Examining the Association Between a Continuing Case Teaching Method and Student Performance and Perceptions in the First Managerial Accounting Course

By
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I certify that I have read this dissertation and in my opinion it meets the academic and professional standards required by Wilmington University as a dissertation for the degree of Doctor of Business Administration

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Finally, I hope my journey through these last few years has provided an example for my children to see the reality of Proverbs 3:5-6.

Abstract

This study examines the relationship between a new teaching method and student performance and perceptions in a first year managerial accounting course at a Mid-Atlantic university. The new teaching method uses a consistent example throughout the course of a semester to teach managerial accounting concepts. It also draws on elements from validated teaching approaches. The study tested the method's effectiveness through the use of a quasi-experimental study. Perceptions related to accounting, the achievement of IMA core competencies, and the achievement of learning objectives were significantly higher among students in the treatment groups. Performance on the final examination, assessments exclusive of the final examination, and final grades were similar between groups. Students in the treatment groups credited the use of a consistent example as an agent which helped them gain a deep and comprehensive knowledge. The findings have favorable implications for students, employers, and universities and lend support for other educators to implement similar methods in their first year accounting courses.

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CHAPTER 1

INTRODUCTION

The demand for accountants continues to grow and universities expect strong enrollments in accounting programs to persist (American Institute of Certified Professional Accountants [AICPA], 2015; U.S. Department of Labor, 2016). At the same time, Baby Boomers are retiring from the profession in record numbers (AICPA, 2016). In addition to concerns related to the quantity of future accountants in general, issues associated with the quality of entry-level accountants abound. Significant "talent gaps" have been found across various locations and workforce sizes. CFOs report having difficulties finding the right talent (Thomson, 2017). Finance and HR professionals report increased time to fill entry-level positions, increased recruiting costs, and hiring under-qualified candidates (Institute of Management Accountants, 2015).

Much onus has been put on accounting educators to help resolve these concerns. One common theme among the calls to reform accounting education relates to teaching methods. The Pathways Commission and its predecessor, the Accounting Education and Change Commission (AECC), explicitly call for accounting instructors to utilize engaging teaching methods to make students active participants in the learning process (Accounting Education Change Commission, 1990; The Pathways Commissioners, 2012). Many students perceive the subject of accounting to be dull or boring (Lehman, 2001; Picard, Durocher, & Gerdron, 2014; Stivers & Onifade, 2014) and their attitudes toward accounting typically decline over the course of a semester (Geiger & Ogilby, 2000; Marriott & Marriott, 2003; Tickell, Lim, & Balachandran, 2012).

Publicized reports from the Pathways Commission and AECC dedicate substantial space to the importance of the first accounting courses. These courses can be the only exposure potential entrants will have to accounting. Research consistently shows that these courses are possibly the most important factors in students' perceptions of accounting and their decisions related to pursuing accounting as a major and career (Accounting Education Change Commission, 1992; Geiger & Ogilby, 2000; Jackling & Calero, 2006; Nelson, Vendrzyk, Quirin, & Kovar, 2008; The Pathways Commissioners, 2012).

Statement of the Problem

While there has been little agreement achieved as to the best active learning approaches, Biggs (1993) asserts that there is a certain degree of consensus that exists about basic assumptions. He posits that most educators agree that teachers must get students to engage in learning activities if students are to learn desired outcomes.

While accounting educators have been increasingly receptive to the concept of active learning, a review of literature finds that most are only employing it through case based methods in upper level courses. These cases are typically narrow in scope, complex in design, and implemented as graded projects to be completed outside of class. Cases designed for the first managerial accounting course are few, and evidence regarding their effectiveness is limited to results from post class questionnaires related to students' perceptions of their learning and the case in general.

Significance of the Study

This study examines the relationship between a new teaching method and student performance and perceptions in the first managerial accounting course. It is significant in three major ways.

First, it focuses on a critically important course in the accounting curriculum. Literature consistently shows that this course has significant effects on students' perceptions and decisions. Accounting organizations specifically call for educators to channel their efforts toward improving students' experiences in these courses. Research related to this course is highly applicable in that it is not only a required course for accounting majors but also a required course in business curricula regardless of concentration at most colleges and universities. Knowledge gleaned from this particular course is especially relevant considering that the vast majority of accountants spend most of their careers within organizations where they have management accounting responsibilities (Siegal, Sorensen, Klammer, & Richtermeyer, 2010).

Second, the teaching method examined is unique. Business students lack the experience and contextual framework necessary to apply this course's concepts (Duncan & Bamberry, 2010; Mastilak, 2012; McInnis, 2001). A pre-class questionnaire was administered using a five-point Likert type scale with 1 representing *strongly disagree* to 5 representing *strongly agree*. The results (n = 155) support other educators' assertions. The mean responses for "I have personal experience in a manufacturing business" and "I have personal experience with or exposure to managerial decisions in a manufacturing business" were 1.89 and 1.61 respectively. This data suggests that students enrolled in this course generally disagree that they have personal experience with manufacturing firms.

This teaching method expands on various active learning methods in an effort to contextualize learning activities and create a sense of continuity and familiarity to enhance student learning. Contrary to textbooks and most existing studies, it approaches material from an internal perspective which represents the professional environment students will encounter and roles they will assume. It differs from most existing cases because it is implemented as an in-

class active learning strategy rather than an out-of-class graded assignment. It serves as the centerpiece of all class sessions. It is the first of its kind to span an entire semester and cover all of the content typically included in the first managerial course.

Third, effectiveness of this method is measured using a survey of student perceptions and a quasi-experimental design whereby students were separated into control and experimental groups. None of the relevant cases examined effectiveness of their cases through the use of control and treatment groups.

The results of this study will be of interest to accounting educators and provide a noteworthy contribution to literature focused on active learning strategies in accounting education.

Research Questions and Hypotheses

The research questions relate to associations between the new teaching method and student performance and perceptions in the first management accounting course. The following research questions guided this study:

- Research Question 1: To what extent is the continuing case method associated with student performance as measured by the final exam? From this research question, the following hypotheses were developed:

  Hypothesis 1a: Students taught under the continuing case method will perform better on the final exam compared to students not taught with the continuing case.

  Hypothesis 1b: Students taught under the continuing case method will perform better on the final exam compared to students not taught with the continuing case when controlled for covariates.

- Research Question 2: To what extent is the continuing case method associated with student performance as measured by assessments exclusive of the final exam? From this research question, the following hypotheses were developed:

  Hypothesis 2a: Students taught under the continuing case method will perform better on assessments exclusive of the final exam compared to students not taught with the continuing case.

  Hypothesis 2b: Students taught under the continuing case method will perform better on assessments exclusive of the final exam compared to students not taught with the continuing case when controlled for covariates.

- Research Question 3: To what extent is the continuing case method associated with student performance as measured by the final course grade? From this research question, the following hypotheses were developed:

  Hypothesis 3a: Students taught under the continuing case method will earn a higher final course grade compared to students not taught with the continuing case.

  Hypothesis 3b: Students taught under the continuing case method will earn a higher final course grade compared to students not taught with the continuing case when controlled for covariates.

- Research Question 4: To what extent is the continuing case method associated with students' perceptions of accounting? From this research question, the following hypothesis was developed:

  Hypothesis 4: Students' perceptions of accounting will be more favorable in sections taught using the continuing case.

- Research Question 5: To what extent is the continuing case method associated with students' perceptions of achieving the IMA core competencies? From this research question, the following hypotheses were developed:

  Hypothesis 5a: Students taught under the continuing case method will have more favorable perceptions of achieving the IMA core competencies compared to students not taught with the continuing case.

  Hypothesis 5b: Students taught under the continuing case method will have more favorable perceptions of achieving the IMA core competencies compared to students not taught with the continuing case when controlled for covariates.

- Research Question 6: To what extent is the continuing case method associated with students' perceptions of achieving stated course objectives? From this research question, the following hypotheses were developed:

  Hypothesis 6a: Students taught under the continuing case method will have more favorable perceptions of achieving the stated course objectives compared to students not taught with the continuing case.

  Hypothesis 6b: Students taught under the continuing case method will have more favorable perceptions of achieving the stated course objectives compared to students not taught with the continuing case when controlled for covariates.

- Research Question 7: How do students perceive the use of a continuing case as a method of teaching? From this research question, the following hypotheses were developed:

Hypothesis 7a: Students will rate the use of the continuing case as method of teaching higher than a neutral point.

- Research Question 8: How do students perceive the use of a continuing case as it relates to achieving the IMA's core competencies? From this research question, the following hypotheses were developed:

  Hypothesis 8a: Students will rate the use of a continuing case in facilitating achievement of IMA core competencies higher than a neutral point.

- Research Question 9: How do students perceive the use of a continuing case as it relates to achieving the stated course objectives? From this research question, the following hypotheses were developed:

  Hypothesis 9a: Students will rate the use of a continuing case in facilitating achievement of stated course objectives higher than a neutral point.

- Research Question 10: How do students perceive the continuing case as a learning tool? From this research question, the following proposition was developed:

  Proposition: Students will find the semester-long common frame of reference and first person perspective to be positive agents in helping them relate to and learn managerial accounting concepts.

Definition of Terms

- Anchored learning: A teaching method which learning activities are contextualized through a common frame of reference.
- Case-based learning: A teaching method that utilizes specific scenarios from real businesses or resembling real-world examples.

- First accounting course: The introductory accounting sequence which includes introductory “financial” and “managerial” accounting.
- Institute of Management Accountants: A worldwide association of accountants and financial professionals which focuses exclusively on advancing the management accounting profession.
- Management accounting: A function of accounting that serves the needs of managers employed inside the organization.Problem-based learning: A teaching method which emphasizes self-directed learning by utilizing unstructured problems.
- Situated learning: A teaching method that concentrates on the relationship between learning and the social situation in which it occurs.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

Numerous accounting organizations specifically pinpoint the first year accounting courses as critical factors in students' perceptions related to the accounting profession. These organizations have challenged accounting educators to employ active learning strategies to better prepare the next generation. A "continuing case" was developed by the researcher to address these concerns. The purpose of this study is to examine its effects on student performance and perceptions in the first managerial accounting course.

The review of literature begins by summarizing the current issues in accounting education and calls to action proposed by leading organizations. A summary of management accounting's evolution and scope follows. Next, a review of student perceptions related to accounting is presented. This is followed by a discussion centered on relevant active learning methods, their theoretical underpinnings, and results of their implementation. The literature review concludes by examining the unique contribution of the teaching method under study, its expansion of current methods, synthesis of varied approaches, and introduction of novel elements.

Issues in Accounting Education

The Accounting Education Change Commission. The Accounting Education Change Commission was appointed in 1989 by the American Accounting Association (AAA), which is the largest community of accountants in academia (American Accounting Association, n.d.). The commission's objective was to be a catalyst for improving the academic preparation of accountants so that entrants to the accounting profession possess the skills, knowledge, and

attitudes required for success in accounting career paths. Position Statement Number 1, Objectives of Education for Accountants, is intended to provide a focus for those working to improve accounting education. The instructional methods section of position statement number one states, "students must be active participants in the learning process, not passive recipients of information" (Accounting Education Change Commission, 1990, p. 3).

Position statement number two is dedicated to the first course in accounting. The "first course" is defined, and commonly known to include, "the introductory accounting sequence, usually taught over two terms" (e.g., introductory "financial" and "managerial" accounting) (Accounting Education Change Commission, 1992). The commission asserts that the first course of accounting is a beneficial course regardless of a student's specific business concentration. All organizations have accountability responsibilities to their constituents and accounting is a powerful tool in creating information to improve decisions that affect those stakeholders. The commission contends that individuals who enter business will be better prepared for their responsibilities if they understand the role of accounting information in decision-making by managers, investors, and others. The statement gives credence to the current inclusion of the first accounting courses as required courses in business curriculums at most colleges and universities.

The report notes that the first accounting course has even more significance for those considering a career in accounting or those considering the option to major in accounting. The first accounting course shapes their perceptions of the profession, the aptitudes and skills needed for successful careers in accounting, and the nature of career opportunities in accounting (Accounting Education Change Commission, 1992). Ultimately, these perceptions affect whether the supply of talent will be sufficient for the profession to thrive. The commission

speaks to the "breadth of influence" possessed by these courses and reminds parties capable of improving the course's effectiveness of this important responsibility. The report notes that faculty and administrative leaders bear the greatest burden in the course's success.

The Pathways Commission. The Pathways Commission's report, "*Charting a National Strategy for the Next Generation of Accountants*", intended to build on previous efforts to reform accounting education such as the Positions and Issues Statements of the Accounting Education Change Commission. Similar to the Accounting Education Change Commission's Position Statement Number Two, the report gave specific attention to the first accounting course. The report states,

> this course serves as perhaps the single most important factor in deciding whether to pursue the study of accounting. Labeling this course as a fork in the road for attracting diverse, high-potential students does not overstate the importance of this course. (The Pathways Commissioners, 2012, p. 86)

The first course in accounting is possibly the only exposure potential entrants will have to accounting.

One major concern of the commission was the relevance of accounting education. Bruce Behn, chair of the commission, stated that "curricula should mirror business processes by providing context and focusing on decision making within a business process context…" (Bonner, 2011, para. 9). The report urges accounting educators to not use textbook based styles as the primary means of presentation (Bloom, 2013). Action items 5.2.1 and 5.2.4 suggest building on previous efforts regarding how the first course in accounting is designed and delivered and challenges educators to incorporate engaging materials. "Without engaging

learning approaches, the first course in accounting may negatively influence students" (The Pathways Commissioners, 2012, p. 87).

Institute of Management Accountants. The Institute of Management Accountants (IMA) is a worldwide association of accountants and financial professionals, which focuses exclusively on advancing the management accounting profession. The organization was founded in 1919 with a membership that now spans 140 countries (Institute of Management Accountants, 2019).

The IMA is especially attentive to confronting the talent gap. In 2014, the IMA partnered with the American Productivity & Quality Center (APQC) to survey 173 finance and HR professionals related to their perceptions about entry-level management accounting talent (Institute of Management Accountants, 2015). The survey found significant gaps between the competencies organizations demand and the competencies that entry-level management accountants possess. Ninety percent of CFOs reported having a hard time finding the right talent, with deficiencies existing in both technical and nontechnical skills (Thomson, 2017). Significant gaps were found across various locations and workforce sizes.

The problem seems to be taking a toll on businesses and entry-level employees. Half of the survey respondents reported increased time to fill entry-level positions. One-third reported increased recruiting costs and nearly one-third are hiring under-qualified candidates. Entry-level management accountants in organizations with hiring challenges report lower job satisfaction than those in organizations with fewer challenges (Institute of Management Accountants, 2015). Overall, only one-quarter of entry-level professionals are satisfied with their jobs compared to half of senior management accounting. One could theorize that a skills deficiency could contribute to lower job satisfaction.

Increasing pressure to improve performance is transforming expectations of management accountants. Today, the expectations of the management accounting team is no longer value stewardship (e.g. auditing, statutory reporting, compliance); it is value creation (e.g. financial planning and analysis) (Thomson, 2017). These expectations for management accountants have implications for most accountants even if they are currently employed in public accounting. The vast majority of accountants spend most of their careers within organizations where they have management accounting responsibilities (Siegal et al., 2010).

According to the most recent edition of Trends in the Supply of Accounting Graduates and the Demand for Public Accounting Recruits (AICPA, 2015), hiring by CPA firms reached an all-time high and universities and employers are bullish about the future. The U.S. Bureau of Labor Statistics projects an 11% increase in demand for accountants and auditors through 2024 (U.S. Department of Labor, 2016). These trends coincide with Baby Boomers retiring in record numbers. Over 40% of today's CPAs will be retiring by 2020 (AICPA, 2016).

The talent skills gap coupled with the projected shortage of accountants are forces which impact the IMA's management accounting competency framework. The framework consists of five major categories: planning and reporting, decision making, technology, operations, and leadership (Institute of Management Accountants, 2017). Planning and reporting encompasses skills required to measure performance and report financial results. Decision making relates to competencies required to guide decisions and manage risk. Technology includes the ability to use information systems to perform record keeping, reporting, and analyses. Operations comprises the competencies needed to contribute to the organization as a cross-functional business partner. Leadership consists of skills required to collaborate with others to achieve common goals.

The Evolution and Scope of Management Accounting

Literature commonly references the industrial revolution as the catalyst for management accounting (Edwards, Boyns, & Anderson, 1995; Kamal, 2015). The need for owners to determine product costs for the purposes of pricing appears to have been a major driver. Others believe the creation of large corporations, which followed the railways and telegraph, initiated managerial accounting practices because transactions which had previously been priced by external markets where now internalized (Shotter, 1999). Investigations of records of Staveley Coal and Iron Works, Carron Company, and Melincyddan Smelting Works from the 1800s indicates the use of managerial accounting practices related to product costing, transfer pricing, overhead allocation, and forecasting. In general, this first phase of management accounting centered on the provision of information.

During the late nineteenth century, new management accounting techniques aided in the evaluation of subordinate managers' performance (Kamal, 2015). The development of variance analyses and other techniques coincided with the development of the scientific management, which focused on efficiencies. While the focus of management accounting shifted in the 1950s to the provision of information for planning and control purposes, it was still primarily a supportive function rather than a strategic function (Abdel-Kader & Luther, 2004). Increased global competition in the 1980s prompted new management and production methods and consequently, cost control and reduction of waste in resources across all business process were priorities (Kamal, 2015). Management accounting information became sought after throughout the organization at all levels. The 1990s brought new technologies that further increased global competition and the focus of management accounting shifted to leveraging resources to create value (Kamal, 2015). These later stages transformed management accounting from a function

that provided financial information to line mangers to a critical component of a company's strategic plan to manage resources and create value. The Institute of Management Accountants (n.d.) calls this the transition from "bean counter" to "business partner". The term "business partner" is important because it implies that management accountants now have the authority and responsibility to tell operating executives why information may or may not be relevant to decision making. These accountants are expected to suggest ways to improve decision quality and be part of the planning process (Siegal et al., 2010).

Student Perceptions of Accounting

The first year accounting courses are the first direct exposure to accounting for most business students and many enter the class with stereotypes perpetuated by various influences. Studies examining depictions of accountants in movies and literature have found them to be portrayed as nerdy bean counters rather than strategic business partners (Beard, 1994; Bougen, 1994; Evans & Fraser, 2012; Parker, 2001). Stereotypes impact the selection process of individuals choosing a profession (Arquero & Tejero, 2009). Confirmation bias impacts judgment when individuals add more weight to information that is consistent with preexisting perceptions (Bazerman & Tenbrunsel, 2011). Holland (1973) found that individuals base career selections on vocational stereotypes because vocation interest can be a way for individuals to express their personalities. Negative stereotypes may lead students to view the profession as incompatible with the exciting careers that they desire for themselves.

Many studies find that students perceive the subject of accounting to be dull or boring (Larkin, 1991; Lehman, 2001; Picard et al., 2014; Stivers & Onifade, 2014). Non-accounting majors perceive that the greatest benefit to not choosing accounting as a major is that a non-accounting major is not as boring (Allen, 2004). Although stereotypes exist, students'

experiences with their first accounting courses seem to impact their perceptions more than any other factor. Jackling and Calero (2006) found that satisfaction with studies in accounting was the most significant predictor of intention to become an accountant. Geiger and Ogilby (2000) found that a student's experience in the first accounting course is a vital factor in choosing a major. A study conducted by Nelson et al. (2008) suggests that many accounting seniors first considered majoring in accounting while in high school but fewer are entering college with preconceived notions that they want to be accountants. Forty percent of students who actually made the decision to major in accounting did so in their sophomore year (Nelson et al., 2008). Seventy-two percent of accounting seniors reported that their first accounting courses had positive effects on their attitudes toward the accounting profession (Nelson et al., 2008). First year accounting students who were very satisfied with their studies were 38 times more likely to be interested in accounting as a career (Jackling & Calero, 2006).

Satisfied students are in the minority. Research indicates that students are generally dissatisfied with their first accounting courses. Chen, Jones, and McIntyre (2004) found that neither accounting nor non-accounting students perceive a high level of future benefit from the first accounting courses.

Marriott & Marriott (2003) conducted a longitudinal study of undergraduate accounting students' attitudes towards accounting as a profession. At the beginning of the course, students had a positive attitude but this fell significantly by the end of their studies. Students found accounting to be less interesting and the prospect of being employed as an accountant less enjoyable. Attitudes towards accountants obtaining personal satisfaction in their work also fell significantly. Geiger & Ogilby (2000) also found that assessments of a first year accounting course declined over the course of a semester for both accounting and non-accounting majors,

although perceptions differed across instructors. Tickell, Lim, & Balachandran (2012) conducted a similar study measuring accounting and other business majors' perceptions of the content, relevance, difficulty, and motivation related to a first year accounting course. While accounting students' perceptions did not change between the beginning and end of the semester, other business majors' perceptions were significantly less favorable at the end of the course.

Students who hold favorable attitudes towards accounting as a profession typically report extrinsic factors as major factors influencing their perceptions, such as salary prospects, job security, and opportunities for advancement (Ahmed, Alam, & Alam, 1997; Felton, Burh, & Northy, 1994; Francisco, Noland, & Kelly, 2003; Stivers & Onifade, 2014). Wells (2015) found that choosing a career for extrinsic reasons leads to a lack of intrinsic motivators, which fosters a surface approach to learning. A surface learning approach is characterized by an unreflective memorization of facts in order to reproduce them in an assessment (Booth, Luckett, & Mladenovic, 1999). When students do not see the relevance of a subject to their personal lives, they have a tendency to memorize just enough to pass the class.

Deep learning takes place when students focus on the content of the task and how it relates to previous knowledge. It is an internal process which integrates new material with their personal experiences, knowledge, and interests. In other words, deep learning searches for meaning while surface learning strives for memorization. Interest in a subject precipitates a search for understanding and studies indicate a connection between the level of interest and deep learning (Fransson, 1977; Nolen, 1988).

Accounting is a difficult subject for many students. Some view accounting as being as difficult as learning a new language (Borja, 2003). Wells (2015) found that one of the major factors which contributed to students perceiving accounting as repetitive and tedious was an

absence of context. Understandably, students with little professional experience will struggle to make the personal connections required to affect authentic interest when material is delivered from an unrelatable perspective. When discouragement robs motivation, negative stereotypes are reinforced. Educators must incorporate new ways of teaching accounting to demonstrate its relevance and stimulate interest if learning is to occur.

Active Learning

Educators should understand the educational theories that underpin instructional design to successfully intervene. A great deal of academic research has gone into the pedagogy of the first accounting courses with little consensus achieved as to the best approaches (The Pathways Commissioners, 2012). While viable theoretical positions are voluminous, Biggs (1993) asserts that there is a certain degree of consensus that already exists about basic assumptions. He posits that most educators agree that teachers must get students to engage in learning activities if students are to learn desired outcomes. Constructivism is the basis of many popular learning theories which center on active learning.

Constructivism. Constructivism is not a specific pedagogy. Rather, it is a study of knowledge which asserts that knowledge is constructed by individuals based on experiences (Hendry, Frommer, & Walker, 1999). Instead of having teaching "transmit" information that students "receive", constructivists emphasize the importance of having students become actively involved in the construction of knowledge (Cognition Technology Group at Vanderbilt [CTGV], 1992a). Constructivism has implications for pedagogical theories. Problem-based learning, situated learning, anchored learning, and case-based learning are examples of teaching theories born out of constructivism.

Jean Piaget and Lev Vygotsky are commonly cited as instrumental in early constructivism. Piaget believed that when individuals encounter new learning situations, they draw on prior knowledge to help make the new experience comprehensible. He identified key aspects of this process: assimilation and accommodation (Reinkling, Labbo, & McKenna, 2000). Individuals assimilate new information by incorporating it into an existing framework without changing the framework. Accommodating new information means that existing knowledge is restructured to fit new information. This "disequilibrium" facilitates learning (Fosnot, 1996).

Vygotsky's theories emphasize social interaction as fundamental in the cognitive development. Social constructivism does not consider knowledge to pre-exist. Rather, knowledge is constructed socially, through activities, as members of society (Kukla, 2000). Proponents of social constructivism believe learners must have ownership of not only the problem solving process but also of the problem itself (Derry, 1999). Opponents criticize this approach as taking constructivism to the extreme. Kirschner, Sweller, and Clark (2006) describe this an "unguided method of instruction". Such pure discovery methods of instruction may not be suitable for novices because they have little or no experience with the subject matter. Mayer (2004) claims constructivism is misapplied when used in this fashion in that the techniques require learners to be behaviorally active but this differs from cognitive activity. His position is that instructors should promote cognitive activity through guided practice.

Piaget and Vygotsky are often associated with John Dewey who proceeded them with well-known publications about education. Among his most popular publications is *Experience and Education* (1938). In this book, Dewey asserts that the provision of a context promotes understanding. Dewey's main concern was a disparity between the students' experiences and the kinds of concepts imposed (Sikandar, 2015). While Dewey called for a shift in education to

make learners the central figures (Dewey, 1910), he recognized that unguided instruction can potentially minimize the importance of the content. He defines the student and curriculum as "two limits" where the student and facts of studies define instruction (Dewey, 1902). The teacher should plan and connect the subject matter to students, keeping in consideration the needs, desires, interests, and cognitive development of the students (Dewey, 1910).

Problem-based learning. Problem-based learning has its roots in medical education which has provided important resources for understanding the issues involved with implementing it into the accounting curricula (Johnstone & Biggs, 1998). Proponents of problem-based learning assert that learning begins with people solving problems (Hung, 2002). The problem-based learning process is described by Boud and Feletti (1997) as presenting a problem to students who organize their ideas as a group, attempt to define the broad nature of the problem, pose questions, and define learning issues that they do and do not understand. Students investigate these issues and then reconvene to integrate their new knowledge into the context of the problem. Students continue this process as they progress through the problem. One important characteristic of problem-based learning is that not all of the facts are given, and therefore, the problem may have more than one acceptable answer based on the assumptions that students make (Hansen, 2006). In other words, these problems are deliberately designed so that there is no fixed formula for conducting the investigation or solving the problem.

While some results from existing studies are mixed, most studies focused on problem-based learning in accounting education generally support the rationale behind this approach (Breton, 1999; Hsu, Yen, & Lai, 2016; Shawver, 2015; Suryanti, 2016). Proponents of problem-based learning consider this approach to mirror real-world situations. Hung (2002) contends that when students are in authentic situations, they are compelled to learn. Stinson and Milter (1996)

use the word “authentic” to describe problem-based learning problems based on the presumption that managers rarely face neat, well-structured problems. This also is true in the medical field where doctors are presented with a patient’s symptoms. The problems are vague and unstructured. Stinson and Milter contrast this “ill-structured” approach to the Harvard Business School Case Studies, which they consider to be “prepackaged and preanalyzed”. They subscribe to the idea that projects should have a large macro approach that addresses business holistically. Milne & McConnell's (2001) review of the developments of problem-based education suggests it develops self-directed learning behaviors, increases levels of motivation, and clinical reasoning skills by bridging the gap between secondary education and life as a professional.

While problem-based learning certainly meets the criteria of active learning encouraged by the AECC, the AECC acknowledges that effective pedagogical methods vary with circumstances (Accounting Education Change Commission, 1993). Some authors have voiced concern with applying problem-based learning across all levels and disciplines. Vernon & Blake (1993) conducted a meta-analysis that spanned a 25 year period and more than 100 studies. Generally, they found that students like problem-based learning because it helps communication and brings up issues not normally discussed, but students are anxious that they are not acquiring the necessary knowledge under this teaching approach. While problem-based learning offers students a stimulating experience and challenging opportunities, the absence of adequate support can leave students feeling insecure rather than empowered (Milne & McConnell, 2001). Problem-based learning techniques have been utilized more in undergraduate and graduate education programs where students have already gained a fundamental understanding of accounting concepts and principles (Dockter, 2012). Stanley & Marsden's (2012) case study about the implementation of a problem-based learning project noted how they eventually decided

to place this project in the final year of the accounting program so that students would possess adequate accounting knowledge.

Situated learning. Situated learning is an instructional approach developed by Jean Lave and Etienne Wenger in the early 1990s and follows the work of Dewey, Vygotsky, and others (Clancey, 1995). The focus of this approach is on the relationship between learning and the social situation in which it occurs (Lave & Wenger, 1998). Rather than concentrating on conceptual structures, educators who subscribe to situated learning question what types of social engagements provide the proper context for learning (Lave & Wenger, 1998).

Situated learning is usually associated with learning in an actual workplace (Matsuo, 2012). This is a common requirement in professions such as teaching and health sciences but there is no such requirement in accounting education (Stanley, 2013). Situated learning emphasizes the social aspect of learning. Lave & Wenger (1991) contend that learning is not the transfer for knowledge from one individual to another but a social process where knowledge is co-constructed, situated in a specific context, and tied to a specific social environment. Lave and Wenger call this social learning environment a "community of practice". The emphasis on learning as a social phenomenon in a specific context serves as a basis for situated learning advocates to marginalize training by abstraction and posit that knowledge does not transfer between tasks (Brown, Collins, & Duguid, 1989). Brown, Collins, and Duguid's "situated cognition" theory contends that knowing is inseparable from doing and that all knowledge is situated in activities bound to social, cultural, and physical contexts. Opponents of this view contend that transfer is dependent on the initial practice and the degree to which a subsequent task is similar in its cognitive elements (Anderson, Reder, & Simon, 1996).

Ahmad, Anantharaman, and Ismail (2012) believe that students first need to acquire "anticipatory" acquisition of the values, attributes, and cognitive practices of a profession, then learn social norms before finally acquiring the tasks and roles of that profession. The rationale is that internalizing values leads to real commitment to a profession rather than viewing a job absent of meaning. Many researchers in this area focus more on situated learning as it applies to accounting curricula rather than a teaching method. These researchers believe accounting curricula concentrates too heavily on the technical aspects of the profession and neglects the social and behaviors issues that face accountants (Bracci & Llewellyn, 2012; Dellaportas, 2015). While the discussion around accounting education's role in society is interesting and important, but it is outside the scope of this study.

Anchored learning. Anchored instruction is a less known form of active learning. There are no existing studies which examine the use of anchored instruction in accounting education. While most studies in this area are focused on elementary school (Shyu, 1999, 2000), middle school (Bottge, Rueda, Serlin, Hung, & Kwon, 2007; CTGV, 1992b; Etheris & Tan, 2004) and high school (Prado & Gravoso, 2011) students, it is considered to be applicable at the college level (Brown et al., 1989). Duncan and Bamberry (2010) assert that anchored instruction may be even more applicable to college students, than to younger students. These researchers contend that the greater maturity of college students gives them an increased ability to transfer knowledge and skills acquired in one context to another.

Anchored instruction was developed by The Cognition and Technology Group at Vanderbilt (CTGV) during the 1990s. In general, teaching activities are designed around an "anchor". The rationale is to contextualize the learning activities with an anchor which serves as a common frame of reference. The use of a common frame of reference can create shared

experiences. These can be useful from a teaching point of view because a teacher can refer to particular experiences knowing that all students have been exposed to it (Duncan & Bamberry, 2010).

CTGV (1991) calls anchored learning environments "macrocontexts". The macrocontexts involve situations that require students to formulate and solve a set of interconnected problems (CTGV, 1992b). CTGV (1991) contrasts this to "microcontexts" which utilize mini-cases and are narrower in focus. While anchored instruction is related to problem-based learning, the point of differentiation is that anchored instruction includes all the necessary data to solve specific problems within the macrocontext (Duncan & Bamberry, 2010).

The contextualized situation is usually presented through a video based presentation format. The logic behind video based delivery of the situation is that the medium gives life to characters and can foster better understanding of the situation for some students as opposed to a written case (Crews, Biswas, Goldman, & Bransford, 1997). Dechef (2005) also asserts that traditional written cases are second-hand reporting of events, which make them less immediate and interesting. Shyu (1999) examined the effects of video based anchored instruction versus printed instruction on Taiwanese elementary school students. While the results of the study indicated a significant difference in achievement between the video based group and the control group, there was no significant difference between the printed storybook group and the video-based group. Shyu noted that the findings suggest that anchored instruction was more important than the medium used.

Some authors point to anchored instruction as akin to apprenticeship training because it can provide a framework in which authentic tasks can be performed within a teacher-student relationship (Jarvela, 1998). CTGV (1990) posits that anchored learning employed in formal

education may be even more effective than workplace apprenticeships because it provides a context where key learning experiences can be planned and facilitated by teachers and then experienced by students. CTGV (1992a) states that the primary goal that guides its selection and development of particular anchors is to allow students who are novices in an area to experience some of the advantages available to experts when they are trying to learn new information. This approach follows the master versus apprenticeship model (Dewey, 1933). Experts in a particular area are immersed in their subject area and familiar with how they think about it. This affords them the opportunity to change their own thinking when encountered with new concepts relevant to their area of interest (CTGV, 1992b). But for novices, new concepts seem like an introduction of new facts or procedures to be memorized. Anchored learning is designed to have novices use their available knowledge to understand the activities demonstrated through the anchor and then be able to experience the changes in their own understanding as they are introduced to concepts that are relevant to the anchors (CTGV, 1992b).

The most popular example of anchored instruction is the Jasper Woodbury series by CTGV. It focuses on mathematical problems solving with extensions to science, history, and geography. Each adventure included in the series is 15-20 minutes. At the end of each story, the major character is faced with a challenge that the students must solve in class before they are allowed to see how the movie character solved it. The Jasper Series was implemented at the middle school level in 16 schools in nine states between 1990 and 1991. Program effectiveness was evaluated using beginning and end of year measures of basic math concepts, word problems, planning skills, student attitudes, and teacher feedback. Both control groups and groups using the Jasper Series improved in basic math skills during the year (CTGV, 1992b). Groups associated with the Jasper Series performed better in word problems and planning skills. When

compared to the control groups, treatment groups showed less anxiety toward mathematics and were more likely to see mathematics as relevant to everyday life (CTGV, 1992a). Teachers' comments were overwhelmingly positive except they reported students tired of the constant testing associated with measuring the effectiveness of the teaching method.

Two studies that focused on college students were found which relate to anchored instruction. Michael, Klee, Bransford, & Warren (1993) evaluated the use of video-based anchor instruction versus traditional classroom instruction in a college setting to test student's mastery of language learning theories. Results were mixed and the sample size was small (22 students). Duncan & Bamberry (2010) examined the use of anchored instruction on undergraduate business students in an international business course. Student responses were favorable.

Case-based learning. Case-based learning is one of the few active learning techniques specifically recommended by both the AECC and Pathways Commission (Accounting Education Change Commission, 1992; The Pathways Commissioners, 2015).

Case based teaching originated in the law field at the start of the twentieth century (Williams, 1992). It was incorporated into business studies soon after with a book of cases appearing at Harvard University in 1922 (Skliarenko & Rameshwar, 2004) where the case method was established as the primary method of instruction in 1924 (Hunter, 2015).

It is the most prevalent active learning method examined in literature and commonly advocated as a possible strategy to improve accounting education (Adler, Milne, & Stringer, 2000; Boyce & Greer, 2012; Boyce, Williams, Kelly, & Yee, 2001; Cullen, Richardson, & O'Brien, 2004; Hassall, Lewis, & Broadbent, 1998; Healy & McCutcheon, 2010; Libby, 1991; Weil, Oyelere, & Rainsbury, 2004).

Case studies are said to engage and motivate accounting students (Boyce & Greer, 2012; Healy & McCutcheon, 2010) by fostering insight into business situations that students would otherwise not experience (Dellaportas, 2015). This can have a significant effect on student perceptions and attitudes (Burton & Sack, 1991). The rationale for the case based learning approach is that students are more receptive to teaching when they are immersed or "living" in the learning experience (Grant, 2015). When there is meaning, interest is sparked (Dechef, 2005; Paul & Mukhopadhyay, 2004) and this can engage students as active participants (Driver, 2001).

Biggs's (1989) work on deep learning suggests four essential elements which Boyce et al. (2001) used as a reference to demonstrate the alignment of the case method to improving accounting education. The climate of learning establishes the motivational context (Biggs, 1989). The teacher needs to create a climate that stimulates students "proprietorial" interest (Biggs, 1989). Boyce et al. (2001) assert that real-world scenarios foster this type of climate by adding a dimension of realism. One could interpret the concept of proprietorial interest to mean something even deeper than the implementation of real world scenarios. It implies a student centered approach when selecting and using case studies. Rippin, Booth, Bowie, & Jordan (2002) point out that the constraints of working in a mass system can diminish the case-based method when the case becomes whatever is available in the standard textbook. Lack of appropriate materials is a criticism of this approach (Burgoyne & Mumford, 2001). McFarlane (2015) contends that relevance must be the key criterion in the selection of case studies in the classroom. Other researchers agree that personal relevance to the lives of students is critical in engaging their interest in case studies (Mustoe & Croft, 1999; Raju & Sanker, 1999).

The second element of Biggs' model is learner activity. Case studies encourage active involvement in the learning process by requiring students to apply knowledge to new situations

and reinforce their real understanding of what they learned (Boyce et al., 2001). To some extent, case studies are defined by how they are taught and by the learning objectives which are ascribed to them (Hassall et al., 1998). Delivering a case study in class does not automatically trigger student activity. Critics points out that case method teaching, or other active teaching methods, may encounter attitudinal barriers from instructors (Libby, 1991) and resistance from students (Adler et al., 2000).

Interaction with others is Biggs' third component. Boyce et al. (2001) note that cases can provide opportunities for this type of interaction. Biggs points out that interaction is comprised of two kinds: interactions with an expert and interaction with peers. An instructor's comfort and desired level of control can influence this interaction (Cullen et al., 2004). The final element of deep learning is well-structured knowledge (Biggs, 1989). Boyce et al. (2001) claim that cases meet this element by moving the focus from strict accounting procedures to concepts. Continuity may be an important component of this. Biggs' posits that content taught piecemeal, isolated from other related content, does not easily lead to deep learning.

Published managerial accounting cases. The case-based method can take on many forms: fictional and real-world, in-class and out-of-class, and open and close-ended from internal or external perspectives. There are a variety of sources which publish cases for use in managerial accounting courses.

The IMA Educational Case Journal (IECJ) is a quarterly online journal that publishes teaching cases and notes (Institute of Management Accountants, n.d.) but does not require evidence regarding the efficacy of the case. A total of 51 cases have been published within the last five years. There are three peer reviewed journals which concentrate on accounting education. The Journal of Accounting Education (ISSN 07485751), published by Elsevier, has

four sections including one section dedicated to educational cases (Journal of Accounting Education, 2019). Issues in Accounting Education (ISSN 15587983, 07393172), published by the American Accounting Association, also has one of its two sections dedicated to "instructional resources" defined as "cases derived from actual or simulated business activities" (American Accounting Association, 2015, p. 1). Accounting Education: An International Journal is published by Routledge (ISSN 14684489, 09639284). It does not explicitly call for or dedicate a specific section to instructional resources or cases. The cases published in these journals cover the gamut of accounting topics and span lower and upper level undergraduate courses as well as graduate course levels. A review of these journals revealed that 20 cases have been published during the last ten years which were either designed specifically for first year managerial accounting students or utilized in other courses but concentrate on topics commonly covered in the first managerial accounting course.

Breadth of cases and implementation. The cases examined in the peer-reviewed accounting education journals generally include a company background and historical financial information followed by requirements or questions. Many cases include information related to the competitive environment, production processes, product specifications, and other facts or circumstances depending on the nature of the case and its corresponding learning objectives. The majority of cases focused on cost-volume-profit and/or product costs and overhead allocation techniques.

There were no relevant cases which spanned an entire semester or included all of the topics typically included in a first year managerial accounting course. In general, the cases were narrow in scope and rich in background, financial data, and other ancillary information.

Most cases were designed as graded projects to be completed outside of class. Some authors provided implementation guidance to instructors which recommended an allowance of multiple weeks for students to complete the requirements. Four cases were classified as mixed, which the author defines as using a case as a teaching tool or active learning method in class as well as an assigned out-of-class project. Only two cases were specifically designed as active learning methods to be implemented during class sessions. Picconi, Smith, and Woods' (2013) case was designed as a "first-day" exercise for an MBA accounting course where students get hands on exposure creating a statement of cash flows. Everaert and Swenson (2014) implemented a hands on exercise inspired by a conference hosted by The Boeing Company in which participants redesigned an advertising display wagon. Everaert and Swenson adapted this to create an activity where students assemble Lego® trucks in class to better understand product costs and the role of accounting in new product development. The authors recommended a maximum of three 75-minute class sessions to implement their truck redesign case.

Intended users and structure. The majority of the cases examined were designed for upper level undergraduate cost accounting courses or graduate courses in MBA and Masters of Accounting programs. Many of these cases require substantial time for students to complete outside of class and integrate technological components such as Excel or OROS Quick, an application used in activity-based costing (Blocher, Shastri, Stout, & Swain, 2009; Bushong, Talbott, & Cornell, 2008; Danvers & Brown, 2009; Hughes, 2013; Roberts & Zamora, 2012; Stout, 2014; Swain, Charles, Hobson, Stocks, & Pratt, 2010).

While some of these authors note that their cases can be used in the first managerial accounting course, cases designed for upper level cost accounting are marked by a complexity and level of detail that is much greater than the first managerial accounting course (Bushong et

al., 2008). It is recommended that students possess a basic understanding of related fundamental managerial accounting topics to benefit from these cases (Heitger & Heitger, 2008; Lamberton, 2008). In addition to the technical requisite knowledge, some authors caution the use of these upper level cost accounting and graduate cases in first year managerial accounting courses because students need exposure to other business courses in order to receive the most benefits (Samuels & Sawers, 2016).

Traditional cases, in their purest form, typically require students to possess a higher level of business and accounting knowledge in order to sort through complex and unstructured problems (Libby, 1991). Roberts and Zamora's (2012) case, for example, centers on an organization that reengineers laptops to sell to governments of developing nations for them to distribute to local school children. The authors note that while students experience real-life problems by retrieving data from a real organization with unaltered budgets, the tradeoff is a more complicated case, which may not be appropriate for an introductory managerial accounting course. Unstructured problems include the need to comprehend available information, recognize problems and constraints, identify applicable data and tools, evaluate relevant data, consolidate analyses, and assess the suitability of proposed solutions (Phillips, 2001). Kohlmeyer and Samuels (2017) assert that real life problems are rarely clearly identified with all information available to the manager. Instead, managers make assumptions and develop a best solution rather than a right solution. Authors like these purposefully build ambiguity into cases to align with real-world business problems.

Two of the twenty relevant cases contained questions which did not possess any “right answers” (Kohlmeyer & Samuels, 2017; Lamberton, 2008). These cases focused on performance evaluation. For example, Lamberton (2008) designed questions which require

students to justify why the company should change its compensation plan, develop measures to track employee performance against strategic objectives, and analyze the strengths and weaknesses of the proposed change. Two cases included only close-ended questions and both involved the construction of a statement of cash flows (Danvers & Brown, 2009; Picconi et al., 2013).

The other 16 relevant cases included a mix of open and close-ended questions. These cases generally require students to provide quantitative answers followed by open ended responses to questions requiring deeper analyses. For example, Stout's (2014) case requires students to perform a detailed technical analysis related to two cost structure alternatives for a delivery company and then "step back" to offer commentary regarding why they would recommend one structure over another. Mammano and Tyson (2008) require students to prepare current and proposed budgets and develop strategies for a not-for-profit organization to remain viable. Swain, Charles, Hobson, Stocks, and Pratt (2010) require students to compute the sales needed to achieve a target profit but also ask students to develop an activity based costing system and justify their rationale related to cost classifications and drivers.

Cases designed specifically for the first managerial accounting courses. While many of the cases intended for upper level costing accounting courses and graduate programs may be altered to accommodate the first managerial accounting course, only three cases were intentionally designed for this audience (Braun, 2013; Brewer, Garamoni, & Haddad, 2008; Stuebs, Bryant, Edison, & Reese, 2017). Campbell and Lewis (1991) assert that simpler cases may benefit introductory accounting students. The three cases were designed accordingly.

Consistent with the 20 cases examined, there appears to be more cases written for upper levels. Braun's (2013) review indicates that there are few cases specifically designed for

introductory accounting students, whose characteristics and needs are more elementary than those of upper level accounting and MBA students. Cases are often too challenging and overwhelming for introductory level accounting students (Brewer et al., 2008; Wolcott, Baril, Cunningham, Fordham, & St. Pierre, 2002).

Another important consideration is the heavy non-accounting business major enrollment in introductory managerial accounting classes (Braun, 2013). Stuebs, Bryant, Edison, and Reese (2017) note how the simplicity of their case facilitates use in this particular course. Brewer, Garamoni, and Haddad (2008) note that a balance must be struck when designing these first year cases. They must offer a realistic business context that will engage students while providing the simplicity that is necessary for an introductory course. All three of these cases utilized closed and open ended questions and relatable small businesses as frames of reference.

Student perspective. Some authors are intentional about setting the stage for how students should approach a case in terms of their perception or role relative to the business. The author has classified these roles as internal or external. Cases that did not provide students with any role in relation to the case were classified as external. These questions resemble end-of-chapter textbook questions like this: "Rank customers from most profitable to least profitable" (Heitger & Heitger, 2008). Other cases provide students a role to step into which is grounded from an outsider's or external perspective. For example, Stuebs et al. (2017) place students in the role of helping a professor in a consulting engagement for "Brittney's Boutique". Only five of the 20 cases explicitly situate students from an employee or owner's perspective (Blocher et al., 2009; Convery & Swaney, 2012; Everaert & Swenson, 2014; Krumwiede & Walden, 2013; Swain et al., 2010). For example, although Dream Chocolate Company is a real company, the authors instruct students to "put yourself in Kay Johnson's (owner) shoes" (Krumwiede &

Walden, 2013), Everaert and Swenson (2014) use the possessive pronoun "your" when phrasing questions such as "Calculate *your* truck's product cost," and Swain et al. (2010) instruct students to assume they are senior staff accountants.

Evidence related to case efficacy. While the cases vary in content, implementation, complexity, and perspective, effectiveness of the cases has been measured similarly. Three of the 20 articles did not provide evidence of the cases' effectiveness. Seventeen of the 20 articles measured effectiveness through student perceptions using a Likert type scale. Thirteen of these cases employed a questionnaire after the case project was complete which measured either one of two variables or both. One variable related to students' perceptions about the case's overall effectiveness. Examples include "The case was a useful learning experience" (Braun, 2013), "I would recommend my professor use this case again in future classes" (Stuebs et al., 2017), "I feel more confident with the material after completing this case" (Samuels & Sawers, 2016), and "The case was interesting (Krumwiede & Walden, 2013).

The second variable focused on students' perceptions related to the case's usefulness in achieving specific course objectives. Examples include "After using the case, I am now able to successfully build a profit-planning model for a multi-product business" (Stout, 2014), "The case increased my understanding of how to apply costs-of-quality concepts to a business" (Kohlmeyer & Samuels, 2017), and "The case helped me understand the difference between variable and fixed costs" (Walters & Pergola, 2009). Results of these end-of-project surveys indicate that students perceive cases to be an effective teaching method and useful in helping them achieve specific course objectives.

Two studies measured students' self-assessed knowledge after the case was complete relative to their perceived beginning knowledge. For example, "My knowledge of allocating

direct costs *was*…My knowledge of allocating direct costs *is*….” (Mammano & Tyson, 2008). Two studies measured students’ self-assessed knowledge before and after the case but these pre and post-test responses were not matched or paired. One example is “How do you rate your overall competency in using Excel to create and manipulate data?” (Convery & Swaney, 2012).

None of the relevant cases examined employed a controlled experiment whereby students were separated into control and experimental groups.

Appendix A summarizes the 20 relevant cases by year, topic, intended level, perspective, structure, measure of effectiveness, and results.

Contribution

Appropriate teaching techniques are essential in effectively preparing the next generation of management accountants. The method examined in this paper was designed to answer the calls of professional accounting organizations to make accounting students active participants in the learning process rather than passive recipients. It specifically addresses the first managerial accounting course, which is generally considered to be one of the most critical elements in students’ perceptions of accountants as people, accounting as a subject, and accounting as a profession. The implementation of such a case comes at a critical time when Baby Boomers are retiring and the role of management accountants is changing. There are implications for the public and profession.

The author calls this original case a “continuing case”. The case centers on All Aboard, Inc., a small business that manufactures toy trains. It is the first of its kind designed to span an entire semester. This continuing case expands on various active learning methods in an effort to contextualize learning activities for a challenging and important course commonly included in an undergraduate business curriculum.

Problem based learning elements. Similar to problem-based learning, the continuing case is designed around problems and decisions which students may encounter in their careers. The distinguishing characteristic of problem-based learning is that it intentionally does not include all of the facts required to solve problems in an effort to mimic real-world situations. The result is that there may be more than one acceptable answer to the problems posed. The continuing case utilizes this approach but only to a degree appropriate for first year managerial accounting students. Each module requires students to solve problems which follow a more fixed approach to problem-solving and consequently have concrete answers. These questions are followed by more subjective questions that resemble problem based learning. These unstructured questions typically center on the strategic role of management accountants in accordance with the IMA's core competencies (Institute of Management Accountants, 2017).

For example, one module requires students to determine All Aboard Inc.'s current margin, turnover, and return on investment using financial information they constructed in previous modules. Drawing on their previous work, students infuse the new information to arrive at a quantitative solution. Next, using the correct solution, coupled with their familiarly with the business's strategic goals, they are called upon to develop specific ways that their company can improve return on investment and analyze the tradeoffs associated with their proposals. The result leverages problem-based learning's authentic, self-directed process while providing the foundational knowledge and concrete direction needed by first year managerial accounting students.

Situated learning elements. The continuing case is designed with the understanding that learning may be tied in some degree to the social environment in which it is constructed. First, the continuing case purposefully instructs students to assume the role of business owner or

employee of All Aboard, Inc. This differs from most existing cases. This perspective is intended to create an environment that stimulates students "proprietorial" interest (Biggs, 1989). The vast majority of accountants spend most of their careers within organizations where they have management accounting responsibilities (Siegal et al., 2010). A learning environment that positions students from an internal perspective better represents the professional environment they will encounter and roles they will assume.

The continuing case also facilitates a "community of practice" whereby students learn from each other by sharing information and experiences (Lave & Wenger, 1998). Physical Lego® pieces are used throughout the semester to demystify seemingly abstract concepts such as direct and indirect costs, variable and fixed costs, product costing methods, work-in-process inventory, journal entries, product cost flow, and budgeting. In addition to this hands on experience, students step into roles such as an assembler or president and acquire a memorable context for differentiating between product and period costs and gain a better understanding of overhead allocation and cost-volume-profit concepts. The classroom itself can also help students experience a more authentic environment when specific areas are used consistently for simulated raw materials storage, work-in-process, finished goods warehousing, or corporate headquarters.

Physical learning aids, assumption of roles, and designated areas in a classroom are designed to create an environment which can leverage the social aspects of learning emphasized by situational learning advocates. The result can be shared experiences that resemble ones experienced by coworkers in a professional environment. As the semester progresses, students have encountered the same challenges and decision points in relation to the same business. A comradery ensues and a "history" develops where students recall shared experiences. These

shared experiences can build a trust among students which can foster exploration and collaboration in the classroom.

While the continuing case is designed to leverage these social situations to improve learning, it does not employ situated learning in its purest form. The continuing case is designed to supplement traditional teaching not replace it. While students work together and "co-construct" knowledge by sharing information, this is done under the guidance of an instructor and typically occurs after concepts have been introduced or simultaneously.

Anchored learning elements. The concept of anchored learning inspired the design of a case that spans an entire semester. While this learning technique has been traditionally employed through video and primarily tested at the middle school level, the underlying principle is highly applicable to the first course in managerial accounting: provide students with a consistent context in which to place new knowledge. The researcher and other educators have observed undergraduate business students to lack the experience and contextual framework necessary to apply the course's concepts (Duncan & Bamberry, 2010; Mastilak, 2012; McInnis, 2001). One of the benefits as cited by the CTGV (1993) is that anchored instruction promotes equity because it gives those lacking experience sufficient background to engage in class.

The provision of a consistent anchor provides a sense of continuity, which is difficult to achieve using piecemeal exercises commonly provided by textbooks. An interconnectedness of class sessions develops and students begin to capture the reality that seemingly unrelated learning objectives or chapters are part of a bigger picture. This level of coherence can help students move from a focus on strict procedures that require memorization to analyzing situations as a "business partner" as prescribed by the IMA (Institute of Management Accountants, 2019). For example, during the first week of a semester, students are introduced to

All Aboard, Inc.'s financial data and work with different costing methods to calculate product costs and construct contribution margin income statements. This same material is used week after week until the end of the semester when students are still utilizing previous work to analyze special offers, constrained resources, and make decisions whether to make or buy parts and drop or retain business segments.

Employing a common frame of reference allows the continuing case to leverage benefits typically associated with out of class apprenticeships. First, students obtain hands on experience under the guidance of an expert or "master" (Dewey, 1933). Second, students are immersed in one company and can grow to understand the role of management accounting at a deeper level. The familiarity with the anchor affords students the ability to concentrate of newly acquired knowledge and its application to a familiar context rather than channeling energy toward learning both a new situation and new material with each exercise.

While this continuing case makes use of an anchor, it is not delivered via video. The case is delivered live in class via a written format and guidance by the instructor. This provides a more cost effective means of delivery and allows for two-way spontaneous interactions between instructor and students and among students. This type of real time interaction can be hindered when students are passively observing a video.

A second factor which differentiates the continuing case from anchored learning is the extent to which information is embedded in the case. Anchored learning typically provides all the information necessary for students to solve specific problems. Likewise, the continuing case includes all of the information necessary to solve computational questions but this not housed within each individual module. Consistent with professional life, students are required to draw on knowledge acquired through prior experiences or modules. While the data for these

computational questions is accessible through various modules, not all data is readily accessible to answer the questions focused on strategic issues.

Case-based learning elements. The continuing case combines select elements of problem-based learning, situated learning, and anchored learning, to create a teaching method which takes the form of a unique case. Designing this as a case builds on a rich library of literature which provides evidence for case-based learning's effectiveness on student performance and perceptions. While accounting bodies generally describe active learning in broad terms, case based learning is one of the few specific techniques recommended by the AECC, The Pathways Commission, and the Institute of Management Accountants.

Infusing a traditional case with elements of other active learning strategies makes this continuing case unique. In addition, this continuing case differs from the majority of existing cases in accounting education literature in a variety of ways.

First, it is designed to span an entire semester and cover all of the content typically included in a first year managerial accounting course. No existing studies were found which have examined the implementation of such a case. Second, this continuing case is designed specifically for first year managerial accounting students. Most existing cases focused on management accounting are written for upper level undergraduate courses or graduate courses. It is generally agreed that these cases are not appropriate for introductory level accounting students. Therefore, the continuing case was designed to strike a balance between providing a realistic business context while providing the simplicity appropriate for these students. Third, this continuing case is designed to be implemented as an in-class teaching method rather than an out-of-class graded assignment. It serves as the centerpiece of all class sessions. This approach is different than most existing cases which require a large amount time to complete outside of

class, possibly because they are primarily designed for upper level students. In contrast, the continuing case is designed as a simple case to provide a consistent context that students can reference when applying concepts to more complex scenarios in out-of-class homework and subsequent courses. The underlying principle driving the in-class implementation is to make students active participants in the learning process, not passive recipients of information (Accounting Education Change Commission, 1990). Fourth, effectiveness of the continuing case is measured using a quasi-experimental design whereby students were separated into control and experimental groups. None of the relevant cases examined employed such a method.

CHAPTER 3

METHODOLOGY

This study was intended to address calls from numerous accounting organizations for educators to improve students' career preparedness and perceptions of accounting by employing active learning strategies. A new active learning method was developed specifically for the first managerial accounting course. The effectiveness of this method was measured using a quasi-experimental design.

The research used formal assessments to measure students' performance as well as Likert-scale questionnaires to measure students' perceived achievement of the IMA core competencies and course objectives. The research also used Likert-scale questionnaires to measure changes in students' perceptions of accounting and the treatment group's perceptions of the continuing case method as a learning tool. Focus groups were also conducted to provide a deeper understanding of students' perceptions to further explain the statistical information obtained through other instruments.

This chapter describes the methods used to address the research questions and their hypotheses. It includes sections on the restatement of the problem, research questions, discussion of the population, instrumentation used, data collection, data analyses, and limitations of the study.

Restatement of the Problem

Numerous accounting organizations have challenged educators to improve students' career preparedness and perceptions of accounting by employing active learning strategies. Educators in various disciplines are employing active learning methods such as problem based learning, situated learning, anchored learning, and case-based learning. The author's research

indicates that the most prevalent active learning method in accounting education is case-based learning.

While literature consistently cites the first accounting course as a critical factor in student perceptions and career choices, a review finds that cases in accounting education are narrow in scope, complex in nature, and designed for upper level undergraduate accounting courses or graduate courses. These cases are commonly implemented as graded projects to be completed outside of class. Cases designed for the first managerial accounting courses are few and evidence regarding their effectiveness is limited to results from post class questionnaires related to students' perceptions of their learning and the case in general.

The continuing case method under study was specifically designed for the first management accounting course. It is delivered from an internal perspective and combines numerous active learning methods to create an in-class case that spans an entire semester. This unique case contributes to the library of existing cases in accounting education journals. Obtaining evidence about the effectiveness of this active learning method through a longitudinal quasi-experimental design will be of interest to accounting educators and provide a noteworthy contribution to literature focused on active learning strategies in accounting education.

Research Questions

The following research questions have guided this study:

- Research Question 1: To what extent is the continuing case method associated with student performance as measured by the final exam?
- Research Question 2: To what extent is the continuing case method associated with student performance as measured by assessments exclusive of the final exam?

- Research Question 3: To what extent is the continuing case method associated with student performance as measured by the final course grade?
- Research Question 4: To what extent is the continuing case method associated with students' perceptions of accounting?
- Research Question 5: To what extent is the continuing case method associated with students' perceptions of achieving the IMA core competencies?
- Research Question 6: To what extent is the continuing case method associated with students' perceptions of achieving stated course objectives?
- Research Question 7: How do students perceive the use of a continuing case as a method of teaching?
- Research Question 8: How do students perceive the use of a continuing case as it relates to achieving the IMA's core competencies?
- Research Question 9: How do students perceive the use of a continuing case as it relates to achieving the stated course objectives?
- Research Question 10: How do students perceive the continuing case as a learning tool?

Population

The population was comprised of students enrolled in sections of Introduction to Managerial Accounting at one of the 14 universities within the Pennsylvania State System of Higher Education. Introduction to Managerial Accounting is a required course for all business majors at most colleges and universities. The population is representative of students enrolled in the same course at other universities because it is comprised of both accounting and non-accounting majors (Braun, 2013).

Contents of the First Managerial Accounting Course

The content covered in the course for this study is representative of the content covered in the same course at other universities. Contents of the top selling introduction to managerial accounting textbooks for undergraduate students were examined to measure the proximity of the content included in the course under study to first year managerial accounting courses at different colleges and universities. "Introduction to Managerial Accounting" was used in the keywords field at Amazon.com on October 7, 2017 to find textbooks published after January 2013. Results were sorted by best-selling. Other fields such as format, condition, reader age, and language were left open. The search resulted in 56 books. The author and one other accounting faculty member examined the results and classified two textbooks as first year undergraduate managerial accounting textbooks used in business curriculums. *Introduction to Managerial Accounting* by Brewer, Garrison, and Noreen was used by the instructor as the required textbook for the course under study. This book netted 15 out of the 56 results. These matches varied in format such as hardcover, loose leaf, electronic, and prior editions. The other relevant text, *Managerial Accounting* by Braun and Tietz, appeared one time. There were three custom editions of managerial accounting books for use at specific universities. Four managerial accounting textbooks were intended for use at the graduate level. Twenty five books were classified as non-comparable college textbooks and nine were considered non-college books.

Contents were compared for the most recent editions of the two relevant textbooks: *Introduction to Managerial Accounting*, 7th Edition (2016) and *Managerial Accounting*, 5th Edition (2018). While some of the topics and subtopics varied in nomenclature, the contents were nearly identical. General managerial accounting concepts, job costing, activity-based costing, process costing, cost-volume-profit analysis, variable costing, master budgeting,

standard costs and variances, performance management, decision making, capital decisions, statement of cash flows, and financial statement analysis were the primary concepts covered by both texts. "Sustainability", which appeared in the last chapter of the Braun and Tietz book, was the only topic not covered in both texts. Appendix B shows a comparison of these two textbooks by chapter.

Controlling for Factors Between Groups

This study spanned two consecutive 15-week semesters: Spring 2018 and Fall 2018. Two sections of Introduction to Managerial Accounting were held each semester. One section from each semester was randomly selected as the treatment and control group.

This study examines the effects of the continuing case teaching method while controlling for other factors. Instructors can affect students' perceptions and consequently, evaluations of a course's effectiveness (Delucchi, 2000; Marks, 2000; Nisbett & Wilson, 1977). This methodology eliminates the "instructor effect" because each section was taught by the same instructor.

The treatment and control classes were taught concurrently within the same semester, controlling for any changes between semesters. For example, the instructor administers new interim exams every semester. Structuring each semester with one control group and one treatment groups promotes comparability in assessments. In addition to being taught within the same semester, both sections were taught in the afternoon and held on the same days of the week. Class session length and structure can affect student performance and perceptions (Carrington, 2010; Gallo & Odu, 2009; Reardon, Payan, Miller, & Alexander, 2008). This study controls for class session length and scheduling because both groups were conducted as face-to-face sessions, held on Tuesdays and Thursdays. Each session was 75 minutes with no breaks.

All students received the same number of instructional hours over a traditional 15-week semester.

In addition to parity in total instruction hours, each group received the same class time by chapter. The required textbook and learning management system was the same for both groups. Course content, as well as its sequence, was identical for both groups. Out of class homework was administered through an online learning management system. The same exercises were assigned for both groups. Homework due dates were the same for both groups. Each group received the same interim examinations each semester. These included two closed book, in class examinations and two online examinations administered on the same days for both groups. Finally, both groups were administered the same final examination. This was a cumulative, closed book examination, delivered in class to both groups.

It is important to note that the same general teaching method was employed during class sessions for both groups. First, the instructor would introduce new material, its theoretical background, and practical implications. This was done via lecture utilizing a document camera/digital projector and chalkboard. Next, students would engage in a hands on learning activity. Most students worked with peers during this period to solve the problems presented to them. The instructor would also help guide students individually during this period.

The content of these hands on activities was the same for both groups. For example, both groups encountered exercises related to labor efficiency variances and labor rate variances on the same day. Textbook problems were used for the control group. These problems are written from an external perspective and utilize different companies as reference points for the efficiency variance and the labor rate variance exercises. Students in the treatment group used problems from the continuing case during this period. Both efficiency variances and labor rate variances

were presented in the context of All Aboard, Inc. Students in the treatment group analyzed the same topics except they were delivered from an internal perspective and in relation to a familiar reference point with which they had had prior "experience". After allowing for this hands on period, the instructor would review the specific exercises and address any additional questions from students.

Note that this study does not examine the effects of a passive learning approach versus an active learning approach. Rather, it is an examination of a novel active learning method versus a "traditional" active learning method. This important distinction also contributes to the researcher's effort to control for factors outside of the continuing case teaching method.

Instruments Related to Student Performance

Three measurements were used to assess the continuing case's effect on student performance: final examination grades, assessments exclusive of the final examination, and total course grades. The final examination was an in-class, closed book cumulative final. Assessments exclusive of the final examination included online homework, in-class pop quizzes, and four interim examinations.

Instruments to Measure Student Perceptions

Instruments to measure student perceptions of accounting. The AECC and Pathways Commission are concerned about student perceptions of accounting. These organizations have urged accounting instructors to employ engaging learning approaches to improve students' experiences in the first accounting courses. Student perceptions impact career choices and have implications for the profession and public.

A pre-class questionnaire and post class questionnaire were administered to both the control and treatment groups. The objective was to measure changes in students' perceptions

related to accounting and gather demographic data including gender, GPA, class level, and major.

The questions designed to measure student perceptions of accounting were based on a review of literature which finds that students commonly find the subject of accounting to be boring and that this perception deters them from pursuing a major or career in this area (Allen, 2004; Geiger & Ogilby, 2000; Jackling & Calero, 2006; Picard et al., 2014; Stivers & Onifade, 2014). This instrument was also based on studies which show that students' attitudes toward accounting typically decline over the course of a semester (Geiger & Ogilby, 2000; Marriott & Marriott, 2003; Tickell et al., 2012). Researchers assert that teaching methods which do not facilitate personal relevance perpetuate this problem. Overall, literature consistently shows that the first year accounting courses are the primary factors which impact student perceptions of accounting (Geiger & Ogilby, 2000; Jackling & Calero, 2006; Nelson et al., 2008).

The first pre class survey was reviewed by an expert panel of three accounting professors with decades of teaching experience at the undergraduate level. This version was structured as three distinct constructs to measure students' perceptions of accounting. The survey was administered to a pilot group of 57 students drawn from two sections of a first year management accounting course. Cronbach alpha statistics were computed to measure the extent to which each statement measured students' perceptions of accounting within the three categories. Poor (<.70) Cronbach alpha statistics resulted for two of the constructs indicating inconsistent responses. However, acceptable Cronbach alpha statistics were obtained when all questions were combined as one construct. Consequently, it was decided to analyze students' perceptions of accounting as one construct. In addition, there was concern related to survey length and it was decided to reduce the number of questions from ten to six. Questions were removed based upon which

omission would increase the alpha, as indicated by IBM SPSS-24. This revision resulted in a Cronbach alpha statistic that exceeded a minimal acceptable level of .70 to demonstrate internal reliability (Pearson, 2010).

Instruments to measure student perceptions of performance. Students' perceptions of their achievement of learning outcomes were collected to enhance the validity of this study. Student perceptions of their learning complements measurements of the continuing case's effectiveness provided by formal graded assessments. Students' perceptions of their learning were measured using two methods: the IMA's management accounting competency framework and stated course objectives.

The questionnaire was administered to a pilot group of students drawn from two sections of a first year management accounting course. Feedback was solicited from a focus group comprised of these participants to identify any confusing questions.

Instruments to measure student perceptions of their performance as measured by the IMA Management Accounting Competency Framework. The IMA Management Accounting Competency Framework consists of five major categories: planning and reporting, decision making, technology, operations, and leadership (Institute of Management Accountants, 2017). Statements were drafted to measure each category except technology. The continuing case teaching method was employed only as an in-class active learning approach. Therefore, technology was excluded as a variable in measuring the effectiveness of the continuing case teaching method.

Questions measuring the relevant competencies were reviewed by the same panel of experienced accounting professors. Copies of the IMA's Management Accounting Competency Framework were provided to each reviewer. Reviewers examined the framework in reference to

the statements in the survey to ensure that the main components of each relevant competency were adequately and appropriately captured in the survey instrument. Changes were made to the initial draft which increased the quality and validity of the survey instrument. The four statements are shown below:

- I have the skills to prepare a financial plan for a specific period of time or project, compare actual results to planned results, and forecast future financial needs and performance
- I feel confident in using financial information to guide decisions which could have strategic consequences on an organization
- I feel prepared to analyze business situations with competing priorities and communicate my findings as a cross-functional business partner to transform company-wide operations
- I would feel confident assuming a leadership role to help others think strategically and lead initiatives to increase profitability

Instruments to measure student perceptions of their performance as measured by course objectives. The thirteen course learning objectives included in the instrument were explicitly stated in the course syllabus and reviewed on the first day of class. These were developed by Millersville University and align with the course content. Two general objectives relate to facilitating long term retention and understanding the interconnectedness of specific topics. The remaining eleven objectives pertain to each chapter covered in the course. These objectives are designed to clearly communicate expectations of students, establish a sequence of milestones, and ultimately describe the intended result of the instruction:

- I understand cost classifications such as variable costs and fixed costs and how these impact contribution margin

- I understand how overhead is applied in a job-order costing system, the corresponding journal entries, and the computation of product costs
- I understand the rationale behind activity based costing and how product costs are calculated under this method
- I understand what equivalent units are and how to use this information to compute a cost per equivalent unit
- I understand how changes in variable costs, fixed costs, selling price and sales volume affect net operating income and break-even points.
- I understand how variable costing differs from absorption costing and feel confident in making decisions related to different business segments
- I am prepared to construct a sales budget, production budget, direct materials budget and direct labor budget
- I can prepare a flexible budget and am prepared to fully explain variances
- I understand how to compute and use return on investment, residual income, delivery cycle time, throughput time, and manufacturing cycle efficiency
- I can differentiate between relevant and irrelevant costs and benefits in a decision and make prudent decisions related to making or buying a product, accepting or rejecting a special order and processing joint products further
- I am prepared to use the payback period, simple rate of return, and present value methods to evaluate investments
- I will remember what I learned for many years
- I understand how all of the topics and chapters are connected

Instruments to Measure Treatment Groups' Perceptions

Students in the treatment groups were provided an additional survey at the end of the semester to measure their perceptions related to the continuing case as a learning tool. This method mirrors the methodology used in the articles examined in the accounting education journals. Similar studies measure the efficacy of their cases by examining student perspectives related to (1) the case's overall effectiveness as a method of teaching and (2) its usefulness in achieving specific course objectives.

Instruments to measure treatment groups' perceptions of the continuing case as a teaching method. Ten distinct statements were developed to measure the effectiveness of the continuing case as a teaching method. These statements were constructed based on the benefits of active learning techniques commonly noted in literature.

The two most common statements found in existing studies which are intended to measure a case's effectiveness as a teaching method ask students to rate the general helpfulness of the case and their agreement with whether the instructor should use the case again. Likewise, these two statements were included to measure the case's overall effectiveness:

- The continuing case was a helpful learning method
- I would recommend that the instructor use this continuing case again in future classes

A recurring theme in the literature examined was the various benefits derived from the provision of a context (Biggs, 1989; Boyce et al., 2001; Brown et al., 1989; CTGV, 1991, 1992b; Dechef, 2005; Dewey, 1933; Duncan & Bamberry, 2010; Grant, 2015; King & McConnell, 2010; Lave & Wenger, 1998; Williams, Leugn, Kent, & Heazlewood, 2002). Six statements were constructed to measure students' perceptions of the usefulness of the continuing case's common frame of reference:

- The continuing case made difficult topics easier to understand
- The continuing case helped me see how topics and chapters were connected
- It was helpful to apply new material to a familiar common frame of reference
- I used the continuing case as a reference when doing homework assignments outside of class
- The continuing case made managerial accounting more relatable
- The continuing case will help me remember concepts longer than if I learned them through varied textbook exercises

Professional accounting bodies have challenged instructors to make students active participants in the learning process, not passive recipients of information (Accounting Education Change Commission, 1990; The Pathways Commissioners, 2012). The review of literature found many researchers to assert that the learning methods under study can engage students as active participants (Biggs, 1989; Brewer et al., 2008; Driver, 2001; Grant, 2015; Stuebs et al., 2017). Therefore, a question was included to measure the continuing case's impact on a student's involvement in class:

- The continuing case made me feel more involved in class

A minority of the managerial accounting cases examined approached the cases from an internal perspective. Researchers have cited the benefits of cultivating a "proprietorial" interest (Biggs, 1989) and the benefits of personal relevance (McFarlane, 2015; Mustoe & Croft, 1999; Raju & Sanker, 1999). The continuing case approaches the common frame of reference from an internal prospective. Therefore, two questions were included to measure student's perceptions related to this approach:

- I prefer learning the material through a continuing case instead of learning with textbook exercises
- Thinking about situations from the first person perspective (business owner or employee of All Aboard, Inc.) helped me understand and apply the new material

These eleven statements reviewed by the same panel of experienced accounting professors to ensure that the questions were well founded and valid measurements of the continuing case as method of teaching.

Instruments to measure treatment groups' perceptions of the continuing case's effectiveness relative to achieving the IMA core competencies and course objectives. In accordance with existing literature, the instrument administered to the treatment group also measured student perceptions of the continuing case relative to specific course objectives. The eleven specific course objectives were identical to the objectives used in measuring the differences between the treatment and control groups with one exception. This supplemental instrument, which focused on course objectives, explicitly phrased each IMA core competency and learning objective relative to the continuing case.

For example, the first learning objective was stated as "*The continuing case helped me understand* cost classifications…" rather than "*I understand* cost classifications…". This type of phrasing which emphasizes the case's impact on learning objectives is consistent with the studies examined in the accounting education journals which focused exclusively on the treatment groups.

Focus groups. Students in the treatment groups were invited to participate in focus groups each semester. The purpose of these focus groups was to provide a deeper understanding

of students' perceptions of the continuing case and to further explain the statistical information obtained through other instruments.

The ideal size of a focus group recommended in literature varies from four to 14 (Then, Rankin, & Ali, 2014). A focus group which is too large can prevent individuals from participating while small groups can limit the diversity desired. Therefore, a maximum of 10 students was established for each focus group. Focus groups were held in a conference room located in the same building where the managerial accounting course was held. This follows Breen's (2006) recommendation that location should be primarily a matter of what is most convenient for participants.

Focus group sessions were held prior to administration of the treatment group questionnaire but after administration of the questionnaire that measured students' perceptions of accounting, achievement of the IMA competencies and achievement of the learning objectives. This sequence was chosen to guard against students using phrases or material from the treatment group instrument to describe their experiences with the continuing case. This allowed for students to use their own words and share the most beneficial aspects of the case without external influencers.

Then, Rankin, & Ali (2014) assert that a moderator should be a person who knows the population and has a strong knowledge base about the topic. Accordingly, the researcher, who was also the instructor of the course under study, served as moderator. The treatment group questionnaire served as a general guide for the focus groups' semi-structured interviews. It was not used as an all-inclusive or restrictive agenda. The moderator limited his role to a guide who posed broad questions, maintained boundaries, and set a tone for an environment that encouraged all members to share their views.

Data Collection Procedures

The researcher received approval from Millersville University's Institutional Research Board to conduct this research which involved human subjects under the aegis of the university. An informed consent form was delivered at the start of the first class of each semester (see Appendix C). The document informed students that this study was part of the instructor's doctoral studies. The description of the study was limited to a statement, which said, "this study examines students' performance and perceptions related to different teaching methods". No other details regarding the study were provided to any students for the duration of this research. Participation was voluntary and no incentives for participation were offered.

Data collection of student performance. The final examination was administered as an in class, closed book paper examination. This was comprised of multiple choice questions and problems where students were not provided answer options. Students used scantrons to record their multiple choice answers and wrote their answers directly on the examination for non-multiple choice questions. The same final examination was used for both groups and all semesters included in this study.

Identical interim examinations were administered to both the control and treatment groups. Answers for interim examinations were publicized throughout each semester to provide students with detailed feedback. Therefore, interim examinations were changed each semester to level the playing field for all students. Two in-class interim examinations were administered each semester and followed the same structure and collection procedures as the final examination. All students were required to purchase access to McGraw-Hill's online learning management system. Two timed interim examinations were delivered online through this platform. Weekly homework assignments were also delivered through this learning management

system. Results were imported into Microsoft Excel for analysis. Two in-class, closed book pop quizzes were also administered each semester. Consistent with other assessments, these quizzes were identical for both the treatment and control groups and were delivered on the same days for both groups.

Data collection of student perceptions. Data related to student perceptions were collected through hard copy surveys distributed at the beginning and end of each semester. Confidentiality was maintained throughout the study by using a unique identifier rather than using identifying information such as students' names.

Data collection of pre-class perceptions. The pre-class questionnaire was administered to both groups at the beginning of the first class session of each semester (see Appendix D). This occurred prior to any review of course material. In addition to demographic data, data related to students' perceptions of accounting was collected. This portion of the pre-class survey employed a five-point Likert type scale with 5 representing *strongly agree* to 1 representing *strongly disagree*.

Data collection of post class perceptions. A post class questionnaire was administered to both groups during the second to last class session of each semester (see Appendix E). A five-point Likert type scale with 5 representing *strongly agree* to 1 representing *strongly disagree* was used by students to rate their perceptions of accounting, their perceptions of achieving the IMA core competencies, and their perceptions of achieving the stated course objectives.

An additional post class questionnaire was administered to the treatment groups during the last class session of each semester (see Appendix F). This instrument measured student perceptions of the continuing case as a method of teaching, its usefulness in achieving the IMA core competencies, and usefulness in achieving course objectives. This instrument utilized a

five-point Likert type scale with 5 representing *strongly agree* to 1 representing *strongly disagree*.

Data Analysis Procedures

Data collected from student assessments and surveys were coded and entered into Microsoft Excel for analysis using IBM SPSS-24.

Data analysis of student performance. Research questions 1-3 asked to what extent is the continuing case method associated with student performance as measured by the final examination, assessments exclusive of the final examination, and final course grade.

Descriptive statistics regarding frequencies, means, and medians were computed for these assessments. Two sample t-tests were performed to assess whether the average differences between the control and treatment groups were statistically significant. Analysis of variance (ANCOVA) was used to evaluate the means of the dependent variables while controlling for these covariates: gender, GPA, math placement level, class level, and major.

Data analysis of students' perceptions of accounting. Research question 4 asked to what extent is the continuing case method associated with students' perceptions of accounting.

First, one item was constructed as a negatively worded statement with the intention to achieve a more valid measurement. This statement was phrased so that agreement represented a relatively low level of the attribute being measured. Responses for "accounting is boring" were reverse scored to create consistency among all statements.

Next, one index variable was created to provide a summary measure of student perceptions of accounting. Cronbach alpha statistics were computed to measure the extent to which each statement measured the same underlying concept. Each index variable exceeded a minimal acceptable level of .70 to demonstrate internal reliability (Pearson, 2010).

Descriptive statistics regarding frequencies, percentages, and means were computed. Paired sample t-tests were performed to assess changes in students' perceptions of accounting from the beginning to the end of the course. Two sample t tests were performed to assess whether the average differences between the control and treatment groups were statistically significant. Analysis of variance (ANCOVA) was used to evaluate the means of the dependent variables while controlling for these covariates: gender, GPA, class level, and major.

Data analysis of students' perceptions of their performance as measured by the IMA core competencies and course objectives. Research questions 5 and 6 asked to what extent is the continuing case method associated with students' perceptions of achieving the IMA core competencies and stated course objectives.

Descriptive statistics regarding frequencies, percentages, and means of responses were computed for each of the four IMA core competencies and eleven course objectives. Two sample t-tests were performed to assess whether the average differences between the control and treatment groups were statistically significant. Analysis of variance (ANCOVA) was used to evaluate the means of the dependent variables while controlling for covariates.

Data analysis of the treatment groups' perceptions of the continuing case. Research question 7 asked how do students perceive the use of a continuing case as a method of teaching. Research question 8 and 9 asked how do students perceive the use of a continuing case as it relates to achieving the IMA's core competencies and stated course objectives.

Descriptive statistics regarding frequencies, percentages, and means of responses were computed for each of the eleven statements related to the case as a teaching method, the four IMA core competencies and the eleven course content objectives. These research questions pertained only to the treatment group. Therefore, one sample t-tests were performed to assess

whether the average responses were significantly different than the neutral point in the Likert scale.

Research question 10 asked how do students perceive the continuing case as a learning tool. Qualitative data were collected through focus groups comprised of students in the treatment groups. The analyses of focus-group data included summaries of the most important themes, noteworthy quotes, and unexpected findings.

Limitations and Delimitations

Delimitations include restricting the population to undergraduate students enrolled in the first management accounting course at one university. The advantage to using this approach was consistency in instruction, timing, assessments, and enrollment which reduced course differences. The researcher was the instructor for all sections under study. This contributes a high level of expertise and consistency to the study. The limitation is the potential for implicit or unconscious bias to exist toward a particular teaching method that could affect the researcher's behavior. Every effort was made to maintain consistency among sections except for the employment of the continuing case. Because results were restricted to the first management accounting course, a limitation of this study is the generalizability of results to other courses and disciplines. Participants were not randomly assigned to course sections. While students had the freedom to schedule their own courses during the registration period, they were not informed about the differences in teaching approaches.

CHAPTER 4

RESULTS

Organization of Data and Summary

This chapter presents demographic information of Managerial Accounting students included in this study and findings based upon analyses of data related to the ten research questions. The purpose of this study is to examine the association of a continuing case teaching method and student performance and perceptions in the first managerial accounting course. Accordingly, a quasi-experimental design was implemented whereby students were separated into control and treatment groups. Demographic data is presented first, followed by findings related to student performance and student perceptions.

Demographic Data

Demographic data of students in the control and treatment groups are presented in Tables 1 and 2. Students that officially withdrew from the course or stopped doing homework or taking examinations are classified as "withdraws" and excluded from the frequencies and percentages in Tables 1 and 2, as well as the results related to student perceptions and performance.

Seventy-five students were enrolled in the control groups at the end of the semesters. Forty-five of these were male and 30 were female. Eighty students were enrolled in the treatment groups at the end of the semesters. Fifty-one were male and 29 were female. The average GPA was 2.86 for a student in the control group and 2.88 for a student in the treatment group. The treatment groups' average credit hours earned at the beginning of the course was 61.53 and 52.58 for students in the control group. Accordingly, the control group was comprised of 16 percent freshmen, 40 percent sophomores, 35 percent juniors, and 9 percent seniors. The treatment group was comprised of 3 percent freshmen, 28 percent sophomores, 56 percent

juniors, and 14 percent seniors. Twenty-three percent of students in the control groups were accounting and/or finance majors. Twenty-five percent of students in the treatment groups were accounting and/or finance majors.

Incoming freshmen are enrolled in their first math class according to their performance on a uniform entrance assessment. Students whose math placement scores resulted in their enrollment in college algebra or a lower level math course are classified as "average". Students who were enrolled in calculus or a higher level math course are classified as "above average". Sixty-eight percent of students in the control group were average math students and 84% of students in the treatment group were average math students.

While most demographic data was similar between the treatment and control groups, it was not identical. These differences are controlled for as covariates in the statistical tests conducted for this study.

Table 1

Demographic Data

	Control		Treatment	
Demographic Data	Frequency	Percent	Frequency	Percent
Roster				
Enrolled at start of semester	80		84	
Withdraws*	5		4	
Enrolled at end of semester	75	100%	80	100%
Gender				
Male	45	60%	51	64%
Female	30	40%	29	36%
Other	0	0%	0	0%
Class level				
Freshmen	12	16%	2	3%
Sophomore	30	40%	22	28%

Junior	26	35%	45	56%
Senior	7	9%	11	14%
Major				
Accounting	12	16%	13	16%
Finance	5	7%	7	9%
Accounting & Finance	17	23%	20	25%
Management	19	25%	27	34%
Marketing	24	32%	18	23%
International business	2	3%	3	4%
Other	13	17%	12	15%
Non Accounting & Finance	58	77%	60	75%
Incoming math placement				
Average	51	68%	67	84%
Above average	24	32%	13	16%

* excluded from demographics and results

Table 2

Demographic Data: GPA and Credit Hours

	Control (n = 75)		Treatment (n = 80)	
Demographic Data	M	SD	M	SD
GPA	2.86	0.62	2.88	0.51
Credit hours completed	52.58	25.22	61.53	20.22

Student Performance

This section summarizes the results pertaining to student performance as measured by the final exam, assessments exclusive of the final exam, and final course grades. Each research question is stated, accompanied by its corresponding hypotheses. The association of the continuing case teaching method with each student performance measure is first examined through t tests without controlling for covariates. The second test applied to each research

question, an ANCOVA test, controls for covariates when examining the association between the continuing case method, and student performance.

Research question 1. Research question 1 asked to what extent is the continuing case method associated with student performance at a Mid-Atlantic university as measured by the final exam? From this research question, the following hypotheses were developed:

$H1_{01:}$ Students' taught using a continuing case perform worse than or equal to students not taught with the continuing case on the final exam.

$H1_{a1}$: Students taught under the continuing case method perform better on the final exam compared to students not taught with the continuing case.

The final examination was a cumulative, closed book, examination delivered in class. A one-tailed two sample t-test was performed to assess whether the difference in mean scores between the control and treatment groups was statistically significant. Table 3 shows the results of the t-test and descriptive statistics.

Table 3

Results of t-Test and Descriptive Statistics for Final Examination Scores

Group								
Control			Treatment					
M	SD	n	M	SD	n	Mean Difference	t	p
0.687	0.176	75	0.718	0.142	80	0.031	1.20*	0.116

* df = 153

While the treatment groups' average final exam score exceeded the control groups' and met the threshold for passing, the difference was not statistically significantly different. Therefore, null hypothesis $H1_0$ cannot be rejected.

These hypotheses were developed from research question 1 to account for covariates:

$H1_{02}$: Students' taught using a continuing case perform worse than or equal to students not taught with the continuing case on the final exam when controlled for covariates.

$H1_{a2}$: Students taught under the continuing case method perform better on the final exam compared to students not taught with the continuing case when controlled for covariates.

An ANCOVA (analysis of covariance) test was conducted to determine a statistically significant difference in final exam scores between the groups while controlling for major, GPA, gender, credit hours earned, and math placement. The ANCOVA test does not show a statistically significant difference between the control groups' and treatment groups' final exam scores after controlling for major, GPA, gender, credit hours earned, and math placement. Therefore, null hypothesis $H1_{o2}$ cannot be rejected. Table 4 shows the ANCOVA results for the final examination.

Table 4

ANCOVA Results for the Final Examination

Source	SS	df	MS	F	p
Major	0.11	1.00	0.11	5.08	0.026
GPA	0.37	1.00	0.37	17.40	0.000
Gender	0.00	1.00	0.00	0.11	0.740
Credit hours	0.02	1.00	0.02	1.07	0.304
Math placement	0.09	1.00	0.09	4.24	0.041
Group	0.04	1.00	0.04	1.82	0.179
Error	3.14	150.00	0.02		

Research question 2. Research question 2 asked to what extent is the continuing case method associated with student performance at a Mid-Atlantic university as measured by assessments exclusive of the final exam? From this research question, the following hypotheses were developed:

$H1_{01:}$ Students taught using a continuing case perform worse than or equal to students not taught with the continuing case on assessments exclusive of the final exam.

$H1_{a1}$: Students taught under the continuing case method perform better on assessments exclusive of the final exam compared to students not taught with the continuing case.

Assessments exclusive of the final examination included online homework, in-class pop quizzes, and four interim examinations. A one-tailed two sample t-test was performed to assess whether average scores on assessments exclusive of the final exam were statistically significantly different between the control and treatment groups. Table 5 shows the results of the t-test and descriptive statistics.

Table 5

Results of t-Test and Descriptive Statistics for Assessments Exclusive of the Final Exam

Group								
Control			Treatment					
M	SD	n	M	SD	n	Mean Difference	t	p
0.858	0.101	75	0.853	0.096	80	-0.005	-0.34*	0.367

* df = 153

Average scores on assessments exclusive of the final exam were nearly identical between the control and treatment groups. Therefore, null hypothesis $H2_0$ cannot be rejected.

These hypotheses were developed from research question 2 to account for covariates:

$H2_{02}$: Students' taught using a continuing case perform worse than or equal to students not taught with the continuing case on assessments exclusive of the final exam when controlled for covariates.

$H2_{a2}$: Students taught under the continuing case method perform better on assessments exclusive of the final exam compared to students not taught with the continuing case when controlled for covariates.

An ANCOVA test was conducted to determine a statistically significant difference in final exam scores between the groups while controlling for major, GPA, gender, credit hours earned, and math placement. The ANCOVA test does not show a statistically significant difference between the control groups' and treatment groups' scores on assessments exclusive of the final exam after controlling for major, GPA, gender, credit hours earned, and math placement. Therefore, null hypothesis $H2_{o2}$ cannot be rejected. Table 6 shows the ANCOVA results for assessments exclusive of the final examination.

Table 6

ANCOVA Results for Assessments Exclusive of the Final Examination

Source	SS	df	MS	F	p
Major	0.06	1.00	0.06	10.93	0.001
GPA	0.50	1.00	0.50	89.01	0.000
Gender	0.01	1.00	0.01	1.44	0.232
Credit hours	0.01	1.00	0.01	0.97	0.326
Math placement	0.00	1.00	0.00	0.28	0.598
Group	0.00	1.00	0.00	0.49	0.487
Error	0.83	150.00	0.01		

Research question 3. Research question 3 asked to what extent is the continuing case method associated with student performance at a Mid-Atlantic university as measured by the final course grade? From this research question, the following hypotheses were developed:

$H3_{01:}$ Students' taught using a continuing case perform worse than or equal to students not taught with the continuing case on the final course grade.

$H3_{a1}$: Students taught under the continuing case method earn a higher final course grade compared to students not taught with the continuing case.

A one-tailed two sample t-test was performed to assess whether average course grades were statistically significantly different between the control and treatment groups. Table 7 shows the results of the t-test and descriptive statistics.

Table 7

Results of t-Test and Descriptive Statistics for Final Grades

Group								
Control			Treatment					
M	SD	n	M	SD	n	Mean Difference	t	p
0.824	0.103	75	0.826	0.096	80	0.002	0.115*	0.4545

* df = 153

Average final grades were nearly identical between the control and treatment groups. Therefore, null hypothesis $H3_0$ cannot be rejected.

These hypotheses were developed from research question 3 to account for covariates:

$H3_{02}$: Students' taught using a continuing case perform worse than or equal to students not taught with the continuing case on the final course grade when controlled for covariates.

$H3_{a2}$: Students taught under the continuing case method earn a higher final course grade compared to students not taught with the continuing case when controlled for covariates.

An ANCOVA test was conducted to determine a statistically significant difference in final course grades between the groups while controlling for major, GPA, gender, credit hours earned, and math placement. The ANCOVA test does not show a statistically significant difference between the control groups' and treatment groups' final course grades after controlling for major, GPA, gender, credit hours earned, and math placement. Therefore, null hypothesis $H3_{o2}$ cannot be rejected. Table 8 shows the ANCOVA results for final course grades.

Table 8

ANCOVA Results for Final Course Grades

Source	SS	df	MS	F	p
Major	0.07	1.00	0.07	11.88	0.001
GPA	0.47	1.00	0.47	80.56	0.000
Gender	0.01	1.00	0.01	1.14	0.288
Credit hours	0.01	1.00	0.01	1.36	0.246
Math placement	0.01	1.00	0.01	1.44	0.232
Group	0.00	1.00	0.00	0.00	0.976
Error	0.86	150.00	0.86		

Student Perceptions

This section summarizes the results pertaining to student perceptions of accounting, achievement of the IMA core competencies, and achievement of course learning objectives. Research questions 4-6 examine differences in perceptions between students in the control groups and those in the treatment groups. Each research question is stated, accompanied by its corresponding hypotheses. The association of the continuing case teaching method with each perception category is first examined through t tests without controlling for covariates. A second test, ANCOVA, is applied to each research question to control for covariates.

Research questions 7-9 pertain only to perceptions of students in treatment groups. Data was collected through an additional survey at the end of the semester. One sample t-tests were performed to assess whether the average responses were significantly different than the neutral point in the Likert scale.

Research question 10 relates to qualitative data collected through focus groups comprised of students in the treatment groups. Feedback from these sessions is reviewed by theme and original descriptors and outcomes provided by students are presented.

Research question 4. Research question 4 asked to what extent is the continuing case method associated with students' perceptions of accounting at a Mid-Atlantic university? From this research question, the following hypotheses were developed:

$H4_{01:}$ Students taught using a continuing case have perceptions of accounting that are unfavorable or equal to students taught under a traditional active learning method.

$H4_{a1}$: Students' perceptions of accounting are more favorable in sections taught using the continuing case.

Students' perceptions of accounting were measured through responses to six individual questions. A five-point Likert type scale was used with 1 representing *strongly disagree* to 5 representing *strongly agree*. The Likert questions are presented below:

Q1: Accounting is an interesting subject

Q2: Accounting is boring (reverse coded to calculate "accounting perceptions" index)

Q3: Accounting skills can add value to departments outside of accounting

Q4: I plan to pursue a professional accounting certification after graduation

Q5: I would enjoy working in the accounting field

Q6: I see how accounting could be useful in my career

While inferences cannot be applied to the population, Table 9 shows that treatment group students in this sample had higher rates of agreement ("agree" or "strongly agree") to each of the six individual questions.

Table 9

Rates of Agreement for Post Class Accounting Perceptions

	Control (n = 75)		Treatment (n = 80)	
	Frequency	Percent	Frequency	Percent
Q1 - Interesting	38	51%	55	69%
Q2 - Boring*	31	41%	42	53%
Q3 - Add value	59	79%	75	94%
Q4 - Certification	13	17%	15	19%
Q5 - Enjoy	16	21%	26	33%
Q6 - Useful	55	73%	69	86%

* reverse scored

The individual questions were aggregated to create one index variable, "Accounting perceptions". Cronbach alpha statistics were computed to measure the internal consistency of the individual questions. A Cronbach alpha of .885 was found, which exceeds an acceptable level (.70) to warrant combining questions into a single index (Pearson, 2010).

The means of the post class accounting perceptions for the control and treatment groups were compared using a one-tailed independent samples t test. Table 10 shows the results of the t-test and descriptive statistics. Results from the t test indicates a significant difference in post class accounting perceptions between the control groups ($M = 3.14$, $SD = .96$) and treatment groups ($M = 3.58$, $SD = .89$); $t(153) = 3.178$, $p < .01$. The null hypothesis is rejected. The data support alternate hypothesis 4_{a1} that students taught under the continuing case method have more favorable perceptions of accounting compared to students not taught with the continuing case.

Table 10

Results of t-Test and Descriptive Statistics for Post Class Perceptions of Accounting

Group								
Control			Treatment					
M	SD	n	M	SD	n	Mean Difference	t	p
3.14	0.96	75	3.58	0.89	80	0.44	3.178*	0.002

* df = 153

These hypotheses were developed from research question 4 to account for covariates:

$H4_{02}$: Students taught using a continuing case have perceptions of accounting that are unfavorable or equal to students taught under a traditional active learning method when controlled for covariates.

$H4_{a2}$: Students' perceptions of accounting are more favorable in sections taught using the continuing case when controlled for covariates.

An ANCOVA was conducted to determine a statistically significant difference in post class perceptions of accounting between the groups while controlling for major, GPA, and gender. The ANCOVA test shows a statistically significant difference between the control groups' and treatment groups' overall post class perceptions after controlling for gender, major, and GPA, $F(1,150) = 13.02$, $p < .01$. Table 11 shows the ANCOVA results for post class perceptions of accounting.

Table 11

ANCOVA Results for Post Class Accounting Perceptions

Source	SS	df	MS	F	p
Major	29.95	1.00	29.95	55.12	0.000
GPA	2.54	1.00	2.54	4.68	0.032
Gender	0.07	1.00	0.07	0.12	0.726
Group	7.08	1.00	7.08	13.03	0.000
Error	81.51	150.00	0.54		

Null hypothesis $H4_{02}$ is rejected. The data supports alternate hypothesis $H4_{a2}$ that students' perceptions of accounting are more favorable in sections taught using the continuing case when controlled for covariates.

Changes in perceptions of accounting. A noteworthy finding related to accounting perceptions is the change which occurred in each group from the beginning to end of the semesters.

A pre-class questionnaire, identical to the post class questionnaire, was also administered to both the control and treatment groups at the beginning of each semester. Like post class accounting perceptions, the individual questions were aggregated to create one index variable. A Cronbach alpha of .816 was found to warrant combining questions into a single index (Pearson, 2010).

An independent samples t test was used to compare the mean of the pre class accounting perceptions between the control and treatment groups. The difference was not statistically significant. The difference between the control groups' and treatment groups' pre class perceptions of accounting was also not statistically significantly different after controlling for gender, major, and GPA through an ANCOVA test.

Table 12 shows that the control groups' perceptions of accounting declined from the beginning of the semesters (M=3.24, SD = .78) to the end of the semesters (M=3.14, SD = .96). The paired samples t test compares two variables that are from the same individual. The within-subjects design controls for differences between participants such as gender, GPA, class level, and major. While perceptions of accounting declined from the beginning to end of the semester for the control groups, the difference was not statistically significant.

Table 12

Results of Paired Samples t-Test for Control Groups' Perceptions of Accounting

Perceptions of accounting								
Pre class			Post class					
M	SD	n	M	SD	n	Mean Difference	t	p
3.24	0.78	75	3.14	0.96	75	-0.10	-.985*	0.328

*df = 74

In contrast to the control groups' declining accounting perceptions, students' accounting perceptions in the treatment groups increased. Table 13 shows that perceptions of accounting increased significantly from the beginning of the semesters (M = 3.26, SD = .74) to the end of the semesters (M = 3.58, SD =.89) for the treatment groups; $t(79) = 4.715$, $p < .01$.

Table 13

Results of Paired Samples t-Test for Treatment Groups' Perceptions of Accounting

Perceptions of accounting								
Pre class			Post class					
M	SD	n	M	SD	n	Mean Difference	t	p
3.26	0.74	80	3.58	0.89	80	0.32	4.715*	0.000

*df = 79

Research question 5. Research question 5 asks to what extent is the continuing case method associated with students' perceptions of achieving the IMA core competencies at a Mid-Atlantic university? From this research question, the following hypotheses were developed:

$H5_{01}$: Students taught using a continuing case have perceptions of achieving the IMA core competencies that are unfavorable or equal to students taught under a traditional active learning method.

$H5_{a1}$: Students taught under the continuing case method have more favorable perceptions of achieving the IMA core competencies compared to students not taught with the continuing case.

The second part of the post class questionnaire administered to both the control and treatment groups measured students' perceptions related to four competencies emphasized in the IMA's Management Accounting Competency Framework. A five-point Likert type scale was used with 1 representing *strongly disagree* to 5 representing *strongly agree*. The Likert questions are presented below:

Q1: I have the skills to prepare a financial plan for a specific period of time or project, compare actual results to planned results and forecast future financial needs and performance

Q2: I feel confident in using financial information to guide decisions which could have strategic consequences on an organization

Q3: I feel prepared to analyze business situations with competing priorities and communicate my findings as a cross-functional business partner to transform company-wide operations

Q4: I would feel confident assuming a leadership role to help others think strategically and lead initiatives to increase profitability

While inferences cannot be applied to the population, Table 14 shows that treatment group students in this sample had higher rates of agreement ("agree" or "strongly agree") to each of the four individual questions related to achieving the IMA core competencies.

Table 14

Rates of Agreement for Achieving the IMA Core Competencies

	Control (n = 75)		Treatment (n = 80)	
	Frequency	Percent	Frequency	Percent
Q1 - Financial planning	48	64%	70	88%
Q2 - Decision making	45	60%	70	88%
Q3 - Cross-function	45	60%	65	81%
Q4 - Leadership	43	57%	54	68%

The individual questions were aggregated to create one index variable, "IMA core competencies". Cronbach alpha statistics were computed to measure the internal consistency of the individual questions. A Cronbach alpha of .875 was found, which exceeds an acceptable level (.70) to warrant combining questions into a single index (Pearson, 2010).

A one tailed two sample t-test was performed to assess whether the difference in perceptions between the control and treatment groups was statistically significant. Table 15 shows the results of this t-test and descriptive statistics.

Table 15

Results of t-Test and Descriptive Statistics for Students' Perceptions of Achieving the IMA Core Competencies

Group								
Control			Treatment					
M	SD	n	M	SD	n	Mean Difference	t	p
3.54	0.88	75	3.93	0.65	80	0.39	3.133*	0.002

* df = 153

Results of the two sample t-test shows a significant difference in perceptions related to achieving the IMA core competencies for those taught under the traditional active learning method (M = 3.54, SD = 0.88) and those taught using the continuing case teaching method (M = 3.93, SD = 0.65); $t(153) = 3.13$, $p < .01$. The null hypothesis is rejected. The data supports alternate hypothesis 5_{a1} that students taught under the continuing case method have more favorable perceptions of achieving the IMA core competencies compared to students not taught with the continuing case.

These hypotheses were developed from research question 5 to account for covariates:

$H5_{02}$: Students taught using a continuing case have perceptions of achieving the IMA core competencies that are unfavorable or equal to students taught under a traditional active learning method when controlled for covariates.

$H5_{a2}$: Students taught under the continuing case method have more favorable perceptions of achieving the IMA core competencies compared to students not taught with the continuing case when controlled for covariates.

An ANCOVA test was conducted to determine whether there is a statistically significant difference in perceptions of achieving the IMA core competencies between the groups while controlling for major, GPA, and gender. The ANCOVA test shows a statistically significant difference between the control groups' and treatment groups' average perceptions after controlling for major, GPA, and gender, $F(1,150) = 10.97$, $p < .01$. Table 16 shows the ANCOVA results.

Table 16

ANCOVA Results for Students' Perceptions of Achieving the IMA Core Competencies

Source	SS	df	MS	F	p
Major	3.22	1.00	3.22	6.05	0.02
GPA	6.48	1.00	6.48	12.18	0.00
Gender	1.62	1.00	1.62	3.05	0.08
Group	5.84	1.00	5.84	10.97	0.00
Error	79.86	150.00	0.53		

Null hypothesis 5_{o2} is rejected. The data supports alternate hypothesis 5_{a2} that students taught under the continuing case method have more favorable perceptions of achieving the IMA core competencies compared to students not taught with the continuing case when controlled for covariates.

Research question 6. Research question 6 asks to what extent is the continuing case method associated with students' perceptions of achieving stated course objectives at a Mid-Atlantic university? From this research question, the following hypotheses were developed:

$H6_{01}$: Students taught using a continuing case have perceptions of achieving stated course objectives that are unfavorable or equal to students taught under a traditional active learning method.

$H6_{a1}$: Students taught under the continuing case method have more favorable perceptions of achieving stated course objectives compared to students not taught with the continuing case.

The third part of the post class questionnaire administered to both the control and treatment groups measured students' perceptions related to thirteen course objectives. A five-point Likert type scale was used with 1 representing *strongly disagree* to 5 representing *strongly agree*. The Likert questions are presented below:

Q1: I will remember what I learned for many years

Q2: I understand how all of the topics and chapters are connected

Q3: I understand cost classifications such as variable costs and fixed costs and how these impact contribution margin

Q4: I understand how overhead is applied in a job-order costing system, the corresponding journal entries, and the computation of product costs

Q5: I understand the rationale behind activity based costing and how product costs are calculated under this method

Q6: I understand what equivalent units are and how to use this information to compute a cost per equivalent unit

Q7: I understand how changes in variable costs, fixed costs, selling price, and sales volume affect net operating income and break-even points.

Q8: I understand how variable costing differs from absorption costing and feel confident in making decisions related to different business segments

Q9: I am prepared to construct a sales budget, production budget, direct materials budget, and direct labor budget

Q10: I can prepare a flexible budget and am prepared to fully explain variances

Q11: I understand how to compute and use return on investment, residual income, delivery cycle time, throughput time, and manufacturing cycle efficiency

Q12: I can differentiate between relevant and irrelevant costs and benefits in a decision and make prudent decisions related to making or buying a product, accepting or rejecting a special order, and processing joint products further

Q13: I am prepared to use the payback period, simple rate of return, and present value methods to evaluate investments.

While inferences cannot be applied to the population, Table 17 shows that treatment group students in this sample had higher rates of agreement ("agree" or "strongly agree") to each of the thirteen individual questions related to achieving the course learning objectives.

Table 17

Rates of Agreement for Achieving Course Learning Objectives

	Control (n = 75)		Treatment (n = 80)	
	Frequency	Percent	Frequency	Percent
Q1 - Remember	36	48%	58	73%
Q2 - Topics connected	54	72%	76	95%
Q3 - Cost behavior	63	84%	71	89%
Q4 - Job costing	46	61%	61	76%
Q5 - ABC	46	61%	63	79%
Q6 - Equivalent units	40	53%	57	71%
Q7 - Break-even	60	80%	71	89%
Q8 - Variable costing	39	52%	49	61%
Q9 - Budgets	47	63%	58	73%
Q10 - Variances	48	64%	59	74%
Q11 - ROI	50	67%	64	80%
Q12 - Relevant costs	40	53%	53	66%
Q13 - Payback	21	28%	31	39%

The individual questions were aggregated to create one index variable, "Learning objectives perceptions". Cronbach alpha statistics were computed to measure the internal consistency of the individual questions. A Cronbach alpha of .931 was found, which exceeds an acceptable level (.70) to warrant combining questions into a single index (Pearson, 2010).

A one tailed two sample t-test was performed to assess whether the difference in learning objectives perceptions between the control and treatment groups was statistically significant. Table 18 shows the result of the t-test and descriptive statistics.

Table 18

Results of t-Test and Descriptive Statistics for Perceptions of Achieving Course Learning Objectives

Group								
Control			Treatment					
M	SD	n	M	SD	n	Mean Difference	t	p
3.65	0.83	75	3.99	0.61	80	0.34	2.89*	0.004

* df = 153

Results of the t test show a significant difference in student perceptions related to achieving the course objectives for those taught under the traditional active learning method (M = 3.65, SD = 0.83) and those taught using the continuing case teaching method (M = 3.99, SD = 0.61); $t(153) = 2.89$, $p < .01$. The null hypothesis is rejected. The data supports alternate hypothesis 6_{a1} that students taught under the continuing case method have more favorable perceptions of achieving the course objectives compared to students not taught with the continuing case.

These hypotheses were developed from research question 6 to account for covariates:

$H6_{02}$: Students taught using a continuing case have perceptions of achieving the course objectives that are unfavorable or equal to students taught under a traditional active learning method when controlled for covariates.

$H6_{a2}$: Students taught under the continuing case method have more favorable perceptions of achieving the course objectives compared to students not taught with the continuing case when controlled for covariates.

An ANCOVA test was conducted to determine a statistically significant difference in perceptions of achieving the course objectives between the groups while controlling for major, GPA, and gender. The ANCOVA test shows a statistically significant difference between the

control groups' and treatment groups' perceptions after controlling for major, GPA, and gender, $F(1,150) = 9.11$, $p < .01$. Table 19 shows the ANCOVA results.

Table 19

ANCOVA Results for Students' Perceptions of Achieving the Course Objectives

Source	SS	df	MS	F	p
Major	4.93	1.00	4.93	10.14	0.00
GPA	2.58	1.00	2.58	5.31	0.02
Gender	0.02	1.00	0.02	0.04	0.85
Group	4.43	1.00	4.43	9.11	0.00
Error	72.89	150.00	0.49		

Null hypothesis $H6_{02}$ is rejected. The data supports alternate hypothesis 6_{a2} that students taught under the continuing case method have more favorable perceptions of achieving the course objectives compared to students not taught with the continuing case when controlled for covariates.

Research Question 7. Research question 7 asks how do students at a Mid-Atlantic university perceive the use of a continuing case as a method of teaching? From this research question, the following hypotheses were developed:

$H7_{01}$: Students rate the use of the continuing case as method of teaching the same as or lower than a neutral point.

$H7_{a1}$: Students rate the use of the continuing case as method of teaching higher than a neutral point.

Students in the treatment groups were provided a survey at the end of the semester to measure their perceptions related to the continuing case as a learning tool. This method mirrors the methodology used in the articles examined in the accounting education journals.

The first portion of the post class questionnaire administered to treatment groups measured students' perceptions of the continuing case as a teaching method. A five-point Likert type scale was used with 1 representing *strongly disagree* to 5 representing *strongly agree*. The Likert questions are presented below:

Q1: The continuing case was a helpful learning method

Q2: I would recommend that the instructor use this continuing case again in future classes

Q3: The continuing case made difficult topics easier to understand

Q4: The continuing case helped me see how topics and chapters were connected

Q5: It was helpful to apply new material to a familiar common frame of reference

Q6: I used the continuing case as a reference when doing homework assignments outside of class

Q7: The continuing case made managerial accounting more relatable

Q8: The continuing case will help me remember concepts longer than if I learned them through varied textbook exercises

Q9: The continuing case made me feel more involved in class

Q10: I prefer learning the material through a continuing case instead of learning with textbook exercises

Q11: Thinking about situations from the first person perspective (business owner or employee of All Aboard, Inc.) helped me understand and apply the new material

While inferences cannot be applied to the population, Table 20 shows that treatment group students in this sample had high rates of agreement ("agree" or "strongly agree") to each of the eleven individual questions related to the continuing case as a teaching method.

Table 20

Treatment Group Students' Rates of Agreement for the Continuing Case as a Teaching Method

	Treatment (n = 69)	
	Frequency	Percent
Q1 - Helpful	66	96%
Q2 - Recommend	64	93%
Q3 - Easier	66	96%
Q4 - Topics connected	63	91%
Q5 - Common frame	61	88%
Q6 - Homework	53	77%
Q7 - Relatable	60	87%
Q8 - Retention	47	68%
Q9 - Involved	64	93%
Q10 - Prefer	58	84%
Q11 - First person	57	83%

The individual questions were aggregated to create one index variable, "Teaching method perceptions". Cronbach alpha statistics were computed to measure the internal consistency of the individual questions. A Cronbach alpha of .913 was found, which exceeds an acceptable level (.70) to warrant combining questions into a single index (Pearson, 2010).

Research question 7 pertained only to students in the treatment groups. Therefore, a one sample t-test was performed to assess whether the responses were significantly different than the neutral point in the Likert scale. Table 21 shows the results of this t-test and descriptive statistics.

Table 21

Results of t-Test and Descriptive Statistics for Treatment Groups' Perceptions of the Continuing Case as a Teaching Method

M	SD	n	t	p
4.36	0.596	69	18.93*	0.000

*df = 68

Students' average evaluation of the continuing case as a teaching method was significantly higher (M = 4.36, SD = .596) than 3.0 (neutral), t(68) = 18.93, p = < .01. The null hypothesis is rejected. The data supports alternate hypothesis 7_{a1} that students rate the use of the continuing case as method of teaching higher than a neutral point.

Research question 8. Research question 8 asks how do students at a Mid-Atlantic university perceive the use of a continuing case as it relates to achieving the IMA's core competencies? From this research question, the following hypotheses were developed:

$H8_{01}$: Students rate the use of a continuing case in facilitating achievement of IMA core competencies the same as or lower than a neutral point.

$H8_{a1}$: Students rate the use of a continuing case in facilitating achievement of IMA core competencies higher than a neutral point.

The second portion of the post class questionnaire administered to treatment groups measured students' perceptions of the how the continuing case facilitated achievement of the IMA core competencies. A five-point Likert type scale was used with 1 representing *strongly disagree* to 5 representing *strongly agree*. The Likert questions are presented below:

Q1: The continuing case helped me understand how to prepare a financial plan for a specific period of time or project, compare actual results to planned results, and forecast future financial needs and performance

Q2: The continuing case helped me understand how to use financial information to guide decisions which could have strategic consequences on an organization

Q3: The continuing case helped prepare me to analyze business situations with competing priorities and communicate my findings as a cross-functional business partner to transform company-wide operations

Q4: The continuing case made me more confident in assuming a leadership role to help others think strategically and lead initiatives to increase profitability

While inferences cannot be applied to the population, Table 22 shows that treatment group students in this sample had high rates of agreement ("agree" or "strongly agree") to each of the four individual questions.

Table 22

Treatment Group Students' Rates of Agreement to how the Continuing Case Facilitated Achievement of the IMA Core Competencies

	Treatment (n = 69)	
	Frequency	Percent
Q1 - Financial planning	59	86%
Q2 - Decision making	58	84%
Q3 - Cross-function	55	80%
Q4 - Leadership	52	75%

The individual questions were aggregated to create one index variable, "Continuing case facilitation of IMA core competencies achievement". Cronbach alpha statistics were computed to measure the internal consistency of the individual questions. A Cronbach alpha of .876 was found, which exceeds an acceptable level (.70) to warrant combining questions into a single index (Pearson, 2010).

Research question 8 pertained only to students in the treatment groups. Therefore, a one sample t-test was performed to assess whether the responses were significantly different than the neutral point in the Likert scale. Table 23 shows the results of this t-test and descriptive statistics.

Table 23

Results of t-Test and Descriptive Statistics for Treatments Groups' Perceptions of how the Continuing Case Facilitated Achievement of the IMA Core Competencies

M	SD	n	t	p
4.09	0.713	69	12.69*	0.000

*df = 68

Students' evaluation of how the continuing case facilitated the achievement of the IMA core competencies was significantly higher (M = 4.09, SD = .713) than 3.0 (neutral), t(68) = 12.69, $p < .01$. The null hypothesis is rejected. The data supports alternate hypothesis 8_{a1} that students rate the use of a continuing case in facilitating achievement of IMA core competencies higher than a neutral point.

Research question 9. Research question 9 asks how do students at a Mid-Atlantic university perceive the use of a continuing case as it relates to achieving the stated course objectives? From this research question, the following hypotheses were developed:

$H9_{01}$: Students rate the use of a continuing case in facilitating achievement of course objectives the same as or lower than a neutral point.

$H9_{a1}$: Students rate the use of a continuing case in facilitating achievement of course objectives higher than a neutral point.

The third portion of the post class questionnaire administered to treatment groups measured students' perceptions of how the continuing case facilitated the achievement of course

objectives. A five-point Likert type scale was used with 1 representing *strongly disagree* to 5 representing *strongly agree*. The Likert questions are presented below:

Q1: The continuing case helped me understand cost classifications such as variable costs and fixed costs and how these impact contribution margin

Q2: The continuing case helped me understand how overhead is applied in a job-order costing system, the corresponding journal entries, and the computation product costs

Q3: The continuing case helped me understand the rationale behind activity based costing and how product costs are calculated under this method

Q4: My understanding of equivalent units and how this information is used to compute a cost per equivalent unit was enhanced by the continuing case

Q5: The continuing case helped me understand how changes in variable costs, fixed costs, selling price, and sales volume affect net operating income and break-even points.

Q6: The continuing case helped me understand how variable costing differs from absorption costing and feel confident in making decisions related to different business segments

Q7: I am better prepared to construct a sales budget, production budget, direct materials budget, and direct labor budget because of the continuing case

Q8: The continuing case helped me prepare a flexible budget and explain variances

Q9: The continuing case helped me learn how to compute and use return on investment, residual income, delivery cycle time, throughput time, and manufacturing cycle efficiency

Q10: The continuing case was useful in helping me differentiate between relevant and irrelevant costs and benefits in a decision and make prudent decisions related to making

or buying a product, accepting or rejecting a special order, and processing joint products further

Q11: The continuous case helped prepare me to use the payback period, simple rate of return, and present value methods to evaluate investments

While inferences cannot be applied to the population, Table 24 shows that treatment group students in this sample had high rates of agreement ("agree" or "strongly agree") to each of the eleven individual questions.

Table 24

Treatment Group Students' Rates of Agreement to how the Continuing Case Facilitated Achievement of the Course Learning Objectives

	Treatment (n = 69)	
	Frequency	Percent
Q1 - Cost behavior	65	94%
Q2 - Job costing	57	83%
Q3 - ABC	59	86%
Q4 - Equivalent units	54	78%
Q5 - Break-even	63	91%
Q6 - Variable costing	51	74%
Q7 - Budgets	60	87%
Q8 - Variances	54	78%
Q9 - ROI	60	87%
Q10 - Relevant costs	55	80%
Q11 - Payback	52	75%

The individual questions were aggregated to create one index variable, "Continuing case facilitation of learning objectives achievement". Cronbach alpha statistics were computed to measure the internal consistency of the individual questions. A Cronbach alpha of .909 was found, which exceeds an acceptable level (.70) to warrant combining questions into a single index (Pearson, 2010).

Research question 9 pertained only to students in the treatment groups. Therefore, a one sample t-test was performed to assess whether the responses were significantly different than the neutral point in the Likert scale. Table 25 shows the results of this t-test and descriptive statistics.

Table 25

Results of t-Test and Descriptive Statistics for Treatment Groups' Perceptions of how the Continuing Case Facilitated Achievement of Course Objectives

M	SD	n	t	p
4.22	0.588	69	17.23*	0.000

*df = 68

Students' evaluation of how the continuing case facilitated the achievement of course objectives was significantly higher (M = 4.22, SD = .588) than 3.0 (neutral), $t(68) = 17.23$, $p < .01$. The null hypothesis is rejected. The data supports alternate hypothesis 9_{a1} that students rate the use of a continuing case in facilitating achievement of course objectives higher than a neutral point.

Research question 10. Research question 10 asked how do students at a Mid-Atlantic university perceive the continuing case as a learning tool. Qualitative data were collected through focus groups comprised of seven students in each of the two treatment groups. From this research question, the following propositions were developed:

$P10_{01}$: Students find the semester-long common frame of reference and first person perspective to be neutral or unfavorable agents in helping them relate to and learn managerial accounting concepts.

$P10_{01}$: Students find the semester-long common frame of reference and first person perspective to be positive agents in helping them relate to and learn managerial accounting concepts.

Original descriptors and outcomes provided by students. Before sharing their general opinions related to the continuing case teaching method, participants were provided blank pieces of paper and asked to write two words to describe the teaching method and two outcomes they derived from its use. Appendix G shows the descriptors and outcomes specified by these students and how each was classified.

Synonymous words among the twenty-eight descriptors provided by students were classified into four categories: relatable, easier, consistent, and engaging. For example, words such as "simpler", "clear", and "easier" were included in the "easier" category. Words such as "relatable" and "real world" were included in the "relatable" category. Words such as "familiar", "consistent", and "continuous" was classified as "consistent". Words such as "involved" and "hands on" were classified as "engaging". Table 26 shows the frequencies and percentages of these descriptors.

Table 26

Original Descriptors Provided by Focus Groups

	Frequency	Percent
Relatable	8	29%
Easier	8	29%
Consistent	6	21%
Engaging	6	21%

The twenty-eight outcomes provided by students were classified into three categories: "Deeper understanding achieved by using a common frame of reference", "Resembled real world scenarios", and "Other". Outcomes such as "Easier to understand because there is a constant

variable.", "Allowed me to see the big picture.", and "Having a continuing case helped the fluidity of the class and made concepts connect." were classified as "Deeper learning achieved by using a common frame of reference". Outcomes such as "Feels more like on-the-job training." and "It made the material applicable" were classified as "Resembled real world scenarios". Outcomes such as "Time saving" and "Student connection" were classified as "Other". Table 27 shows the frequencies and percentages of the outcomes.

Table 27

Original Outcomes Provided by Focus Groups

	Frequency	Percent
Deeper learning acheived by using a common frame of reference	18	64%
Resembled real world scenarios	5	18%
Other	5	18%

Deep learning facilitated by a common frame of reference. The remainder of each feedback session lasted approximately 45 minutes with all students actively participating. The major theme that emerged in these discussions was the teaching method's facilitation of deep learning. Students described this as "understanding" the material. For example, students said, "I actually understand the material", "You know what you're actually doing instead of just going through the motions", "It (the teaching method) focused on concepts and applying material rather than memorizing material or formulas", and "I can see the big picture".

When considering the factors that facilitated this deeper understanding, the consistent use of an example throughout the course of a semester permeated all discussions. The moderator challenged the participants to discuss specific attributes as to why students believed the continuous nature of the teaching method helped them achieve a deeper learning. Four themes

emerged: ease of learning, better allocation of time and cognitive effort, tangibility of examples, and memorability.

First, almost all students described the teaching method as an aid in making the material "easier" to learn. The researcher infers that this notion of "easier" may be equated to "more intuitive" due to the provision of a consistent context. One student said, "It's easier because we see all the things come together". Other students made comparisons to employment. For example, "It feels the same as being at a job. The more you're at your job, the more you know the in's and out's of it. You get more comfortable with it."

This sense of familiarity and comfort from the continuous example also seemed to enhance learning because it allowed students to focus on the learning objectives versus other factors typically inherent in traditional active learning methods. One student described her self-talk when encountering new material: "I say to myself, alright, this is the same company we've been working with the last few months, I just need to apply this new concept". Another student attributed her better understanding "because you only have to learn the new material, not a whole new business or situation with each example."

Third, students reported that the physical demonstrations enhanced the benefits they derived from the continuous nature of the teaching method. The continuing case centered on All Aboard, Inc., a small fictitious business which manufactured toy trains. The instructor utilized a physical toy train to illustrate many topics. For example, the "manufacturing" of a finished train was physically demonstrated in class by using the four "raw materials" to construct a train. These four physical parts agreed to the descriptions in the case and were consistently used throughout the semester. In addition, the instructor used students in the class to physically demonstrate the assembly of a train and its movement through the manufacturing process when

discussing direct labor, costing methods, and overhead allocation. New products, such as toy cars or accessories, were brought into the class to provide examples for business decisions and capital budgeting. Select student comments were "Bringing in the toy train with the direct materials, the head, the body, and the base helped it made sense" and "it was helpful as a visual learner to see direct materials, see labor being applied and visualize other concepts like when we added a new product line with red trains and blue trains".

The benefit of retention or memorability was a popular theme that transpired from the physical aspects discussed by students. Feedback was favorable but differed in terms of how students attributed the benefits of memorability. Some students shared that the tangible aspect of the teaching method was a helpful resource when doing in class examinations. "I visualized the train and problems we did while I was taking exams. I thought of everything through that context," said one student. Another student said, "I get bad test anxiety. This method made a huge difference because I could visual the train scenarios when taking the exams." Other students felt that their scores on exams would have been comparable in the absence of a continuing case teaching method. They emphasized the benefit of long term retention as opposed to short term retention for graded assessments. For example, one student said, "I don't think it shows in the grades. I think it provides a better opportunity past schooling."

One aspect of the continuing case that was not raised by students was the first person perspective. This was the only specific topic initiated by the moderator. Students' feedback was mixed after becoming aware of this approach. Some students naturally approach new material in this manner and made comments similar to this student's: "I put myself into the example and naturally do that for most classes. I noticed phrasing like "our company" and "us" but I don't think it made a difference to me. It's all about the same example for me." Other students

indicated that this approach, although unbeknownst to them, may have helped foster engagement and ownership. For example, one student said, "When you started out the very first class and explained how this is "our" company and we're going to go over this together for the whole semester, it made it more exciting. It was obvious this wasn't going to be a regular class. It seemed more interesting."

The data supports alternate proposition $P10_{a1}$ that students find the semester-long common frame of reference and first person perspective to be positive agents in helping them relate to and learn managerial accounting concepts.

Summary

Demographic data was found to be similar between the control and treatment groups. Differences of covariates are controlled for through ANCOVA tests. The mean final exam score for students in the treatment groups exceeded the mean final exam score for students in the control groups, although the difference was not statistically significantly different. Means scores for assessments exclusive of the final, as well as mean final grades, were similar for students in the treatment and control groups.

Perceptions related to accounting, achievement of IMA core competencies, and achievement of learning objectives were significantly higher for students in the treatment groups when compared to students in the control groups. Students in the treatment groups rated the role of the continuing case in their achievement of the IMA core competencies and learning objectives significantly higher than the neutral point. These students also rated the continuing case as method of teaching significantly higher than the neutral point. Student feedback from focus groups indicates that they achieved a deeper level of learning and attributed this to the use of a common frame of reference throughout the semester.

CHAPTER 5

DISCUSSION, CONCLUSIONS, IMPLICATIONS, AND AREAS FOR FUTURE RESEARCH

Summary

Research consistently shows that the first courses in accounting have significant influence on students' major and career decisions (Geiger & Ogilby, 2000; Jackling & Calero, 2006; Nelson et al., 2008). Research also consistently indicates that students' experiences in these important courses result in declining perceptions toward the subject and shrinking interest in pursuing accounting as a career path (Chen et al., 2004; Geiger & Ogilby, 2000; Marriott & Marriott, 2003; Tickell et al., 2012).

Accordingly, accounting organizations have challenged educators to develop and implement teaching methods which engage students and foster favorable perceptions toward the profession. The call to pursue such methods comes at an important period when retiring Baby Boomers are leaving the profession and hiring managers are struggling to find qualified talent to fill these positions (AICPA, 2016; IMA, 2015; Thomson, 2017). Compounding these challenges is the evolution of management accounting from a role which provides information to one that provides solutions and plays a strategic role decision making (Institute of Management Accountants, 2019; Kamal, 2015; Siegal et al., 2010; Thomson, 2017). Consequently, it is more important than ever that the first courses in accounting stimulate interest for students to learn deeply in order to prepare them for successful careers.

The author created a new teaching method for the first managerial accounting course to address these challenges. The method is the first to use a common frame of reference as the focal point for each class session in an effort to contextualize learning activities and stimulate

learning. It combines the use of a consistent example throughout a 15-week semester with elements of validated learning approaches such as problem-based learning, situated learning, anchored learning, and case-based learning. Contrary to textbooks and most existing studies, it approaches material from an internal perspective which represents the professional environment students will encounter and roles they will assume.

The purpose of this study is to examine the association between a continuing case teaching method and student performance and perceptions in the first managerial accounting course. Effectiveness of this method is measured using student performance data, surveys of student perceptions, and feedback from focus groups. The study was constructed using a quasi-experimental design whereby students were separated into control and experimental groups.

This chapter contains discussions and implications related to the results of this study, as well as suggested areas for future research. First, results from students' perceptions are discussed. Second, outcomes related to student performance are reviewed, followed by a critique of limitations, suggestions for future research, and concluding remarks.

Student Perceptions

Perceptions of accounting. Reports publicized from the Pathways Commission and AECC dedicate substantial space to the importance of the first accounting courses. The emphasis on these particular courses is due to the critical role they play in affecting students' perceptions of accounting. While depictions of accountants and the profession are typically characterized as boring, which biases students' perceptions prior to enrolling in the first accounting courses, research consistently finds that it is students' experiences in the first accounting courses which impact their perceptions the most (Geiger & Ogilby, 2000; Jackling & Calero, 2006; Nelson et al., 2008). The Pathways Commission's 2012 report states, "this course

serves as perhaps the single most important factor in deciding whether to pursue the study of accounting" (The Pathways Commissioners, 2012, p. 86).

The first part of the pre class questionnaire administered to students on the first day each semester was designed to measure students' incoming perceptions of accounting through six questions related to their interest in accounting as a subject, their interest in accounting as a career, their agreement to whether accounting is boring, and their perceptions related to the subject's usefulness to businesses and to their personal careers. Students in the control (M = 3.24, SD = .78) and treatment groups (M = 3.26, SD = .74) started the semesters with similar perceptions of accounting.

Based on existing research (Geiger & Ogilby, 2000; Marriott & Marriott, 2003; Tickell et al., 2012), the expectation was that students' perceptions of accounting at the end of the semester would be lower than their perceptions at the beginning of the semester, regardless of which teaching method they encountered. Consistent with existing literature, students in the control groups reported lower overall perceptions of accounting at the end of the semester although the decline from beginning to end of the semester was not statistically significantly different. Contrary to existing studies, students in the treatment groups reported significantly higher perceptions of accounting compared to their perceptions at the beginning of the semester. A statistically significant difference in post class perceptions of accounting was also present when controlling for covariates. In addition, treatment group students' post class perceptions of accounting were significantly higher than students taught under a traditional active learning method.

Accounting perceptions implications. The significant increase in perceptions from the beginning to end of a semester and the significant difference between the control groups' and

treatment groups' post class perceptions of accounting lends validity to the AECC and Pathways Commission's claims that the method of teaching can impact students' perceptions of the accounting. It also has implications for students and employers.

Ultimately, students' perceptions of accounting affect whether the supply of talent will be sufficient for the profession to thrive. The favorable perceptions of students taught under the continuing case method comes at a critical time when experts are predicting an exodus of Baby Boomers from the profession (AICPA, 2016) coupled with an 11% projected increase in demand for accountants and auditors through 2024 (U.S. Department of Labor, 2016). If the first courses in accounting do significantly influence students' perceptions and career decisions, as literature consistently shows, one can infer from these results that the continuing case method of teaching could have a positive effect on those organizations struggling to find candidates to fill entry-level positions.

In addition, the findings indicate potentially favorable long term implications for employers and students. Students' positive attitudes toward accounting as a profession are often centered on extrinsic factors (Mustapha & Abu Hassan, 2012; Stivers & Onifade, 2014), such as salary prospects and job security. However, intrinsic motivators are increasingly important to students and their long-term career choices (Duffy & Sedlacek, 2007) with some authors contending that intrinsic rewards lead to higher job satisfaction (Borzaga & Tortia, 2006; Mottaz, 1985; O'Reilly & Caldwell, 1980; Tymon, Stumpf, & Doh, 2010). When compared to students taught using a traditional active learning method, students taught under the continuing case method reported higher post class perceptions related to their interest in accounting, their perception of its boringness, and the level of enjoyment they would receive by working in the

profession. These factors characterize intrinsic rewards derived from accounting rather than rewards derived from external sources.

If students taught under a continuing case method have a higher level of interest and enjoyment in accounting, as indicated by the results in this study, these students may be more likely to choose accounting as a career because of intrinsic motivators, enjoy the work more, and consequently stay in the field longer. This better matching of careers and genuine interests could present win-win scenarios for employers concerned about retention and succession planning during this pivotal period in the profession, as well as students who are searching for more than a just a secure job and favorable salary.

Perceptions of achieving the IMA core competencies. In addition to concerns related to the quantity of students entering the accounting profession, the industry is encountering challenges related to the quality of recent accounting graduates. The IMA has done extensive research related to this "talent gap" and found significant gaps between the competencies organizations demand and the competencies that entry-level management accountants possess. Consequently, employers are facing increased time to fill entry level positions, increased recruiting costs, and increased training costs associated with the hiring of underqualified candidates (Institute of Management Accountants, 2015). Many authors point to the role of accounting education in not preparing students for the modern accounting profession (Kavanagh & Drennan, 2008; Mohamed & Lashine, 2003). Today's management accountants are expected to add value to an organization's strategic goals rather than simply providing information. If accountants are expected to add value, they must possess the skills required to critically analyze problems and use information to develop solutions.

In an effort to guide educators and create the most relevant CMA examination, the IMA created the management accounting competency framework. The framework focuses on areas that align with planning, decision making, operations, and leadership. At the end of each semester, students in both the control and treatment groups were asked to rate their level of achieving these competencies. Students taught under the continuing case method reported significantly higher perceptions of achieving the IMA core competencies, before and after controlling for covariates.

The researcher posits that the treatment groups' significantly higher assessment of achieving the IMA core competencies is related to the continuing case method. Not only did this factor surface when comparing students taught under the continuing case method to students taught under a traditional active learning method, but students also provided positive feedback through another instrument. An additional questionnaire was provided to students in the continuing case sections on the last day of the semester. Different than the survey administered to both the control and treatment groups, this treatment-group-only survey explicitly asked students to rate the continuing case's role in helping them achieve the IMA core competencies. Students' evaluation of how the continuing case facilitated achievement of the IMA core competencies was significantly higher than the neutral point.

Perceptions of achieving IMA core competencies implications. Students are capable of memorizing and performing accounting's computational or technical elements in the abstract. In the absence of a context, however, achieving the higher order skills prescribed by the IMA presents a challenge. The Pathways Commission shares the IMA's concerns about the relevance of accounting education and calls for accounting education to mirror business processes by providing a context and focusing on decision making within a business context (Bonner, 2011).

Factors that characterize "business processes" often differ from those that characterize academic experiences. Businesses are characterized by core products and services with unstructured, often messy, problems that are not accompanied by a formula. In these real world settings, managers often leverage prior knowledge gleaned from experiences to make decisions (Roberto, 2009).

The knowledge gleaned from such "real-world" experiences may explain why students who possess experience through internships are more likely to be hired (Callanan & Benzing, 2004; Knouse, Tanner, & Harris, 1999; Martin & Wilkerson, 2006; Rigsby, Addy, Herring, & Polledo, 2013). It is reasonable to assume that employers view these internship experiences as valuable in preparing recent college graduates to face the complex challenges they will encounter in today's marketplace.

It may be unrealistic to expect entry level management accountants to possess higher order skills without availing students of an opportunity to develop them through experiences that mimic real business contexts. Student feedback indicates that the continuing case teaching method affords them an opportunity to practice these skills in a setting that resembles an internship. Numerous students in the continuing case sections described their learning experiences similar to employment experiences. One student said, "It (the continuing case) went along as we went along. It felt like on the job training more than learning something". Other students said, "It doesn't feel like we're in a class", and "It feels the same as being at a job. The more you're at your job, the more you know the in's and out's of it. You get more comfortable with it."

One could argue that the breadth of the continuing case may benefit students even more than an internship. While internships provide true real world experience, they are often limited in scope. Participation in a continuing case exposes students to all of the fundamental

managerial accounting tools and their application. This allows students to leverage prior knowledge gleaned from earlier in the course and apply it to subsequent scenarios and decisions encountered later in the semester. As one student put it, "When I go get a job, I am not going to have to re-learn what the raw materials are and how much they cost each day. I'll know that and my job will be about using that information to make decisions. That's what this case was like, more relatable to a real job."

The results indicate that the continuing case teaching method may be one way to help close the talent gap. This could have favorable implications for employers searching for qualified candidates and simultaneously benefit students. If students taught under the continuing case method are better acquiring the core competencies suggested by the IMA, as indicated their perceptions of achieving them, students will be better prepared to sit for the Certified Management Accountant (CMA) examination. CMA examination candidates grew by 40 percent in 2017 (Gerrone & Fenske, 2017) and the certification seems to be paying off. CMAs earn 67 percent more in salary than non-CMAs (Institute of Management Accountants, 2018). On target with the soon-to-be college graduates in this study, the largest difference in compensation related to CMAs was found in lower-level positions who earn 119 percent more than their non-CMA counterparts (Institute of Management Accountants, 2018).

Perceptions of achieving learning objectives. The course under study is typically a required course in business curricula at most colleges and universities. The textbook used in this course was one of the two most popular first year Managerial Accounting undergraduate textbooks. Its subject matter is nearly identical to its competitor's and concentrates on general managerial accounting concepts, job costing, activity-based costing, process costing, cost-volume-profit analysis, variable costing, master budgeting, standard costs and variances,

performance management, decision making, and capital decisions. Accordingly, eleven learning objectives were established for this course, which are representative of learning objectives for the same course at other universities.

Students in the control and treatment groups were provided a survey at the end of each semester which asked them to rate their achievement of the course objectives. Students taught under the continuing case method reported significantly higher average perceptions of achieving the course learning objectives, before and after controlling for covariates. In addition to the results shown by comparing the treatment and control groups, the assertion that the continuing case was a positive agent in achieving the course objectives was further evidenced by results from the treatment group only survey. This survey asked students in the continuing case sections to rate the continuing case method's role in helping them achieve the course learning objectives. These students' evaluation of how the continuing case facilitated the achievement of course objectives was significantly higher than the neutral point.

Perceptions of achieving course learning objectives implications. Students' perceptions of achieving learning objectives is one of the most popular ways to measure the effectiveness of teaching methods in accounting education literature. It supplements student performance data to provide a comprehensive picture of a teaching method's effectiveness and is important because a students' perception of achievement may have implications for students' academic and career fortitude as well as a university's financial well-being.

Self-efficacy is an individual's belief related to the ability to perform tasks (Smith, 2001). Gist and Mitchell (1992) assert that individuals use "past performance and attributes about the causes of that performance as major predictors of how he or she can perform" (p. 192). These authors believe that self-efficacy is not fixed. Self-efficacy changes as new information and

experiences are acquired. The results from this study show that students taught under the continuing case method rate their level of achieving course learning objectives significantly higher than students taught under a traditional active learning method. These treatment group students credited the continuing case as a major factor in their achievement of learning objectives.

Gist & Mitchell (1992) contend that external factors, such as students' first-hand experiences, affect self-efficacy indirectly via motivation as an internal factor. While motivation can be influenced by many external and other internal factors, researchers generally agree that it positively affects performance (Guay, Ratelle, Roy, & Litalien, 2010; MacLaren, Tran, & Chiappe, 2017; Rugutt & Chemosit, 2009). Potential self-efficacy gains derived through the continuing case method and the longer term impact they may have on future academic and professional pursuits are especially important. Self-efficacy influences career selection and coping with challenging professional situations (Lent, Brown, & Larkin, 1987; Stumpf & Brief, 1987).

As new entrants to the profession, today's students will need the belief that they can meet the increasingly high expectations which employers are setting for them if they are to persist in the complex tasks put before them. Continuing case students' significantly higher perceptions related to their preparedness in the application and understanding of the stated learning objectives imply that these students may possess these critical beliefs in their abilities to a higher degree than their counterparts.

Increases in college tuition continue to exceed inflation. A teaching method that students perceive as helpful in facilitating learning and career preparation will not only benefit these future accountants but may also have longer term implications for universities which implement

similar methods. Tuition and fees were 40 percent higher in 2015-2016 at public four-year institutions than ten years prior (Brunker, 2015). Student debt has recently declined but there is still concern about the level which many Americans carry. This problem is compounded by unfavorable graduation trends (Brunker, 2015). Students who drop out still carry debt but not a degree to accompany it. Consequently, Americans are skeptical about the value of a college education. A recent Wall Street Journal poll found that 47% disagree that a four-year degree will lead to a good job and higher lifetime earnings (Belkin & Mitchell, 2017). Younger people, ages 18-34, are even more skeptical, with 57% of this group disagreeing that a four-year degree will lead to a good job and higher lifetime earnings.

It is critical for universities to retain and graduate satisfied students in order to recruit future students and sustain alumni giving. Alumni provide 26.1 percent of voluntary support to higher education (Seltzer, 2018), and their giving is positively correlated with the perceived quality of their academic experience (Gaier, 2005; Sung & Yang, 2009; Tom & Elmer, 1994). Likewise, students' satisfaction with their major curriculum and their perceptions of career readiness are factors in recruitment and retention (Caza, Brower, & Wayne, 2015). While a continuing case teaching method in a first year management accounting course certainly does not guarantee a constant stream of future students and donations, the results suggest that students perceive it as helpful in mastering the material and preparing them for careers. Similar to students' perceptions and their mediating effects on self-efficacy, it is reasonable to believe that perceptions about the acquisition of knowledge and quality of educational experiences may bear fruit in the long run via an inclination to give or refer the next generation of students.

Perceptions of the continuing case as a teaching method. The prior discussions concentrate on practical implications for the accounting profession, higher education, students, and entry level accountants. The following discussion focuses on underlying reasons why students taught under the new teaching method reported higher perceptions of achievement. This has implications for pedagogy in accounting education.

In addition to assessing the teaching method's role in achieving the IMA core competencies and course learning objectives and comparing responses gathered from the control and treatment groups, a questionnaire was administered to students in the treatment groups which asked them a series of questions to assess the continuing case as a method of teaching. This approach follows those used in accounting education journals to assess other teaching interventions. Ninety-six percent of students in the continuing case groups agreed that "The continuing case was a helpful method".

Deep learning. Students consistently indicated that this method helped them truly learn the concepts. Seventy-three percent of students in the treatment groups agreed to "I will remember what I learned for many years" compared to only 48 percent of students in the control groups. One student said, "Most students brain dump after the semester ends and they don't remember anything. You're never going to remember the formulas you learned in college, but if you learn how to think, how to think through problems like we did with the train business, we will remember it." Other students distinguished the learning like this: "It (the teaching method) focused on concepts and applying material rather than memorizing material or formulas." and "I can pass classes by knowing what the right answer should be. This class, I actually get it. I know I'll remember this material longer (compared to other courses)."

When students take a deep approach to learning, they look for meaning in a course's content and try to relate it to personal experiences (Duff & McKinstry, 2007). This is contrary to a surface learning approach where students simply memorize material (Booth et al., 1999). Students usually resort to rote memorization because they perceive a topic as abstract and many business students find accounting to be irrelevant or absent of context (Borja, 2003; Wells, 2015).

Student feedback indicates that the continuing case method provided the necessary personal experience discussed by researchers in order convert abstract formulas into something meaningful and relevant. "Relatable" was one of the most popular descriptors provided by students in the focus groups. Eighty-seven percent of students in the continuing case groups agreed with "The continuing case made managerial accounting concepts more relatable". Lucas and Meyer (2005) contend that having a personal interest in material is what motivates students to make sense of what is being studied, move beyond surface learning, and ultimately learn deeply. Consistent with this claim, students in the continuing case reported that they "actually understood" the material as opposed to other similar classes.

Common frame of reference. Overwhelmingly, students cited the use of a common frame of reference as the driving factor which fostered their deeper learning. Eighty-eight percent of these students agreed, "it was helpful to apply new material to a familiar common frame of reference". "Consistent" was one of the most popular original descriptors provided by students in focus groups. Understanding enhanced by using a common frame of reference was the most popular outcome cited by focus group students. Students made comments such as, "We see all the things come together", and "I can see the big picture". This feedback is consistent with "well-structured knowledge", an element of deep learning (Biggs, 1989).

Ninety-five percent of students taught under the continuing case method agreed with "I understand how all the topics and chapters are connected" compared to 72 percent of students taught under a traditional active learning method. In addition, students in the continuing case groups attributed this understanding to the continuing case teaching method with 91 percent of them agreeing to "The continuing case helped me see how topics and chapters were connected".

It is difficult to determine with certainty whether the consistent use of a common frame of reference was a mediating variable that caused other factors to ultimately affect students' perceptions about learning deeply or if it was one of many comingled factors inherent in the teaching method that helped students learn. Regardless, student feedback about the factors which impacted their understanding provides information that will be of interest to accounting educators as they consider this method relative to several existing teaching approaches, some of which are commonly employed in other fields and levels of education.

Similarities and distinctions to existing methods. Stinson and Milter (1996) describe problem-based learning as "authentic" because they contend it resembles situations that managers face in practice as opposed to neat and tidy textbook problems. Research related to problem based learning implies that it develops self-directed learning behaviors and increased levels of motivation (Hung, 2002; Milne & McConnell, 2001). The continuing case teaching method facilitated this authentic environment to a degree appropriate for first year accounting students. After introducing new concepts, students were provided opportunities to apply them to problems which tied into the toy train business. As one student put it, "You kind of just let us go at it. It's how the real world is going to be when you're in a job. We need to start doing it that way now."

After students worked clear cut quantitative problems, always related to All Aboard, Inc., more subjective situations were discussed where students leveraged prior knowledge to address strategic issues that may affect their business. "You let us be managers" is how one student characterized it. The consistent example seemed to allow for introducing a purer form of problem based learning, which typically presents challenges for lower level accounting students. One student said, "Since we've been in the same company for so long, you start to put things together, and I noticed that I was asking questions which were less about the material and more about how it works together, big picture stuff." Many authors note that unstructured problem solving can be counterproductive for students who do not possess a fundamental understanding of accounting concepts and principles (Dockter, 2012; Milne & McConnell, 2001; Stanley & Marsden, 2012). Therefore, although the learning method seems to facilitate an understanding of fundamental concepts, educators need to present unstructured problems with care and adequate support in these first courses.

Situated learning emphasizes learning as a social phenomenon and research varies in the degree to which knowledge construction and transfer is purportedly tied to a specific social environment. The continuing case teaching method should not be classified as situated learning but data from this study indicate that certain elements of this method align with the benefits that researchers contend accompany the social aspect of learning. Students said, "So many classmates are involved. There's not many classes where so many students are constantly involved." and "it's easier to pay attention and be engaged in class". Ninety-three percent of students in the treatment groups agreed with "The continuing case made me feel more involved in class". The use of a consistent example and the inclusion of visual aids, such as the train's raw materials, seemed to facilitate a shared experience among students. Members of the focus

groups recalled specific teaching demonstrations and problem solving situations which exemplified Lave and Wenger's (1998) "community of practice" where groups of people collaborate or share knowledge. One student describe it this way: "You only had to teach it once. With so many people engaged, even if some didn't completely get it the first time, there was so many people around me helping".

Student feedback clearly indicates that the use of a common frame of reference throughout the entire semester was the most salient characteristic of this teaching method and facilitated learning more than any other factor. Most studies related to anchored learning are associated with elementary and middle school students, but the rationale of this learning method is the same as this study: contextualize learning activities with a common frame of reference (an anchor). Anchored learning was created by The Cognition and Technology Group at Vanderbilt (CTGV) and delivered primarily through the use of a video series. The Group described the learning environments as "macrocontexts" where students integrate prior knowledge gleaned from earlier videos with new concepts to solve interconnected problems. The results from related studies showed that middle school students were more likely to see mathematics as relevant to everyday life (CTGV, 1992b). "Relatable" was a recurring original descriptor provided by students and the teaching methods' helpfulness in moving from abstraction to relevance seemed to make learning "easier" for the accounting students in this study.

"Easier" was another popular word provided by students in the focus groups to describe this teaching method. Their feedback indicates that the teaching method made it easier to understand concepts that would have otherwise been difficult to comprehend if a common frame of reference had not been used. As one student put it, "It's easier because we see all the things come together". Ninety-six percent of students in the treatment groups agreed that "The

continuing case made difficult topics easier to understand". Students said the method made learning easier because they could channel time and cognitive energy toward new concepts rather than learning new problem situations or contexts for every learning objective. The implication is that they were able to eliminate a nonvalue added activity and make more of their efforts. "I feel like it's time saving because each class you (the instructor) don't need to re-explain the business. If you refer to direct materials, everyone knows what the direct materials are and how much they cost."

Other students drew connections between how they channel cognitive effort under this teaching method to how they expect their effort to be channeled in a professional setting by analogizing the initial information learned about a company and its products in the managerial accounting class to learning this information as a new employee at a business. These initial pieces of information do not have to be re-learned with each new problem or situation. Instead, the information is used in decision making and subsequent situations. Comparisons between the teaching method and what students expect in professional environments was as common theme in the focus groups and this mirrors the CTGV's contention that this method has qualities similar to workplace apprenticeships (CTGV, 1990).

Finally, this method supports existing literature related to case based learning with some noteworthy differences. Case based learning is the most prevalent active learning method in accounting education literature. Proponents say case based learning provides students insight into real business situations that they would not otherwise experience. These exercises are said to engage and motivate students (Boyce & Greer, 2012; Healy & McCutcheon, 2010), especially if a case is personally relevant to the lives of students (Mustoe & Croft, 1999; Raju & Sanker,

1999). Many educators try to accomplish this by choosing modern cases or cases which concentrate on industries or companies that students are interested in.

The teaching method in this study approached the notion of personal relevance through an uncommon viewpoint, the first person perspective. The majority of cases examined for this paper positioned the student's role from an outsider's or external perspective. The continuing case teaching method explicitly situated students as business owners or employees of All Aboard, Inc. Students said, "I found myself thinking about what I would do as if it were my company. After 14 weeks, I feel attached to this train company" and "it made it more exciting". These comments align with Biggs' (1989) work on deep learning which challenges educators to create a climate of learning that stimulates students "proprietal" interest. Eighty-three percent of students in the treatment groups agreed that "Thinking about situations from the first person helped me understand and apply the new material". The researcher posits that this first person perspective enhances one of the existing strengths of case based learning which is the receptivity of students when they are "immersed in" or "living in" the learning experience (Grant, 2015).

Most existing cases reviewed by the author which focus on managerial accounting topics are complex, narrow in scope, and designed for upper level accounting courses or graduate courses as out-of-class graded assignments. Following recommendations from other first year managerial accounting instructors (Brewer et al., 2008; Stuebs et al., 2017), this adaption of case based learning strives to provide a realistic business context to engage students while doing so in a simplistic way to meet students where they are. The method infuses the continuity of anchored learning, situated learning's shared experiences, and elements of problem-based learning with the familiarity and well documented effectiveness of case based learning to create a new approach for teaching the first managerial accounting course. Overall, students taught under this

method agreed, at a rate of 93 percent, that they "would recommend that the instructor use this continuing case again in future classes".

Student Performance

Assessments exclusive of the final exam. Assessments exclusive of the final exam included online homework, two online exams, two in-class closed book exams, and three open-note in-class pop quizzes. Average scores for assessments exclusive of the final exam were 85.8 percent (SD = .101) for students in the control groups and 85.3 percent (SD = .096) for students in treatment groups. GPA and major were covariates that showed a significant association to performance on assessments exclusive of the final exam. GPA accounted for 39 percent of the variance in scores of assessments exclusive of the final exam. Major accounted for 7 percent of the variance in scores of assessments exclusive of the final exam. The difference between groups was not statistically significant.

Final grades. The first managerial accounting course is a required prerequisite for subsequent courses at the university in which this study was conducted. Students must achieve a C- or higher in order pass. Of students enrolled at the end of the semesters, ninety-two percent of those in the treatment groups earned a final grade of C- or better while 85 percent of students in control groups earned a final grade of C- or better.

Although the passing rate was higher for students in the treatment groups, average final grades of the control groups (M = .824, SD = .103) were not significantly different from treatment groups' (M = .826, SD = .096). Among the covariates included in the ANCOVA test, major and GPA showed a significant association with final grades. GPA accounted for 38 percent of the variance in final grades and major explained 8 percent of the variance in final grades. Accounting and finance majors' average final grade in the treatment group was 85%,

which was 3 percentage points higher than non-accounting and finance majors in the treatment group. There was a larger difference in average final grades between majors in the control group. Accounting and finance majors in the control group had an average final grade of 86%, which was 5 percentage points higher than non-accounting and finance majors in the control group.

Final exam. While the difference in average final exam scores between the control and treatment groups was not statistically significant, the average final exam score for a student in the treatment group (M = .718, SD = .14) exceeded the average final exam score for a student in the control group (M=.687, SD = .176) and had a lower deviation in scores. Similar to the other student performance tests, GPA and major were covariates which showed a significant association to performance on the final exam but the covariates' relative effect sizes were lower for the final exam than on assessments exclusive of the final exam and final grades. GPA only accounted for 13 percent of the variance in scores of the final exam. Major accounted for 4 percent of the variance in scores on final exam.

The final exam was a traditional closed book, in-class, cumulative exam. The rationale underlying this format is to measure a student's learning in its entirety. In addition to the exam's comprehensive structure, it was also constructed to include a variety of question formats including multiple choice questions, opened ended problems that required students to generate original answers, and a series of essay questions where students were required to explain concepts in written form. This follows the approach by professional exams such as the CPA and CMA examinations. Davidson (2002) argues that exams should require students to explain concepts and to solve problems where they identify solutions. The emphasis on analyzing and explaining concepts aligns with deep learning where learners employ critical thinking skills.

Opinions vary regarding the effectiveness of multiple choice questions versus open ended questions and their ability to assess knowledge.

Final exam performance by question type. Additional analyses were done on students' final examination performance by question type. While further exploration is needed to confirm the generalizability of the findings, there is a suggestion that students taught under the continuing case method may have higher performance on assessments that require higher levels of comprehension.

Looking first at the multiple choice section, mean scores were 68.1 percent (SD = .17) for students in the control groups and 70.3 percent (SD = .148) for students in the treatment groups. While the average score for a student in the continuing case groups was higher than a student in the control groups, the difference was not statistically significantly different. When covariates were controlled for by conducting an ANCOVA test, only GPA was found to be significantly associated with differences between groups on multiple choice questions on the final exam, accounting for 10 percent of the variance in scores. Now looking at the final exam's open ended problems, students taught under the continuing case method achieved an average score of 73.9 percent, while the average score for students in the control groups was 66.6 percent on the open ended problems. Again, GPA was the only variable found to be associated with scores to a significant degree but its effect size was lower than multiple choice questions. Finally, students in the treatment groups performed better on the essay questions which required explaining concepts. Their average score on these questions was 73.3 percent (SD = .24) compared to control group students' 68.7 percent (SD = .26).

Discovering that the largest differences between the treatment and controls groups were in open ended questions adds an interesting perspective on the teaching method's efficacy,

especially for educators who believe open-ended problems better assess the skills and knowledge required to be successful in the modern accounting environment. Accordingly, the CPA examination has increased the volume of simulation questions and written communications (Hart, 2018). Critics of multiple choice questions maintain that this format may be a better measure of test taking rather than a measure knowledge when compared to open ended questions. Skeptics posit that test takers can discover an error in their calculation if their answer is not included in the answer choices (Heck & Stout, 1998). Test takers can also work backwards by beginning with the answer choices and through a process of elimination, increase the probability of selecting the correct answer (Carter & Kravits, 2015; Ozuru, Kurby, Briner, & McNamara, 2013). This means that multiple choice formats avail test takers with opportunities to pinpoint the correct answer among choices instead of actually generating the answer from scratch.

Heck and Stout (1998) performed an experiment in an introductory finance class where students were provided identical exams: one in multiple-choice format and one in open-ended format. Students performed better on the multiple choice format but much of the difference was eliminated when controlling for guessing. The guessing correction was based on an equation used in other studies. If this research is reliable, the higher scores achieved by treatment group students on the open-ended questions bodes well for the continuing case method and its effectiveness in acquiring a sound understanding of managerial accounting.

Limitations

The sample was drawn from undergraduate students enrolled in the first management accounting course at a Mid-Atlantic university. This limits the generalizability of the results but provided consistency in instruction, timing, assessments, and enrollment which reduced course

differences. The researcher was the instructor for all sections under study. While this contributes a high level of expertise and consistency to the study, the limitation is potential implicit or unconscious bias toward a particular teaching method. This could affect the researcher's behavior when conducting in class sessions. Every effort was made to maintain consistency among sections except for the employment of the continuing case. Because results were restricted to the first management accounting course, a limitation of this study is the generalizability of results to other courses and disciplines.

Students received informed consent forms at the start of the first class of each semester under study. A description of the study in the forms was limited to a statement which said, "this study examines students' performance and perceptions related to different teaching methods". No other details regarding the study were provided to any students for the duration of this research. Nonetheless, students could have altered their behavior, knowingly or unknowingly, in response to being observed. Paradis and Sutkin (2017) call this an observer effect, otherwise known as the Hawthorne Effect. Finally, students were not randomly assigned to course sections. It should be noted that students had the freedom to schedule their own courses during the registration period and were not informed about the teaching differences before registering for the course or during the duration of the research.

Future Research

Replication of this study would potentially improve the reliability of the results but exact replication is not feasible. Other instructors of the first managerial accounting course will have different examinations, homework, and weighting of assessments to compute a final grade. Each accounting instructor will differ in their classroom presence, although the use of control and

treatment groups can control for this effect. Despite these obstacles, accounting educators may be still find value in replicating this study within the practical confines that exist.

The sections under study focused on topics included in *Introduction to Managerial Accounting* by Brewer, Garrison, and Noreen. This is one of the top two textbooks used for the first managerial accounting course. The learning objectives in this textbook are equivalent to *Managerial Accounting* by Braun and Tietz, the other popular textbook used for this course. Instruments related to student perceptions about accounting, achievement of IMA core competencies, achievement of learning objectives, and the role of the continuing case method in facilitating learning will allow for straightforward replication and are found in the appendices.

Collection procedures related to these instruments, as described in Chapter 3, should also be conducive for replication. In addition to examining the association of the teaching method to student performance and perceptions related to accounting, the achievement of IMA core competencies, achievement of learning objectives, and the role of the continuing case method in facilitating learning, the inclusion of other dependent variables such as students' evaluations of instructors may also be informative to accounting educators.

Generalizability could be enhanced by applying the experiment to the first financial accounting course. This course is part of the introductory accounting sequence and, like the first managerial accounting course, is typically included as a required course for business majors at most colleges and universities. As part of this introductory accounting sequence, the first financial accounting course has the same salience as the first managerial accounting course in terms of influencing students' perceptions about accounting and their subsequent decisions related to majors and careers. Research consistently shows that students' perceptions of accounting decline from the beginning to end of the semester in this course and students

generally find the subject to be boring (Geiger & Ogilby, 2000; Marriott & Marriott, 2003; Picard et al., 2014). This is why the first financial accounting course is included in the calls for interventions by the AECC and Pathways Commission.

A similar study that tests the use of a semester-long common frame of reference as the center piece for teaching would help inform accounting educators in assessing whether it is reasonable to apply the results found in this study to the first accounting sequence as a whole. The instruments used in the study pertaining to perceptions could be adjusted to match the content of the first financial accounting course.

The author suggests replacing instruments which students' perceptions of achieving the IMA core competencies to instruments which measure perceptions of achieving the AICPA (American Institute of Certified Public Accountants) core competencies to align with the course's emphasis on external financial reporting. Likewise, the instrument measuring students' perception of achieving the course learning objectives should be adjusted to learning objectives pertaining to the first financial accounting course. These learning objectives commonly focus on the financial statements, transaction analyses, accrual accounting, and various components of the balance sheet including cash, receivables, inventory, plant assets, liabilities, and stockholders' equity.

This study also paves the way for interested authors to add to the existing body of accounting education literature which focuses on cases. The Journal of Accounting Education and Issues in Accounting Education both have sections dedicated to educational cases. The review of literature found that 20 cases have been published during the last ten years which concentrate on topics commonly covered in the first managerial accounting course. The majority of these cases are complex and narrow in scope, focusing on cost-volume-profit and/or overhead

allocation techniques. None spanned all of the topics typically included in a first year managerial accounting course.

Most of these cases were designed as graded projects to be completed outside of class and crafted for upper level undergraduate accounting courses or graduate courses. These cases are often too challenging and overwhelming for introductory level accounting students (Brewer et al., 2008; Wolcott et al., 2002). Few intentionally constructed the case to situate the student as an owner or employee. The addition of a simple yet broad case, written with the first year accounting student in mind, will benefit an underserved and diverse composition of students in this class. It will also benefit accounting instructors by providing written materials to support their efforts in utilizing this new teaching method in class.

Research that solicits input from industry about this teaching method would be valuable. The AECC and Pathways Commissioners have advocated for accounting educators to make learners active participants, but these organizations have not explored specific teaching methods or endorsed any as best practices to prepare new entrants and close the existing talent gap. The existing talent gap is well documented and the undesirable consequences of this mismatch between employers' expectations and entry-level talent are clear. The IMA has led the effort in retrieving data from finance and HR professionals to shed light on their perceptions about entry-level management accountants. Most agree that the expectations of management accountants have shifted from "bean counter" to "business partner" (Institute of Management Accountants, 2019).

Accordingly, the IMA's management accounting competency framework was redesigned to reflect a relevant skill set. While shortcomings of entry-level accountants are well documented and professionals generally agree on what should be included in today's accounting

curricula, active professionals have not been consulted about the methods in which these core competencies should be taught. It may be unconventional for the academic community to glean insight from active accountants about *how* to teach in addition to inquiring about *what* to teach. If educators believe that the provision of a context helps accounting students learn, it would be reasonable to solicit input from those in the industry about how best to accomplish this. Input from professionals about numerous learning methods, including the continuing case method, would add a new perspective to existing literature. Not only would input from managers be informative, but also input from college graduates who have recently entered the industry may be especially informative in creating the best method to prepare undergraduate students for today's competitive environment.

Longitudinal studies related to this teaching method could take many forms and be advantageous to accounting educators. The collection of student data in subsequent courses who had been in control or treatment groups for the first accounting courses would provide insight into the longer term academic implications of the continuing case teaching method. For example, students' performance and perceptions could be collected and analyzed when they are in intermediate accounting courses to pinpoint any differences that are associated with the teaching method that was used for their introductory courses. Likewise, data related to recent alumni could provide insight regarding current students' expectations that the continuing case method will prepare them better for careers. This could be measured through success in pursuing professional certifications or professional growth as measured by promotions and titles. Direct input from former students' who are in employed in the industry about how and why they believe the continuing teaching method affected their professional preparation would be informative.

Finally, extending the concept of leveraging a common frame of reference for teaching purposes to other fields would help assess a broader generalizability of the results pertaining to this accounting course. Entrepreneurship students, for example, may benefit from "living in" one business for the duration of a semester and applying appropriate concepts to a single entity. Utilizing the first person perspective also seems appropriate for these courses. Other business disciplines such as finance, marketing, and management may find that using this method of teaching sparks the required interest for students to develop a sense of ownership and search for meaning rather than resorting to surface learning.

Concluding Remarks

This study examined a novel teaching approach for a course which research shows is a critical factor in students' major and career decisions. The method was the first to utilize a consistent frame of research as the centerpiece of each teaching session for the duration of an entire semester. Unlike any relevant cases in accounting literature, the study tested this teaching method's effectiveness through the use of a quasi-experimental study, where students were separated into control and experimental groups.

Students in the treatment groups assessed their achievement of the IMA core competencies and course learning objectives significantly higher than students in the control groups. Students in the treatment groups also held significantly higher perceptions of accounting at the end of the semesters than their counterparts. These findings come at a critical period for the profession, higher education, and soon-to-be college graduates. The results indicate that the continuing case teaching method may assist accounting educators who are striving to meet the challenges presented by professional accounting organizations to better engage students in the first accounting courses and enhance perceptions about the profession. The results suggest that

the continuing case teaching method is a practical tool which aligns with the IMAs ongoing efforts to close the talent gap. The data collected in this study shows that the teaching method helps facilitate confidence and achievement in the areas pinpointed by the IMA as core competencies required by today's modern managerial accounting environment. Such outcomes can have cascading effects for employers struggling to find qualified talent, recent college graduates' success and satisfaction in their careers, and universities' long term fundraising and recruitment efforts.

Students taught under the continuing case teaching method performed better on the cumulative final examination, although not significantly better, and similarly on assessments exclusive of the final examination and final overall grades when compared to students taught under a traditional active learning method. An in depth view of performance on the final examination indicates that students in the treatment groups performed better on every question type, with open ended questions demonstrating the largest differences. The high performance on these especially difficult questions may suggest that students taught under the continuing case method develop a deeper understanding of the material and superior skills required to be successful in the modern accounting environment. Further research is needed to support this proposition.

Finally, this study provides a unique contribution to existing literature by testing a teaching method that incorporates elements from validated approaches into a novel method which uses a consistent frame of reference over a 15-week semester to teach fundamental accounting concepts. Students overwhelming reported that the teaching method was useful, engaging, and promoted comprehensive learning. The positive results from a course consistently

described as challenging for instructors and students, lends support for other accounting educators to implement and test a similar method in their classes.

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Appendix A - Applicable Managerial Accounting Cases

Year	Author(s) and Title	Journal	Topic(s)	Fiction / Non-Fiction Perspective Open/Closed Ended In/out of class	Evaluation of case efficacy	Case designed for	Number of under-graduate students	Number of graduate students	Results
2017	Kohlmeyer & Samuels Rebecca's Cofffee and Tea House: A strategic mapping and balanced scorecard case study	Issues in Accounting Education	Performance evaluation	Fiction External Open Out of class	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	upper level accounting undergraduate, graduate	66	73	7-point Likert scale Responses significantly higher than neutral point
2017	Stuebs, Bryant, Edison & Reese Brittney's Boutique: Tailoring a budget for function as well as fashion	Journal of Accounting Education	Contribution margin, Cost-volume-profit analysis, Cash budget	Fiction External Mixed Out of class	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	First managerial accounting course	178	0	5-point Likert scale Responses significantly higher than neutral point
2016	Samuels & Sawers Arizona Microbrewery, Inc.: An instructional case on management decision making	Issues in Accounting Education	Cost-volume-profit analysis, constrained resources, make versus buy	Non-Fiction External Mixed Out of class	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	First managerial accounting course, upper level undergraduate, graduate level	77	23	5-point Likert scale Mean scores for individual questions higher than neutral point
2014	Everaert & Swenson Truck redesign case: Simulating the target costing process in a product design environment	Issues in Accounting Education	Product costs, Activity-based costing	Fiction Internal Mixed In class	Survey of students' self-assessed knowledge before and after the case, student perspectives related to the case's overall effectiveness and its useful in achieving specific course objectives	upper level accounting undergraduate, graduate	0	50	7-point Likert scale Significant improvement in self-assessed knowledge. Mean scores for individual questions
2014	Stout Pack-and-Go Delivery Service: A multi-component cost-volume profit (CVP) learning resource	Accounting Education: an international journal	Cost-volume-profit analysis	Fiction External Mixed Out of class	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	upper level accounting undergraduate, graduate	134	51	5-point Likert scale Mean scores for individual questions higher than neutral
2013	Braun Custom fabric ventures: An instructional resource in job costing for the introductory managerial accounting course	Journal of Accounting Education	Job costing	Fiction External Mixed Mixed	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	First managerial accounting course	244	0	5-point Likert scale Mean scores for individual questions higher than neutral point
2013	Hughes Sunshine Daycare Center: Growing a business to profitability	Issues in Accounting Education	Cost-volume-profit analysis, variance analysis, budgeting	Non-Fiction External Mixed Out of class	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	graduate level	0	17	10-point Likert scale Mean scores for individual questions higher than neutral
2013	Krumwiede & Walden Dream Chocolate Company: Choosing a costing system	Issues in Accounting Education	Job costing, process costing, activity-based costing, special orders	Non-Fiction Internal Mixed Out of class	Survey of student perspectives related to the case's overall effectiveness	upper level accounting undergraduate, graduate	36	82	5-point Likert scale Responses significantly higher than neutral point
2013	Picconi, Smith & Woods Arborista, Inc.: An instructional resource case	Issues in Accounting Education	Statement of cash flows	Fiction External Closed In class	Survey of students' self-assessed knowledge before and after the case	upper level accounting undergraduate, graduate	0	46	Significant improvement in self-assessed knowledge

Year	Author(s) and Title	Journal	Topic(s)	Fiction / Non-Fiction Perspective Open/Closed Ended In/out of class	Evaluation of case efficacy	Case designed for	Number of under-graduate students	Number of graduate students	Results
2012	Convery & Swaney Analyzing business issues - with Excel: The case of Superior Log Cabins, Inc.	Issues in Accounting Education	Cost-volume-profit analysis, variable/absorption costing, budgeting, capital investments	Fiction Internal Mixed Out of class	Survey of students' self-assessed Excel and problem-solving abilities before and after the case (not paired)	200 level management accounting course	712	0	7-point Likert scale Significant improvement in self-assessed knowledge
2012	Roberts & Zamora One laptop per child: The $100 challenge	Issues in Accounting Education	Cost-volume-profit analysis, cost structure, pricing, budgeting	Non-Fiction External Mixed Out of class	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	upper level accounting undergraduate, graduate	84	67	7-point Likert scale Responses significantly higher than neutral point
2010	Swain, Charles, Hobson, Stocks & Pratt Managing the CPA firm at Dodge Company: "Shoeing the cobbler's children"	Issues in Accounting Education	Cost-volume-profit analysis	Non-Fiction Internal Mixed Out of class	Not provided	First managerial accounting course, upper level undergraduate, graduate level	500	40	Not provided
2009	Blocher, Shastri, Stout & Swain Instructional case: Blue Ridge revisited - Integrating ABC and OROS Quick software	Journal of Accounting Education	Activity-based costing	Fiction Internal Mixed Mixed	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	upper level accounting undergraduate, graduate	22	96	4-point Likert scale High level of agreement that the case was extremely
2009	Danvers & Brown Out-West Products, Inc.: A financial modeling and decision analysis case	Journal of Accounting Education	Cost-volume-profit analysis, statement of cash flows, ratios	Fiction External Closed Out of class	Not provided	First managerial accounting course, upper level undergraduate, graduate level	NA	NA	NA
2009	Walters & Pergola An instructional case: Cost concepts and managerial analysis	Issues in Accounting Education	Product costs, cost classifications	Fiction External Mixed Out of class	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives. Instructor assessment of students' acheivement in case wirting assignment using a rubric	graduate level	Not specified. One undergraduate section. Several	Not specified. Several graduate sections.	5-point Likert scale Student perceptions and instructor assessments higher than neutral point. Student perceptions higher than instructor
2008	Brewer, Garamoni & Haddad University Tees: Introducing fundamentals of management accounting in small business	Journal of Accounting Education	Break-even, contribution margin income statements, pricing decisions	Non-Fiction External Mixed Mixed	Not provided	First managerial accounting course	NA	NA	NA
2008	Bushong, Talbott & Cornell Instructional Case - Activity-based costing incorporating both activity and product costing	Accounting Education: an international journal	Classification of costs, activity-based costing	Fiction External Mixed Out of class	Representative student comments	upper level accounting undergraduate	4 comments provided	0	General end-of-semester course evaluations Favorable

Year	Author(s) and Title	Journal	Topic(s)	Fiction / Non-Fiction Perspective Open/Closed Ended In/out of class	Evaluation of case efficacy	Case designed for	Number of under-graduate students	Number of graduate students	Results
2008	Heitger & Heitger Jamestown Electric Supply Company: Assessing Customer Profitability	Issues in Accounting Education	Customer profitability, segments,	Fiction External Mixed Mixed	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	upper level accounting undergraduate, graduate	103	39	5-point Likert scale Mean scores for individual questions higher than neutral
2008	Lamberton Baier Building Products, Inc.: Performance incentives and variance analysis in sales distribution	Issues in Accounting Education	Performance evaluation	Fiction External Open Out of class	Survey of student perspectives related to the case's overall effectiveness and its usefulness in achieving specific course objectives	upper level accounting undergraduate, graduate	32	76	5-point Likert scale Mean scores for individual questions higher than neutral point
2008	Mammano & Tyson Developing an operating budget for Extended Family, Inc.: A not-for-profit human service organization	Issues in Accounting Education	Budgeting	Non-Fiction External Mixed Out of class	Survey of students' self-assessed knowledge before and after the case	upper level accounting undergraduate, graduate	Not specified. One undergraduate	Not specified. One graduate section.	5-point Likert scale Improvements in self-assessed knowledge

Appendix B - Top Selling Introduction to Managerial Accounting Textbooks Content

Introduction to Managerial Accounting, 7th Edition	Managerial Accounting, 5th Edition
Brewer, Garrison, and Noreen	Braun and Tietz
2016	2018
McGraw-Hill	Pearson
Chapter 1: Managerial Accounting and Cost Concepts	Chapter 1: Introduction to Managerial Accounting
Chapter 1: Managerial Accounting and Cost Concepts	Chapter 2: Building Blocks of Managerial Accounting
Chapter 1: Managerial Accounting and Cost Concepts	Chapter 6: Cost Behavior
Chapter 2: Job-Order Costing	Chapter 3: Job Costing
Chapter 3: Activity-Based Costing	Chapter 4: Activity-Based Costing, Lean Operations, and the Costs of Quality
Chapter 4: Process Costing	Chapter 5: Process Costing
Chapter 5: Cost-Volume-Profit Relationships	Chapter 7: Cost-Volume-Profit Analysis
Chapter 6: Variable Costing and Segment Reporting: Tools for Management	Chapter 6: Cost Behavior
Chapter 7: Master Budgeting	Chapter 9: The Master Budget
Chapter 8: Flexible Budgets, Standard Costs, and Variance Analysis	Chapter 11: Standard Costs and Variances
Chapter 9: Performance Measurement in Decentralized Organizations	Chapter 10: Performance Evaluation
Chapter 10: Differential Analysis: The Key to Decision Making	Chatper 8: Relevant Costs for Short-Term Decisions
Chapter 11: Capital Budgeting Decisions	Chapter 12: Capital Investment Decisions and the Time Value of Money
Chapter 12: Statement of Cash Flows	Chapter 13: Statement of Cash Flows
Chapter 13: Financial Statement Analysis	Chapter 14: Financial Statement Analysis
	Chapter 15: Sustainability

Appendix C – Informed Consent Form

You are being asked to participate in a research study conducted by Brian Trout as part of his doctoral studies at Wilmington University. This study examines students' performance and perceptions related to different teaching methods. Please read the following carefully and ask any questions you have before signing.

By signing this consent form, you are signifying that you understand the information provided below and agree to participate.

- At the beginning and end of the semester, you will be asked to complete questionnaires.
- Your name will not be associated with the answers you provide. Your confidentiality will be maintained throughout the study by the use of the last four digits of your Millersville ID (M#) as a participant ID, rather than using identifying information such as your name or full ID.
- All participants must be over the age of 18.
- Participation is voluntary and can be terminated at any time.
- There no known risks associated with this study.

If you have any questions concerning the research study, please contact Brian Trout.

This study will be completed at the end of the semester. If you are interested in the results of this research, please contact Brian Trout.

This project has been approved by the Millersville University of Pennsylvania Institutional Review Board for the Protection of Human Subjects. If you have questions, please contact Rene Munoz at 717.871.4457 or by email at rene.munoz@millersville.edu.

_____

Participant signature Date

Brian Trout

Millersville University

Accounting & Finance Department

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McComsey Hall 346

717-871-4454

Appendix D – Pre Class Questionnaire

Last four digits of MU #: _____

1. Gender:_____

2. Cumulative GPA:_____

3. Class level (circle one)

- Senior
- Junior
- Sophomore
- Freshmen

4. Major (circle one)

- Accounting
- Finance
- Management
- Marketing
- International
- Other (please specify)_____

Please rate your agreement with each statement by writing the number next to each statement according to the following scale:

5 - Strongly agree
4 - Agree
3 - Undecided
2 - Disagree
1 - Strongly disagree

_____I have personal experience in a manufacturing business

_____I have personal experience with managerial decisions in a manufacturing business

_____Accounting is an interesting subject

_____Accounting is boring

_____Accounting skills can add value to departments outside of accounting

_____I plan to pursue a professional accounting certification after graduation

_____I would enjoy working in the accounting field

_____I see how accounting could be useful in my career

Appendix E – Post Class Questionnaire

Last four digits of MU #: _____

Please rate your agreement with each statement by writing the number next to each statement according to the following scale:

5 - Strongly agree
4 - Agree
3 - Undecided
2 - Disagree
1 - Strongly disagree

Accounting

_____Accounting is an interesting subject

_____Accounting is boring

_____Accounting skills can add value to departments outside of accounting

_____I plan to pursue a professional accounting certification after graduation

_____I would enjoy working in the accounting field

_____I see how accounting could be useful in my career

Core Competencies

_____I have the skills to prepare a financial plan for a specific period of time or project, compare actual results to planned results and forecast future financial needs and performance

_____I feel confident in using financial information to guide decisions which could have strategic consequences on an organization

_____I feel prepared to analyze business situations with competing priorities and communicate my findings as a cross-functional business partner to transform company-wide operations

_____I would feel confident assuming a leadership role to help others think strategically and lead initiatives to increase profitability

Learning objectives

_____I will remember what I learned in this class for many years

_____I can see how all of the topics and chapters are connected

_____I understand cost classifications such as variable costs and fixed costs and how these impact contribution margin

_____I understand how overhead is applied in a job-order costing system, the corresponding journal entries, and the computation product costs

_____I understand the rationale behind activity based costing and how product costs are calculated under this method.

_____I understand what equivalent units are and how to use this information to compute a cost per equivalent unit

_____I understand how changes in variable costs, fixed costs, selling price and sales volume affect net operating income and break-even points.

_____I understand how variable costing differs from absorption costing and feel confident in making decisions related to different business segments

_____I am prepared to construct a sales budget, production budget, direct materials budget and direct labor budget

_____I can prepare a flexible budget and am prepared to fully explain variances

_____I understand how to compute and use return on investment, residual income, delivery cycle time, throughput time, and manufacturing cycle efficiency

_____I can differentiate between relevant and irrelevant costs and benefits in a decision and make prudent decisions related to making or buying a product, accepting or rejecting a special order and processing joint products further

_____I am prepared to use the payback period, simple rate of return, and present value methods to evaluate investments.

Appendix F – Post Class Questionnaire (treatment group only)

Last four digits of MU #: _____

Please rate your agreement with each statement by writing the number next to each statement according to the following scale:

5 - Strongly agree
4 - Agree
3 - Undecided
2 - Disagree
1 - Strongly disagree

The continuing case as a learning tool

_____The continuing case was a helpful learning method

_____I prefer learning the material through a continuing case instead of learning with textbook exercises

_____It was helpful to apply new material to a familiar common frame of reference

_____I would recommend that the instructor use this continuing case again in future classes

_____The continuing case made managerial accounting more relatable

_____The continuing case made me feel more involved in class

_____The continuing case made difficult topics easier to understand

_____I used the continuing case as a reference when doing homework assignments outside of class

_____The continuing case helped me see how topics and chapters were connected

_____Thinking about situations from the first person perspective (business owner or employee of All Aboard, Inc.) helped me understand and apply the new material

_____The continuing case will help me remember concepts longer than if I learned them through varied textbook exercises

The continuing case relative to core competencies

_____The continuing case helped me understand how to prepare a financial plan for a specific period of time or project, compare actual results to planned results and forecast future financial needs and performance

_____The continuing case helped me understand how to use financial information to guide decisions which could have strategic consequences on an organization

_____The continuing case helped prepare me to analyze business situations with competing priorities and communicate my findings as a cross-functional business partner to transform company-wide operations

_____The continuing case made me more confident in assuming a leadership role to help others think strategically and lead initiatives to increase profitability

The continuing case relative to learning objectives

_____The continuing case helped me understand cost classifications such as variable costs and fixed costs and how these impact contribution margin

_____The continuing case helped me understand how overhead is applied in a job-order costing system, the corresponding journal entries, and the computation product costs

_____The continuing case helped me understand the rationale behind activity based costing and how product costs are calculated under this method.

_____My understanding of equivalent units and how this information is used to compute a cost per equivalent unit was enhanced by the continuing case

_____The continuing case helped me understand how changes in variable costs, fixed costs, selling price and sales volume affect net operating income and break-even points.

_____The continuing case helped me understand how variable costing differs from absorption costing and feel confident in making decisions related to different business segments

_____I am better prepared to construct a sales budget, production budget, direct materials budget and direct labor budget because of the continuing case

_____The continuing case helped me prepare a flexible budget and explain variances

_____The continuing case helped me learn how to compute and use return on investment, residual income, delivery cycle time, throughput time, and manufacturing cycle efficiency

_____The continuing case was useful in helping me differentiate between relevant and irrelevant costs and benefits in a decision and make prudent decisions related to making or buying a product, accepting or rejecting a special order and processing joint products further

_____The continuous case helped prepare me to use the payback period, simple rate of return, and present value methods to evaluate investments.

Appendix G – Descriptors and Benefits Provided by Focus Groups

Student	Word	Word	Benefit	Benefit
1	Clear	Simpler	Easier to understand using the same materials versus using lots of different scenarios	Less new information to grasp/get used to, easier to focus on new concepts
2	Clear	Easier	Easier for me to understand because it puts things in perspective	Building block
3	Familiar	Simpler	Using the same case throughout the semester really helped me grasp the new concepts we were going over.	Looking back at everything we did with the same train corporation, it really showed what all is done / needs to be done for a company to succeed
4	Involved	Hands on	Time saving	Easier to understand because there is a constant variable you can relate to the changing variables
5	Relatable	Recognition	Student connection	Grabs attentions of the student because of its familiarity
6	Simple	Relatable	Relates to the business world	Feels more like on-the-job training
7	Engaging	Relatable	Having a continuing case helped the fluidity of the class and made concepts connect	It was easier to think about how it would be used in real life
8	Tangible	Consistent	Allows the reason or concept of a lesson to be seen through the example. Literally seeing the raw materials for example helped me actually understand what we're doing	Consistent theme throughout chapters and examples
9	Real world	Interesting	Comprehensive, allowed me to see the big picture	All encompassing
10	Helpful	Clear	We weren't all over the place. Having the continuing case made it seems like I knew what I should be doing	It was the same. We weren't thinking of different scenarios or businesses when we were learning the material

11	Informative	Organized	It was easier to learn concepts when relating back to the same thing	The consistent example keeps learning more organized
12	Familiarity	Association	The common frame of reference was extremely helpful	Already familiar with the details of the business so I didn't have to relearn things
13	Cumulative	Traceable	It made the material relatable	It made the material applicable
14	Creative	Continuous	I think in pictures (creatively) so when taking a test, I see the trains and recall the modules	Much easier to remember than formulas