
Interpretation and Analysis	<p>Record transactions related to three different investments using the cost method, fair market value method, and equity method Determine (research) the fair market value of each investment Record treasury stock purchases Record dividends paid to shareholders Identify information necessary for making year-end adjustments</p>
Evaluation	<p>Record the adjusting entry for insurance expense Record the adjusting entry for rent expense Record the adjusting entry for professional fees Record the adjusting entry for supplies expense Record an adjustment for December invoices for services Compute and record income tax expense Prepare the four financial statements using summary and detail general ledger accounts (includes preparing closing entries)</p>

(continued)

Step in the Critical Thinking Process	Accounting Task Completed
Inference	Identify reasonable alternative accounting methods for each investment Determine the year-end adjustments for each alternative method for each investment
Explanation	Identify advantages and disadvantages of using alternative methods for each investment given the situation Provide reasonable support for the selected accounting method for each investment
Self-Regulation	Agree summary general ledger (GL) account balances to detail GL account balances Agree closing entries to the detail GL account balances Review transactions posted to the retained earnings account Ensure balance sheet amounts agree to the GL Ensure income statement amounts agree to the GL Agree the ending cash amount on the cash flow statement to the ending cash account balance

The comparison shows that students who practice accounting procedures using EOCM primarily complete tasks within the first three steps in the critical thinking process. These first three steps are interpretation, analysis, and evaluation. Recording transactions falls within the interpretation and analysis steps. EOCM provide the information required to record transactions. Therefore, students using EOCM do not practice interpreting information provided on business documents. For example, estimating bad debt expense is a procedure required by EOCM; however, students compute the estimated amount using given information which eliminates the need for students to use judgment. Furthermore, students use given information to determine year-end adjustments for investments.

Textbook readings discuss various reasons a company may use one method as opposed to another method. Furthermore, EOCM ask students to identify amounts reported on the financial statements using alternative accounting methods. However, EOCM also

state the accounting method students should use, eliminating the need for most inference and explanation tasks completed for the CP. Tasks in the self-regulation step completed to cross-check account balances are not necessary when using EOCM that provide correct final account balances. Some mini-cases presented in the EOCM provide a business situation and require students to identify the most appropriate accounting method. However, students use limited information provided to make the decision. The comparison of CP tasks to the requirements in EOCM agrees with the findings of Davidson and Baldwin (2005) that less than 10% of EOCM require the use of higher level thinking skills.

Students who completed the CP responded to question prompts on RPs that asked them to compare the thinking required to complete practice problems (EOCM) to the thought processes used to complete tasks for the CP. The following responses summarize students' perceptions of the usefulness of the practice problems (homework) with respect to tasks that fall within the analysis and interpretation steps in the critical thinking process:

*The homework is helpful because it allows me to walk through to the **correct answer**.* (RP3, S13, 2016)

*What the homework did well is help us **understand the format of the equations and how to execute the math** once we had made all of the decisions.* (RP3, S6, 2016)

Other responses, like the following, emphasize the limitations of the EOCM for practicing critical thinking skills:

*You read a problem and **it tells you** exactly how long it will be used for, if there is a residual value exactly what that is ... Once you have this information **all you have to do is plug the numbers into the fairly simple and straight forward equations do some simple math and you have your answer**.* (RP3, S11, 2016)

*The homework was easier to work through because of the **simple, isolated layout of each question**. One drawback that I have experienced is the **passive***

thinking I use with each of the homework assignments. I seem to work each problem as fast as I can without really learning anything. (RP3, S13, 2016)

You also do not have to make very many decisions and estimations for yourself because the problem tells you what to do and what methods to use. The problem is very black and white in the fact that everything is given to you including the book values, residual values, historical cost and useful life. There is no decision making and there is right and wrong answer based off of textbook information and procedures. (RP3, S3, 2016)

Students recognized that practice problems require structured problem-solving that leads to one correct answer (Erwin, 2000; Jones, Dougherty, Fantaske, & Hoffman, 1997) and does not require higher level thinking (inference and explanation steps). In contrast, the following responses indicate students recognized that the CP allowed them to achieve a deep understanding of accounting procedures:

Work done on the project showed me the importance of adjusting journal entries. The homework and lecture videos provided an insight ... how to record them, but solely completing them on the homework felt procedural. The project provided some realism to how important it was to decide ... if un-adjusted or adjusted incorrectly, the financial statements for the company would be completely wrong. (RP4, S18, 2016)

In homework problems ... we just went with what they told us. We had a lot of autonomy during the project, which really made us feel more like accountants. I think the biggest thing we learned from justifying, was learning how to explain why we made our certain decision because of how it would affect the financial statements. So basically, what each method would do to our company. (RP4, S21, 2016).

Other responses similar to the following highlighted the ambiguity and decision-making that occurred during the inference and explanation steps in the critical thinking process as they completed the CP:

On the other hand, during the casework [CP] most of the information given to us in online homework are not given and you have to make reasonable and supportable reasons to why you decided to choose ... when we were doing the project, we had a hard time giving reasons to support our choice of useful life, just because we have never thought that it is part of the accountant's responsibility and we have never had to do it before as it is always given to us in the homework problems. (RP 3, S16, 2016)

*The project provides several opportunities to make company decisions about inventory, investments, and depreciation. I had to look at the specific parts of our company and decide which methods would be most suitable. **Looking at the company as a whole** there were going to be different outcomes depending on which method was used. This means **that we have to look at the goals of the company and decide which method is going to provide the desired outcome**. All of the materials associated with the project provided a comprehensive overview of this. (RP 4, S20, 2016)*

Written responses to question prompts such as those presented indicate that students recognized the difference in thinking skills required to work practice problems and complete CP work.

The tasks students perform completing CP work that practice problems do not require (not bold in Table 5.1) represent opportunities for accounting instructors to incorporate activities that require the use of critical thinking skills. Students who complete the following types of exercises will practice using higher order thinking skills as they complete authentic accounting work:

- 1) use authentic business documents (checks, invoices, shipping documents) to determine amounts and record transactions,
- 2) prepare detail and summary general ledgers when completing the accounting cycle,
- 3) reconcile account balances in the detail general ledger to reports and work schedules,
- 4) use an accounts receivable aging report and customer specific information to determine write-offs and estimate bad debt expense,
- 5) identify advantages and disadvantages of alternative accounting methods in a specific business situation,

6) select and support an appropriate alternative accounting method for a given business situation, and

7) estimate amounts necessary to perform accounting procedures.

Instructors who change the structure of the information students use to perform accounting procedures and require students to work with situations that have more than one reasonable solution will encourage students to practice steps in the critical thinking process (Facione, 1990).

The design of the CP incorporates certain aspects of various models researchers propose instructors should use to encourage the development of critical thinking skills. Tasks in the beginning of each phase in the CP required students to analyze data for value and content, synthesize information, use reflective thinking, and delay judgment until adequate data are available (Huffman et al., 1991). Later tasks in each phase asked students to employ argument analysis, judge likelihood in uncertainty, and evaluate alternatives (Halpern, 1998). Most tasks encouraged students to consider multiple perspectives (Lim, 2011b) and use all the facts to decide which information was relevant for justifying a recommendation (Facione, 2011). The CP also assisted students with identifying the strengths and weaknesses of their own thinking skills (Facione & Gittons, 2013).

Ennis (1989) identified four common methods instructors use to teach critical thinking skills: general, immersion, infusion, and mixed. A meta-analysis of 117 studies conducted by Abrami et al. (2008) found the mixed method of teaching critical thinking processes separately and then applying learning directly to course content produced the greatest improvement in students' critical thinking skills. Furthermore, the researchers identified the infusion method as the second most effective method. Time constraints

magnified by using class time for CP work eliminated the option to use the mixed method of instruction. As such, I employed the infusion method and encouraged students to apply critical thinking processes to solve discipline-specific problems as they completed authentic work.

Some accounting instructors who recognized the limitations of EOCM for developing higher order thinking skills have studied the results of adding small unstructured projects to an accounting course (while maintaining the traditional primary reliance on a textbook and EOCM). Findings from observations and student surveys in qualitative studies indicate that students believe they used higher order thinking skills to complete the additional assignments (Baker, 2011; Finger, 2010; Grimm, 2015; Killian, Huber, & Brandon, 2012; Kilpatrick, et al., 2013; McGowan, 2012; Phillips & Nagy, 2014; Sargent & Borthick, 2013; Spiceland et al., 2015; Wynn-Williams et al., 2016; Young & Warren, 2011). Researchers agree that learning to think critically occurs over a long period of time with consistent practice in a variety of situations (Ennis, 1993, Facione, 1990; Halpern, 1998; Kurfiss, 1988; Paul, 1985). Students who completed the CP practiced steps in the critical thinking process during the entire semester.

This study did not include gathering data for evaluating the improvement in students' critical thinking ability. However, students' grades (see Table 4.4) on CP work provide information for evaluating the adequacy of students' skills. Students had great difficulty performing tasks in phase one due to a variety of implementation issues. After providing instruction in areas where students lacked understanding, students' ability to adequately complete authentic accounting work improved. Students' prior perceptions about accounting work affected students' ability to progress through the critical thinking process. A lack of

experience with making accounting related judgments created challenges for students when they worked on tasks in the explanation step in each phase of the CP. I discuss the effect of implementation issues on students' ability to adequately complete tasks in detail in the next section. Additionally, the discussion of findings related to students' reflective thinking addresses changes to instruction that influenced students' thinking about the nature of accounting work.

Implementation Issues

Biggs et al. (2001) allege, "The heart of the teaching/learning system is at the process level, where the learning related activity produces or does not produce the desired outcomes" (p. 136). The CP, the primary learning activity in this study, required students to follow the steps in Kolb's (1984) experiential learning model. Students learned conceptual and procedural knowledge (concrete experimentation), analyzed and organized new information (reflective observation), applied knowledge to complete authentic accounting tasks (abstract conceptualization), and used judgment to consider alternatives and recommend a solution (active experimentation). Learning activities with similar characteristics fall in the category of problem-based learning (PBL) (Bonner, 1999; Wines et al., 1994).

Researchers have found that similar teaching interventions do not consistently lead to the same results, and the degree to which students achieve learning objectives is heavily dependent on implementation procedures (Niu et al., 2013). Shuell (1986) proposed that successful implementation of PBL activities depends on the following factors:

- 1) students' prior knowledge,

- 2) the realization that students' interpretation and understanding of new information depends on the availability of appropriate schemata, and
- 3) the context in which the instructor presents the material (p. 429).

These proposed factors for successful integration of PBL activities are consistent with Biggs et al.'s (2001) theory of alignment of teaching and learning, which emphasizes that instructors must align students' prior knowledge and the teaching context with activities and assessments to achieve learning goals. Other researchers also suggest that PBL activities must be appropriate to students' level of prior knowledge (Des Marchais, 1999; Schmidt et al., 2011; Sockalingam et al., 2010).

The implementation issues that occurred during this study correspond with the aforementioned researchers' criteria for successful implementation of a PBL activity. Table 5.2 illustrates the relationship between Shuell's (1986) factors for successful implementation and the implementation issue themes discovered during analysis (see Table 4.5). I expected students to begin the course with a working knowledge of basic accounting terminology, the ability to record transactions, and an understanding of the accounting cycle gained in the sophomore class (pre-requisite knowledge). Prior knowledge also included the learning students acquired before class as they watched video lectures and worked structured problems. I anticipated students' prior knowledge, supplemented by brief explanations of more difficult procedures, would provide the schemata necessary for completing CP tasks. The teaching context includes my intentions to minimize lectures and in-class practice of structured accounting procedures. I also expected students to learn from each other as they worked in groups of two to complete CP tasks. Limited class time to

Table 5.2

Implementation Issues Correlated with Factors Required for Successful Implementation of Problem-based Learning Activities (Shuell, 1986)

Implementation Issue Themes	Factors for Success
Basic accounting procedures	Students' prior knowledge
Students' lack of understanding	Students prior knowledge Availability of appropriate schemata
Structure of the comprehensive project	Availability of appropriate schemata Context in which the instructor presents the material
Time constraints	Context in which the instructor presents the material

achieve the learning objectives magnified the importance of aligning the CP tasks with students' prior knowledge and the teaching context.

Integrating the CP into the IFA course did not occur as I expected during the first action research cycle in 2015. To resolve the implementation issues, I made adjustments to in-class instruction and spent most of my time answering individual questions related to how to complete CP tasks. The changes resulted in an improved learning process for students; however, I found that further adjustments to instruction were necessary during the 2016 cycle. In the following sections, I discuss the changes in instruction I incorporated to resolve the issues with respect to students' prior knowledge, appropriate schemata, and the teaching context.

Students' prior knowledge. All students who participated in this study had previously achieved the following learning objectives and passed the sophomore course:

- 1) describe and identify the fundamental elements of financial statements (revenues, expenses, assets, liabilities, and equities),
- 2) explain the characteristics of financial statements prepared using U.S. generally accepted accounting principles (GAAP),
- 3) record business transactions using journal entries, and
- 4) summarize transactions and prepare financial statements.

In addition to prior knowledge gained in the sophomore accounting course, students also needed a basic understanding of the accounting terminology and procedures related to each topic prior to beginning CP tasks. I expected students to become familiar with accounting concepts and procedures related to new topics as they completed before-class assignments. The video lectures and textbook included explanations of terminology, the purpose of each accounting procedure, and how to perform accounting procedures. The online homework system provided step-by-step answers for structured practice problems, allowing students to compare their work to correct procedures.

Pre-requisite knowledge. I provided a review of pre-requisite knowledge at the beginning of each cycle. During the spring 2015 semester, students watched video lectures, practiced structured problems, and completed an extensive accounting cycle project to review prior knowledge. The review process did not produce acceptable results; approximately half of the 2015 students failed to score 70% or better on a test over foundational knowledge and accounting procedures. Replacing the accounting cycle project with additional in-class discussion of declarative knowledge and practice of structured accounting procedures in the 2016 semester produced similar results. Students' scores on a test over pre-requisite knowledge improved from the first week of class to the third week of class (see Tables 4.6

and 4.7). However, students' understanding of pre-requisite knowledge was insufficient for completing CP tasks presented in formats different than structured problems.

Accounting majors typically take the IFA course in their junior year; however, approximately 25% (2015) and 35% (2016) of students in this study were seniors. Most students had waited until their senior year to complete course requirements for their minor degree. In many cases, two years had passed since the students completed the sophomore course. Student 9 provided the following insight about the effect the time between courses had on prior knowledge:

Having taken Accounting I class the fall semester of my sophomore year I had a significant amount of time between classes that made it hard for me to recall a lot of the things that were the basis to this class. Because of this I had a lot of trouble on the Pre-req test. My teacher that I had was not to the level of teaching that I got out of this class and so as a result I did not learn but still got a good grade. We watched breaking bad in class one time ... very disappointed. (RP4, S9, 2016)

He noted the time between courses and the difference in the depth of learning in his previous accounting course hindered his ability to use prior knowledge. The following responses indicate students also may have underestimated the level of understanding required to complete CP tasks:

In the beginning of the class I did not take a lot of time to revisit the prerequisites for the class. After I passed the "pre-req quiz" with a 70% I thought I knew all I needed. In hindsight, I wish I would have still studied more and mastered them before I started the project. (RP4, S28, 2016)

I definitely would have taken the beginning part more seriously. Since we kind of went over adjusting entries and journal entries in intro to accounting I figured I already had a pretty good grasp on what was being covered the first few weeks ... I often still made mistakes. (RP4, S16, 2016)

By the end of the semester, students understood pre-requisite knowledge was necessary for completing CP tasks.

One purpose for requiring students to complete the CP was to encourage deep learning. In an effort to align assessments with learning objectives, I intentionally minimized the impact of objective tests on students' grades to discourage surface approaches to learning (Biggs, 1996; Entwistle & Entwistle, 1991; Herbert et al., 2009). The pre-requisites test accounted for only 5% of each student's grade. The low influence on students' grades, along with minimal time allocated to in-class review, may have sent an incorrect message that pre-requisite material was not important for success in the class (Sambell & McDowell, 1998; Struyven et al., 2005)

The findings indicate most students need more than a few hours of review to achieve a level of understanding deep enough to apply pre-requisite knowledge to unfamiliar situations. The number of topics and accounting procedures students learn in the IFA course and the time required to complete CP work leaves about one week for review of pre-requisite knowledge. Given the time constraints and the extensive use of pre-requisite knowledge, instructors who incorporate a CP should require students to re-capture pre-requisite knowledge before the course begins. Establishing the requirement to achieve 80% or better on a test over pre-requisite knowledge prior to enrolling in the IFA course should ensure students begin the class with an adequate level of foundational accounting knowledge. Instructors can then use the first week to relate the pre-requisite knowledge to the authentic accounting work students will perform on the CP (discussed later in this section).

Knowledge of new topics. Prior to beginning the course, I believed the before-class activities would provide the prior knowledge students need to complete work on the CP. However, as illustrated in Table 5.1 and previously discussed, traditional learning materials (textbooks, traditional lectures, and structured practice problems) do not provide information

related to many of the tasks students performed on the CP. Therefore, students lacked the prior knowledge required to complete CP tasks. I continuously answered students' questions and used class time to provide ad hoc instruction to resolve the lack of understanding that prevented students from practicing critical thinking skills. Additionally, I used findings in the 2015 cycle to add targeted class discussions to eliminate confusion during the 2016 cycle. Students who had adequately reviewed pre-requisite knowledge and used before-class learning materials to prepare for CP work still lacked sufficient knowledge to complete the following tasks:

- 1) use business documents (checks, purchase orders, shipping documents, etc.) to record transactions,
- 2) use a general ledger to summarize transactions and prepare financial statements,
- 3) prepare and use the accounts receivable aging report,
- 4) prepare and use end-of-period inventory reports,
- 5) select and support an alternative accounting method, and
- 6) make and support reasonable estimates of unknown amounts.

Instructors who incorporate the CP must provide explanations of the aforementioned documents, reports, and thought processes. Some students may use the additional examples as a pattern to follow when completing repetitive CP work; however, without the additional explanations students will not know how to begin work on CP tasks. Surface-level prior knowledge and an unfamiliarity with some parts of accounting work resulted in incomplete schemata students needed to complete CP tasks.

Appropriate schemata. Schemata are patterns of thought used to organize information and identify relationships. Students develop schemata with exposure to new

knowledge and experiences (Piaget, 1950). The pre-requisite knowledge and before-class learning activities formed the schemata students relied on to perform tasks on the CP. As previously discussed, the traditional before-class learning materials students used to develop schemata did not discuss all thought processes required to perform CP work. Therefore, students began work on the CP without appropriate schemata, creating unique implementation issues. I answered questions and facilitated additional in-class discussion targeted towards building students' schemata necessary for work on CP tasks. The types of questions students asked indicated students could not automatically organize and apply declarative and procedural knowledge in a manner useful for critical thinking (Ennis, 1993; Halpern, 1999; Kurfiss, 1988; McPeck, 1981; Paul, 1985). Students needed assistance with: 1) using documents to record transactions, 2) recording amounts in the detail general ledger, and 3) applying judgment.

Using documents to record transactions. Recording and summarizing business transactions is an integral part of all accounting procedures. I expected students to develop schemata useful for recording transactions when watching lectures, reading, and practicing structured problems. Given the required practice, I was surprised to find that students continuously had difficulty recording familiar business transactions. After review of the findings, I discovered many of the reasons students had not developed appropriate schemata.

The before-class learning materials provided descriptions of business transactions in the following format:

- 1) Bixby Company, Inc. paid \$300 for office equipment on 4/01/14.
- 2) On 12/01/14, Bixby Company, Inc. sold inventory that cost \$1,000 for a sales price of \$2,000.

Students practice enough to know that when they see the word “paid,” cash decreases. Consistent practice also helps students identify account names from the words used in the description. For example, students recognize office equipment, inventory, and sales as accounts to use to record the business transaction presented above.

Students used business documents to identify and record transactions when completing CP tasks. Working with business documents required students to identify dates and amounts as well as the proper account names to use without clues. For example, students would use a check written by the company along with an invoice for the office equipment to identify the information needed to record transaction one. Recording transaction two required the use of a sales order and a receiving document. In each case, students who completed work on the CP had to find and interpret the appropriate documents.

Students who had developed the schemata required to record transactions in the format provided in before-class materials could not use the same thought processes to record transactions on the CP. After answering similar questions multiple times, I identified the issue and facilitated in-class discussions to explain the difference between structured practice problems and using documents to identify information. These additional explanations allowed students to understand how to perform CP work; however, building new schemata applicable to each CP task was time-consuming and inefficient.

Student 2 summarized the action that I implemented to help students build appropriate schemata:

*Another approach that could help would be trying to **find more relationships between the homework and the project, instead of treating them separately ... finding more similarities** and ways to correlate [homework with the CP] would have made the projects easier, **as opposed to treating them as two unrelated assignments.** (RP4, S2, 2016)*

I found myself allocating more class time to discuss the format of the CP and the relationship to practice problems as the study progressed. However, as Student 2 suggested, more discussion concerning the relationships between homework and CP work prior to students working on each phase of the CP would have been beneficial.

Findings from both the 2015 and 2016 cycles during the study demonstrated the need for instructors to facilitate a class discussion at the beginning of the course that provides examples of how accountants interpret and use documents to record transactions. For example, instructors could begin the course with a review of the accounting cycle that includes providing students with:

- 1) ten checks the company wrote to pay for long-term assets and services along with related purchase invoices,
- 2) five receiving documents and invoices related to inventory purchases,
- 3) five sales invoices, and
- 4) three checks from customers who paid sales invoices.

As part of the exercise, the instructor should explain how to interpret and record the information presented on each document. The instructor should also write a description of each transaction in the same format that students see in traditional textbooks and practice problems. An overview of how accountants use business transactions before students begin work on the CP should build schemata useful for recording transactions.

Summarizing accounts in the general ledger. The next step in the accounting cycle after recording business transactions is to record each amount into the related account and summarize account balances. Practice problems require students to record amounts in *T accounts* and then summarize each account to determine a final amount (see Figure 4.3).

However, few practice problems require students to consider all (including previous transactions) recorded amounts in all accounts when preparing financial statements. Practice problems led students to believe that:

*Journal entries and t-accounts were **just little parts** of the accounting process **that did not amount to much** (RP4, S23, 2016) and **did not seem as necessary to do.** (RP4, S27, 2016)*

Students who considered only a few transactions while working practice problems without agreeing left and right side total balances did not understand the importance of recording all amounts to accounts. CP tasks required students to consider all the company's transactions and record all amounts in the general ledger (see Figure 4.1). In both semesters, students failed to understand the importance of recording all amounts into accounts until they had difficulty preparing financial statements because total amounts differed. After completing the CP, the students had a different understanding of the process:

I realized how important journal entries are, and making sure that they are reported to the t-accounts. It was one of those things, that even though you emphasized it a lot, you don't realize how big of a mistake it is till the end, when the trial balance does not balance. During the homework, it wasn't that big of a deal, because we never had to do the trial balance. (RP4, S19, 2016)

One of the most important things that I learned while doing the comprehensive project is the value of posting journal entries to the T-accounts. Not only does this give you the opportunity to stay organized throughout the process but it allows you check your work at the end. Posting to the T-accounts gives you the opportunity to find mistakes. The project has been an eye-opening experience in terms of the accounting process as a whole. (RP4, S20, 2016)

Recognition of the importance of properly recording all amounts in the general ledger earlier in the semester would have eliminated many procedural errors and reduced the time required to complete the project.

To resolve this issue, instructors should begin the semester with an in-class exercise that requires students to complete the accounting cycle using a general ledger, rather than T accounts. Replacing T accounts with a general ledger in the aforementioned accounting cycle activity that incorporates business documents will help students realize the importance of recording all amounts to accounts. An alternative approach is to give students correct journal entries along with a general ledger that contains errors. The exercise should demonstrate that the failure to record all amounts results in the totals on the left (debits) disagreeing with totals on the right (credits). Total debits must equal total credits to properly prepare financial statements. Students should find and correct errors before preparing the financial statements.

Accounting instructors with professional accounting experience are probably wondering, as I did, whether using a simple accounting software package would be a better alternative for resolving the issue of incomplete recording of amounts. Accountants who work in large companies use integrated software that automatically records amounts into the proper account after recording transactions. Business owners and accountants at smaller companies generally use simple software packages to record amounts to accounts. The use of software to record transactions and manage the general ledger would more closely simulate the work environment of most professional accountants.

Using an accounting software package would reduce the time required to complete tasks on the CP, as well as eliminate errors related to recording amounts, which are two significant implementation issues. However, eliminating the step of maintaining a general ledger may reduce students' understanding of the process. Findings indicate that students did not understand the importance of recording each amount to the appropriate account and the

impact that each transaction has on final account balances until they had to resolve errors to prepare financial statements. The use of a software package would eliminate all recording errors. However, students would not gain an appreciation of the impact of each transaction on the information provided on the financial statements. To resolve this issue, I recommend using a continuous Excel spreadsheet that sums each account balance and the total of all accounts each time students record an amount to an account. Students will then compare total debit amounts to total credit amounts at the end of each task. Using Excel will eliminate time-consuming manual computations accountants rarely make and eliminate the issue of finding all mistakes at the end of the CP before preparing financial statements.

Use of judgment. Students also had difficulty using judgment to estimate unknown amounts and select and support an appropriate accounting method. As previously discussed and illustrated on Table 5.1, traditional learning materials do not require students to practice using judgment. Furthermore, structured problems provide amounts that professional accountants must estimate. The traditional video lectures and textbook did provide conceptual explanations of the impact of various methods on financial statements. However, before-class problems did not require students to practice making judgments. The lack of required practice caused students to overlook material related to making judgements:

If I were to look more at the book I believe I would have performed better on the comprehensive project. I utilized the SMA.com [practice problems] more than the book. The book included more in-depth examples and illustrations that would have given me a better understanding. The book also includes examples as to why some methods are chosen that would have helped my group explain the reasoning behind some of our decisions with the methodology. (RP4, S18, 2016)

He noted that a deep approach to studying with the intention to understand examples and illustrations would have helped him complete CP tasks. The same student reflected about the opportunity to apply before-class learning when selecting a method to complete a CP task:

A lot of important decisions were made during the comprehensive project that accountants make in real life that were not incorporated by doing the homework problems or watching the lecture videos. The homework and lecture videos showed me how to execute and complete the methods, but the project taught me how to apply my decision for the betterment of the company. (RP4, S18, 2016)

He described the difference in the thinking required to select a method on the CP and the schemata developed from working structured problems to prepare for class.

The textbook and video lectures explained how the results of each accounting method impact the financial statements. Additionally, I provided general explanations about why a company may decide to use each method. Most students wrote the reasons provided in the textbook without much thought to support the method selected on the CP. For example, students selected an inventory method because the method resulted in a higher income during times of inflation, which is good for investors; however, students failed to notice the company's inventory items were experiencing deflation and the company had no outside investors. A lack of practice prevented students from developing schemata necessary to identify contextual relationships that influenced the appropriateness of a decision.

The before-class learning materials ignored the fact that accountants use judgment to estimate unknown amounts. As such, students initially defaulted to prior schemata and attempted to compute or locate estimated amounts. Additionally, students had no schemata to help them determine when an estimate was reasonable and supportable. Students 4 and 5 wrote the following reflections about the responsibility of an accountant to estimate amounts:

Making estimates such as writing off accounts receivable and determining the useful life of an asset helped me understand how accounting is not as black and white as I once thought it was. I had always heard that accountants make estimates in the past, but I thought it was based on a strict set of rules, when in reality it can be quite flexible. (RP4, S5, 2016)

By doing the homework problems or watching the videos, I would never have learned that the accountant is the one who estimates the useful life and salvage value of a long-term asset. I will never forget how shocked my partner and I were, when we were doing the class project and read that we have to estimate the useful life of our long-term assets by ourselves. We were definitely expecting the useful life to be given to us, and we had a hard time deciding how much time we should expect to use our assets. But now we know that it is an accountant's responsibility. (RP4, S15, 2016)

I found that most students did not realize accountants must estimate unknown amounts prior to recording transactions. As discussed in chapter four, I helped students build the correct schemata related to making judgments by answering questions as they worked. I was careful to provide direction that did not interrupt students' critical thinking. Therefore, I did not provide feedback to students on the reasonableness of judgments until after students completed each phase of CP work.

A more effective way to help students build appropriate schemata is to provide targeted instruction and facilitate related activities that require the use of judgment. The class discussions should occur before students complete similar work on CP tasks. For example, instructors could use mini-cases that provide a situation and have students debate the most appropriate method. Practice working with an accounts receivable aging report to determine a reasonable range of uncollectible amounts will help students understand how accountants make and support estimates. The situations students practice should be obviously different from the company's situation in the CP to discourage students from mindlessly following the same process used to solve the in-class activity as they complete CP work.

Teaching context. My role in the learning process was to help students understand concepts and procedures they did not learn from before-class learning materials and answering students' questions as they worked to complete the CP (Barrows, 2002; Hmelo-Silver, 2004). My goal was to provide the level of guidance that encouraged students to follow the critical thinking process and reflect on the work of the professional accountant. Furthermore, I recognized that students would need additional support in areas of expected difficulty (Choo et al., 2011; Simons & Klein, 2007).

The teaching context employed in this study was unique in that I intended for students to effectively "teach themselves" the less complex accounting concepts and procedures using video lectures, a textbook, and structured problems. Furthermore, I expected students to apply before-class learning to complete CP tasks. This departure from a traditional lecture-based course was necessary to ensure that students experience the dissonance required to develop intellectually (Perry, 1970). Changing from a traditional teaching context to a student-centered learning environment (Barr & Tagg, 1995) created implementation issues related to: 1) students' learning before class, 2) feedback on CP work, 3) structured problems, 4) written instructions for the CP, 5) order of CP work, and 6) allocation of limited class time.

Students' learning before class. I began most class periods with a brief overview of the material I expected students to learn before class. The purpose of the discussion was to determine if students had learned to perform structured accounting procedures using before-class learning materials and provide additional instruction when needed. Most of the time, students completed the before-class assignments and were familiar with concepts and accounting procedures related to the topic of study. However, an unexpected issue emerged.

Students who had previously developed study habits that brought success on objective tests had difficulty determining the depth of learning necessary to adequately complete work on the CP. Student 7 summarized the difficulty students had determining how to study to prepare for the application of this knowledge:

*Looking back, I would have approached the class at the beginning of the semester, the same way that I did towards the end. Throughout the course of the class, I started to learn **that I did much better on the project work when I put in the work outside of class by reading the book and watching the videos. Because towards the beginning, I just skimmed through the information. Usually it's not important to have everything down until the test comes around, but in this class, you have to have a better understanding of the concepts at all times because we do project work so often, and things go much quicker if you are prepared.*** (RP4, S7, 2016)

Like most students, Student 7 understood the level of learning that brought success on objective tests. However, students had no prior experience with CP work and had difficulty determining their own learning goals (Duff & McKinstry, 2007; Trigwell & Prosser, 1991). By the end of the course, most students agreed with Student 15, who expressed the following thoughts about the level of learning required:

I wish I could have done my homework with an intention of understanding the concept and the reasoning behind the accounting procedure, rather than the intention of getting the answer right. Because I think, if I could have taken the time to understand why I am solving the problem the way I am, I would be able to solve any other problem related to that topic. (RP4, S15, 2016)

All students wrote similar reflections that gave evidence that they recognized working structured practice problems with the goal of achieving a correct answer did not provide the level of understanding adequate for completing CP tasks. Most students developed personal learning goals in their sophomore accounting class after taking their first objective test (Biggs, 1987; Gibbs, 2010). In a similar manner, students learned the level of understanding required to perform CP work by doing CP work. The aforementioned additional class

discussions and practice that relate before-class learning to CP work should help students determine the appropriate level of understanding required to successfully complete the CP.

Feedback on CP work. Instructors who teach the sophomore accounting course traditionally rely on practice of structured problems to help students learn accounting procedures. Structured problems always lead to one correct answer. Furthermore, objective tests reinforce the idea that accounting work always has a correct answer. Based on past experiences, students began work on the CP with the expectation that I would confirm correct answers as they completed each step for each task on the CP.

According to Paul (1985), students' expectation that instructors will tell them what to do presents a strong obstacle to instructors who teach critical-thinking skills. Therefore, to align the teaching context with the primary learning objective, I began the first research cycle with the firm policy that I would not provide feedback on correct answers until after students finished each phase. Two implementation issues resulted as I followed my policy of no feedback on phase one during the 2015 cycle. First, students initially would not continue to the next step without confirmation of correct work, significantly slowing progress. Second, errors in accounting procedures that had a verifiable answer affected the results of tasks that required students to use their previous work to make and support judgments.

One primary goal of implementing the CP was to show students that accounting work is ambiguous. In effort to emphasize the ambiguity, I did not initially provide students with enough feedback on their work to allow them to confidently transition from tasks that had a correct answer to tasks that required judgment. Fischer and Pipp (1984) theorized that students perform at a *functional level* without support and at an *optimal level* with proper support. My plan to ask students to work without any confirmation of correct work caused

them to work at a functional level. Student 5 reflected about an instance when more instructor support would have optimized the learning process:

*My partner and I were a bit caught off guard when we had to make write offs because we had no idea what to base our estimate off of. **We spent a good amount of time worrying about getting the right answer when we could have been thinking and analyzing to come up with a reasonable answer.** (RP4, S5, 2016)*

Student 5 and his partner would have benefited from confirmation that their aging report was correct and further guidance on how to use the information on the aging report to estimate the accounts the company is unlikely to collect. To optimize the teaching context, instructors should provide check figures for tasks with correct answers and explain which tasks require subjective judgment.

Structured problems. Findings related to incorporating the CP into an IFA course consistently refer to the difference in the structured problems students work to prepare for class and the tasks on the CP. The difference in requirements led me to question whether instructors, who center the teaching context around the authentic work of the accountant (e.g., the CP), should assign students structured homework problems.

The primary benefit students gain from working structured problems is that the repetitive nature of structured problems build a portion of the schemata necessary to perform the unstructured CP tasks. For example, students learn how to do the following when working structured problems: 1) associate account names to common business transactions, 2) summarize account balances, 3) compute values related to various alternative accounting methods, and 4) report account balances on the financial statements. Some students recognized the benefit and thought that working more practice problems would have improved their understanding of CP tasks:

*I could have worked through more practice problems. This is what I have done in the past, and it helped a lot. **Working through practice problems has always helped me more than reading and lecture.** (RP4, S12, 2016)*

*I wish I would have **worked out the problems on SMA multiple times to truly understand** what I needed to know without second guessing myself so **I could apply it to the project better.** (RP4, S26, 2016)*

Students appropriately recognized the need for a level of familiarity with accounting procedures; however, they did not realize that working structured problems did not provide experience related to many tasks on the CP.

The disadvantage of students working structured practice problems is that the schemata students create and rely on is different than most of the thought processes required to complete CP tasks. Therefore, the structured problems may mislead students about the level of thinking required to complete CP work. Students 8 and 21 noted the disadvantage of incomplete schemata and proposed solutions:

*If there was **extra practice made to resemble the case work, it would have been very helpful, versus just doing homework where you could memorize the steps you needed to take.** For example, I mean more homework or practice problems where the student has to make more of their own judgment calls and then justify & follow through with it in order to complete the calculations. (RP4, S21, 2016)*

*The project was really difficult to do for me ... if there was anything that I should've done differently it was to **look at the work required for the next section to see what was required ... I should've gone home ... and prepared myself for the project work.** My issue was that **I would learn the work on study my accounting [homework system] then would have a hard time applying that knowledge to the project work.** (RP4, S8, 2016)*

The above reflections recommended more supplemental instruction and study to help students understand how to apply learning from working practice problems to CP tasks. Students also noted the importance of instructors providing additional instruction before students perform CP tasks.

No student reflections indicated that working structured problems was confusing or hindered learning. Furthermore, all students recognized the benefit of beginning the learning process with less complex, structured problems. As such, I recommend that instructors use structured problems as an important component of the teaching context until unstructured practice problems are available. Additionally, instructors must recognize the limitations previously discussed and provide additional timely instruction and examples to complete students' schemata.

Written instructions for CP work. The purpose of the written instructions was to eliminate confusion without removing the ambiguity associated with authentic accounting work. Students' lack of prior knowledge combined with minimal written instructions prevented them from working independently to complete CP tasks during the 2015 cycle. I resolved the issue of inadequate written instructions by continuously answering students' questions as they progressed through each task. However, students often stopped work while waiting their turn to ask questions, significantly slowing progress. Prior to beginning the 2016 cycle, I added extensive step-by-step guidance associated with computations and structured accounting procedures to the written instructions. Common reflections similar to the following provided evidence that the additional instructions did not eliminate the need to think when completing CP tasks:

One important thing I learned was how to think analytically. I had to take what I learned on the homework and in class problems and then apply them to a real-life situation without as much guidance. (RP4, S11, 2016)

The project made me think more about strategy and less about the math to execute the problems. That thought process ... accounted for a bulk of our time when doing the project. (RP4, S11, 2016)

This project has taught me how to think like an accountant. You start to pick up on why things are the way they are or where mistakes are just by looking

at t-accounts. This project taught me how to document, where to look for errors, and how to decide one method over another. (RP4, S23, 2016)

Instead, the revised instructions served to ensure students did not miss steps required to complete accounting procedures and led to more useful data to consider when making judgments. The results on the comprehensive final exam (discussed in findings to research question five) indicate that the extensive instructions did not prohibit students from achieving adequate knowledge of accounting procedures (Choo et al., 2011; Simons & Klein, 2007).

Order of CP work. The four phases of the CP followed the order of topics learned in a traditional IFA course: sales and accounts receivable, inventory, long-term assets, and investments. Students had a different level of familiarity with tasks in each phase of the CP. Furthermore, each phase required students to apply judgment in a distinct manner for the first time. The traditional order of work made it difficult for students to build on prior knowledge and problematic for me to know when to provide necessary additional instruction. Findings suggest that instructors should order CP tasks beginning with work students are most familiar with and those with the least complexity: inventory, long-term assets, investments, and sales and accounts receivable. The final phase of the CP, financial reporting, will expose the relationships between all accounts and the impact of all prior work on the financial statements. Re-ordering CP tasks gives the opportunity for instructors to provide additional instruction in the following sequence:

- 1) interpreting and using information on business documents,
- 2) selecting and supporting a familiar accounting method,
- 3) applying accounting guidance to make decisions,
- 4) making and supporting simple estimates and preparing simple work schedules,
- 5) selecting and supporting an unfamiliar accounting method,

- 5) making and supporting more complex estimates, and
- 6) preparing complex work schedules.

Instruction should include explanations of how accountants consider the company's context and management's goals when using judgment. The revised order of CP work allows students to more effectively use prior knowledge and provides the time and opportunity for scaffolded instruction.

Allocating limited class time. The allocation of limited class time affects every implementation issue. During the study, I allocated class time to four major activities: 1) class discussions about accounting procedures and CP work, 2) work on the CP, 3) feedback on CP work, and 4) feedback on reflection papers. The findings from the 2015 cycle indicate that I should have facilitated more class discussions to explain the relationships between before-class learning and CP work. The changes I made to the content and timing of class discussions during 2016 provided more class time for CP work. Findings from the 2016 cycle indicate students need explanations about and practice making judgments (estimates and selecting an accounting method). Additionally, students need a thorough discussion that provides feedback on CP work. Other findings, summarized as follows, should allow students to be more efficient and provide more time for students to think as they work through CP tasks:

- 1) Require students to score 80% or more on a test over pre-requisite knowledge prior to enrolling in the course,
- 2) Provide a review of the accounting cycle that explains the use of documents and correlates structured problems to CP work,
- 3) Order topics of work from the least to the most complex, and

4) Provide the detail general ledger in a continuous Excel spreadsheet.

The findings from the 2016 cycle also revealed the importance of providing class discussions related to tasks students will work on during the same class.

The course schedule presented in Table 5.3 incorporates the aforementioned actions to resolve implementation issues that occurred during both cycles of the study. The revised schedule allocates approximately 42% of class time to instruction and 58% of class time to CP work. The proposed allocation of time is the same time I allocated to class discussion (42%) and CP work (58%) during the 2016 cycle. However, the proposed schedule allows instructors to provide optimal support to students as they complete all CP work during class.

Summary

The findings related to research question one suggest that students practiced the critical thinking process as they completed CP work. However, implementation issues related to the level of students' prior knowledge, students' schemata, and adapting the teaching context to best support students' learning occurred throughout the study. The difference in my expectations of students' abilities to apply prior knowledge to complete CP work and students' actual level of understanding created most of the implementation issues. Findings indicate that the accounting professional's work does not mirror the work students practice using traditional learning materials. I discovered and implemented data-driven action to resolve the implementation issues throughout the study in a manner that encouraged students to practice critical thinking skills. Incorporating changes that I discovered while analyzing data after the second cycle ended has the potential to further minimize or eliminate implementation issues and improve the learning environment.

Table 5.3

Proposed Course Schedule for Future Semesters

Week	Topic of Discussion / Activity	Lecture Time	CP Time
1	Course Introduction	30	
	Pre-requisites Test (Pass prior to enrolling in the course)	0	
	Review of Accounting Cycle: Documents and General Ledger	130	
2	Comprehensive Project (CP): Overview and Introduction		30
	Inventory: Periodic and Perpetual / FIFO, LIFO, Average (Documents / Reports)	60	
	CP Work: Phase 1 (Inventory)		70
3	Lower of Cost or Market/Inventory Adjustments: Relate to CP Work	30	
	CP Work: Phase 1		130
	CP Work: Phase 1 Due		50
4	Long-term Assets: Asset versus Expense / Explain CP work on Phase 2	50	
	CP Work: Phase 2 (Long-term Assets)		60
	Discussion/Feedback: RP 1 and CP Phase 1	40	
5	Correct Errors on CP Work: Phase 1		30
	Long-term Assets: Making Estimates and Selecting a Method	60	
	CP Work: Phase 2 (Long-term Assets)		30
6	Long-term Assets: Impairment	40	
	CP Work: Phase 2 Due (Long-term Assets)		120
7	Discussion/Feedback: RP 2 and CP Phase 2	30	
	Correct Errors on CP Work: Phase 2		30
	Accounting for Investments (Selecting and Supporting a Method)	50	
	CP Work: Phase 3 (Investments)	50	
8	CP Work: Phase 3 Due		70
	Revenue Recognition Principles	50	
	Sales and Accounts Receivable Transactions / CP Documents & Reports	40	

(continued)

Week	Topic of Discussion / Activity	Lecture Time	CP Time
9	Discussion/Feedback: RP 3 and CP Phase 3 Correct Errors on CP Work: Phase 3 CP work: Phase 4 (Sales and Accounts Receivable)	30	30 100
10	Estimating Bad Debt Expense using Aging Report and Judgment CP work: Phase 4	80	80
11	CP work: Phase 4		160
12	Revenue Recognition Principles and L/T Contracts CP work: Phase 4 Due	60	100
13	Cash Flow Statement Discussion/Feedback: RP 4 and CP Phase 4 Correct Errors on CP Work: Phase 4	80 40	40
14	Cash Flow Statement (Specific to CP Work) CP Work: Phase 5 (Accounting Cycle / Prepare Financial Statements)	60	100
15	CP Work: Phase 5 Due		160
	Total Time in Minutes	1,010	1,390
	Total Time in Hours	16.83	23.17
	Percent of Total Class Time	42%	58%

Many implementation issues occurred because students perceived accounting work as structured procedures that do not require reflective and critical thinking. Work on CP along with additional instruction changed students' understanding of accounting work. Tasks that fell within the inference, explanation, and self-regulations steps required students to apply reflective thinking. Therefore, students whose thinking fell within a higher stage of reflection found the later tasks in each phase of CP work less challenging. The following discussion of findings related to the depth of students' reflections provides further insight into students' perceptions of the work of the accountant.

Students' Reflections about Accounting Work

The types of assessments an instructor uses to evaluate learning is an important aspect of aligning the teaching context with activities to accomplish learning objectives (Biggs et al., 2001). In the present study, I evaluated the results of CP work and the nature of students' written thoughts on RPs to periodically assess students' learning. The CP and RPs encouraged students to apply knowledge and reflect on learning, rather than recall facts and procedures (Biggs, 1996; Entwistle & Entwistle, 1991; Herbert et al., 2009).

I replaced periodic objective tests with short RPs to reinforce the need for students to use a deep approach to learning to achieve success in the course (Gibbs & Dunbar-Goddet, 2007; Gibbs & Simpson, 2004; Van Gaal & De Ridder, 2013; Watty et al., 2010). Students responded to question prompts on each RP and I designed the prompts to encourage deep reflection about decisions accountants make as they perform accounting procedures. Students who reflected at a deep level acknowledged that accountants use subjective judgment to make and support decisions that impact financial reporting (Entwistle et al., 2000; Prosser & Millar, 1989). Students who wrote surface-level non-reflections described calculations, structured procedures, financial statement accounts and amounts, accounting guidance, and use of documents to gather information (Entwistle & Ramsden, 1983; Trigwell & Prosser, 1991). At the end of the 2016 cycle, I coded the 2016 student responses to question prompts on RPs according to Mezirow's (1991) four stages of professional reflection. Responses that fell in stages one and two gave evidence of surface-level non-reflection. Reflections in stages three and four demonstrated a meaningful understanding of the process and purpose of accounting work, or a change in overall perspective towards accounting work.

New experiences that force students to encounter dissonance create opportunities for learning (Biggs & Tang, 2011; Piaget, 1950; Terenzini, 1999). Students in this study experienced the following activities as they learned to perform accounting work:

- 1) completed before-class assignments (video lectures, textbook readings, and structured practice problems),
- 2) read public company footnotes,
- 3) participated in class discussions, and
- 4) completed CP tasks.

Before-class assignments reinforced pre-requisite knowledge and exposed students to new accounting concepts and procedures. Reading footnotes encouraged students to think about why a company selected an accounting method and how the decision impacted financial reporting. Class discussions and CP tasks required students to synthesize old and new knowledge and apply learning to authentic accounting work.

Students began the semester with the belief that accounting work does not involve reflective thinking. After participating in class discussions and completing CP work, students' views about the nature of accounting work changed. Exposure to authentic accounting tasks encouraged students to use a deep approach to study and apply meaningful learning. Students were unable to successfully complete CP tasks using the surface-level approach to learning that brought them success in a previous accounting course.

Students' Prior Experiences

Accounting students decide that a surface approach to learning will achieve their learning goals in their first sophomore-level financial accounting course (Elias, 2005; Lucas, 2001; Sharma, 1997). A surface approach to learning involves memorizing declarative

knowledge or repeating previously practiced procedures (Biggs, 1987; Entwistle & Ramsden, 1983; Trigwell & Prosser, 1991). All instructors who teach the sophomore accounting class at the university where this study occurred use the same textbook, before-class problems, and multiple-choice final exam. Additionally, students demonstrate learning on periodic objective tests and do not complete reflective assignments. I reviewed the common final exam and noted that students with strong memory skills and surface-level understanding could correctly answer most questions. Furthermore, common reflections similar to the following indicate students had not previously used a deep approach to learning accounting:

This class requires application of the material we learned and up until this class I felt I had never really had to do that. I have always been able to memorize things and do just fine. (RP4, S26, 2016)

*I previously thought... that I would be able to make it through accounting courses by **just memorizing concepts.*** (RP4, S20, 2016)

Students 26 and 20 acknowledged that memorizing course content in prior accounting courses had brought success. Student 16 reflected on her approach to learning accounting:

I wish I had realized that you were trying to show us that the accountant does more than just follow accounting procedures. For example, I didn't get what you were looking for in a reflection paper till my 3rd reflection paper. In my 1st and 2nd reflection paper I was just writing about all the methods and procedures, because we (as students) are just not used to thinking beyond that in the accounting classes. I am so glad you pushed us to think beyond the accounting procedures because I think we really need to if we want to be a great accountant in the real world. (RP4, S16, 2016)

Her thoughts are consistent with sophomore accounting students at other universities who believe that learning accounting involves acquiring factual knowledge and memorizing accounting procedures (Elias, 2005; Lucas, 2001; Sharma, 1997).

I told students during the first day of class that memorizing course content would not bring success in the course. Furthermore, I explained that students would do authentic

accounting work and write about their learning to demonstrate understanding instead of taking objective tests. Students had no prior experiences with applying accounting knowledge or answering question prompts to demonstrate meaningful understanding. Therefore, students initially assumed they could use the same surface learning approach that had brought past success on objective tests (Biggs, 1987; Gibbs, 2010; Newble, 2016).

Students will use a surface approach to learning until the approach is no longer effective (Gijbels et al., 2008; Jensen et al., 2014; Segers & Dochy, 2001). Therefore, I intentionally used assessments that students could not complete through recall of declarative knowledge and procedures (Rogers, 2001). Approximately half of the tasks on the CP required students to use deep reflective thinking. Furthermore, the short RPs helped students develop meaningful understanding as they wrote about their own experiences (Ash & Clayton, 2004; Eyler & Giles, 1999; Menz & Xin, 2016; Ritchhart et al., 2011).

I included question prompts on the RPs to guide students as they learned how to reflect deeply about accounting practice (Menz & Xin, 2016; Ritchhart et al., 2011). The question prompts on the RPs aligned with Tsingos et al.'s (2014) proposed best practices for teaching students to strive for deep learning. The researchers suggest that instructors should require students to integrate old knowledge with new knowledge, link academic knowledge with practice, learn by experience, and generate alternative solutions. Table 5.4 illustrates how each question prompt on the RPs aligned with suggestions for best practice. Some questions provided students with more than one approach to deep reflection. Homework problems and reading footnotes helped students integrate new knowledge. The CP encouraged the use of reflection and gave students new experiences to reflect upon when writing RPs (Harvey et al., 2016; Kolb, 1984; Tsingos et al., 2014). Learning activities

appeared to encourage deep reflection. However, students who had previously relied on a surface approach when learning accounting needed extensive instruction and support before they transitioned from non-reflective thinking to reflective thinking for meaningful understanding.

Changes to Instruction and Question Prompts

The purpose of the RPs was to encourage students to reflect deeply about how accountants use judgment to perform accounting procedures. At the beginning of the study, I incorrectly assumed students could adequately address the question prompts and provided no specific instructions related to writing RPs.

Table 5.4

Question Prompts Aligned with Best Practices for Encouraging Reflective Thinking (Tsingos et al., 2014)

Question Prompt	Best Practice
Issues	Link academic knowledge with practice Generate alternative solutions
AHA Moments	Integrate old knowledge with new knowledge Link academic knowledge with practice
CP Work	Integrate old knowledge with new knowledge Link academic knowledge with practice Learn by experience Generate alternative solutions
Homework	Integrate old knowledge with new knowledge
Public Company	Link academic knowledge with practice

General Instruction. I failed to realize that students had no prior experience writing RPs in other courses and needed general instruction about the following before they could adequately write a reflection paper:

- 1) how a reflection paper is different from a research paper,
- 2) how to organize responses to a question prompt,
- 3) how to specifically address each part of the question prompt,
- 4) how many different issues to address, and
- 5) how to reflect on learning without primarily describing declarative knowledge and structured accounting procedures.

During both semesters, I facilitated a class discussion to provide general instructions about the aforementioned areas of confusion. The general instructions provided direction on the format of the RPs; however, the instructions did not encourage students to give evidence of meaningful understanding about decision-making processes. In addition to general instructions, I provided directions specific to each question prompt.

Specific Instruction. During 2015 and 2016 cycles, I provided detailed written feedback on each RP, noting opportunities for deeper reflection. After grading the 2016 students' first RP, I noted the need to explain when accountants follow accounting guidance to perform accounting procedures and when accountants use judgment to estimate amounts and select an accounting method (see Figure 4.6). After this discussion, students began to understand the situations that require accountants to make decisions. Student 15 reflected on the progression of her approach to answering question prompts:

When I was writing the first reflection paper, I was focusing more on showing that I understand the accounting procedures. I was thinking that by stating those procedures, that I was actually talking about the issues that

the accountant should consider when accounting for accounts receivables and sales.

On my second reflection paper, I now understood that the issues that I should be talking about involves the decisions that the accountant makes. I knew in my mind that I should be talking about the decision, and the beginning of each paragraph started in a good direction, but I always ended up finding myself talking about the procedures again. Up to this point I was struggling to differentiate between an accounting procedure and decisions and issues that the accountant must consider,

By the 3rd paper I knew the difference between accounting procedures and that the accountant makes the decisions before applying those procedures and methods. I knew I had to focus my mind on the decisions and get away from the procedures, so wrote them all on separate sheets of paper to make sure I don't start with decisions and find myself talking about the procedures again. That really helped a lot. (RP4, S15, 2016)

Student 15, like all students, did not understand until about halfway through the 2016 semester that structured procedures and computations necessary to record transactions are not issues that require accountants to use judgment. Experiential learning during CP work, along with additional instructions, provided a deeper understanding of the importance of making judgments when performing accounting procedures (Kolb, 1984). As such, beginning with RP 3, an increased number of reflections described the types of accounting decisions students made while performing tasks on the CP.

Students also needed instructions on how to fully address the AHA moments prompt. I provided examples of responses that properly addressed the “because” part of the prompt with respect to meaningful learning. The examples had little affect and most students continued to credit class discussions or textbook explanations for a new understanding of structured accounting procedures. I gave no specific instructions related to the homework or CP work question prompt. I did not want to unintentionally influence the depth of students’

reflections. In addition to adding instruction, I also revised the wording of question prompts during each semester to encourage deeper reflection.

Issues question prompt. The purpose of the issues question prompt was to encourage students to reflect deeply about the decisions accountants make when performing accounting procedures. Figure 5.1 provides an overview of the changes made to the issues question prompt during both the 2015 and 2016 cycles. The words in bold highlight revisions or words added to encourage deeper reflection. Most 2015 students responded to the question prompt on the first three RPs with descriptions of accounting procedures (stages one and two) and did not discuss issues related to the topic. I removed the follow-up parts of the prompt to focus students' reflections on the situations that require accountants to use judgment. The specific reference to judgments provoked more students to give evidence of deeper reflection; however, many students limited their responses to the one issue they felt they could best explain.

While grading the students' first RP in 2016, I noticed students did not seem to understand the difference between routine accounting procedures and issues that require accountants to use judgment. Changing the prompt on the third RP (2016) to highlight factors accountants must consider, along with prohibiting descriptions of structured accounting procedures, seemed to elicit deeper reflection. Student 18 reflected on the change in wording:

My thought process for the third paper was different than the other two because I had to think of the most important things accountants must consider when accounting for long-term assets as opposed to looking for issues accountants faced. I didn't produce any accounting procedures ... my thought process was different than when I was looking for issues. (RP4, S18, 2016).

Issues Question Prompts

2015 RPs 1 and 2:

Important issues that the accountant must consider when performing accounting procedures:

Questions to answer, Sources of information,

Impact on financial statements

RP 1: All in one paragraph

RP 2: Four separate prompts

2015 RP 3

Added: 1) 2) 3) 4) for each part of the question prompt to encourage reflection on each part of the prompt on all issues

2015 RP 4

Added: Explain each issue and the related judgments made by accountants to properly address the issue

2016 RP 1

State 4 different significant issues the accountant must consider when accounting for sales and accounts receivable. Explain each issue and the related decisions and judgments made by accountants

2016 RP 2

State 3 different significant issues ... **Do not state GAAP rules, calculations, or journal entries.** Relate operational issues to the **decisions** the accountant makes

2016 RP 3

Write about the **most important things** an accountant must consider when accounting for ... **Do not provide detail of accounting procedures, calculations, or journal entries.** Consider the **decisions** the accountant must make.

Figure 5.1. Changes to the issues question prompt.

She identified a common problem: students did not understand that an issue is a situation that requires an accountant to make a decision. The RPs replaced objective tests over accounting concepts and procedures. Therefore, students who did not understand the meaning of the word “issues” used the issues prompt as an opportunity to demonstrate declarative and procedural knowledge.

AHA moments question prompt. The purpose of the AHA moments question prompt was to encourage students to reflect on changes in thinking that occurred during the learning process. Figure 5.2 provides an overview of the changes made to the AHA moments question prompt during the study. The change in 2016 to require students to fully explain their thoughts seemed to encourage more students to describe why they changed their thinking; however, they neglected to discuss the point in the learning process that the change occurred. Instructions related to the “because” part of the prompt to encourage deeper reflection about the learning process resulted in some deeper reflections. Asking students to describe learning they would remember for a long time provoked most students to reflect on the ambiguous nature of accounting work.

Homework and CP question prompt. The purpose of the homework and CP question prompt was to encourage students to reflect on experiential learning (Kolb, 1984). I added the question prompt at the beginning of the 2016 cycle after noticing students rarely described personal learning experiences working with before-class materials or completing tasks on the CP. Figure 5.3 provides an overview of the changes I made to the question prompt during the 2016 cycle. On RP 1, students generally described the specific procedures they completed during each activity. I found most students described the least complex and most complex work with some reflection about the different thought processes he or she

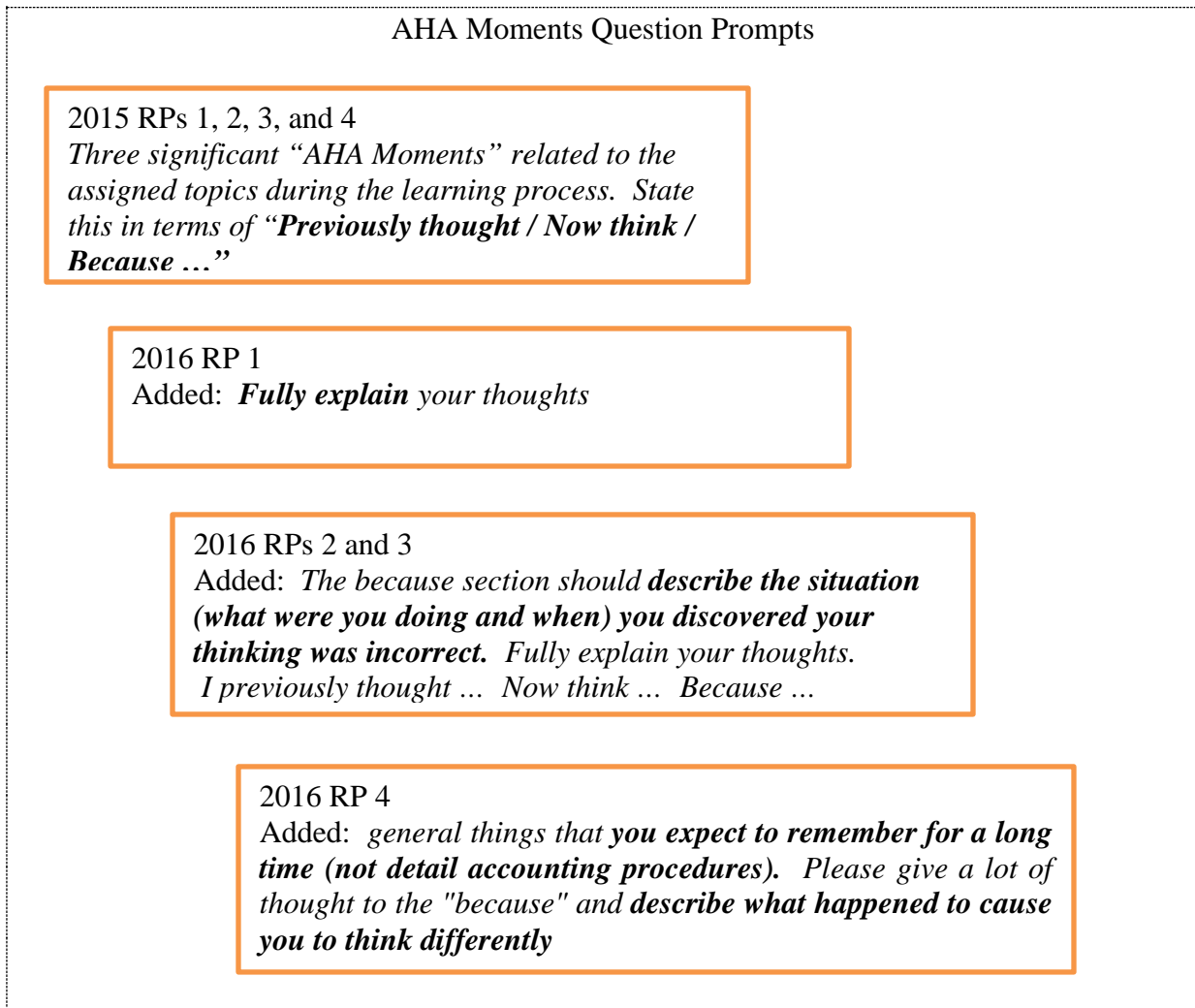


Figure 5.2. Changes to the AHA moments question prompt.

used on RP 2. In response, I revised the prompt on RP 3 and asked students to consider differences and similarities. The wording of the prompt on RP 3 seemed easier for students to understand. To follow the directions in the last prompt, most students described at least one structured accounting procedure (stages one or two). I inadvertently changed the wording on the last question prompt to encourage lower stage reflections about structured accounting procedures.

Homework and CP Work Question Prompts

2016 RP 1

Compare the work you completed on the project [CP] to the homework problems for sales and accounts receivable. Compare and contrast the work and the type of thinking required to complete the work for each. (Be very specific and demonstrate thought; general, surface answers will get no credit.) Homework: Comprehensive Case Work:

2016 RP 2:

Compare and contrast the work and the type of thinking required to complete the work for each. Then comment on the parts of each that come easy to you and the things that challenge you for each type of work. (Be very specific and demonstrate thought; general, surface answers will get no credit.)

2016 RPs 3:

Discuss the differences and similarities in the thinking required to complete the case work and the online homework. Be very specific and demonstrate thought; general, surface answers will get no credit.

2016 RP 4

Discuss the most important things (or types of things) that you learned while doing the comprehensive project that you did not learn by doing homework problems or watching the lecture videos. This should be big picture things as well as specific accounting procedures. Discuss means to describe "how" working the project helped you learn.

Figure 5.3. Changes to the homework and CP work question prompt.

Public company question prompt. The public company question prompt required students to read footnotes that described a company's accounting policies. After reading the footnotes, students reflected on how the accountant's choice of accounting methods impacted

items reported on the financial statements. Figure 5.4 provides an overview of the changes made to the public company question prompt during both cycles. The general wording of the prompt on RP 1 (2015) resulted in reflections about the financial health of the company from an investor's perspective without consideration of the work of the accountant. I changed the prompt to specifically require reflection about accounting methods. Most students continuously restated the information provided in the footnotes or the textbook to address the prompt. Other students provided erroneous speculation about why the company may have selected the method.

The requirement to explain why resulted in only a few instances of deeper reflection. Regardless of the wording in the prompt, students consistently restated the footnotes and described accounting procedures with little reflection on the accountants' decisions. I did not discover specific evidence to support why students limited reflections to restating the information provided by the company. Most footnotes provide a description of the method chosen and discuss the reporting of related accounts and amounts. I suspect that students believed the company's accountant selected the correct method. Therefore, students saw no reason to explore the judgment used to make the decision.

Summary. I found little evidence that changes to question prompts encouraged students to reflect upon the use of higher order thinking to make accounting decisions. Students' prior experiences with accounting led them to initially believe accountants use non-reflective thinking to perform repetitive structured procedures. A class discussion about the diagram provided in Figure 4.6 helped students understand the accounting procedures that require accountants to make subjective decisions. A significant increase in the number of reflective responses (stages three and four) occurred once students understood when

Public Company Question Prompts

2015 RP 1: *Look at the financial statements and footnotes for 3 different public companies and describe the judgments that you made about each company related to the assigned topic.*

2015 RP 2: *VERY BRIEFLY state the method the company uses to account for inventory and then explain how the company's method of accounting for inventory impacts the amounts reported on the financial statements.*

2015 RP 3: Replaced and then: *specifically explain ... that the accountant applied judgment to account for ... and how it impacted the amounts reported on the financial statements.*

2015 RP 4: Replaced *Then discuss ONE important instance the accountant used judgment ... and the impact on the amounts reported on the financial statements.*

2016 RP 1: Added and clarified: *IN YOUR OWN words. Then explain ONE important instance their accountant would use estimates and judgments ... and the impact the estimates and judgments have on financial statements.*

2016 RP 2
Added: *Then explain the significant reasons why you believe this company uses the chosen method ... Do not make general statements; be specific to the Company.*

2016 RP 3: Added and clarified: *IN YOUR OWN words. Then explain (specific to the company) the impact of the accounting methods used on the financial statements.*

Figure 5.4. Changes to the public company question prompt.

accountants follow structured procedures and when accountants use judgment to make decisions. The greatest influence on students' depth of reflection was students' experiences performing accounting work. A new and meaningful understanding of accounting work emerged as students used reflective thinking to complete authentic tasks on the CP.

Comprehensive Project Tasks

Students reflected on their learning on a RP after completing related CP tasks. Table 5.5 provides a summary of CP tasks students completed using non-reflective thinking and reflective thinking. Recording transactions and computing amounts require surface-level non-reflective thinking. Tasks that required students to use judgment to estimate amounts and select and support an accounting method involve deeper reflective thinking. All phases of CP work required students to record transactions. Phase two required a large amount of time to compute amounts, whereas phases one, three, and four required minimal computations. Students' first experience using judgment and reflective thinking occurred in phase one when they considered many different factors and estimated bad debt expense. Phase two required students to select and support an accounting method, a different application of making judgments. Students practiced using judgment to both estimate amounts and select an accounting method during phase three work.

Table 5.6 presents the estimated percentage of time students devoted to completing CP work in each step of the critical thinking process. I used notes in my RRJs related to students' progress working on CP tasks and my knowledge of how much time each task should take to estimate the time required to complete each task listed in Table 4.2. I then computed the percentage of total time students worked on each step of the critical thinking process during each phase of the CP. Next, I related each step in the critical thinking process

Table 5.5

Summary of Non-reflective and Reflective Tasks in each Phase of CP Work

Phase of CP Work	Non-reflective Thinking Tasks	Reflective Thinking Tasks
One	Use documents to record transactions and prepare the accounts receivable aging report	Use the accounts receivable aging report and customer agreements to identify uncollectible accounts and estimate bad debt expense
Two	Record inventory purchases using documents Compute ending inventory using Excel spreadsheets: six different accounting methods	Select and support a method to value inventory
Three	Apply accounting guidance to record purchases of long-term assets Compute depreciation expense	Estimate useful lives for long-term assets and select and support an accounting method
Four	Record transactions related to investments Review the general ledger and other information and make year-end adjustments to accounts Use the general ledger to prepare financial statements	Select and support the most appropriate accounting method for three different investments.

to Mezirow's (1991) four stages of reflection. Overall, students divided their time almost equally between tasks they could do with minimal (stage two) or no reflection (stage one) and tasks that required reflection to complete (stages three and four). Time used to complete non-reflective tasks in phase two (70%) was twice the amount of time used to compute amounts and record transactions in phases one and three. Phase two involved the non-reflective task of computing ending inventory using Excel spreadsheets (stage one).

Table 5.6

Percentage of Total Time Students Worked to Complete CP tasks in Each Step of the Critical Thinking Process Related to Mezirow's (1991) Stages of Professional Reflection

Step in the Critical Thinking Process	Mezirow's Stage of Reflection	RP 1: Phase 1 % of Time	RP 2: Phase 2 % of Time	RP 3: Phase 3 % of Time	RP 4: Phase 4 % of Time	All CP Work: % of Time
Interpretation and Analysis	1	15%	55%	15%	25%	27%
Evaluation	2	20%	15%	15%	25%	19%
Non-Reflective		35%	70%	30%	50%	46%
Inference and Self-regulation	3	45%	15%	55%	40%	39%
Explanation	4	20%	15%	15%	10%	15%
Reflective		65%	30%	70%	50%	54%
Total Time		100%	100%	100%	100%	100%

Students spent more time using reflective thinking to make estimates and evaluate alternatives (stages three and four) in phases one and three than in phases two and four. Therefore, tasks in phases one and three required the deepest level of reflection to complete. Phase four required students to use inference and self-regulation to select an accounting method and review the accuracy of account balances.

I expected the degree of non-reflective and reflective thinking students used to complete CP tasks to influence students' perspective on the thinking processes professional accountants use to perform work (Kolb, 1984). Figure 5.5 presents the weighted average

stage of students' reflections for all responses to question prompts compared to the weighted average stage of reflection required to complete CP work. A weighted average below 2.0 for CP work signals that tasks required students to perform more structured procedures using non-reflective thinking. A weighted average above 2.0 indicates students directed more effort towards using reflective thinking to make decisions. The depth of students' responses on RP 1 and RP 2 closely follow the depth of reflection required to complete CP work on phases one and two. On RP 3 and RP 4, the depth of students' reflections exceeded the level of reflection required to complete related CP work, evidence that more students understood the importance of using judgment to perform accounting work. The absence of a public

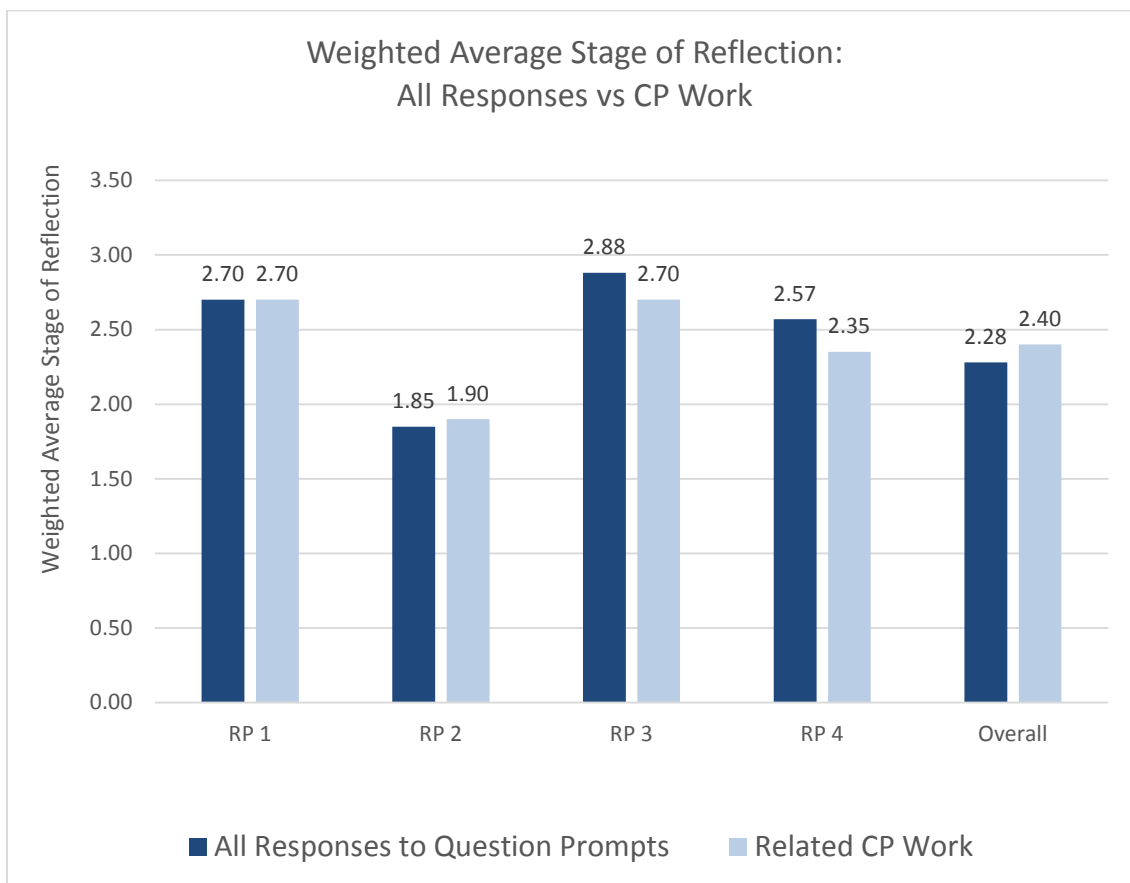


Figure 5.5. Weighted average stage of students' responses to all questions prompts on each RP compared to the weighted average stage of reflection required to complete related CP tasks (Mezirow, 1991).

company question prompt on RP 4 had a slight positive effect on the overall weighted average response to question prompts.

Responses to question prompts on each reflection paper. The depth of students' reflections trended with the level of reflection required to complete related tasks in the CP. Additionally, the weighted average stage of response varied with the subject of the question prompt. Figure 5.6 presents the weighted average stage of reflection of students' responses to each question prompt on each RP. A higher weighted average stage of response indicates a deeper overall level of reflection. The weighted average stage of responses to the issues and AHA moments prompt on RP 1 was lower due to students' prior experiences using a surface-level approach to learning accounting. At the beginning of the semester, students believed accounting work consisted of structured procedures (stages one and two). Inventory work in phase two required time-consuming computations, resulting in a low weighted average stage of responses on all question prompts. The weighted average depth of responses to the issues and AHA moments question prompt increased after RP 2, as students gained a better understanding of accounting tasks that require judgment. Most students gave less thought to structured procedures and reflected more on the subjective decisions they made while working on CP tasks in response to the issues and AHA moments prompt on RP 4.

Almost all students reflected on the significant challenges they encountered estimating uncollectible accounts (stage three) in response to the CP prompt on RP 1. Overall, responses that described the thinking required to complete CP work generated the deepest weighted average level of reflection, except for inventory work, which primarily

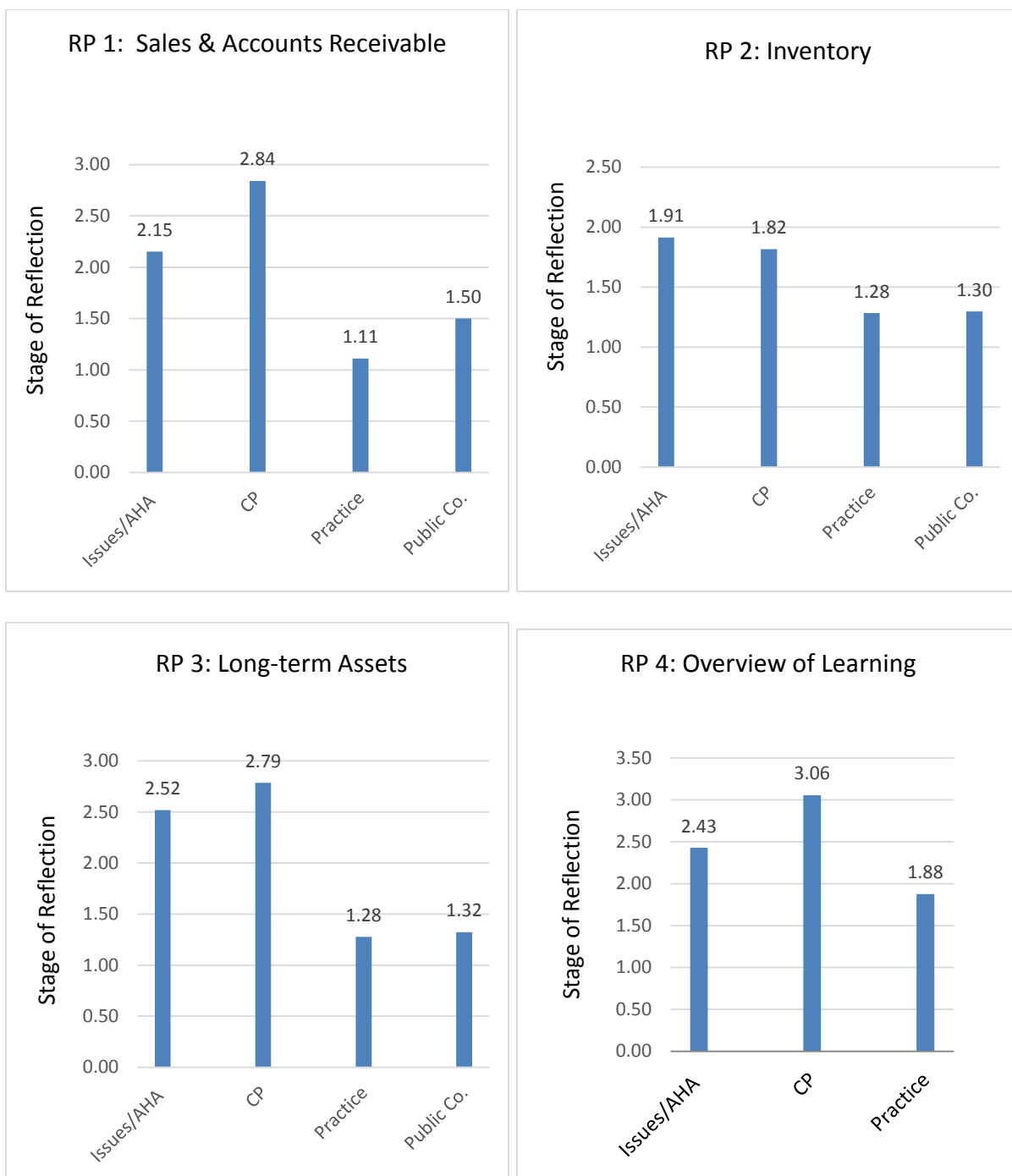


Figure 5.6. Weighted average stage of students' reflection on each question prompt on each reflection paper.

consisted of computations. Students' descriptions of learning that occurred while working practice problems on all topics indicated that non-reflective thinking was adequate to do the work. Practice problems have one correct answer and generally do not require students to use reflective thinking (Davidson & Baldwin, 2005). No responses related to learning from homework gave evidence of stage three or four reflection. Students consistently restated information provided by the company about the accounting procedure (stage one) and the impact on the financial statements (stage two) in response to the public company question prompt.

Figure 5.7 presents the percentage of all responses that fell in each of Mezirow's (1991) four stages of reflection. More than half (62%) of students' responses were non-reflective descriptions of computations, accounting rules, and accounting procedures (stages one and two). Approximately one-fourth (27%) of all reflections acknowledged that the accountant uses judgment to make estimates and select accounting methods (stage three). Stage four reflections (11%) explained how accountants make and support judgments or described a change in perspective about the nature of accounting work.

University students generally reflect in a primary stage approximately 70% of the time and move to an adjacent stage in unusual situations (King & Kitchener, 2004). Furthermore, accounting students perform accounting procedures by using surface-level stage one non-reflective thinking (Elias, 2005; Lucas, 2001; Sharma, 1997). Students in this study varied their stage of reflection according to the demands of their learning experiences. No previous studies provided findings related to accounting students' level of reflective thinking that would be useful for comparing to the results of this study. However, senior-level education students use descriptive reflection (stages one or two) approximately 70% of

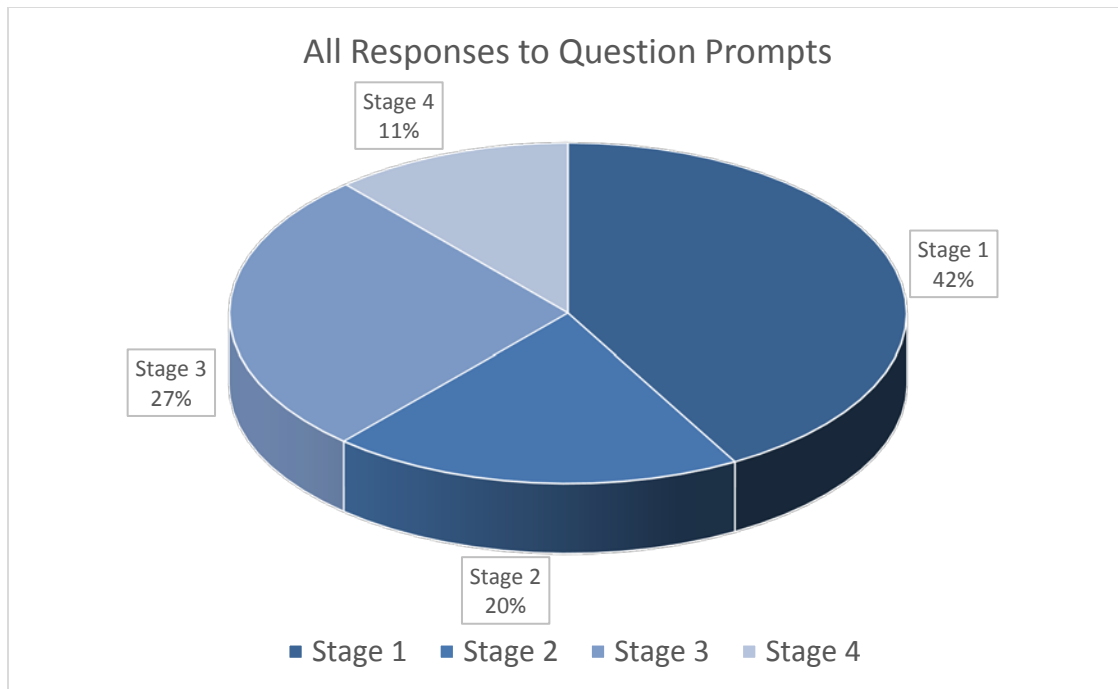


Figure 5.7. The percentage of total responses to all question prompts that gave evidence of each stage of Mezirow's (1991) four stages of professional reflection.

the time when writing about planning and implementing a unit of study. Approximately 30% of students' reflections described conversations that would fall in either stage two or stage three, and critical reflection (stage four) accounted for less than one percent of all reflections (Hatton & Smith, 1995). Other studies conducted to determine the typical depth of university students' reflections found that most undergraduate students use non-reflective thinking and have difficulty using higher stages of reflective thinking (King & Kitchener, 1994; Kurfiss, 1988; Pavelich & Fitch, 1988). Overall, students in this study gave evidence of deeper reflection at the end of the semester than other university students.

Summary

Incorporating assessments that required reflection changed students' perspectives related to the thought processes required to complete accounting work. Student 5 described the typical progression of thoughts students experienced over the course of the semester:

*I previously thought: That there was **always a right answer for every situation** in accounting. I believed that there was **a procedure laid out for every situation**. I figured **every accountant would always come up with the same answer** for how to account for a situation [stage one]*

*Now think: That **this is simply not true** at all. Going deeper into each account **made me realize all of the considerations that need to be made, and just how subjective the accounting process truly is**. [stage three]*

*Because: **Choosing a method for inventory revealed subjective considerations such as whether the accountant believes prices will be rising or falling in the future. Additionally, the accountant needs to choose what he believes to be a reasonable way of accounting for inventory. This requires consideration of economic trends, which I thought had little or nothing to do with accounting. These economic trends also apply when considering whether to test for impairment of assets. If the economy is weak, the accountant needs to assess whether the assets on the balance sheet are not stated above probable future economic benefit** [stage four]. (RP4, S5, 2016)*

The reflection papers gave students an opportunity to evaluate their own learning process.

Two factors had the most influence on the trend in the depth of students' reflections as the semester progressed:

- 1) the type of work students performed on CP tasks related to the same topic(s), and
- 2) students' understanding of when accountants follow accounting guidance to perform structured procedures and when accountants make subjective decisions using judgment.

I found no evidence that the changes I made to question prompts influenced students' responses, except for replacing the words "accounting issues" with "accounting decisions." Students who initially believed accounting work consisted of structured procedures had few prior experiences to help them identify issues that accountants must resolve. The wording changes to the question prompts would have most likely had no influence without additional instruction about when and how accountants use judgment to complete accounting

procedures (see Figure 4.6). Furthermore, many CP tasks that required students to use reflective thinking provided experiences for students to reflect deeply.

The findings in this study agree with the conclusions of Harvey, Coulson, and McMaugh (2016), who analyzed the findings of other researchers who incorporated teaching interventions to encourage students to use reflective thinking. The researchers found that:

- 1) strategic teaching interventions develop reflective skills,
- 2) the ability to reflect on meaningful understanding improves with practice, and
- 3) reflection occurs at different levels for different purposes and not all reflection is critical.

Students began the course with the perspective that accounting work consists of performing structured procedures using non-reflective thinking. A change in students' depth of reflection slowly occurred as I explained and students experienced the difference in thought processes accountants use to perform structured procedures and the reflective thinking required to make accounting decisions. The primary teaching intervention, the CP, required students to use reflective thinking. The type of tasks students completed generally determined the level of reflection students used to describe their work. Deeper reflective thinking occurred as students better understood how and when accountants use judgment. Student 27 reflected on the change in his understanding of accounting work that occurred as he practiced reflective thinking:

*In this paper [RP3], I began to see the impact and the importance of accounting decisions. Previously, I did not fully comprehend how certain decisions we made were affecting our company. **After completing this section, and having to make a lot of choices regarding the classification of our assets and their useful lives, I now realize how significant accountants are in the decision-making process. Because we had to make so many important decisions in part three, the learning differences between the project and the homework became more apparent.** (RP4, S27, 2016)*

He, like all other students, had practiced using judgment in the first two phases of the CP. However, most students did not really understand the impact of the judgments accountants make until the third phase of the CP. A deeper understanding led to evidence of deeper reflection at the end of the semester.

Students provided only surface-level reflections when describing structured practice problems regardless of changes to question prompts or instruction. Findings from this study indicate that structured practice problems (homework) do not require higher stages of reflective thinking. Furthermore, public company footnotes provide the information to answer the question prompt. Students generally repeated the answer provided in the footnote without further reflection about why the accountant would select the method.

Students' responses to question prompts often demonstrated incorrect reflections about accounting procedures and concepts (Ash et al., 2005). I summarized the errors in thinking while grading and clarified misunderstandings during class discussions. Students' knowledge about accounting work increased after I used students' reflections to identify incorrect thoughts and provided further instructions. For example, Student 3 reflected:

*I wish we could have had the class discussions about common misunderstandings BEFORE we wrote the reflection papers. **That was by far the days I learned the most about each topic and learned that before that day, I was interpreting the lesson wrong.** (RP5, S3, 2015)*

I followed her suggestion and, when possible, informed students of common misunderstandings during class discussion before students wrote the RPs in 2016. Class discussions and completing CP work provided students with deep and meaningful learning experiences to reflect deeply about. The following section explores the effect that CP work and RPs had on students' ability to perform accounting procedures.

Students' Ability to Perform Accounting Procedures

Students who achieved the primary learning objectives of the IFA course in this study demonstrated the ability to: 1) practice critical and reflective thinking skills, and 2) perform accounting procedures. Higher order thinking skills and the ability to perform accounting procedures are both necessary for success in the accounting profession (Tysiac, 2016). The findings to research questions one and three indicate that the CP and RPs encouraged students to practice critical and reflective thinking skills. I analyzed the results of students' work on the CP and the final exam to determine students' ability to perform routine accounting procedures. For purposes of this study, routine accounting procedures consist of recording transactions, adjusting account balances, and reporting financial information according to GAAP.

I allowed students to use all available resources when completing CP tasks and RPs and did not require students to take objective tests or memorize for recall during the semester. At the end of the semester, I used an objective comprehensive final exam to evaluate students' ability to recall and demonstrate declarative and procedural knowledge. Students typically adjust their approach to learning to accomplish the assessment requirements (Healy et al., 2014; Joughlin, 2010). Problem-based learning (CP work) and written RPs generally encourage students to use a deep approach to learning (Kolb & Kolb, 2005; Laird et al., 2008; Young & Warren, 2011). In contrast, students typically use a surface approach to study when practicing structured procedures and preparing for objective tests (Entwistle et al., 2000). Students who participated in this study completed learning activities and assessments that encouraged a deep approach to study during the semester. Accounting instructors can compare learning demonstrated by students in a traditional IFA

course to students' results on the final exam after completing task-based and written assessments. In this section, I will discuss how the learning activities and assessments affected students' ability to perform routine accounting procedures.

Students' Approach to Learning

I did not assess students' ability to recall declarative and procedural accounting knowledge during the semester. Therefore, students who did not have to rely on memory may have intentionally adjusted their study approach during the semester (Laird et al., 2008). I asked students to describe their approach to learning on the last reflection paper. Student 27 provided a typical reflection:

*I always did the medium tests when they were assigned, but **I usually did not do the others. This extra practice would have helped me develop a greater understanding of the material** so that when I got to the project work, where the questions were more complex, I would [have] had a better idea of what to do. (RP4, S27, 2016)*

He admitted that he did the minimum amount of practice problems, and regretted not working to achieve a deeper understanding. Furthermore, he made no reference to a change in approach when studying for the final exam. Student 27 and his partner completed CP tasks with 90% accuracy, which gave evidence of meaningful learning. His approach to learning for understanding resulted in a score of 90% on the final exam. He consistently demonstrated the ability to perform accounting procedures on CP tasks and the final exam.

Student 23 provided some insight on why students gave minimal time to completing practice problems:

Because this class had no tests, I did not always do the extent of studying I should have. With the final exam coming up, I feel that I know the information because of the project but there are parts of the chapters I could have known better leading up to my studying [for the final exam]. Sometimes it was hard to make sure I studied the chapters well when I knew that I was

not being tested over it anytime soon or if I had a lot of homework for other classes that I thought was more important. (RP4, S23, 2016)

She admitted that she managed her time and adapted her study habits to the course requirements. She and her partner consistently performed well on CP tasks (93%), which gave her confidence that she understood how to perform procedures. However, she was unable to correctly answer as many multiple-choice questions over structured procedures and scored 66% on the final exam.

Student 7, like some other students, changed his approach to study as the semester progressed:

Looking back, I would have approached the class at the beginning of the semester, the same way that I did towards the end. Throughout the course of the class, I started to learn that I did much better on the project work when I put in the work outside of class by reading the book and watching the videos. Because towards the beginning, I just skimmed through the information. Usually its not important to have everything down until the test comes around, but in this class, you have to have a better understanding of the concepts at all times because we do project work so often, and things go much quicker if you are prepared. (RP4, S7, 2016)

He realized that he had to achieve a deep understanding to successfully complete CP work even though he would not have an objective test until the end of the semester. He and his partner completed approximately 85% of CP tasks correctly. He did not describe the study approach he used to prepare for the final exam. His minimal efforts to prepare to perform some CP tasks resulted in a score of 43% on the final exam.

The aforementioned students provide examples of the three most common approaches to study used during the semester. Some students used practice problems to gain an understanding of the procedures performed on CP tasks. Others realized they did not study enough during the semester to achieve recall of declarative knowledge and structured procedures. Some students acknowledged that minimal study did not prepare them to

complete CP tasks and increased their efforts as the semester progressed. Students wrote the last reflection paper before the final exam; therefore, responses made no reference to the impact their study approach had on their final exam grade.

About 70% of students' grades in the course related to CP work and RPs, assessments that did not require memorizing for recall. The objective final exam that required recall accounted for 20% of a student's grade. Therefore, students who could demonstrate understanding of how to perform accounting procedures could earn a passing or good grade without memorization. Most students acknowledged they spent less time studying to prepare to complete CP work and write RPs than they would have devoted to learning for recall on objective tests. Furthermore, a few students acknowledged resorting to a surface approach to memorize procedures at the end of the course (Healy et al., 2014; Struyven et al., 2005).

Each assessment required students to demonstrate different types of knowledge and skills. Accounting instructors may question whether or not students can adequately learn to perform accounting procedures without memorizing for recall. Other instructors may wonder whether an objective final exam is necessary when students demonstrate the ability to use higher-order thinking skills to perform authentic accounting work during the semester. The understanding required to perform authentic accounting work on the CP is substantially different than the knowledge required to recall learning and answer questions on an objective test.

Assessment Environment

I used two different types of assessments (CP and final exam) to evaluate students' ability to perform accounting procedures. The first task-based assessment simulated a professional accountants' work situation. The second, an objective final exam, took place in

the traditional academic testing environment. Table 5.7 compares the characteristics of the assessment environment associated with CP tasks and the final exam. Students completing CP tasks worked with a partner, asked questions of the instructor, and had open access to any available resources. In contrast, students worked independently without any help from the instructor or other resources when completing the final exam. Considering the first three

Table 5.7

Characteristics of the Assessment Environment for the Comprehensive Project (CP) and the Final Exam

Characteristic	CP Work	Final Exam
Memory	No recall	All recall
Instructor Assistance	Written instructions Instructor responded to questions	None
Collaboration	Worked with a partner	Individual effort
Information	Written instructions, agreements, and business documents Results of other CP tasks	Questions provide all relevant information
Structure of Work	Business documents Pages for recording transactions General ledger Work schedules Excel spreadsheets	Independent multiple-choice questions Select account names Identify correct financial statement line items and amounts
Grading	All: Errors in one procedure leads to other incorrect procedures. Each procedure graded separately	Half: One step or concept to arrive at the answer Half: One answer after a sequence of steps to arrive at the answer

answering questions on the final exam. However, students completing CP tasks had to identify and interpret unstructured information to complete the accounting procedures. The complex process of sorting through and interpreting agreements and documents made the CP tasks substantially more difficult than using given information on the final exam.

Furthermore, students used work on one CP task to perform the subsequent CP tasks. As such, students who erroneously performed one procedure incorrectly performed other procedures in a CP task. A similar situation occurred on final exam questions that required students to perform a sequence of steps to arrive at the answer. An error in only one of the related calculations or procedures resulted in an incorrect answer. Approximately half of the questions on the final exam required students to complete a sequence of steps to obtain the answer. Students could also systematically eliminate some of the choices on declarative knowledge related questions on the final exam and make an educated guess at the answer—an option not available on CP work. A comparison of scores on the CP to the final exam results provides insight; however, one should consider the difference in the environment and the scope of each assessment when evaluating students' ability to perform accounting procedures.

Students' Performance on Assessments

Students performed three types of routine accounting procedures. The first, recording transactions, required students to identify or compute amounts and determine the increase or decrease to appropriate accounts. Recording adjustments involved determining the correct ending balance for an account and recording the proper change to the account. Third, accountants prepare financial reports after recording all transactions and adjustments. Figure 5.8 presents charts that compare students' performance on CP tasks and final exam questions



Figure 5.8. Students' performance on the comprehensive project (CP) compared to students' performance on the comprehensive final exam for each topic by type of accounting procedure.

related to recording transactions and adjustments for each major topic. I considered a score of 70% or better as evidence of adequate ability to perform accounting procedures. Most IFA courses consider 70% or better to be a passing grade. Furthermore, multiple-choice questions on the final exam appeared on Certified Professional Accountant (CPA) examinations, tests students take after they have completed two to three additional financial accounting courses.

Record transactions. Recording transactions on CP tasks consisted of using documents and agreements to gather data prior to recording changes to accounts. Some transactions required students to repeatedly use the same type of documents and account names. Students received instructions about how to record the first transaction. Assistance at the beginning of a repetitive task should lead to students' correctly performing similar procedures. However, students need the opportunity to reinforce learning through performing the procedures. Overall, students correctly performed 85% of the repetitive procedures on CP tasks. Other CP tasks required students to gather information and use judgment to record non-repetitive procedures. Students recorded non-repetitive transactions with a high level of accuracy (81%).

On the final exam, students had more success recording revenue transactions than following multiple transactions through accounts to arrive at correct accounts receivable and allowance account balances. With respect to long-term assets, students adequately recorded costs as an asset or an expense. A lack of repetition, along with the demands of preparing financial statements during the last phase of the CP, most likely contributed to students' inability to properly account for investment transactions on the final exam. Overall, students had the most difficulty with final exam questions that required a sequence of steps to obtain

the correct answer. One incorrect step or a mathematical error may have caused students who understood the procedure to reach a wrong answer.

Together, the CP and the final exam comprehensively assessed students' ability to record transactions related to all topics learned in the course. Students correctly answered 74% of the questions on the final exam and properly completed 84% of the CP tasks associated with recording transactions. Students earned a passing score on both assessments. Therefore, the findings support that students learned to sufficiently record transactions.

Record adjustments. Tasks on the CP related to recording adjustments required students to: 1) use the general ledger to identify accounts in need of adjustment, 2) obtain related documentation, 3) determine the amount of the adjustment, and 4) record the adjustment. The written instructions helped students identify accounts in need of adjustment; however, the correct adjustment depended on how students had previously recorded transactions. Students had the most success making adjustments in CP tasks when following a process like the steps required in practice problems. Students' ability to record adjustments in CP tasks improved as the semester progressed. However, the overall score of 68% correct on CP work fell slightly below the requirement to meet the related learning objective.

Questions related to recording adjustments on the final exam required students to determine the correct amount and the appropriate account(s). The paragraph of information provided unadjusted account balances, account names, and other facts necessary to determine the correct answer. Most questions required students to follow a sequence of prior transactions. Students who missed one step in the sequence obtained an incorrect answer. Therefore, I could not objectively determine if students did not understand how to record the various transactions included in the question or could not properly record the adjustment.

Students gave evidence of the ability to record transactions, and this evidence led me to believe students could not determine the proper adjustment. Overall, students properly determined the correct amount and account slightly more than half of the time (54%) on the final exam. Therefore, students did not demonstrate sufficient ability to record adjustments on the final exam.

Based on my experience, students' difficulty with recording adjustments is consistent with other students in a traditional IFA course. Student 21 described a common sentiment:

Adjusting entries have always been a huge struggle for me. No matter how much I think I finally understand it, I always seem to do them wrong in the homework. However, in the project was the first time that I believe I understood why exactly we made the adjusting entries. (RP 4, S21, 2016)

She, like most students, failed to understand that different situations require a different adjustment to accounts. The information in the CP and on the final exam was provided in a different format than practice problems. Students attempting to use the pattern of thinking they used on practice problems with limited understanding would have difficulty recording proper adjustments on CP tasks and the final exam. Overall, students performed better on the CP (68% correct) than on the final exam (54% correct) with respect to recording adjustments. The results on both assessments indicate that students did not learn to properly record adjustments to accounts. The ability to follow many transactions through various accounts and correctly record adjustments generally requires more practice than students experienced in this course.

Financial reporting. Financial reporting entails summarizing business transactions and presenting amounts on financial statements according to GAAP. On the CP, students prepared financial statements using the accounts and amounts in the general ledger. Incorrect final account balances led to wrong amounts on the financial statements; however, I did not

mark it incorrect when students reported an amount on the financial statements that agreed with the general ledger. Overall, students demonstrated the ability to correctly use a general ledger to prepare financial statements (81%). The format of the final exam did not allow students to demonstrate their ability to prepare a complete set of financial statements. Instead, students answered multiple-choice questions to demonstrate declarative knowledge related to items included in various sections of the financial statements. Students' performances may have been affected by minimal class discussion about financial statement presentation issues (Healy et al., 2014). Overall, students demonstrated adequate understanding of financial statements on the final exam (70% correct).

Topics not included in comprehensive project tasks. Students completed CP tasks commonly performed by professional accountants working for a medium-size business. I did not include business transactions that occur in specific industries or only in certain situations in CP tasks. Video lectures and practice problems exposed students to topics included in a traditional IFA course that students did not experience on the CP. Table 5.8 presents the topics included on the final exam students did not encounter on the CP. During a "minimal" class discussion, I explained the related conceptual issues and provided an example. For all topics that included "practice," I discussed the more challenging aspects of the topic and worked in-class practice problems with the students. Two factors may have contributed to the poor performance on topics not included on the CP. First, students probably did not allocate much study time to content I discussed minimally in class (Healy et al., 2014; Joughlin, 2010), which generally leads to weaker learning (Chmielewski-Raimondo et al., 2016). Second, some questions required students to perform a sequence of steps to obtain the

final answer. Students who performed one of the steps incorrectly would obtain a wrong final answer.

Overall. The ability to perform routine accounting procedures requires knowledge of recording transactions, recording adjustments, and preparing financial statements. Table 5.9 summarizes the overall percentage of the routine accounting procedures students correctly performed on the CP and the final exam. Overall, students demonstrated the ability to

Table 5.8

Students' Performance on Final Exam Topics not on the Comprehensive Project (CP)

Topic	Extent of Class Discussion	Students Correctly Answered
Reporting comprehensive income	None	59%
Recording a sale of an investment	Minimal	38%
Reporting discontinued operations	Minimal	41%
Adjusting inventory for loss of value (Lower of cost or market)	Minimal	41%
Reporting contingencies	Minimal	48%
Long-term asset for impairment	Minimal	83%
Reconciling a bank statement	Practice	78%
Accounting for payment discounts	Practice	78%
Reporting amounts related to long-term revenue contracts	Practice	78%
Changing the estimated useful life after using a long-term asset for five years	Practice	86%
Average Percent Correct		58%

properly record transactions and prepare financial statements. Most companies use an integrated computer system or software package that automatically records repetitive transactions as employees enter amounts into the system. Furthermore, the accounting system automatically places almost all amounts and accounts on financial statements according to an established format. As such, the ability to record repetitive transactions and properly prepare financial statements may be the least important skills students need to

Table 5.9

Percentage of Correct Accounting Procedures Performed on the Comprehensive Project (CP) and the Final Exam

Type of Procedure	CP Tasks	Final Exam
Record Transactions	84%	74%
Record Adjustments	68%	54%
Prepare Financial Statements	81%	70%
Overall Average	81%	66%

acquire. Accountants add value when they record non-repetitive transactions. Students gave evidence of the ability to properly record unstructured non-routine transactions on CP tasks. However, students did not adequately learn to record adjustments. Accountants record adjustments after analyzing previously recorded transactions during the period. More experiences working with general ledger accounts and business documents (CP tasks) are necessary to prepare students for the challenges associated with recording adjustments after graduation.

Overall, students demonstrated stronger performance on the CP (81%) than on the final exam (66%). The guidance that I provided on CP work was most likely less than students will receive from supervisors or co-workers after graduation. Professionals collaborate and share knowledge in the workplace (Hart, 2015). Professional accountants quickly remedy memory lapses using easily accessible online information. Additionally, supervisors do not provide a paragraph of relevant information included in questions on the final exam. Therefore, performance while working on CP tasks is more likely to represent students' ability within a professional environment than scores on objective final exam questions (Walker & Leary, 2009). The findings indicate that students acquired the skills and abilities to adequately perform most routine accounting procedures.

Limitations

The purpose of this study was to develop an instructional method that prepares students for the challenges associated with professional accounting work. I gathered evidence that indicated students practiced critical thinking while performing CP tasks. I also found that the trend in the depth of students' reflections closely followed the nature of the accounting work they performed. During the study, I successfully resolved implementation issues related to incorporating the CP and RPs into the IFA course. Accounting educators can use the results of this study to bring about positive change; however, the research methods I used had limitations.

The participants in this study self-selected through independent registration for the course. Students who registered for this course may have been aware of my reputation as an instructor inclined to use challenging, non-traditional teaching methods. Most students who participated in this study were not accounting majors. Therefore, students in this study may

not represent a typical group of students enrolled in an IFA course. Students may have had experiences in other courses prior to or during the semester that affected the development of their intellectual skills. The variables that impact a student's ability to use critical and reflective thinking are unlimited. I did not collect data or implement controls to distinguish learning that occurred in this course from development that resulted from other experiences. Furthermore, I did not analyze the change in students' critical thinking skills that resulted from implementing the new instructional method.

Time constraints made it challenging for me to reflect on implementation issues and students' learning during class. I had to rely on my memory and short notes taken during class when writing in my RRJs. Additionally, I did not have sufficient time to code students' RPs or my RRJs until after the last research cycle ended. I made changes throughout each cycle after considering the nature of the questions students asked during class, students' responses in RPs, and my thoughts concerning students' work. I used the first primary action research cycle (2015) to resolve major implementation issues and find ways to enhance learning. Therefore, I did not analyze the results of the 2015 students' work. A more timely and complete coding of narrative data may have produced findings that led to different actions during the study.

Students completed the CP in groups of two, which may have, at times, represented the ability of only one of the two students. I did not compare knowledge demonstrated on individual RPs and the final exam to group CP work to uncover inconsistencies in students' performance. The question prompts on RPs served to guide students' thoughts about the professional accounting work. Some prompts asked students to reflect at deeper stages and directly prohibited surface-level non-reflection. Findings indicate that the wording of the

question prompts had little impact on students' responses; however, prompting reflection presents a confounding variable that may have influenced students' responses.

Students performed all CP work manually or on Excel spreadsheets. Most companies use an accounting system that automatically records repetitive transactions as employees enter related data into the system. The accounting system also automatically records amounts in the general ledger and summarizes account balances. Students in this study manually recorded transactions and placed related amounts in general ledger accounts. Therefore, students' experiences recording repetitive transactions and maintaining general ledger accounts differed from a professional work environment.

I did not compare the final exam results of students in this study to other students who learned to perform accounting procedures in a traditional IFA course. Therefore, I do not know if the students who completed a CP and RPs in place of periodic objective tests achieved a stronger understanding of routine accounting procedures than students in a traditional IFA course. The answer to each question on the final exam was either 100% correct or incorrect. I did not determine the type of error that caused students to incorrectly answer final exam questions. A mathematical mistake or one error in a multi-step process may have concealed students' overall understanding of routine accounting procedures. Assessments that require students to work structured problems typically allow for partial credit, while objective questions do not. Instructors who evaluate students' learning using different types of assessments may have difficulty comparing the scores of students in this study to other students' performances. The limitations of this study provide opportunities for future research in a variety of areas.

Future Research

Most instructors who teach financial accounting rely on traditional textbooks and end-of-chapter materials (Davidson & Baldwin, 2005; Spiceland et al., 2015). As a result, students believe accounting work consists primarily of mathematical computations and recording transactions in accordance with accounting rules (Elias, 2005; Jackling, 2005). A few accounting instructors have added small, unstructured assignments to traditional course assignments (Heagy & Lehmann, 2005; Kern, 2002; Sargent & Borthick, 2013; Stanley & Marsden, 2012). However, findings from prior studies have not yet ignited widespread, meaningful change to accounting instruction and assessment (Hahn et al., 2013; Johnson & Slayter, 2012; McNellis, 2015; Shoulders & Hicks, 2008). Instructors may be hesitant to discontinue the use of traditional textbooks and practice problems due to the time required to develop learning materials that encourage higher order thinking. Action research designed to develop case studies that require students to consistently use judgment at strategic times during the semester would provide instructors with supplemental non-traditional learning materials.

Accounting instructors who have experimented with curriculum that requires higher order thinking have expressed concern that students may have acquired less than adequate declarative and procedural knowledge (Albrecht et al., 1994; Catanach et al., 2000). No prior studies have attempted to determine the instructional methods and type of assessment that best develops higher order thinking skills *and* promotes the acquisition of strong declarative and procedural knowledge (Herbert et al., 2009; Jensen et al., 2014; Karpicke & Aue, 2015; Struyven et al., 2005; Van Gog & Sweller, 2015). An opportunity exists for accounting instructors to conduct studies that measure students' ability to perform

routine accounting procedures after completing various types of unstructured and structured assignments.

The instructional method in this study incorporated a CP and RPs in a class of approximately 30 students at a private university. Future research that explores implementation issues associated with using the CP and RPs in a variety of settings (e.g., public university, community college, large class size) would be beneficial to other instructors teaching under different circumstances. One objective of this study was to develop question prompts that encouraged reflective thinking about accounting procedures. Instructors would benefit from research that evaluates how well the instruction related to RPs and the recommended three prompts discovered in this study encourage deep reflection about accounting work. During each major cycle, students completed learning activities and assessments designed to encourage a deep approach to learning (Tsingos et al., 2014). In contrast, at the end of each major cycle, I evaluated students' ability to perform routine accounting procedures using an objective final exam that encourages a surface approach to study (Herbert et al., 2009; Joughlin, 2010). Future action research with the goal of developing a comprehensive final assessment that encourages a deep approach to learning would be helpful to instructors who desire to align all assessments to promote deep learning. Furthermore, research aimed at determining whether learning demonstrated on short RPs, authentic work, or objective tests provide a better indication of students' ability to perform accounting work after graduation would be beneficial to accounting instructors who evaluate student learning (Baeten et al, 2010; Walker & Leary, 2009).

One objective of accounting curriculum is to prepare graduates to pass the Certified Public Accountant examination (CPA exam). In the Fall of 2017, administrators revised the

CPA exam to include substantial evaluation of a candidate's higher order thinking skills (AICPA, 2016; Tysiac, 2016). The recent revision to the CPA exam creates a stronger need for accounting educators to help students develop critical and reflective thinking skills. Students who have completed unstructured projects and case studies believe the experience increased their critical thinking skills (McGowan, 2012; Phillips & Nagy, 2014; Sargent & Borthick, 2013; Spiceland et al., 2015). However, no accounting educators have used standardized tests to measure the change in critical thinking skills that occurs as students complete different learning activities. Improvement in one's higher order thinking skills occurs with practice over time (Epp, 2008; Facione, 1990; Rogers, 2001). Therefore, future researchers should also measure the improvement in students' skills after a sequence of courses that include practicing critical and reflective thinking.

Conclusion

Since the 1990s, accounting professionals and educators have called for curriculum aimed at developing intellectual skills (AECC, 1990; AICPA 2016; Albrecht & Sack, 2000; Baril et al., 1998; Black, 2012; Lawson et al., 2015; Stanley & Marsden, 2012). I used action research methodology to successfully develop and implement an instructional method that required accounting students to practice critical and reflective thinking. Students performed authentic accounting work as they completed a CP. After completing CP tasks, students responded to prompts on RPs and contemplated decisions accountants make and significant new understanding. I aligned the primary learning activities and assessments to encourage students to use a deep approach to learning and practice higher order thinking (Biggs et al., 2001). Students' perceptions about the knowledge and skills required to perform accounting

work changed as they completed the CP and reflected on authentic accounting work (Bergsteiner & Avery, 2014; Kolb & Kolb, 2005; Phillips & Graeff, 2014).

The Comprehensive Project

Evidence gathered in this study clearly supports that students who completed the CP consistently practiced critical thinking skills. Each phase of the CP involved substantial work that required students to practice each of the six steps in the critical thinking process (Facione, 1990). Tasks within the inference and self-regulation steps in the critical thinking process also required students to use reflective thinking. I did not measure the change in students' critical thinking skills that occurred as they completed the CP. However, I incorporated the combination of instructional methods researchers have found most significantly improves students' critical thinking skills: class discussions, simulations, and coaching (Abrami et al., 2015). Students who participated in this study had never performed accounting procedures that required the use of higher order thinking. I confronted many implementation issues as I supported students' efforts to do authentic accounting work for the first time.

Almost all implementation issues occurred because students did not have the knowledge or appropriate schemata necessary to perform authentic accounting work (Shuell, 1986). In a prior accounting course, students worked structured problems to learn to associate account names with business transactions, compute amounts, record transactions, and prepare financial statements. Although the aforementioned procedural knowledge is important (Tysiac, 2016), the findings in this study indicate that structured problems do not build the schemata students need to complete authentic accounting tasks. In fact, working

structured problems provided students with a limited and sometimes inaccurate view of accounting work:

I previously thought... That accounting was a standard practice with set rules that are clear cut and easy to follow. I simply believed it was an automatic practice of every company. (RP 4, S24, 2016).

I previously thought...that accountants did not really have to make any decisions and that GAAP left no room for interpretation. (RP4, S27, 2016)

I previously thought... accountants simply sit at a desk and run through numbers all day. (RP4, S8, 2016).

Students began the course unaware that accountants use judgment to make decisions that impact financial reporting. This lack of understanding prevented students from effectively using higher order thinking to complete CP tasks during the first month of the course.

Findings from this study indicate instructors who desire to encourage students to practice critical and reflective thinking must strategically teach students when and how accountants use higher order thinking skills. Figure 5.9 compares the steps students performed as they worked structured practice problems to the tasks students completed in the CP. The left side of the diagram presents the requirements of most structured practice problems. Students work with given information to determine account names and amounts and record transactions. A final step asks students to show the impact of transactions on the financial statements. Structured practice problems generally do not require students to use higher order thinking (Davidson & Baldwin, 2005). Students follow a similar process to record repetitive transactions included in CP tasks; however, students must interpret business documents to identify the various transactions, accounts, and amounts. CP work also requires students to maintain general ledger accounts. Tasks that require the use of higher order thinking follow the process presented on the right side of Figure 5.9. Accountants must

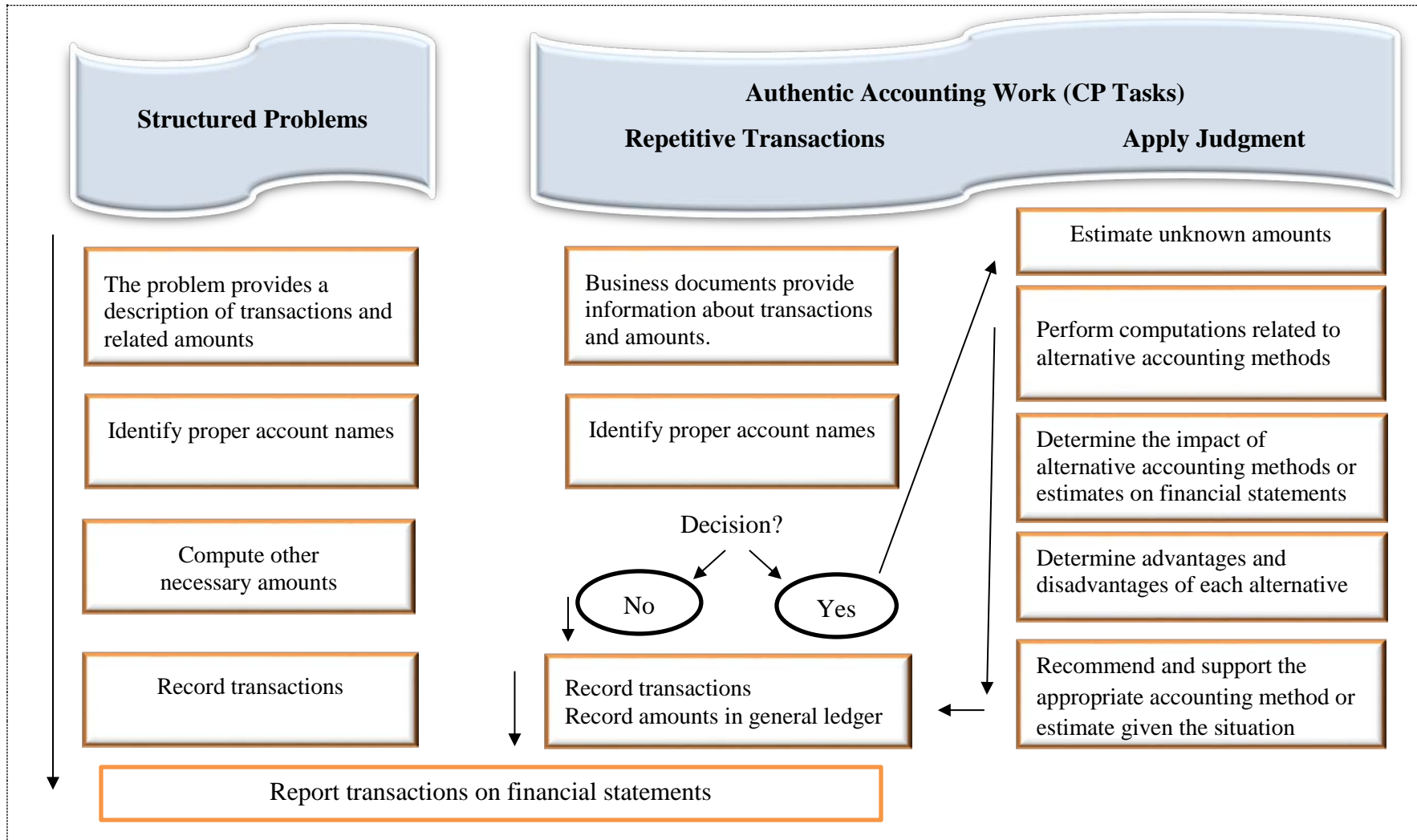


Figure 5.9. The process students follow when completing structured practice problems and authentic accounting work.

use judgment to estimate amounts or select an accounting method prior to recording some transactions and determining reported amounts.

To avoid implementation issues, instructors must provide students with guidance related to all tasks accountants complete when performing work. Structured practice problems do not expose students to the thinking processes accountants use to perform professional work. Therefore, junior-level accounting students need additional instruction to prepare them with the understanding required to do the following:

- 1) interpret information on business documents,
- 2) determine and support estimated amounts, and
- 3) select and support an appropriate accounting method.

During each action research cycle, I provided additional class discussion and answered students' questions as they worked. This approach enabled students to make progress on CP tasks. The most challenging part of the implementation process was identifying and providing appropriate additional instruction in time to eliminate students' confusion before they began working on CP tasks. Instructors should begin the semester with a review of the accounting cycle using a mini-case that requires students to use business documents to record about 15 transactions and maintain a general ledger. The mini-case will provide the instructor with the opportunity to explain the relationships between structured practice problems and repetitive CP tasks. Instructors should refer to the overview of authentic accounting work presented in Figure 5.9 as they explain the relationships between structured practice problems and the CP tasks at the beginning of each phase of CP work. At strategic times during the semester, instructors should use brief case studies to teach students how accountants make estimates and select the most

appropriate method. These brief case studies will help students understand the thought processes accountants use to make decisions before they attempt to use their own judgment to complete CP tasks. Instructors who require students to complete CP work in the order of least complex to most complex set of tasks will find it easier to scaffold new information in a manner that enables students to continuously build on prior knowledge.

Findings suggest that students who complete a CP need a strong understanding of pre-requisite knowledge. The initial implementation process will go much smoother for future accounting instructors who require students to score above 80% on a pre-requisites test before enrolling in the course. Additionally, instructors who take the following actions will free up class time for tasks that require critical and reflective thinking:

- 1) provide check figures for some account balances,
- 2) use a continuous Excel spreadsheet for the general ledger, and
- 3) provide more frequent feedback to students.

An effective way for instructors to provide more frequent and formal feedback is to grade each phase of the CP in two parts: repetitive transactions and transactions that require the use of judgment. Findings related to the CP suggest that instructors can teach students traditional content and require students to practice critical and reflective thinking while performing authentic accounting work.

Reflection Papers

Students responded to prompts on short RPs to demonstrate their understanding of accounting work. Replacing periodic objective tests with RPs was an important aspect of encouraging students to use a deep approach to learning (Gijbels et al., 2008; Segers et al., 2006; Struyven et al., 2005). Two factors had the most influence on students' views

about accounting work and, therefore, the depth of students' reflections: 1) students' understanding of when and how accountants use judgment, and 2) the level of reflection required to complete CP tasks. Students who did not realize that accountants make decisions focused their reflections on structured procedures and accounting rules. Responses on these students' RPs demonstrated mostly surface-level non-reflective thinking during the first part of the semester. More evidence of deeper stage reflection appeared after students consistently used their own judgment to make accounting decisions (Epp, 2008; Kolb, 1984; McGuigan & Kern, 2002; Tsingos et al., 2015). The trend in the depth of students' reflections closely followed the extent of critical and reflective thinking required to complete CP tasks.

One objective of this study was to discover prompts that best encouraged deep reflection. Question prompts that asked students to describe thoughts about CP work produced the deepest stage of professional reflection (Mezirow, 1991). The AHA moments and issues question prompts provoked most students to reflect on meaningful learning after their perception of accounting work changed to include decision-making. Students described fewer accounting procedures (non-reflective thought) after they obtained an understanding of how accountants influence financial reporting. Question prompts related to practice problems and accounting policies of public companies encouraged non-reflective thought (Davidson & Baldwin, 2005).

Based on the findings in this study, the following question prompts should best encourage students to reflect deeply about the work of the accounting professional:

- 1) Explain the decisions that an accountant makes when performing accounting procedures related to the topic of ... Consider factors that influence the decision-making process.
- 2) Reflect on your experiences completing CP tasks.
- 3) Reflect on things you have learned that you expect to remember after the course ends. Provide your reflection in the format of:

I used to think ... I now think ... Because ...

The wording changes I made to question prompts appeared to only minimally influence the depth of students' reflections. In fact, students' efforts to fully address prompts and demonstrate declarative knowledge to earn a higher grade may have, at times, limited deep reflection (Ash & Clayton, 2004; Ritchhart et al., 2011; Tsingos et al., 2014). Given that students understand when accountants use higher order thinking, the simplicity of the three question prompts should encourage students to deeply reflect both on accounting work and significant learning experiences.

Routine Accounting Procedures

Routine accounting procedures include recording transactions, adjusting account balances, and preparing financial statements. Students learned to perform routine accounting procedures as they completed before-class assignments and CP tasks. Additionally, I facilitated class discussions to review before-class content and explain how students should approach CP tasks. I considered the ability to properly perform 70% or more of routine accounting procedures to indicate adequate ability. A score of 70% is consistent with the requirements to pass the course.

With respect to recording transactions and preparing financial statements, students properly performed 82% of CP tasks and correctly answered 73% of the questions on the final exam. Most errors in recording transactions on CP tasks involved a failure to record amounts in general ledger accounts. Students had difficulty with final exam questions that required a sequence of steps to obtain the correct answer. Students adequately prepared financial statements using general ledger account balances in CP work. The most commonly missed questions on the final exam related to financial reporting topics students did not encounter on the CP. Overall, students demonstrated adequate ability to record transactions and prepare financial statements.

In contrast, most students did not learn to properly adjust account balances. Students correctly made 68% of the adjustments on the CP and 54% of the adjustments on the final exam. As previously stated, inaccurate CP work resulted from overlooking missing amounts in general ledger accounts. Students who had memorized steps in structured practice problems had difficulty working with general ledger accounts and unfamiliar wording in final exam questions. Based on my past experiences, IFA students commonly have difficulty properly making adjustments to account balances.

Overall, students correctly performed a greater percentage of routine accounting procedures on the CP (81%) than on the comprehensive final exam (66%). A lower score on an objective final exam is consistent with findings in other studies in which students completed task-based assessments and objective tests (Tran et al., 2015; Van Gog & Kester, 2012; Van Gog & Sweller, 2015). Researchers have not yet determined whether task-based assessments or objective tests provide a better indication of students' understanding (Baeten et al., 2010; Strobel & Barneveld, 2009; Walker & Leary, 2009).

Therefore, I believe that the results of the two assessments together give a more complete picture of students' achievement. The combined results of both assessments give evidence that students achieved the ability to adequately perform routine accounting procedures (greater than 70%).

Summary

I used action research methods to develop and implement an instructional method that required students to practice critical and reflective thinking as they learned to perform accounting procedures. Findings to research question one gave evidence that students consistently practiced critical thinking as they completed CP tasks. I identified and successfully resolved implementation issues that occurred as I integrated the CP into the IFA course (research question two). The question prompts on RPs asked students to reflect on the professional accountants' use of judgment as well as describe notable new understanding. Findings to research questions three and four indicate that the depth of students' responses on RPs closely followed the level of reflection required to complete CP tasks. The changes I made to the wording of the question prompts had little influence on the depth of students' reflections. Students who completed CP tasks and wrote RPs instead of completing periodic objective tests demonstrated a sufficient overall ability to perform routine accounting procedures. Like most IFA students, the students in this study had difficulty making adjustments to account balances.

Perhaps the most significant learning students achieved during the course was coming to the realization that performing accounting work involves higher order thinking:

I previously thought: That there was always a right answer for every situation in accounting. I believed that there was a procedure laid out

for every situation. I figured every accountant would always come up with the same answer for how to account for a situation. Now think: That this is simply not true at all. Going deeper into each account made me realize all of the considerations that need to be made, and just how subjective the accounting process truly is. (RP4, S12, 2016)

I previously thought: that accounting was much more difficult due to the need to memorize such a wide array of rules and how they would apply to every accounting situation. Now think: That accountants think in a different way than this. They use a thought process in order to approach every situation. (RP4, S5, 2016).

I previously thought: accounting jobs were becoming less important because of accounting software. Now think: Although there are computer programs that help (e.g., QuickBooks), a huge part of the accountant's job is composed of estimations and their best judgments. Because: During the case project, I realized how many decisions my partner and I had to make which required judgment calls. Estimations, choices between methods, and knowledge of the business environment were all used in the project. (RP4, S12, 2016).

I learned how to understand why each accounting decision is made. Every time my partner and I had to choose between multiple methods, we brainstormed reasons and ideas as to why one method was better than the other. This type of thinking allowed me to understand how actual accountants do their jobs. Furthermore, going through each reason for and against certain methods reinforced what I had learned from lecture and studying. (RP4, S12, 2016)

Students who believe accountants only follow a set of rules and compute amounts will not see the need to use a deep approach to learning or apply critical and reflective thinking (Elias, 2005). The new instructional method provided students with experiences that revealed the importance of using higher order thinking when performing accounting work.

The Accounting Education Change Commission (1990) specifically called for instruction that requires students to be active participants in the learning process, locate multiple sources of information, solve unstructured problems in unfamiliar settings, and exercise judgment using an unfocused set of facts. Since the AECC made this request,

individual accounting instructors have added small unstructured projects and assignments to traditional instructional methods. (Baker, 2011; Craig & McKinney, 2010; Finger, 2010; Grimm, 2015; Killian et al., 2012; Kilpatrick et al., 2013; McGowan, 2012; Phillips & Nagy, 2014; Sargent & Borthick, 2013). However, the literature gives no evidence that accounting educators have made widespread change to instruction to better meet the needs of accounting graduates (Behn et al., 2012; Davidson & Baldwin, 2005; Duchac & Amoruso, 2012; Spiceland et al., 2015). I used action research methods to successfully develop and implement an instructional approach that meets the request of the AECC (1990) and requires students to practice higher order thinking skills. The findings from this study offer insight into how instructors can avoid the implementation issues that occur when asking accounting students to use higher order thinking skills and perform authentic work. Additionally, instructors who desire to incorporate higher order thinking into the IFA course will benefit from the learning materials developed through this study, including: 1) the comprehensive project along with written instructions, 2) content and instruction to add to the course, 3) question prompts that encourage reflective thinking, and 4) a feasible course schedule. Analysis of data gathered in this study revealed reasons why current students had difficulty applying declarative and procedural knowledge to unstructured CP work. Accounting educators working to change curriculum should seriously consider the limitations associated with using EOCM structured problems discovered in this study.

My experience developing and implementing this innovative instructional method was a challenging and difficult process. Nevertheless, I believe I provided my students with a unique and valuable understanding of accounting work. Two students described

their views of the learning experience which echoed the thoughts of most students who participated in the study:

The project really brought everything we have learned together into one cohesive unit. Often times, when I was doing the homework problems or looking at the videos, it was hard to get a sense of how the different lessons related to each other. Through the project, I have been able to see how everything is connected and that one decision can affect so many other things. This comprehensive look has really furthered my understanding of the learning material and enhanced my ability to make decisions. (RP4, S27, 2016)

I really enjoyed the project. While it was very challenging and sometimes very frustrating it was rewarding in the end. I like how it seems to give a real world feel to an accounting class. I felt that it was actually something tangible we were doing and learning rather than just memorization for a regular exam. While difficult, I felt like I learned more in this class as a whole than any other I have taken. (RP4, S26, 2016)

Students embraced the challenges associated with completing authentic accounting tasks, despite the unexpected problems that accompanied my new approach to teaching and learning. Furthermore, implementation issues did not prevent students from achieving the learning objectives of the course.

The opportunity to learn with students as they performed authentic accounting work and practiced higher order thinking skills was by far the most rewarding experience I have encountered during my twenty years of teaching. I found it especially inspiring to free students from the chore of memorizing facts they would soon forget. The look of satisfaction on students' faces as they completed the CP was remarkable. I strongly encourage other instructors to "appreciate the power of living the ideas about which they are lecturing" (Palmer & Zajonc, 2010, p. 109).

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Appendix A

Pre-requisites Test on Day One

1. Answer the following questions for company on the attached public company financial statements for the most current year. State the name of the line item and the amount for the most current year.
 - A. How much does the company owe for goods and services; expected to be paid in about 30 days?
 - B. How much was paid to shareholders in the current year?
 - C. How much value was permanently lost on goodwill during the current year?
 - D. What is the cumulative value invested in other companies to date?
 - E. What amount was paid to purchase other companies that was greater than the FMV of net assets acquired, cumulative to date?
 - F. How much have customers paid the company before receiving goods and services, cumulative to date?
 - G. What is the current year gain or loss on operations in the current year that won't occur in the future?
 - H. What is the allocated cost of using long-term assets in the current year?
 - I. How much did the company spend in cash to acquire its own stock during the year?
 - J. How much do customers owe the company that is due within 30 days?
 - K. How much cash does the company have in the bank or invested for less than 90 days with no interest rate risk?
 - L. How much was incurred to acquire customers, ship products, and run the day to day operations of the business during the current year?
 - M. How much has been contributed by stockholder's to date?
 - N. How much does the company have in assets that are held for sale to customers?
 - O. What is the total change in net worth of owners during the current year?
 - P. What is the company's profit or loss less dividends cumulative to date?
 - Q. How much must be paid to the federal government for earnings this year?
 - R. What was the total price of goods and services provided to customers?
 - S. What is the cost of the goods and services that were sold to customers?
 - T. How much has been paid for services not yet provided to the company?
 - U. How much cash was paid to repay long term debt during the current year?
 - V. How much total cash was used to purchase property, plant, and equipment during the current year?
 - W. How much did the company earn for each share of common stock outstanding?
2. Prepare journal entries in proper format for the following transactions.
 - a. Sold products that cost the company \$23,000 for a sales price of \$50,000 on account.
 - b. Received interest in the amount of \$500 that was previously accrued in the prior year.
 - c. Paid \$7,200 to suppliers for amounts owed on account.

3. The unadjusted trial balance for the Hartford Co. on December 31, 2014 is as follows:

<u>Accounts</u>	<u>Debit</u>	<u>Credit</u>
Cash	15,000	
Accounts Receivable	35,000	
Supplies	12,000	
Prepaid Insurance	10,000	
Equipment	80,000	
Accumulated Depreciation		30,000
Note Payable		10,000
Unearned Revenues		6,000
Capital Stock		24,000
Retained Earnings (1/1/2012)		63,000
Dividends	2,000	
Sales Revenue		42,000
Salary Expense		3,000
Supplies Expense	13,000	
Loss on Sale of Equipment	10,000	
Extraordinary Gain		5,000

Additional Information, not yet recorded:

- a. Supplies on hand at year end totaled \$18,000
 - b. Unexpired prepaid insurance at the end of the year totaled \$4,000.
 - c. Equipment is expected to be used for 10 years and then sold for \$5,000.
 - d. The note payable has an interest rate of 8%. The note was signed on September 1, 2012
 - e. Revenues unearned total \$2,000 at year end.
- A. Prepare all required adjusting journal entries for Hartford Companies.
 - B. Prepare all required closing journal entries for Hartford Company.
 - C. State the amount reported for retained earnings on the December 31, 2014 balance sheet?
4. Write True if the statement is true and F if the statement is False on the line beside the statement.
- _____ a. The only requirement that must be met for an item to be reported as an asset is that the company must own or control the asset.
 - _____ b. An expense is always reported in the period the cash is paid for a service.
 - _____ c. The income statement reports cumulative amounts.
 - _____ d. Reported amounts are determined by calculations and the judgment of the accountant is not involved in determining reported amounts.
 - _____ e. Revenue for providing goods is always reported in the period the goods are provided to the customer.
 - _____ f. The matching principle requires that total assets equal total liabilities plus total owner's equity.
 - _____ g. GAAP provides only one way of accounting for each transaction.
 - _____ h. The primary responsibility of an accountant is to calculate numbers and prepare reports.

Appendix B

Accounting Cycle Project Information and Instructions

You are the accountant that works for the CPA firm Fuzzy's Taco Shop (FTS) has contracted with to do the accounting and prepare financial statements. Your responsibility is to complete the work for the month of January 2015 using the documents FTS brought to you in a shoe box and other information the firm knows about the company.

Your supervisor has provided the following list of things for you to do to complete the task:
Post the journal entries to the T accounts as you record the entries.

- Record the journal entries for checks written in the month of January.
- Record the journal entries for January sales and the corresponding change to cash or accounts receivable.
- Record the journal entries for payroll and payroll tax expenses and related payments.
- Record all necessary month-end adjustments.
- Balance the T accounts and do an adjusted trial balance (summary general ledger)
- Prepare the January 2015 income statement.
- Prepare closing entries.
- Prepare the January 2015 Balance Sheet.

The following additional information is available:

On November 1st, 2014, Fluffy's Taco Shop entered into an agreement with First National Bank (FNB) to purchase a certificate of deposit for \$25,000. The deposit earns interest of 1.5% annually and has a maturity date of 11/1/2017. Interest earned is received annually on November 1st of each year.

The deposit slips include only cash and checks related to sales revenue.

Amounts paid by the credit card banks are automatically deposited in Fluffy's cash operating account. The bank provides Fluffy with a report of weekly automated deposits (ACH).

The requested amount represents sales that customers paid for with a credit card.

The paid amount represents the cash received for sales on credit cards before credit card fees.

The bank takes the credit card fee out of the payment for credit card sales to Fluffy's.

The company has estimated that approximately \$2,000 of accounts receivable may not be collected as of January 31, 2015.

On December 28, 2014, Fluffy's received a payment from a customer in the amount of \$945 for catering services. The food and service were provided on January 14th, 2015.

The company records depreciation and amortization expense for a full month in the first month the asset is used to produce revenue regardless of how many days the asset is actually used in the month it is purchased. Estimated useful lives by category are as follows: Equipment 5 years; Furniture and Fixtures 7 years; Vehicles 5 years; Trademark 25 years.

The company did not use the trademark during 2015.

The accrued compensation account is used to record amounts owed to employees (paid the following week on Friday) and to the IRS for employee tax withholdings and employee payroll taxes. Payments to the IRS are due quarterly on 1/15, 4/15, 7/15, and 10/15 each year.

The company records payroll expense for the week ending closest to the month end and does not adjust for the days that should be in another month as the difference is not considered significant. Payments to employees are automatically transferred to employee bank accounts and the entry is made at the end of the month for the cash transfer.

The payroll report can be difficult to read and your supervisor has provided the following notes:

- The “work week end” is the Friday the employees finish work for the week.
- The hours worked and the amount paid is earned during the “work week.”
- The “payment date” is the date employees are paid for the previous weeks work.
- An entry is made to record the payment of the amount accrued in the previous month.
- An entry is made to record the payments made during the month.
- An entry is made to record the amounts earned in the current month, not paid until the following month.
- Entries are made separately to accrue employer payroll taxes.

At the end of the January 2015, Fluffy’s employees counted all supplies on hand and estimated the value to be approximately \$855.

The inventory control team counted food inventory at the end of the day on January 31st and determined the value on hand to be \$15,410.

The company provides basic health insurance coverage to managers. The company entered into a policy on July 1, 2014 that expires June 30, 2015. The annual insurance premium of \$7,200 was paid half on July 1, 2014 and half on January 3, 2015. The company also has a policy for business liability and property insurance.

The company intends to repay all amounts borrowed on the Wells Fargo Line of Credit on the termination date. No borrowings or repayment occurred on the line of credit during January 2015.

Income tax is expected to be 35% of earnings before taxes.

Allstate Insurance

Business Liability and Property Insurance Agreement

Why it's beneficial.

Whether you have a business on Main Street or work under the roof of your own home, the Allstate Business Owner Policy offers a flexible package of protection that can adjust and grow with your business — as it grows. Allstate helps keep you ready for tomorrow.

Pertinent Financial Information

- A.** The term of this policy shall begin at 10:00a.m. on June 1st, 2014 and end as indicated by either party. Following such initial period, the term of this policy shall run from June 1, 2014 to May 31, 2015. The insured months shall begin with the due date of the first insurance payment.
- B. Fixed Term.** The total insurance price of this policy is \$21,600. Of this amount, the first payment of \$5,600 is due on June 5, 2014. The remainder is payable in 8 monthly installments of \$2,000 each, due on the 5th day of each month, beginning July 2014.

Property

Coverage is for your building and/or business property, including the contents of your building, for direct physical loss in many situations.

General liability

Provides protection for legal liability as a result of a lawsuit or other covered claim.

Loss of business income

Protection for loss of business income sustained up to 12 months due to a covered loss.

Equipment breakdown

The policy protects against electrical, air conditioning, refrigeration, boiler/pressure vessel, and communication equipment from physical damage caused by mechanical and electrical breakdowns.

Building glass

Protection from loss from external causes to exterior glass for which you are legally responsible.

Wells Fargo Business Loan

Long Term Debt Agreement

Date	September 1, 2013
Credit Amount	\$126,000 Principle Amount
Terms	5-years
Interest Rates	7.25% Annual Fixed Rate Interest, payable Monthly on the 1 st of each month until the principle amount is repaid.
Collateral	None needed — this is an unsecured loan.
Fees	<ul style="list-style-type: none"> • No Annual or Pre-payment Fees. • Opening Fee: Waived.

Wells Fargo Line of Credit

Wells Fargo hereby agrees to make \$25,000 available to Fluffy Tacos Shop between the period of March 15, 2014 and March 14, 2016. Amounts may be borrowed under the line of credit at the request of the owner of Fluffy's Taco Shop and may be repaid at any time prior to the termination date of the line of credit on March 14, 2016. Interest will be charged and paid via automatic withdrawal from the associated operating account at Wells Fargo Bank. Annual interest on actual borrowings is 6.7%. Interest on actual borrowings is paid quarterly on March 31, June 30, September 30, and December 31.

Appendix C

Comprehensive Project Information and Instructions (2015)

Holistic Health was founded by Ruth Naturely and incorporated in the State of Texas on December 26, 2013. Ruth and her family contributed \$200,000 in exchange for 20,000 shares of \$0.25 par value common stock on January 2, 2014. The mission of the company is to provide natural holistic products to people to enhance overall health.

The company's primary customers are independent health food stores; some of which have more than one store. The company also sells products at Farmer's markets and other natural products trade shows. A website offers products for sale on line.

The company purchases five different products from a small all natural manufacturing company located in India called India Organic Health. The products are shipped by Federal Express to Holistic Health and the shipping cost is included in the purchase cost per unit of product. Holistic Health employs a quality inspector who works at the India manufacturing to ensure the quality and integrity of the products.

Following is a brief description and natural ingredients of the five products:

Oil: Promotes a healthy scalp that reduces hair loss and promotes strong hair. Gray hair may return to the original color. Natural organic ingredients consist of: Centella or Gotu kala (Brahmi), Camellia Oil, and Indian Gooseberry (Amla) 16 ounces \$39.99 price

Hair Conditioner: A unique natural treatment to intensively condition and treat damaged, dry and frizzy hair due to bleaching, perms, environment damage or chlorinated water. Natural organic ingredients consist of: Ultra-moisturizing Shea, Abyssinian, Jojoba Oil, Avocado Oils, and essential oils of Myrrh, Rosemary, and Chamomile. 16 ounces \$19.99 price

Rose Anti-wrinkle Cream: Infuses beauty and health into the face overnight. Extremely beneficial for mature, wrinkled, weathered, blotchy, dry and ultra-dry skin. Natural organic ingredients consist of: Olive Butter, Shea, Raspberry Seed Oil, Pumpkin Seed Butter, Rose Extract, naturally honey-scented Beeswax, Lavender Oil, and Chamomile Oil. 16 ounces \$49.99 price

Acai-Orchid Anti-aging Daily Moisturizer: Contains skin-beneficial anti-oxidants for daily use and moisturizer under makeup or alone. Promotes healthy even skin tone and protects from pollution and environmental effects. Natural organic ingredients consist of: Aloe, Jojoba, Orchid Extract, Acai berry, Apple pectin, White Orchid. 16 ounces \$49.99 price

Tooth Paste: All natural tooth paste that strengthens gums, removes plaque, and whitens teeth. Organic natural ingredients consist of: Jojoba, Antimicrobial oils of Myrrh & Frankincense, Clove oil, Peppermint, and Stevia. 16 ounce \$9.99 price

The Company uses an accounting software package to generate invoices and pay invoices. These documents along with copies of checks are provided to the accounting firm who records all transactions and prepares financial statements. The accounting firm provides monthly statements during the year and waits until year-end to make all adjustments to the accrual basis.

You are the accountant who works for the CPA firm that does the company's accounting. Use the information and schedules provided to record the transactions for the month of December, prepare all year-end adjusting entries, prepare all supporting schedules (that will be provided in the event the company borrows money in the future to expand) and all required financial statements for the year ended December 31, 2014.

The summary general ledger as of November 30, 2014 is provided. You must record all transactions on the journal entry log and post them into the T accounts to create a detail general ledger for the month of December and for year end. The summary general ledger as of December 31, 2014 will be used to prepare financial statements.

Sales and Cash:

Information to use:

- 1) Merchant Report: Credit Card Sales December 2014
- 2) Customer invoice and shipping document
- 3) Payment received from customer (checks)
- 4) Holistic Health Deposit slips

Record goods provided to customers on credit for the month of December.

Record customer payments for the month of December.

Record sales on credit cards using the merchant report

Record the following payments the company received from the merchant bank for sales on credit cards:

12/8/2014	\$187.69
12/15/2014	\$931.09
12/23/2014	\$680.25
12/29/2014	\$1095.57

On December 2, 2014, the company shipped an order for a case of 12 Anti-wrinkle cream units to a customer who had paid for the goods at regular price on November 28, 2014 at an average cost of \$22.16 each. This order was included in November sales and cost of goods sold.

The company provided counseling services (courses on how to live healthier) to customers with a value of \$6,800 during December 2014 and the customers were not invoiced until January 13, 2015.

One customer paid \$945 on November 30, 2014 for an order that was to be shipped on December 20, 2014 and this order was not actually shipped until January 3, 2015.

Accounts Receivable:

Use the sales invoices/shipping document to customers and the customer payments to complete the accounts receivable detail aging report for the year ended December 31, 2014. Use the “Merchant Account” customer as a guide for the format of the report. The sales and collections were previously recorded in the general ledger.

The company determined in December that invoices in the amount of \$1,634.35 of the Merchant Credit Card Account receivable that is 61+ days past due is disputed and will not be collected.

Record the journal entry for write-offs and determine and record estimated bad debt expense. The company uses the percent of sales method at the end of each month and then uses the accounts receivable aging method at year end.

The industry averages for companies that sell natural health products are as follows:

- % of total Accounts Receivable: 6%
- % of Aging: Current 0.5%; 1 – 30 days 1.25%; 31-60 days 3.5%; 60+ days 25%
- % of Sales: 1%

A detail review of the invoices past due over 60 days provides the following information:

- Ray’s Health Foods: 50% of invoices are past due more than 180 days
- Sunshine Health: 30% of invoices are past due more than 180 days
- Natural Foods Shops: 40% of invoices are past due more than 180 days
- Remington Health Products: Entire amount is related to an order the customer says was never received. The shipping documents for this order have not been located
- Credit Card Merchant: All invoices are disputed by the customers
- All other Customers: 25% of the invoices are past due more than 180 days

Prepare a schedule to support the reasonableness of your estimate for bad debt expense.

Inventory:

Information to use:

- 1) Invoice/Shipping documents for sales to customers
- 2) Invoice/Receiving documents for purchases of inventory
- 3) Inventory reports for each method (to be completed)

The company purchases all inventory from India Organic Health, Inc. One order was placed and received each month through November. During December, the supplier changed their order processes and several orders were placed without incurring increased cost.

Inventory is paid for according to terms and a check is processed and sent to India Organic Health approximately 20 days after inventory is received. Inventory purchases are recorded directly to the inventory account.

The previous accountant determined the value of inventory and cost of goods sold at the end of each month (through November) using the periodic average cost method. The inventory reports provide inventory purchases by month for each item.

The company has asked you to determine the value of inventory and cost of goods sold under each of the six methods provided under GAAP. Complete the computation of the inventory and cost of goods sold values for the each of the following methods as of December 31, 2014:

Periodic: FIFO, LIFO, and Average
Perpetual: FIFO, LIFO, and Moving Average

Recommend the most appropriate method for this company, support your recommendation, and record the entries to account for inventory and cost of goods sold. The adjustments for a difference in the inventory count and inventory obsolescence should be made after the computations for each of the six methods.

The company counts inventory in the warehouse at the end of each month. The inventory quantities counted are as follows:

- 1) 470 units
- 2) 316 units
- 3) 208 units
- 4) 401 units
- 5) 487 units

While counting inventory (on December 31), the inventory manager noticed that 100 containers of Acai Orchard Moisturizer were not properly sealed and are not sellable.

Prepare a schedule of year-end inventory adjustments for shrink and spoilage. Do not adjust the inventory schedules. The inventory report and a schedule of inventory adjustments must be provided to the auditors to support the amounts in the general ledger.

Long-term Operating Assets:

The previous accountant recorded all items purchased during the year to the property, plant, and equipment account. The checks related to the purchases, with a description on the check, are provided.

The company has contractually agreed to pay the inventory supplier (India Organic Health) for two years of product research and development beginning January 2014; paid in February of 2014. The contribution to research and development gives the company the right to purchase products developed in the next three years at a price of 20% lower than the stated sales price.

The company purchased a Toyota Camry for a total amount of \$21,624.88. A cash down payment was made for \$5,000 and the balance was financed with a 3 year note with monthly payments of \$ 505.77 due on the 18th of each month with an interest rate of 6%. The first payment was made on February 18th, 2014. The company paid each monthly payment prior to the due date during 2014. Record the payment made on December 12, 2014.

The company purchased a customer list of 25,000 customers from a marketing firm.

On April 2, the company paid a retainer fee to a law firm for general contract assistance. The retainer covered six months of services.

The company sold the back support chairs for \$250 on September 30, 2015 because they were not comfortable to sit in. The previous accountant debited cash and credited property, plant, & equipment for \$250 at the time of the sale.

The company's depreciation policy is to begin depreciating assets on the first day of the month of the asset is placed in service.

Make any adjustments required to the property, plant, and equipment account.

Compute depreciation expense using the straight-line method and the double declining balance method. A template for this is provided.

Determine which method is most appropriate for the company to use and support your decision.

Record the entries for depreciation and amortization.

Prepare a long-term assets (PPE and Intangibles) walk-forward schedule for the auditors. An excel template for this is provided.

Investments:

The company has the following investments:

- 1) 200 shares of Apple, Inc. purchased at a cost of \$84 per share on May 4, 2014. The company intends to hold this investment for a minimum of two years. The company received three quarterly dividend payments through November 2014.
- 2) 40 shares of Chipotle purchased at a cost of \$677 on August 28, 2014. The company intends to hold this investment until mid-2015. The company received no dividends.

3) The company made a \$24,000 investment in OrgHerb, Inc., a company that manufactures organic herbs on January 8, 2014. The company purchased 1,000 shares, which is 25% of the common shares. At the time of the purchase, OrgHerb, Inc. owned a building with a FMV \$60,000 greater than the net cost on the balance sheet with a 20-year life. OrgHerb, Inc. earned \$52,000 for the year ended 12/31/2014 and paid a \$0.50 dividend per share on December 15, 2014.

Make the journal entries to account for the company's investments.

Other Information:

The company paid monthly insurance premiums for the first five months of the year in the amount of \$600 per month. The company paid for 12 months of insurance at a cost of \$6,900 on June 1, 2014. The insurance policy covers property, liability, and high deductible employee healthcare.

The company signed a two-year lease agreement for the facility on February 1, 2014. Payments were made in the amount of \$2,700 for each quarter on February 1, May 1, August 1, and November 1. The company operated out of the facility during the month of January 2014 prior to signing the lease agreement. The owner of the facility did not charge for the use in January.

The company is under contract to pay the CPA firm \$350 per month. The company paid a legal retainer fee for contract review services of \$2,500 on January 2, 2014 for the year.

The office manager estimates that the company has approximately \$800 of supplies on hand on December 31, 2014.

A review of the invoices received in January 2015 for December services noted the following:

TXU Energy	\$314.56
ATT Cell Phone and Internet Service	\$208.37
Federal Express	\$984.52
Hoerner Box Company (for shipping boxes)	\$124.13
Merchant Credit Card Services	\$ 64.29
Blue Mesa Catering Services	\$452.69

The company's income tax rate is expected to be 28%. Three quarterly payments in an equal amount of \$5,000 were paid to the IRS on April 15th, July 15th, and October 15th of 2014.

The company paid a dividend of \$0.50 per share to investors on December 21st, 2014.

The company repurchased 2,000 common stock shares from shareholders for \$8 per share on December 10th, 2014.

Appendix D

Comprehensive Project Information and Instructions (2016)

Ruth Naturely founded Holistic Health on December 26, 2014. Ruth and her family contributed \$200,000 in exchange for 20,000 shares of \$0.25 par value common stock on January 2, 2015. The mission of the company is to provide natural products to people to enhance overall health.

The company's primary customers are independent health food stores; some of which have more than one store. The company also sells products at Farmer's markets and other natural products trade shows. A website offers products for sale on line.

The company purchases five different products from India Organic Health, a small all natural manufacturing company located in India. The products are shipped by Federal Express to Holistic Health and the shipping cost is included in the purchase cost per unit of product. Holistic Health employs a quality inspector who works at the India manufacturing to ensure the quality and integrity of the products.

A brief description and natural ingredients of the five products follows:

Natural Hair Oil: Promotes a healthy scalp that reduces hair loss and promotes strong hair. Gray hair may return to the original color. Natural organic ingredients consist of: **Centella or Gotu kala (Brahmi), Camellia Oil, and Indian Gooseberry (Amla) 16 ounces \$39.99 price**

Hair Conditioner: **A unique natural treatment to intensively condition and treat damaged, dry and frizzy hair due to bleaching, perms, environment damage or chlorinated water. Natural organic ingredients consist of: Ultra-moisturizing Shea, Abyssinian, Jojoba Oil, Avocado Oils, and essential oils of Myrrh, Rosemary, and Chamomile. 16 ounces \$19.99 price**

Rose Anti-wrinkle Creme: Infuses beauty and health into the face overnight. Extremely beneficial for mature, wrinkled, weathered, blotchy, dry and ultra-dry skin. Natural organic ingredients consist of: Olive Butter, Shea, Raspberry Seed Oil, Pumpkin Seed Butter, Rose Extract, naturally honey-scented Beeswax, Lavender Oil, and Chamomile Oil. **12 ounces \$49.99 price**

Acai-Orchid Anti-aging Daily Moisturizer: Contains skin-beneficial anti-oxidants for daily use and moisturizer under makeup or alone. Promotes healthy even skin tone and protects from pollution and environmental effects. Natural organic ingredients consist of: Aloe, Jojoba, Orchid Extract, Acai berry, Apple pectin, White Orchid. **12 ounces \$49.99 price**

Tooth Paste: All natural tooth paste that strengthens gums, removes plaque, and whitens teeth. Organic natural ingredients consist of: Jojoba, Antimicrobial oils of Myrrh & Frankincense, Clove oil, Peppermint, and Stevia. **8 ounces \$9.99 price**

The Company uses an accounting software package to generate invoices and make payments. All invoices, check copies, and documents are provided monthly to the accounting firm who records all transactions and prepares financial statements. You are the accountant who works for the CPA firm that does the accounting and reporting for Holistic Health. The previous accountant completed work through the month of November. The accounting firm makes almost all adjustments necessary to report using the accrual basis in December, at year-end.

Use the information and schedules provided to record the transactions for the month of December, prepare all year-end adjusting entries, prepare all supporting schedules and all required financial statements (balance sheet, income statement, statement of stockholder's equity and cash flow statement using the indirect method) for the year ended December 31, 2015.

The summary general ledger as of November 30, 2015 is provided. Record all transactions on the journal entry log and post them into the T accounts to create a detail general ledger for the month of December and for year end.

Important: You must post the entries into the T accounts as you make the journal entries.

Double check that all postings in T accounts are correct prior to completing each task to avoid time consuming issues with the trial balance being out of balance later.

You will transfer all balances on the December detail general ledger to the December summary general ledger and use the summary general ledger to prepare financial statements.

Specific instructions and information for each topic follow.

Sales /Accounts Receivable / Cash

Information gathered:

- 1) Merchant Report: Credit Card Sales December 2015 (for online website sales)
- 2) Customer invoices: Shipments to customers/stores (separate from online sales)
- 3) Payments received from customer (checks received from health food customers/sales)
- 4) Holistic Health Deposit slips: No entry is required, the receipt of cash will be recorded when the payment via check is recorded. The total of the deposit slips should equal the total amount debited to cash for customer checks.

1) Record the journal entries for goods provided to customers on account for the month of December. The company records **all** sales and sends the invoice to the customer on the invoice date. The company ships via Fed-Ex, guaranteed next day delivery. Source data: Customer Invoices

2) After recording all sales invoices based on the invoice date, consider the terms of shipment stated on the invoice and make all necessary journal entries to adjust sales revenue for December.

3) Record the journal entries for all cash received from customers for the month of December.

Source Data: Checks received from customers.

4) Reconcile amounts recorded to cash to the total amount deposited in the Company's bank account after recording cash collected from customers. Source document: Deposit Slips

Total posted to cash for cash received \$_____

Total amount of deposit slips \$_____ Resolve any differences

Credit Card Sales:

5) Use the credit card sales schedule and record the journal entries for sales made online via credit card (separate from the health food stores). The company invoices each credit company for sales for the first half of the month on the 15th and the second half of the month on the 31st.

6) The Company received the following cash for sales on credit cards from the credit card companies (c = current):

	<u>Amex</u>	<u>MC</u>	<u>Visa</u>	<u>Discover</u>
12/4	\$142.21 (C)	\$262.37(C)	\$106.15(C)	\$103.64(C)
12/4	\$ 26.35 (1-30)	\$ 26.35(1-30)		
12/18	\$180.62 (C)	\$366.12(C)	\$396.55(C)	\$312.90(C)

Record the journal entry for each individual receipt of cash for credit card sales. The credit card companies wire each cash payment directly into the Company's bank account and the accountant has not yet recorded the receipt of cash.

7) Record all entries necessary related to the following information brought to your attention.

7.A.) On December 2, 2015, the company shipped an order for a case of 12 Anti-wrinkle cream units to a customer who had paid for the goods at regular price on November 28, 2015 at an average cost of \$22.16 each. The company recorded sales for this order and the cash received in November.

7.B.) The company provided counseling services (courses on how to live healthier) to a variety of customers for a total of \$6,800 during December 2015. The Company actually invoiced the customers on January 3, 2016.

7.C.) One customer paid \$945 on November 30, 2015 for an order the Company agreed to ship to the customer on December 20, 2015. This order was shipped on January 9, 2016.

Accounts Receivable Aging Report:

8) Complete the accounts receivable detail aging report as of December 31, 2015. Use the first three customers (already completed) as a guide for the format of the report. The company reports amounts owed on the invoice date when the title to the goods is assumed to transfer during the period. Source Data: Sales Invoices and Customer Payments.

The activity on the accounts receivable aging report should agree with the sales and collections previously recorded in the general ledger to the accounts receivable account. The total of all amounts owed on the accounts receivable aging report should agree with the balance in the accounts receivable general ledger account.

Total amounts owed per the aging report on 12/31: \$ _____

Ending accounts receivable balance per the December
detail general ledger on 12/31: \$ _____

Natural Foods Shops: The past due invoices were shipped in July and August of 2015. The company says they intend to pay and are currently experiencing a shortage of cash.

Remington Health Products: \$2,493.12 past due is related to orders the customer says was never received. The shipping documents for this order have not been located.

All other Customers: 75% of the invoices are past due more than 180 days and these customers are no longer doing business with Holistic.

All amounts owed to the Company for credit card sales that are past due are in dispute.

Bad Debt Expense and Allowance for Uncollectible Accounts:

Refer to the information provided above with respect to amounts owed by each customer and also consider the following:

The company uses the percent of sales method at the end of each month and then uses the accounts receivable aging method at year end.

The company estimates and records a monthly bad debt expense at 2.5% of sales. Check the current balance in the bad debt expense general ledger account and determine if the proper estimate has been made through the month of November.

This is the company's first year of business and no prior history of write-offs is available.

13) Record the journal entry to correct the bad debt expense for the first eleven months (if necessary) on the journal entry log. Post the journal entry (if made) to the general ledger.

14) Record the journal entry to correct the bad debt expense for the month of December using the percent of sales method on the journal entry log. Post the journal entry to the general ledger.

15) Estimate total uncollectible accounts as of 12/31/2015:

Use the excel workbook (Bad Debt Expense) to organize your work and support your year-end estimate of the probable future benefit of accounts receivable and the annual bad debt expense.

State the customer and the probability of non-collection for amounts that are past due 31-60 days and past due 60+ days.

Consider the potential bad debt expense related to accounts that are not yet past due.

Present three different estimates: high, mid-range, and low. State the reasons to use and not use each estimate and the probability that each will occur (total 100%) below.

High Estimate: Total Bad Debt Expense Adjustment _____ Probability ____%
this will occur

Mid-range Estimate: Total Bad Debt Expense Adjustment _____ Probability ____%
this will occur

Low Estimate: Total Bad Debt Expense Adjustment _____ Probability ____%
this will occur

High Estimate:

Reasons to use the high estimate:

Reasons to not use the high estimate:

Mid-range Estimate:

Reasons to use the mid-range estimate:

Reasons to not use the mid-range estimate:

Low Estimate:

Reasons to use the low estimate:

Reasons to not use the low estimate:

16) Select the most probable estimate and record the adjustment to the allowance account and bad debt expense for the year. Fill in the allowance T account below to show how you determined the necessary year end adjustment for bad debt expense. Refer to your general ledger detail and begin with writing the amounts currently in the allowance account.

Allowance Account

--	--

17) Print the excel workbook that supports your estimate of bad debt in a manner that is easy to read.

Inventory

Information and Excel workbooks to use:

Sales Invoice documents for sales to customers

Invoice/Receiving documents for purchases of inventory

Excel Workbooks: Inventory reports for each method (partially completed)

Additional information:

a. The company purchases all inventory from India Organic Health, Inc. Holistic Health placed and received one order per month in January through November. During December, the supplier increased the price of each item and Organic Health began purchasing inventory each week.

b. Holistic Health pays India Organic Health in terms of n20, FOB destination.

c. The accountant records inventory purchases directly to the "Purchases" expense account. All purchases and inventory receipts are recorded on the date inventory is received.

d. The accountant closed the purchases account (moved it to cost of goods sold) and adjusted total cost of goods sold at 35% of sales at the end of each month during January through November. The difference between total available to sell and cost of goods sold was reported as the cost of inventory. No method of inventory (FIFO, LIFO, Average) has been selected prior to year-end.

e. The accountant kept detailed data to use for the periodic average cost method of accounting for inventory through the month of November. You will complete the inventory reports using the Average, FIFO, LIFO methods (both periodic and perpetual) and then compute the December 31, 2015 value for inventory and cost of goods sold for each method. You will then determine the most appropriate inventory method to use.

f. December Online sales (credit card) are assumed to be sold on the first day of December when computing the value of inventory and cost of goods sold. The company has determined any difference in the use of the actual date of sale would be insignificant. Treat them the same as a December 5 week sale and consider the online sales first.

Work to complete:

1) Record the 4 journal entries to record the weekly purchase of inventory. Post the entries to the detail general ledger. Source Data: Inventory Purchase Documents (4, one each week)

2) Record the entry to move the total amount in the purchases account to cost of goods sold. Post the entry in the detail general ledger.

3) *Excel Workbook:* Complete the inventory schedule for the **periodic average cost** method for products 4 and 5. Products 1, 2, and 3 are complete.

Important: The company records inventory quantities received on the receipt date noted on the inventory purchase document.

The company records inventory quantities sold on the shipping date noted on the customer invoice.

Step 1: Determine the quantity of purchases and sales for each week and enter the quantity for each week on the average cost report (in Excel).

Use the purchase documents and the sales invoices to customers (A/R).

Step 2: Compute the average cost of one unit (round to dollars and cents in Excel)

Step 3: Value the inventory held per the inventory report on 12/31/2015 in Excel:

Units in inventory per the schedule:	_____
x Average cost for 1 unit	\$ _____
= Total value of inventory	\$ _____

Step 4: Compute the value of cost of goods sold in Excel:

$$\text{Total Available \$} \quad \text{less} \quad \text{Value of Inventory} = \text{Cost of Goods sold}$$

4) *Excel Workbook:* Complete the inventory schedule for the **FIFO periodic and perpetual** methods (the same) for all 5 products. Determine the total value of ending inventory as of 12/31/2015. The report should compute the value of ending inventory (quantities left in the warehouse), not the Cost of Goods sold. Subtract the value of ending inventory from the total cost of goods available to compute cost of goods sold.

5) *Excel Workbook:* Complete the inventory schedule for the **LIFO periodic** method for all 5 products. Determine the total value of ending inventory as of 12/31/2015. The report computes the value of ending inventory, not the Cost of Goods sold. Subtract the value of ending inventory from the total cost of goods available to compute cost of goods sold.

6) *Excel Workbook:* Complete the inventory schedule for the **LIFO perpetual method** for products 4 and 5. Review the completed schedule for products 1, 2, and 3 and determine how the schedule works before beginning your work on products 4 and 5. The report computes the value of ending inventory, not the Cost of Goods sold. Subtract the value of ending inventory from the total cost of goods available to compute total cost of goods sold.

7) *Excel Workbook:* Complete the inventory schedule for the **Moving Average perpetual** method for products 4 and 5. Review the completed schedule for products 1, 2, and 3 and determine how the schedule works before beginning your work on products 4 and 5. The report computes the value of ending inventory, not the Cost of Goods sold. Subtract the value of ending inventory from the total cost of goods available to compute total cost of goods sold.

8) Summarize the results of your work below for each method:

Periodic: Average Cost	Inventory value on 12/31/15:	\$ _____
	Cost of goods sold 2015:	\$ _____
Both: FIFO	Inventory value on 12/31/15:	\$ _____
	Cost of goods sold 2015:	\$ _____
Periodic: LIFO	Inventory value on 12/31/15:	\$ _____
	Cost of goods sold 2015:	\$ _____
Perpetual: LIFO	Inventory value on 12/31/15:	\$ _____
	Cost of goods sold 2015:	\$ _____
Perpetual: Moving Average	Inventory value on 12/31/15:	\$ _____
	Cost of goods sold 2015:	\$ _____

Excel Workbook: Summarize your work on the inventory summary report (do it here also).

9) Determine the most appropriate inventory method for Holistic Health and support your recommendation. Think about each method and document (and number) your reasons to use and not to use each method in a manner that is easy to follow. Decide first if the company should use the periodic or the perpetual method. After you decide on periodic or perpetual, decide which method the company should use: FIFO, LIFO or Average.

Complete your support for your decision on the next page before you write your answer below.

1st: Periodic or Perpetual? _____

2nd: FIFO, LIFO, Average? _____

9) Support for the decision on which inventory method to use.

Periodic: Reasons to use

Periodic: Reasons to not use

Perpetual: Reasons to use

Perpetual: Reasons to not use

FIFO: Reasons to use

FIFO: Reasons to not use

LIFO: Reasons to use

LIFO: Reasons to not use

Average or Moving Average: Reasons to use

Average or Moving Average: Reasons to not use

10) Make the journal entry to make inventory equal to the value using your chosen method. Post the entry to the detail general ledger. Show your work to determine the amount of the adjustment below. Write the amounts that are currently in the detail general ledger, determine the subtotal and adjust the subtotal to the amount determined on the inventory schedule for your chosen method.

Inventory

Make sure the balance in the inventory account equals the amounts for inventory and cost of goods sold on the inventory schedule after posting your entry to the detail general ledger.

11) Consider the following information:

11.A.) The Company counted inventory in the warehouse on December 31st. The inventory quantities actually counted in the warehouse are as follows:

- 1) 444 units
- 2) 274 units
- 3) 185 units
- 4) 384 units
- 5) 456 units

11.B.) While counting inventory (on December 31), the inventory manager noticed that 100 containers of Acai Orchard Moisturizer were not properly sealed and are not sellable.

Show the calculations to determine the amounts of any necessary adjustments below:

A. Inventory Count:

B. Moisturizer:

12) Write the required journal entries on the journal entry log and post the entries to the detail general ledger.

13) Add the adjustments to the Excel Workbook of the inventory summary schedule for your chosen method only and compute the final December 31 inventory balance using your chosen method.

14) Agree the amount in the inventory account in the detail general ledger to the column for your chosen method on the inventory summary schedule.

Long-term Operating Assets

The previous accountant recorded all items purchased during the year to the property, plant, and equipment account. Amounts in the property, plant, and equipment detail general ledger account must be moved to the major categories of property, plant, and equipment and intangible assets noted on the December detail general ledger or other accounts in order to leave the property, plant, and equipment account (category) with a zero balance. It is possible that amounts initially recorded to property, plant, and equipment should have been recorded to an expense account.

Additional information related to some of the checks is provided on the following page.

1) Obtain the check copies of checks written for all items purchased and recorded to property, plant and equipment. Determine the appropriate account to record for each check and note it below:

Check Number	Description	Move to the Account of:
2106	_____	_____
2114	_____	_____
2189	_____	_____
2194	_____	_____
2208	_____	_____
2211	_____	_____
2227	_____	_____
2234	_____	_____
2235	_____	_____
2315	_____	_____
2318	_____	_____
2319	_____	_____
2322	_____	_____
2328	_____	_____
2341	_____	_____
2426	_____	_____
2514	_____	_____
2567	_____	_____
2842	_____	_____
2912	_____	_____

2) Record the entries to make the appropriate adjustments on your journal entry log.

Debit account name?	\$	
Property, Plant, Equipment	\$	

3) Post all entries made to the proper account in the detail general ledger.

Additional Information related to checks written:

The company has contractually agreed to pay the inventory supplier (India Organic Health) for two years of product research and development beginning January 2015; paid in February of 2015. The contribution to research and development gives the company the right to purchase products developed in the next three years at a price of 20% lower than the stated sales price.

On January 18, 2015, the company purchased a new Toyota Camry for a total amount of \$21,624.88. A cash down payment was made for \$5,000 and the balance was financed with a 3-year note. Note: The accounting for the note will be completed later in the Notes Payable section.

On March 8, 2015, the company purchased a customer list of 25,000 customers.

On April 2, 2015, the company paid a retainer fee to a law firm for general contract assistance. The retainer covered six months of services.

The company sold the "back support chairs" for \$250 on September 30, 2015 because they were not comfortable to sit in. The previous accountant debited cash and credited property, plant, & equipment for \$250 at the time of the sale.

The Company's policy is to begin depreciating long-term assets on the first day of the month the Company places the asset in service.

4) List all items recorded to a particular category of property, plant, and equipment and intangible assets below in the account and state your estimated useful life beside each item.

Item:***Estimated Useful Life:***

Automobiles

 years

 years

 years

 years

Computer Equipment (Office Equipment)

 years

 years

_____	_____ years
_____	_____ years
_____	_____ years
_____	_____ years

Furniture and Fixtures

_____	_____ years
_____	_____ years
_____	_____ years
_____	_____ years
_____	_____ years
_____	_____ years

Leasehold Improvements

_____	_____ years
_____	_____ years
_____	_____ years

Intangible Assets

_____	_____ years
_____	_____ years
_____	_____ years
_____	_____ years
_____	_____ years
_____	_____ years

5) State your support for the estimated useful lives noted above. Explain your reasoning for similar items together.

Automobiles

A) Items and Life: Reasons

B) Items and Life: Reasons

Computer Equipment (Office Equipment)

A) Items and Life: Reasons

B) Items and Life: Reasons

C) Items and Life: Reasons

Furniture and Fixtures

A) Items and Life: Reasons

B) Items and Life: Reasons

C) Items and Life: Reasons

Leasehold Improvements

A) Items and Life: Reasons

Intangible Assets:

A) Items and Life: Reasons

B) Items and Life: Reasons

C) Items and Life: Reasons

6) Use the ***Excel Workbook*** (already formatted) and compute depreciation expense for each item using the straight-line method for each item for 2015 and 2016.

7) Use the ***Excel Workbook*** (already formatted) and compute depreciation expense for each item using the double declining balance method for each item for 2015 and 2016.

8) Determine the most appropriate depreciation method for Holistic Health and state your reasons on the following page:

Chosen Method: _____

For Straight-line:

Against Straight-line:

For DDB:

Against DDB:

9) Use the **Excel Workbook** (already formatted) and prepare a long-term assets (PPE and Intangibles) walk-forward schedule in the following format:

Beginning Balance	+	Additions	-	Sales	=	Ending Balance
-------------------	---	-----------	---	-------	---	----------------

Remember that this is the first year of business for this company.

10) Record all entries for depreciation and amortization on the journal entry log.

11) Post the entries into the December detail general ledger and balance the accounts.

12) Agree the balances in the December detail general ledger to the walk forward.

Notes Payable

The company purchased a Toyota Camry for a total amount of \$21,624.88. A cash down payment was made for \$5,000 and the balance was financed with a 3 year note with monthly payments of \$ 505.77 due on the 18th of each month with an interest rate of 6%. The company established automatic wires for payments to the bank from the company's operating cash account (no check is written for the payment). The first payment was wired on February 18th, 2015.

The company wired each monthly payment prior to the due date during 2015.

The entry the accountant should have made to record the wire to the bank (payment) on February 18, 2015 follows:

Long-term Notes Payable	\$422.65	
Interest Expense	\$ 83.12	
Cash		\$505.77

The previous accountant should have recorded all payments made on the note similar to the entry above, with a different amount of interest each month, per the amortization schedule (provided on the Excel).

1) Check the balance in the notes payable account on November 30 and make sure the balance agrees to the amount owed on the amortization schedule at the end of November. If the balance does not agree to the amortization schedule, the accountant did not record the interest portion of the payment when payments were made. Record interest expense in an amount that makes the balance in the notes payable account on November 30 agree to the amortization schedule.

Interest Expense	\$	
Long-term Notes Payable		\$

Write the entry above and on your journal entry log and post amounts into the detail general ledger.

2) Record the payment made on December 12, 2015. Use the amortization schedule provided.

Long-term Notes Payable	\$	
Interest Expense	\$	
Cash		\$

Write the entry above and on your journal entry log and post amounts into the detail general ledger.

3) Agree the balance in the notes payable account in the detail general ledger to the amount owed per the amortization schedule at the end of December, 2015.

4) Record the portion of the principle on the note that is due to be repaid in one year or less. Use the amortization schedule to determine the correct amount that should be reported as current

Long-term Notes Payable	\$	
Current Portion of Notes Payable		\$

Write the entry above and on your journal entry log and post amounts into the detail general ledger.

5) Determine the interest incurred on the notes payable for the time period of December 19th to December 31st (13 days). This amount has not yet been paid by the company and will be paid when the January payment is made. Use the amortization schedule.

Total interest due to be paid on 1/18/2016:		\$ _____
x Days owed for December / 30 days		_____
		(round to 2 decimal points)
= Interest to Accrue:		_____

Write the entry to accrue interest with the adjusting entries on the journal entry log.

Post the entry into the detail general ledger.

Investments

The company has the following investments on November 30, 2015:

- 150 shares of Apple, Inc. (public company) purchased at a cost of \$129.50 per share on May 4, 2015.
- 30 shares of Chipotle Mexican Grill, Inc. (public company) purchased at a cost of \$752.25 on August 6, 2015.
- The company made a \$25,000 investment in OrgHerb, Inc., a private company that manufactures organic herbs on January 8, 2015. The company purchased 1,000 shares, which is 20% of the common shares. At the time of the purchase, OrgHerb, Inc. owned a building with a FMV \$60,000 greater than book value on the balance sheet with a 20 year life. OrgHerb, Inc. earned a net loss of \$52,000 for the year ended 12/31/2015 and paid a \$0.50 dividend per share on December 15, 2015. Holistic Health receives monthly financial statements, meets quarterly with the management team of OrgHerb, Inc. and does not have a seat on the board of directors.

The previous accountant recorded the purchase of all the investments with an increase to the investment account and a decrease to cash. The accountant made no others entries related to investments during the year.

Work to do:

1) Determine which method to use for each of the individual investments and state your reasons for choosing the method.

Apple, Inc. Method: _____

Reasons you chose this method and did not chose the other methods. Answer both.

1) Chipotle Mexican Grill, Inc. Method: _____

Reasons you chose this method and did not chose the other methods. Answer both.

1) OrgHerb, Inc. Method: _____

Reasons you chose this method and did not chose the other methods. Answer both.

2) **Excel Workbook:** Do all necessary calculations required for the journal entries for your chosen method for each investment. You will need to gather the information required to do the accounting using the chosen method.

3) Record the journal entries on the journal entry log.

4) Post the entries to the December detail general ledger and balance the accounts. Make sure that your account balances agree with the work you performed to account for investments.

Other Adjusting Entries

Information to use:

The company paid monthly insurance premiums for the first five months of the year in the amount of \$600 per month. The company paid for 12 months of insurance at a cost of \$6,900 on June 1, 2015. The insurance policy covers property, liability, and high deductible employee healthcare.

The company signed a two-year lease agreement for the facility on February 1, 2015. Payments were made in the amount of \$2,700 for each quarter on February 1, May 1, August 1, and November 1. The company operated out of the facility during the month of January 2015 prior to signing the lease agreement. The owner of the facility did not charge for the use in January.

The company is under contract to pay the CPA firm \$350 per month.

The company paid a legal retainer fee for contract review services of \$2,500 on January 2, 2015 for the year.

The warehouse manager estimates that the company has approximately \$800 of supplies on hand on December 31, 2015.

Invoices received in January 2016 for December 2015 services follows:

TXU Energy	\$314.56
ATT Cell Phone and Internet Service	\$208.37
Federal Express	\$984.52
Hoerner Box Company (for shipping boxes)	\$124.13
Merchant Credit Card Services	\$ 64.29
Blue Mesa Catering Services	\$452.69

Work to do:

1) Record ALL adjusting entries on the journal entry log.

Step 1: Determine if the above information was previously recorded and if it was recorded, which accounts were used (look at the detail general ledger).

Step 2: Determine the proper account the amount should be reported to and the correct ending balance on December 31, 2015.

Step 3: Adjust the amount in the proper account to the correct balance and record the change to the associated account.

2) Post the entries written on the journal entry log in the December detail general ledger.

FINISH THE ACCOUNTING CYCLE:

Additional Information:

The company repurchased 5,000 common stock shares from shareholders for \$8 per share on December 10th, 2015.

The company paid a dividend of \$0.50 per share to investors on December 21st, 2015.

1) Record the above transactions on the journal entry log and post the amounts into the detail general ledger.

Use the Excel workbooks to do the following:

2) Transfer all balances from the December detail general ledger to the December summary general ledger. Make sure that the Summary General Ledger balances. If it is not in balance, find and correct your errors.

3) Prepare the Income Statement

The company's income tax rate is expected to be 28%. Three quarterly payments in an equal amount of \$2,500 were paid to the IRS on April 15th, July 15th, and October 15th of 2015.

4) Record the entry to accrue income tax expense. Post the entry into the December detail general ledger. Revise and review the December summary general ledger and make sure it balances.

5) Finalize the Income Statement.

6) Prepare Closing Entries and determine the final balance in the Retained Earnings account.
Do not post the closing entries to the detail general ledger.

7) Prepare the Balance Sheet.

8) Prepare the Statement of Stockholders' Equity.

9) Prepare the Cash Flow Statement.

Before calling the financial statements "Final"

The Company must decide if they are going to continue to do business in 2016 and beyond. The Company has been unsuccessful finding new customers in the past 6 months due to a new competitor. The owner will heavily rely on earnings for the current year to make this determination. The owner considers an annual income of greater than \$15,000 adequate to continue to put effort into the business. Your final reflection paper should address how you should consider this new information, and the appropriateness of your decisions related to accounting methods and estimates given the owner's goals.

Appendix E

Rubrics for Comprehensive Project (2016)

Comprehensive Project: Part I: Sales and Accounts Receivable

Transactions:	Points			
Recorded sales from shipping documents correctly:				
Number in correct out of 16	3			
January Credit Card Sales				
Number incorrect out of 8	2			
January Cash Received from Customers (checks)				
Number incorrect out of 13	2			
January Cash Received from Credit Card Banks	2			
Number Incorrect out of 10				
Sales Adjustments:				
January Sales recorded in December (3 reversals)				
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 33%; text-align: center;">849.75</td> <td style="border: 1px solid black; width: 33%; text-align: center;">3398.72</td> <td style="border: 1px solid black; width: 33%; text-align: center;">2649.15</td> </tr> </table>	849.75	3398.72	2649.15	3
849.75	3398.72	2649.15		
7) Other issues related to sales				
Incorrect out of 3	6			
Detail General Ledger Accounts				
Cash Balance	2			
Accounts Receivable Balance	2			
Revenue Balance (Both accounts)	2			
Accounts Receivable Aging Report:				
Sales and Collections Reported Correctly on the report:				
Current	1			
1 to 30 days past due	1			
31 to 60 days past due	1			
61+ days past due	1			
Total on Aging Report is equal to A/R general ledger account:	3			

(continued)

Write-Off Accounts:

List of items identified for write-off is reasonable	3
Journal entry	
Account names / debit and credit	1
Amount	1
Posted Correctly in the detail general ledger	1
Write-offs are stated on the aging report correctly	1

Bad Debt Expense % of sales adjustment:

% of Sales method for November is recorded correctly	1
% of Sales method for December is recorded correctly	1

Bad Debt Expense Year End Adjustment (Excel Workbook):

% AR method top of excel	
Amounts for categories of aging are correct	2
% uncollectible are reasonable	2
Total estimated uncollectible is reasonable	2
Specific Accounts	
Amounts for each customer are correct	1
High Estimates are reasonable	2
Medium Estimates are reasonable	2
Low Estimates are reasonable	2

Justification for Bad Debt Expense:

Probability of High/Medium/Low are reasonable	2
Reasons to use/not use HIGH are reasonable/specific	4
Reasons to use/not use MID-RANGE are reasonable/specific	4
Reasons to use/not use LOW are reasonable/specific	4

Final Adjustment to Bad Debt Expense:

T account is properly completed / = detail account	1
Entry is properly recorded	1
Entry is properly posted	1
Final Allowance account balance equals total estimated uncollectible accounts (high, medium, or low)	1
Final allowance balance is reasonable to the situation	4

TOTAL SCORE on PART I 75

Comprehensive Project: Part II Inventory

Transactions:

Recorded purchases of inventory	
Number in correct out of 4	2
Record purchases moved to CGS correctly	2

Inventory Reports

Average Cost

Total Purchase Quantity Correct	1
Total Sales Quantity Correct	1

Average Cost Product 4

Average Cost Correct	1
Ending Inventory Correct	1
CGS Correct	1

Average Cost Product 5

Average Cost Correct	1
Ending Inventory Correct	1
CGS Correct	1

FIFO Periodic

Product 1 is Correct	1
Product 2 is Correct	1
Product 3 is Correct	1
Product 4 is Correct	1
Product 5 is Correct	1
CGS is Correct	1

LIFO Periodic

Product 1 is Correct	1
Product 2 is Correct	1
Product 3 is Correct	1
Product 4 is Correct	1
Product 5 is Correct	1
CGS is Correct	1

LIFO Perpetual

Product 4 is Correct	1
Product 5 is Correct	1
CGS is Correct	1

(continued)

Moving Average	
Product 4 is Correct	1
Product 5 is Correct	1
CGS is Correct	1
Inventory Summary Report is Completed Correctly	1
Choice of Inventory Method	
Support for decision on periodic or perpetual:	
Periodic use: reasonable/specific?	2
Periodic don't use: reasonable/specific?	2
Perpetual use: reasonable/specific?	2
Perpetual don't use: reasonable/specific?	2
Support for FIFO / LIFO / Average	
FIFO use: reasonable/specific?	2
FIFO don't use: reasonable/specific?	2
LIFO use: reasonable/specific?	2
LIFO don't use: reasonable/specific?	2
Average use: reasonable/specific?	2
Average don't use: reasonable/specific?	2
Adjustments to Inventory	
Subtotal in Inventory account = Inventory Report (after adjusting for the method used)	2
Inventory count adjustment is correct Journal entry agrees to adjustment/posted correct	2 1
Inventory obsolescence adjustment is correct Journal entry agrees to adjustment/posted correct	2 1
Final Inventory Balance	
Summary Schedule is adjusted correctly for the chosen method	2
Detail general ledger agrees to summary schedule	4
TOTAL SCORE on PART II: Inventory	65

Comprehensive Project: Part III Long-term Assets

Transactions: Reclassifications	Points
2106 Furniture & Fixtures	2
2114 Intangibles	2
2189 Intangibles	2
2194 Supplies	2
2208 Auto	2
2211 Furniture & Fixtures	2
2227 Furniture & Fixtures	2
2234 Leasehold Improvements	2
2235 Supplies	2
2315 Intangibles	2
2318 Furniture & Fixtures	2
2319 Computer Equipment	2
2322 Computer Equipment	2
2328 Supplies	2
2341 Professional Services Exp	2
2426 Meals & Entert Exp	2
2514 Advertising Exp	2
2567 Computer Equipment	2
2842 Furniture & Fixtures	2
2912 Auto	2

Estimated Useful Life

Automobiles: Reasonable

Type 1 (if different)	1
Type 2 (if different)	1

Computer Equipment: Reasonable

Type 1 (if different)	1
Type 2 (if different)	1
Type 3 (if different)	1

(continued)

Furniture and Fixtures	
Type 1 (if different)	1
Type 2 (if different)	1
Type 3 (if different)	1
Leasehold Improvements	1
Intangible Assets	
Type 1	1
Type 2	1
Type 3	1
Depreciation Expense	
Stright-line method:	
Useful lives agree to support	1
Considers months used during	
year	1
Calculations are correct	1
Double-Declining Balance	
Useful lives agree to support	1
Considers months used during	
year	1
Calculations are correct year 1	1
Calculations are correct year 2	1
Support for chosen method:	
For Straight-line:	
Specific	2
Reasonable	2
Against Straight-line:	
Specific	2
Reasonable	2
For Double Declining Balance:	
Specific	2
Reasonable	2
Against Double Declining	
Balance:	
Specific	2
Reasonable	2
Walkforward and Journal Entries	
Depreciation Expense recorded correctly	2

Walkforward agrees to general ledger 3

Notes Payable: (continued)

Journal Entries are correct:

- | | |
|--|---|
| 1) Review of Nov 30 Interest Exp Balance | 1 |
| 2) Payment made on Dec 12 | 1 |
| 4) Reclass of Notes Payable to Current | 1 |
| 5) Accrued Interest is correct | 1 |

Long-term Notes Balance is correct 2

Current Portion Notes Pay Balance is correct 2

Interest Expense balance is correct 2

TOTAL SCORE on PART III 90

Comprehensive Project Part IV: Investments, Adjustments, Financial Statements

Investments	Points
Apple, Inc.	
Method is reasonable and justified properly	3
Entries are correct	1
Investment balance in GL agrees with FMV or calcs	2
Accumulated Gain/Loss agrees in GL if used	2
Chipotle Mexican Grill, Inc.	
Method is reasonable and justified properly	3
Entries are correct	1
Investment balance in GL agrees with FMV or calcs	2
Accumulated Gain/Loss agrees if LT FMV is used	2
OrgHerb, Inc	
Method is reasonable and justified properly	3
Calculations are correct	1
Entries are correct	3
Investment balance in GL agrees with FMV or calcs	1
Accumulated Gain/Loss agrees in GL if used	1

(Continued)

Adjustments

Prepaid Insurance Balance is Correct	1
Insurance Expense Balance is Correct	1
Prepaid Rent Balance is Correct	1
Rent Expense Balance is Correct	1
CPA firm fees recorded properly	1
Legal Retainer Fee is recorded properly	1
Supplies Balance is Correct	1
Accounts Payable:	
TXU	1
ATT	1
Fed Ex	1
Hoerner Box	1
Merchant CC	1
Blue Mesa	1
Entries are recorded properly and posted correctly	1
Final Accounts Payable Balance is Correct	

Equity Transactions:

Treasury Stock purchase is recorded properly and account balance is correct	2
Dividends Paid is recorded properly and account balance is correct	2

Financial Statements:

December Summary General Ledger agrees with T accounts	
Number of accounts that do not agree	3
Tax Expense is properly calculated and recorded	1
Prepaid Tax or Tax Payable balance is correct	1
Income Statement agrees with December GL	
Number of accounts that do not agree	3
Closing entries agree with December GL	1
Number of accounts that do not agree	
Closing Entries are posted into retained earnings account	1

(continued)

The balance Sheet agrees with December GL Number of line items that are incorrect	1
The balance Sheet is correct and balanced Number of line items that are incorrect	5
The statement of stockholders' equity is properly formatted and shows common stock issued, treasury stock, and dividends	3
The Cash flow statement is correct: Number of line items that are incorrect out of about 25	8
Total Part IV	70