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Inversed Learning in an Intermediate Accounting Course

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Inversed Learning in an Intermediate Accounting Course

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by

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ABSTRACT

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Students enrolled in accounting courses often struggle because of the complexity of the topic. Accounting instructors have searched for effective means of fostering student success, but the learning process continues to change. Critical thinking and problem solving abilities are vital for students and future professionals. Thus, teaching should not be limited to the transmission of information. By moving the dissemination of basic knowledge outside the classroom inversed learning allows class time for deep dives into complex topics and hands-on activities. Students who are actively involved in learning tend to be more successful in the classroom.

The purpose of this study was to determine how undergraduate students in an intermediate accounting course respond to an inversed classroom structure as it relates to financial accounting. A quasi-experimental, quantitative approach was used to investigate whether the academic performance of students who received instruction in a flipped classroom significantly differed from students who received instruction in a traditional classroom. Subgroups of students within the treatment group were examined to determine their response to the intervention.

The study was completed over 2 semesters. Participants were determined by pre-existing groups. Students enrolled in an intermediate accounting course during the spring 2018 semester received instruction in a traditional manner. Students enrolled in the same course during the fall 2018 semester were taught using the inversed model. The researcher for this study also served as

the instructor for both groups. Academic achievement was measured by student performance on four exams administered during each semester. Six research questions were addressed using MANOVA, ANOVA, and multiple regression analyses. The results indicated students generally perform better in the inversed learning environment than in the traditionally formatted classroom. Although the comparisons were not statistically significant, students in the flipped classroom did achieve higher scores on 3 of the 4 exams. No significant interaction was found between the classroom environment and gender or learning style. Both college GPA and gender were found to be significant predictors of academic performance. The findings from this study may support faculty in the enrichment of college curriculum by promoting active learning.

DEDICATION

I dedicate this work to my family and friends who have loved me unconditionally and shaped me into the person I am today. I first dedicate this study to the memory of my loved ones who started this journey with me but passed on before seeing it to completion. To my mom, whose unwavering belief in me gave me the confidence to strive for even the most unrealistic goals. She never missed an opportunity to brag to others about my accomplishments. To my mother-in-law, who taught me to always do what is right even when it is not easy. She exemplified what it is to be a Godly woman, wife, and mother and inspired me to be a better human being. To my grandfather, who instilled in me a love of music, a strong work ethic, and a desire to always better myself. His contagious smile will always be remembered.

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CHAPTER 1

INTRODUCTION

Classroom instructors have always sought to identify the most effective approach to teaching students. Throughout the years there have been many different pedagogical theories explored. Educators are continuously experimenting with different forms of instruction to find the best approach. One of the more recent developments in education has been the flipped classroom model (Logan, 2015; Yilmaz, 2017). A flipped classroom is an instructional technique used to create an active student-centered learning environment. Activities that traditionally occur during class time are moved outside of the classroom and vice versa. Students are exposed to the cornerstone material prior to attending class by watching prerecorded lectures at home (Schwankl, 2013). During class instructors answer questions, facilitate discussion among the students, and elaborate on the fundamental ideas from the recordings (Berg, Ibrahim, Magaster, & Salbod, 2015). Students also engage in hands-on activities to apply the concepts covered in the videos (Galway, Berry, & Takaro, 2015).

Although the term flipped classroom is relatively new, the core principles underlying the model are not (Honeycutt, 2016). The idea stemmed from the realization that student engagement in the learning process is essential. The notion of inversed learning was first introduced in 1993 (King, 1993). King criticized the outdated conventional learning model and claimed class time should be used for analysis and application rather than transmission of information. The author emphasized the need for students to be active participants rather than passive listeners. Harvard professor Eric Mazur further contributed to the progression of the flipped classroom with the release of the book *Peer Instruction: A User's Manual* in 1997. Students in Mazur's class prepared for learning before class by reading and answering questions

about the material. The course design reduced the need for direct instruction during class time and allowed more opportunities for interactive learning and in-depth thinking (Schell & Mazur, 2015).

The innovative approach gained momentum when an article written by Lage, Platt, and Treglia (2000) specifically discussed inverted learning and how it could be used to meet the needs of students with all types of learning styles by opening up class time for one-on-one guidance. The scholars used prerecorded lectures on VCR tapes to move the presentation of information outside of the classroom (Honeycutt, 2016). With a lack of sophisticated technological resources, most educators were still resistant to the revised classroom structure. One of the most well-known contributors to inverted learning is Salman Khan, founder of the Khan Academy. The Khan Academy provides online tutorial videos that allow students to skip lessons they have mastered and replay segments that are complex or troublesome. Students are able to take responsibility for their learning, specifically when they do not understand a concept. Many of the videos offered by the Khan Academy are now used for flipped classroom instruction.

Bergmann and Sams are considered to be pioneers of the inverted classroom. The high school chemistry teachers were the first to fully implement the model in 2007. Initially Bergmann and Sams provided narrated PowerPoint slides to students who were absent and missed the lessons. The instructors realized other students could benefit from the recordings as well. The classroom was soon transformed into an interactive learning space and the flipped classroom was born. Students were instructed to watch the videos at home prior to attending class. Instead of lecturing class time was spent helping students with the concepts they did not understand in the videos and completing lab work (Bergmann & Sams, 2012). Since then the

flipped classroom has continued to attract attention among educators. The availability of learning technologies such as YouTube and podcasts has made implementation more feasible. In 2018 the Flipped Learning Global Initiative was launched in response to the growing interest in inversed learning and to ensure consistent training and support for professionals who use the flipped design in their classrooms.

The reality is the learning process has dramatically changed over the last two to three decades. Basic information is now instantly available with the click of a button. The current generation's mantra for seeking knowledge is "Google It." As such, education must go beyond the memorization of facts and figures. Technology has changed virtually every aspect of our lives and instructors must be willing to embrace a modern attitude toward pedagogy. Teaching can no longer be limited to the dissemination of information from behind a podium, especially on the college platform. Students must be equipped with the skills necessary to analyze, evaluate, and synthesize large volumes of data and then apply the information to real-world situations (Franklin & Morrow, 2017). They must be able to use knowledge, rather than simply memorizing it. Critical thinking and problem solving abilities are imperative for today's students and future professionals. By moving the transmission of basic knowledge outside the classroom, the flipped classroom provides the opportunity for deep dives into complex topics and hands-on activities that reinforce the concepts previously learned at home. The inversed model has quite literally turned the learning process on its head with student engagement in the classroom.

The body of literature provides compelling support for the emphasis on active learning in the classroom. The flipped classroom is grounded in the theoretical framework of constructive learning. The constructivist theory of learning states knowledge cannot be transmitted. Rather, knowledge is constructed by individuals as they try to make sense of information by applying it

to previous knowledge and experiences (Gilboy, Heinerichs, & Pazzaglia, 2015). In a lecture setting, the professor is disbursing information, not knowledge. Active learning provides students the opportunity to reconstruct information in a personally meaningful way, which provides a deeper understanding of the concept and allows for easier recall later (King, 1993).

Inversed learning is also closely aligned with the principles of Vygotsky's zone of proximal development. The zone of proximal development is the notional area between what students can do independently and what they cannot do at all (Pritchard & Woollard, 2010). Honeycutt (2016) encouraged educators to design classroom learning activities that fall in the zone of proximal development, in other words tasks that can only be completed with guidance. Most students can receive information on their own. However, they struggle to synthesize, analyze, and evaluate information. Students need assistance when completing tasks that require higher order thinking skills. Thus class time should be used for these types of activities with the presence of the instructor.

The flipped classroom is heavily influenced by the ideas of both the constructive learning and zone of proximal development educational philosophies. The theories each indicate learning does not occur in a vacuum. Students must have contextual references to provide a framework for understanding the new information. The engaging in-class activities of the flipped classroom provide students the opportunity to process the content through application to various scenarios. The theories also suggest knowledge formulation is enhanced by the interaction and collaboration with others (Kim, Kim, Khera, & Getman, 2014). The level of cognitive achievement is contingent on the amount of support provided by more knowledgeable and experienced individuals. The flipped classroom allows class time for both individualized learning with the instructor and group thinking among peers.

Statement of the Problem

The purpose of this study was to determine how undergraduate students in an intermediate accounting course at a regional university respond to an inversed ("flipped") classroom structure as it relates to financial accounting. A quasi-experimental, quantitative approach was used to investigate whether the academic performance of accounting students who receive instruction in a flipped classroom (treatment group) significantly differs from the academic performance of accounting students who receive instruction in a conventional learning environment (control group). Moreover, subgroups of students within the treatment group were examined to determine their response to the intervention.

Research Questions

The study was designed to investigate the following research questions:

Research Question 1

Is there a significant difference in academic achievement as measured by scores of each of the 4 exams (Exam 1, Exam 2, Exam 3, and Exam 4) between students in the control group (traditional classroom instruction) and students in the treatment group (flipped classroom instruction)?

Research Question 2

Is there a significant difference in academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4) between students in the control group (traditional classroom instruction) and students in the treatment group (flipped classroom instruction) in regard to gender?

Research Question 3

Is there a significant difference in academic achievement as measured by total exam

scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4) between students in the control group (traditional classroom instruction) and students in the treatment group (flipped classroom instruction) in regard to preferred learning style (visual, auditory, and kinesthetic)?

Research Question 4

Are prior grade point average (GPA) and the method of instruction (traditional/flipped) statistically significant predictors of academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4)?

Research Question 5

Are American College Test (ACT) scores and the method of instruction (traditional/flipped) statistically significant predictors of academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4)?

Research Question 6

Are prior grade point average (GPA), American College Test (ACT) scores, gender, preferred learning style (visual, auditory, kinesthetic), and the method of instruction (traditional/flipped) statistically significant predictors of academic achievement as measured by total exam scores (sum of Exam I, Exam 2, Exam 3, and Exam 4)?

Significance of the Study

Historical evidence has shown accounting courses often have high failure rates (Kealey, Holland, & Watson, 2005). In response accounting professors have used a variety of alternative instructional approaches in hopes of improving the learning experience and decreasing failure rates (Froman, 2001). Prior research has shown student engagement leads to increased levels of knowledge comprehension and retention (Brame, 2013; Gilboy et al., 2015). Students who are active in the learning process tend to be more successful in the classroom. The interactive aspect

of the flipped model offers students an opportunity to deepen their understanding of the material and develop critical thinking skills (Schwankl, 2013).

Even though there are several studies exploring the effectiveness of flipped classrooms, little research has been conducted specifically related to the use in college accounting courses (Buchholz & Kass, 2015). The purpose of this study is to determine how undergraduate students in an intermediate accounting course at a regional university respond to an inversed ("flipped") classroom structure as it relates to financial accounting. This study enhances the current literature by exploring the effectiveness of two different pedagogical techniques on student success in the accounting classroom. This study should contribute to the continuous efforts of college educators who aim to enrich the learning experience. The findings from this study may be beneficial to accounting faculty interested in flipping the classroom to improve student comprehension of accounting topics. It proposes an alternative way to structure the classroom to incorporate technology and foster an environment which emphasizes problem solving and critical thinking. The modified approach may also influence student opinions about accounting as a career. By increasing pass rates and creating a better perception of the accounting field, students may be more likely to select accounting as a major.

Lastly, the inversed teaching technique may improve student readiness for the Certified Public Accountant (CPA) licensure exam and a future career in the accounting profession. In 2010 the American Institute of CPAs (AICPA) partnered with the American Accounting Association (AAA) to create the Pathways Commission on Accounting Higher Education. The group was tasked with studying the future structure of higher education for the accounting profession and developing a strategy to improve the competency and integrity of the next generation of accountants (Behn et al., 2012). One recommendation was to reform accounting

education with purposeful integration of accounting research and exposure to real-word issues in the classroom. Further, the Commission encouraged the rejuvenation of accounting curriculum and pedagogy in response to the rapidly changes in the accounting practice driven by technological advancement. They claimed "more context-rich critical thinking and hands-on problem solving that mimics complex data creation and analysis . . . in current world practices will better prepare students for the accounting profession" (Pathways Commission for Accounting Higher Education, 2012). The AICPA responded to the initiative with significant revisions to the uniform CPA examination intended to increase the measurement of higher order skills (Behn et al., 2012). The updated format prioritizes the assessment of critical thinking (application, analysis, and evaluation) and places less emphasis on lower level skills (remembering and understanding) (Tysiac, 2017). As the flipped classroom may help students reach those higher levels of Bloom's taxonomy, it has the potential to increase their readiness for future professional endeavors.

Definition of Terms

The following terms and definitions are to aid the reader in fully understanding the contents of this research study. Terms specific to this study are explained in the following definitions:

1. Blended Learning: The incorporation of technology-driven instruction in a learning environment paired with a traditional delivery mode (Berg et al., 2015). This type of learning can also be referred to as hybrid learning.
2. Flipped Classroom: A course design in which the timing and location of the typical lecture and homework elements are reversed (Honeycutt, 2016). Flipped classrooms are a type of inversed learning strategy.

3. Inversed Learning: A pedagogical model in which the events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa (Honeycutt, 2016).
4. Traditional Classroom: Learning environment in which instruction is delivered to students in a face-to-face lecture format (Chen & Jones, 2007). Application of key concepts is typically practiced independently at home with assigned exercises.
5. Zone of Proximal Development: Notional area of understanding or cognitive development that is close to but just beyond a learner's current level of understanding (Pritchard & Woollard, 2010).

Delimitations and Limitations

The research is delimited to one regional university in the southeastern region of the United States. Only students enrolled in an intermediate accounting course during the spring 2018 and fall 2018 semesters who were at least 18 years old were eligible for participation in the study. This study is further delimited to participants who chose to return a completed consent form. The results may not be generalizable to other populations or educational settings. The homogeneity of the participants in the two groups was evaluated by means of grade point average (GPA) and American College Test (ACT) scores. Nonetheless, the inherent differences in the student participants assigned to each group introduces an additional variable which could contribute to differences noted in academic performance in the traditional classroom verses the flipped classroom. Academic achievement was measured by student performance on four exams administered during each semester. Exams were developed by the instructor and were consistent between the two groups. Researcher bias is also a potential delimitation of the study, as the researcher was also the instructor of all of the intermediate accounting course sections used in

the study. The study is also delimited by the theoretical framework that was selected for the research. The theoretical framework for this study was chosen after considering previous research related to student engagement and active learning.

The study is limited by the definition of academic achievement and the selected measurement instrument. It is assumed the examinations used for data collection were reliable and valid, providing an effective means of measuring student performance. Exams used to determine academic achievement for purposes of research were the same as that used to determine a student's semester course grade. Further, the sample size is considered to be sufficient to detect significant differences in academic achievement between the groups. Statistical procedures performed to analyze the data were appropriate to address the corresponding research question and possessed the power to detect differences in performance between the various student groups. The study was designed to explore whether the academic performance of students in an intermediate accounting course taught using a traditional approach differed from those students who received instruction in an inversed manner. It cannot be concluded that variations in exam scores between the two groups is driven only by the classroom format. Further, the results of the study do not provide insight into why students perform differently in these two environments.

Overview of the Study

The study is organized into five chapters. Chapter 1 consists of a brief introduction to the research topic, highlighting key points from the literature review. Chapter 1 also includes the statement of the problem, research questions, and the significance of the study. Limitations and delimitations of the study are described and definitions of key terms are provided at the conclusion of the chapter. A review of the literature related to this study is provided in Chapter

2. The review focuses on the fundamental concepts of the flipped classroom pedagogy and practical application of the teaching approach. It includes an assessment of the benefits and challenges of inversed learning, as perceived by both the students and the instructor. Chapter 3 contains the methodology used in this study, including the research participants, data collection procedures, and statistical analysis. Chapter 4 includes a description of the findings from the data analysis. A summary of the findings, final conclusions, and recommendations for practice and future studies are provided in Chapter 5.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

Students enrolled in intermediate accounting often find these courses to be particularly difficult because of the amount of information and the complexity of the subject matter (Brink, 2013). Topics discussed in intermediate accounting are the foundation for many of the subsequent courses students are required to take in an undergraduate accounting program. Thus, it is essential for accounting majors to absorb the content of these courses to have success in future courses and the profession (Brown, Danvers, & Doran, 2016). Accounting educators have the challenge of presenting complicated topics in depth, while maintaining the students' attention and ensuring they understand and retain the information. The lecture has traditionally been the primary means of content delivery in a college classroom. Although it is at times supplemented with problem demonstration or case discussions, the instructor's lecture is generally the center of the pedagogy (Duxbury, Gainor, & Trifts, 2016). The lecture can be beneficial for transmitting information, but it is limited in its effectiveness for meeting other learning objectives (Pollock, Hamann, & Wilson, 2011)

Studies have revealed traditional instruction may not lead to substantial learning achievements. Research by Arum and Roksa reported no statistical difference in critical thinking and complex reasoning in 45% of students after two years of higher education and 36% of students after four years of higher education (as cited in Chen, 2017). Further, the work of cognitive and educational psychologists over the last few decades has provided evidence that today's students do not learn in the same way the previous generation of students learned (Synder, 2000). There is still debate over what learning means, but academics acknowledge it is

a dynamic process that is different for everyone (Sikkema & Sauerwein, 2015).

Advances in the business environment have changed the required skills and knowledge of future accounting professionals. An understanding of the fundamental technical concepts are still an assumed trait of accounting graduates. In addition, the profession expects students to demonstrate higher-order cognitive skills such as problem solving and analysis (Lento, 2017). Lento called for a paradigm shift in accounting education. Instructors of higher education must change what they are doing in the classroom to integrate conceptual knowledge attainment and relevant critical thinking skills (Casagrand & Semsar, 2017). Accounting educators and professionals agree that accounting is best learned by doing it. The purpose of this literature review is to evaluate the findings of previous studies related to the flipped classroom and explore how active learning has impacted student success. McNally et al. (2017) stated the literature is currently lacking empirical evidence to support the effectiveness of the flipped classroom. Certain studies to date have relied on anecdotal evidence to assess learning achievements rather than quantitative analysis (Borthick, Jones, & Wakai, 2003). Logan (2015) concurred the quantitative research is limited but noted the studies that have been conducted show either an increase in student learning or no significant change. Moreover, much of the research performed to date on the flipped classroom has not focused on its effectiveness in a college-level business course (Buchholz & Kass, 2015; Duxbury et al., 2016).

Blended Learning

Technology is a powerful tool that is being used to transform education in a wide variety of ways. It is providing new and innovative means of learning through the use of multimedia devices. Technology is often used to modify the mode of delivery. Although not an entirely new concept, the use of distance education has gained tremendous popularity in recent years.

As the trend of incorporating technology into the classroom has escalated, institutions have implemented more online courses and even complete online programs (Duncan, Kenworthy, & Mcnamara, 2012). Despite the fact there are many benefits to online classes, namely flexibility and convenience, there are also disadvantages to a pure online structure. One of the primary drawbacks of the online learning environment is the lack of social interaction. Research has indicated that interaction is an essential aspect of the learning process and educators have struggled with how to address the issue in an online environment (Ward, Peters, & Shelley, 2010). The lack of collaboration and support can cause students to feel isolated and disconnected from both the instructor and their peers (Duncan et al., 2012; Falloon, 2012; Ge, 2012). Without face to face interaction students do not have the opportunity to ask questions and receive real-time support.

Blended learning is becoming widely accepted as one of the more effective teaching strategies (Picciano, 2009). Berg et al. (2015) defined blended learning as the incorporation of technology-driven instruction in a learning environment paired with traditional delivery mode. Scholars have discovered pairing the conventional classroom with an online delivery mode may foster the ultimate learning experience (Clark, 2015; Picciano, 2009; Schwankl, 2013). Efforts have been made to determine the appropriate balance between offering opportunities for interaction and collaboration found in the traditional classroom with maintaining the flexibility and autonomy associated with online courses. Without a rigid structure students have the freedom to learn at their own pace in an online course. However, exclusive online learning lacks important elements of effective education, namely social interaction. Borthick et al. (2003) endorsed the dual cognitive-social nature of learning and emphasized the importance of designing courses that weave the two components together without allowing one to overshadow

the other. Although the blended approach is best known for the combination of online and traditional face-to-face instruction, it does not necessary have to be structured in that manner. Blending learning can be as simple as incorporating a variety of instructional techniques in the course design (Picciano, 2009). The variation in teaching tools can be used to meet the learning needs of diverse students and foster collaboration between individuals with different capabilities and competency levels (Ge, 2012).

Previous studies have documented student preference for the blended style of learning. In a study of students learning to speak English as a foreign language, students in the blended environment reported more satisfaction with the learning climate (Sucaromana, 2013). Additionally, the students expressed a better attitude toward the subject and higher levels of intrinsic motivation. Wanner and Palmer (2015) found students wanted personalized learning by means other than online learning. They preferred an interactive and collaborative face-to-face setting with well-structured activities. Falloon (2012) discovered students preferred a classroom format that would allow for self-paced preparation to learn the fundamental concepts and real-time interaction to discuss material and deepen their understanding of the material. Most learners need time for individualized absorption and reflection of information while also having the support and guidance from the instructor in order to maximize the effectiveness of the class (Duncan et al., 2012). This is the primary concept of the blended or hybrid approach to classroom management. Many believe the blended classroom provides the "best of both worlds" with a mix of conventional learning with modern technology-based instruction (Beyth-Marom, Saporta, & Caspi, 2005).

Not all academics recognize the value of the blended approach to education. Some scholars argue that the advantages of online programs are too numerous to ignore. Wang and

Schrager (2017) claimed that online programs are not only effective but also engaging, immersive, and inexpensive to offer. Others discount the benefit of social interaction incorporated in a hybrid style. In 2015 Stack found no significant differences were identified in the academic performance of students enrolled in a pure online section verses a traditional section. Stack concluded face-to-face interaction with peers or the instructor does not have an impact on a student's success.

Characteristics of an Effective Flipped Classroom

Recently the idea of inverting or flipping a classroom has generated discussion among academics. The flipped format is best described as a blended-learning technique (Galway et al., 2015). It combines asynchronous learning with online technology and conventional face-to-face learning through application in the classroom (Larsen, 2015). The known successes of flipped classrooms are compelling educators to rethink their traditional instructional strategy. Still yet, critics are skeptical of the new instructional method. Tucker (2012) claimed educators are constantly promoting new pedagogies only to abandon them later and flipping may just be the latest educational trend.

In a traditional classroom students attend a face-to-face lecture in which the instructor presents the material. Aside from asking questions the students are simply passive listeners. Subsequently the students complete homework assignments outside of class to reinforce their understanding of the main concepts. The problem with this conventional pedagogy is the lack of student engagement. The learning process is centered on the instructor rather than the student. The goal of a flipped classroom is to redirect the focus of the classroom from the teacher to the students (Bergmann & Sams, 2012).

Basics of Flipping

There is no precise way to flip a classroom. The literature is full of examples of how different individuals approached the flipped classroom; however, there is a lack of consensus on the definition. Bergmann and Sams (2012) described the flipped classroom as a mindset not a specific methodology. Though there is not a clear definition of a flipped classroom, scholars tend to agree on the basic elements of the model. One key aspect of all flipped classrooms is the exposure to core content prior to attending class (Brame, 2013; McNally et al., 2017; O'Flaherty & Phillips, 2015). Secondly, in-class activities are used to reinforce main concepts and facilitate active learning. The hands-on tasks aim to promote higher learning and development of more advanced cognitive skills (Brame, 2013; McNally et al., 2017; O'Flaherty & Phillips, 2015). The teaching strategy has been "I do," "We do," and then "You do" for many years. According to Schmidt and Ralph (2016) the flipped classroom reverses that strategy with the "You do," "We do," and "I do" mentality (see Figure 1).

Preclass Activities

Lectures generally are not the most effective teaching strategy, but direct instruction is necessary to a certain extent to communicate basic ideas and concepts (Bergmann & Sams, 2012; Gilboy et al., 2015). The inversed format requires students to watch prerecorded videos or read assigned material prior to attending class. The videos and reading materials provide the foundational knowledge of the subject matter students would typically receive during the traditional classroom lecture. The preclass learning prepares students for meaningful in-class learning activities (Balan, Clark, & Restall, 2015). The preclass exposure to material can take on a variety of forms. In addition to textbook readings and video lectures, students may also be required to listen to podcasts, read journal articles, or review website content.

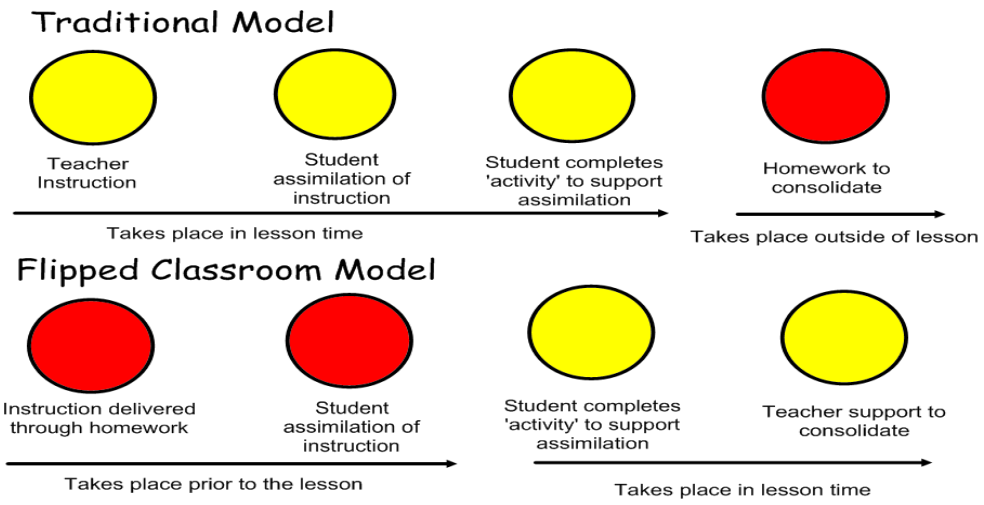

Figure 1. Comparison of traditional and flipped learning (adapted from Steed, 2012)

One of the most common forms of preclass instruction for the flipped classroom is screencasting (Schell & Mazur, 2015). Screencasting is essentially a video recording of the activities on a computer screen as well as audio. A screencast allows the instructor to narrate and annotate Powerpoint slides or demonstrate examples on a virtual whiteboard. This is beneficial in a course such as accounting that is problem-oriented. Information can be developed by the instructor or a third party. For instance, instructors can require students to watch videos created by the Khan Academy. This diversifies the course content and helps students stay attentive. Lento (2017) warned educators when using third party videos to ensure the content aligns with the learning objectives for the class. The chief objective of the videos is to provide a basis of understanding so that class time may be spent on more challenging cognitive tasks (Schell & Mazur, 2015). Thus, it is critical the students participate in the preclass activities and gain a solid understanding of the information. Heinerichs, Pazzaglia, and Gilboy (2016) suggested incorporating questions in the videos to give students the opportunity to assess their comprehension. Starting class with student-initiated questions also provides students time to

clarify misunderstandings from the preclass activities and evidence their completion of the preclass assignments.

In-Class Activities

The traditional classroom fosters inactive learning. An inverted classroom encourages student-centered learning through hands-on instruction and collaboration with peers (Galway et al., 2015; Gilboy et al., 2015; Honeycutt, 2016). The Flipped Learning Network has defined this teaching style as "a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment." Rather than passively receiving information, active learning helps students get involved with the information presented (King, 1993). When lecture is the primary mode of delivery, students tend to memorize information and regurgitate it on a test. Engaged students learn to analyze information and identify cause-effect relationships. Consequently, they develop a deeper understanding of the information (King, 1993).

Role of the Instructor

Because class time is no longer needed for content delivery, the role of the instructor and the definition of teaching changes in a flipped classroom. Duxbury et al. (2016, p. 50) defined a flipped classroom teacher as "one who manages the process in a way to maximize student learning." The instructor transitions from a "sage on the stage" to a "guide on the side" (Heinerichs et al., 2016; King, 1993). As classroom facilitator the instructor will lead class discussions, answer questions, and elaborate on complex topics from the videos. A common practice is to review basic concepts from the preclass learning activities at the beginning of class (Brame, 2013). Many instructors use audience response systems, known as "clickers", to informally gauge the students' understanding. This may spur mini-lectures or class discussions

that focus on the subjects the students have not mastered. The remainder of the class period students work independently or in groups to apply the information to exercises, problems, or case-studies. The instructor is readily available to assist students during the application of the material. Bergmann and Sams (2012) asserted one of the main rewards of the flipped classroom is the teacher is present when students translate content from lectures into relevant information instead of when they initially hear it. There are an assortment of hands-on activities that can be used to expand fundamental concepts and develop a richer understanding. Class time can be used for problem-based simulations, case studies, exercises, or conventional homework assignments (Berg et al., 2015; Clark, 2015; Galway et al., 2015; Schwankl, 2013). To encourage group discussions and cooperative learning, instructors can use techniques such as think-pair-share, jigsaw activities, and classroom games (Roach, 2014).

Extending Beyond a Reconstructed Format

Some academics have questioned the benefits of inversed learning alleging it simply mimics an online environment with the use of video lectures outside of the classroom (Brown et al., 2016). Although most flipped classrooms do present information with videos, it is not the essence of the instructional model. Classes can be flipped without the technology. Further, lectures do not constitute the entire learning process. Learning requires both content delivery and application. When assessing the value of a flipped classroom, Lieberman (2017) noted more emphasis should be put on the in-class learning activities instead of the video lectures as they are the basis of the inversed learning. Otherwise, the focus remains on the teacher rather than the student. Shifting responsibility of learning to the student and creating a student-centered environment is a vital aspect of the flipped classroom (Schell & Mazur, 2015). Bishop and Verleger (2013) also clarified the flipped classroom is not just the rearrangement of activities, it

is the expansion of curriculum. The reversal of lecture and homework is not what makes the flipped method effective. The movement of the lecture outside of the classroom allows for the creation of a unique learning space where students can stretch their thinking while working collaboratively with peers and the instructor (Larsen, 2015). Class time is not merely a study hall for the completion of homework assignments (Bergmann & Sams, 2012). It is a time for intellectually stimulating discussions and activities. Inverted learning allows students to independently perform lower levels of cognitive work, namely acquiring and comprehending knowledge, prior to attending class. More advanced levels of cognitive work occur during class time, with the support of the teacher and peers (Brame, 2013). Implementation of a flipped classroom not only addresses the growing expectation to incorporate technology in the classroom but may also increase student learning by encouraging deeper thinking and problem solving (Schwankl, 2013).

Common Pitfalls

Schell and Mazur (2015) cautioned flipping is not a cure-all. Instructors frequently do not see the results they anticipate the first time the inversed pedagogy technique is used. Creating an effective flipped class can take multiple attempts as the instructor and students adapt to the new structure. Often the success of the flipped classroom is dependent on the educator's instructional sensitivity and ability to modify for students' diverse needs (Larson, 2015). It is also contingent on student buy-in. Students are often confused and skeptical the first time they are introduced to inversed learning. It is important to explain the overall concept as well as how and why it is advantageous to them (Gilboy et al., 2015; Kokina & Juras, 2017). Student attitudes are a reliable indicator of student buy-in to the flipped approach (Casagrand & Semsar, 2017). An individual's attitude significantly influences his or her behavior and learning

(Wlodkowski & Ginsberg, 2017). Hence, it is critical students begin the flipped class with a positive attitude. Without an optimistic attitude students will not make the most of the learning opportunities and will not reap the full benefits of inversed learning. A positive classroom environment starts with the instructor. If the teacher is excited about learning, the students will follow behind (Honeycutt, 2016).

Renewed Thinking

The transition from a traditional classroom to a flipped model requires a shift in the mindset of both the instructor and student (Roehl, Reddy, & Shannon, 2013). Students and instructors generally associate teaching with lecturing (Duxbury et al., 2016). For the flipped classroom to work this thinking needs to be revised. Students need to understand teaching and learning goes beyond the transmission of information. It is the responsibility of the instructor to prepare the students for this new style of learning and clearly communicate expectations. Part of the change in mindset is moving the responsibility of learning from the teacher to the student. In a traditionally structured class the teacher's brain is actively working during the lecture while the students sit passively in their chairs (Bergmann & Sams, 2012). In a flipped class the students are the active participants. The instructor is no longer playing the game but is simply the coach on the sidelines. Instructors must allow students to take control of the learning process. Nonetheless, the teacher's presence in the classroom is still an important part of inversed learning. In a study by Kim et al. (2014) students mentioned the need for instructors to provide structure, give instructions and guidelines, and offer support to students during the in-class activities.

Millennial and Nontraditional Students in the Flipped Classroom

There is a general consensus higher education faculty do not adequately make use of

available technologies in pedagogy even though learning technologies enable flexibility in teaching and innovation in learning (Beyth-Marom et al., 2005; Picciano, 2009). Although use of technology is not a requirement of the flipped classroom, it is a normal practice. It is an effective way to modernize the learning process in higher education. Evolution of the college classroom is necessary as the newest generation of students is less patient with the conventional lecture format and expects the integration of technology and hands-on activities in education (Behn et al., 2012). Brown et al. (2016) affirmed one of the primary reasons for the shift to active learning is the millennial generation. Millennials are generally defined as individuals who were born in the early 1980s through the early 2000s. They are frequently referred to as "digital natives" as they have been surrounded by technology since birth and do not remember a world without computers and the internet. Technology is not viewed as a tool but rather a vital aspect of their existence (Phillips & Trainor, 2014).

Research has shown millennials think and process information differently from previous generations (Phillips & Trainor, 2014; Roehl et al., 2013). Millennials experiment by trial and error and prefer to use technologies to apply information and make new discoveries (Pilato & Ulrich, 2014). Instant access to information has weakened their attention span and their ability to focus (Brown et al., 2016). As such, educators must make changes to accommodate the unique needs of these learners. Pilato and Ulrich (2013) stated the best learning environment for these students is one that allows for interaction and is less formal than the traditional lecture-style classroom. In studies conducted by both Buchholz and Kass (2015) and Phillips and Trainor (2014), millennial-aged students indicated a preference for the flipped classroom and a desire to learn by doing rather than listening. Many college educators express frustration with the seemingly disinterested millennial students, but the interactive nature of the flipped

classroom may be an effective way to engage these tech-savy learners (McCallum, Schultz, Sellke, & Spartz, 2015). It is a means of teaching them in the way they are accustomed to learning.

Not everyone in college is a digital native. Nontraditional aged students make up a significant portion of the postsecondary population. Students age 25 years or older are typically categorized as nontraditional aged learners. They often have delayed enrollment in college, work full or part time jobs, and have families to support (Wlodkowski & Ginsberg, 2017). As such, their intrinsic and extrinsic motives for completion of a college degree is different than the traditional student. Autonomy and self-direction are the chief traits that separate them from their younger peers (Rothes, Lemos, & Gonçalves, 2014). These students also process information and learn in a different manner. Adult learners are pragmatic. Receiving information is not sufficient for them. They want to understand how the information can be used to solve problems or build new skills. They need to connect the knowledge to their daily life (Wlodkowski & Ginsberg, 2017). Thus, they are more engaged in learning when they can relate information to their past experiences (Chen, 2017). Adult learners also appreciate the importance of teamwork and collaborative thinking. Creating a learning community provides an opportunity for these students to share their experiences and apply textbook information to real-world scenarios in an interactive format (Franklin & Myers, 2016).

Many people assume nontraditional aged students would be resistant to the flipped classroom as they are not as comfortable with technology as the millennial generation. Picciano (2009) discussed the "digital divide hypothesis" that infers a disconnect between the way older generations ("digital immigrants") and younger generations ("digital natives") use technology. Nonetheless, the flipped classroom may actually address many of the specific needs of this

demographic group (Chen, 2017). The self-paced nature of the at-home lectures meshes with the autonomous and self-driven traits of adult learners. Further, the collaborative learning environment provides time for the pragmatic learners to apply the new information to problems through interactive activities. They can better understand why the information is relevant and how it relates to prior experiences. Although the use of technology may be a roadblock to learning initially, the in-class application and interaction are crucial to the success of adult learners. However, the literature is scarce on the response nontraditional aged students have to the flipped classroom.

Impact on Student Academic Performance

Past studies have shown a flipped classroom has the potential to be an effective teaching approach if implemented appropriately. Some researchers have used statistics to quantitatively measure the impact of inversed learning on students' academic performance. Most of the studies on the flipped classroom in higher education have assessed effectiveness by comparing either (a) student grades in a traditional class verses student grades in a flipped class or (b) pre- and posttest results in a flipped setting (McNally et al., 2017). In a comprehensive review of the relevant literature performed by O'Flaherty and Phillips (2015), the overarching theme showed an increase in academic performance as measured by improved exam scores and pre- and posttest changes. Although no studies were found that indicated the flipped classroom had a negative impact on academic achievements, there were studies that suggested the methodology does not significantly change a student's academic performance. Therefore, the literature is inconclusive as to whether there is a positive correlation between implementation of the flipped classroom and improved academic performance.

In Schwankl's 2013 study of the implementation of a flipped technique in an

undergraduate mathematics class, one section of students was instructed using the traditional methodology while another section was exposed to the flipped delivery model. Using statistical analysis to compare the pre- and posttest scores of both sections, Schwankl found that students who were in the flipped classrooms received significantly higher scores throughout the semester than those who received instruction in the traditional classroom. Similarly, Berg et al. (2015) found students enrolled in an introductory audiology course who were taught via the inversed approach also performed significantly better on case studies and exams than their peers who were instructed by conventional means. In a 2016 study conducted by Sun and Wu, students enrolled in an undergraduate physics class were given the option of the two instructional techniques, based on their learning preferences. As with Schwankl and Berg et al., Sun and Wu discovered a statistically significant difference between the academic achievement of those in the flipped classroom and those in the traditional classroom. Once again students who watched the prerecorded lectures at home in advance of participating in classroom activities were more successful on examinations. Chen and Line reported an average increase of four percentage points in a microeconomics course (as cited in Roach, 2014). A study at a private university in Tokyo produced similar results when the inversed approach was used to teach English to undergraduate students. Average test scores increased from 474 to 649 (36.9%) for students in the flipped classroom, whereas average scores for the students in the traditional classroom only increased from 484 to 617 (27.5%) (Obari & Lambacher, 2015). Deslauriers, Schelew, and Wieman (2011) also found students in a traditional physics course had an average exam score of 41 compared to the flipped class with an average exam score of 74.

Conversely not all quantitative research performed resulted in such findings. In a study of two high school mathematics classes, one group was taught using a conventional format

(control group) while a second group of students were instructed using a flipped approach (experimental group). Although the grades on average were slightly higher for the experimental group, the difference was determined to be insignificant (Clark, 2015). Comparable results were noted in studies by Baytiyeh (2017) and Briggs (2014). Clark et al. (2016b) observed mixed results after flipping multiple engineering courses which consisted of freshman through seniors. Two of the courses showed significant improvement in exam scores in the flipped classroom compared to the traditional classroom. Exam scores for two other courses were statistically equivalent between the traditional and flipped formats. Jensen, Kummer, and Godoy (2015) used quantitative analysis to compare an active conventional classroom to an active inversed classroom. The data showed no significant difference in learning gains or student satisfaction. The scholars concluded the increase in test scores frequently seen in the flipped classroom may stem from the active-learning element instead of the reverse order of the learning process. Sparks (2013) examined the change in exam scores for a freshman college class when the flipped method was used. The researcher found 81.5% of students exhibited no significant improvement in academic performance. Sparks criticized prior studies that claimed significant learning improvements in the flipped classroom based on anecdotal observations, creating conflicting results between self-reported learning verses quantitative analysis of measured learning. As such, the research remains questionable as to whether a flipped classroom significantly improves student success rates.

Student Perceptions of the Flipped Classroom

Rather than analyzing the variations in academic performance, other studies were designed to determine students' perceptions of and satisfaction with a flipped classroom format. Student attitude toward learning is an important part of their success (Wlodkowski & Ginsberg,

2017). Therefore, consideration of student preferences is necessary to fully understand the value of the flipped approach. According to O'Flaherty and Phillips (2015) students generally responded positively to the flipped classroom and learning satisfaction increased. Interviews and case studies performed by Larson (2015) revealed that students were initially hesitant to embrace the new methodology, but ultimately enjoyed the flipped approach. Kim et al. (2014) used a mixed approach of quantitative data (surveys using a rating scale) and qualitative data (interviews) to gauge students' satisfaction with and perception of the flipped classroom. Kim et al. found students were overall satisfied with the learning experience. Berg et al. (2015) and Yilmaz (2017) also discovered students had a positive attitude toward flipped delivery mode. When three professors each flipped their undergraduate business courses (finance, financial accounting, and managerial accounting), students in all three courses expressed a strong preference for the flipped classroom over the conventional style of learning (Duxbury et al., 2016).

One of the primary reasons given for the preference for inversed learning was the flexibility of learning with self-paced lecture videos (Du & Taylor, 2013; Gilboy et al., 2015; Wanner & Palmer, 2015). Students in a study by Scafuto, Fernando, Mangini, Maccari, and Ruas (2017) also appreciated the autonomous and independent nature of the at-home learning. The researchers further indicated the variety of content delivery and hands-on learning techniques were preferred by students. Roach (2014) noted 91% of students believed they benefited from having an assortment of lecture styles. In another study students enjoyed the reversed style because it created "a classroom environment where a variety of instructional practices were utilized, rather than one that only used direct instruction with lectures and note-taking requirements" (Clark, 2015, p. 105). Students like to be active participants and the

flipped classroom is found to be more engaging. Students in many studies specified the interactive and collaborative aspects kept learning interesting and reduced boredom (Bishop & Verleger, 2013; Duxbury et al., 2016; McNally et al., 2017; Yilmaz, 2017). Students also agreed the flipped classroom enhanced the quality of learning. Students valued the richness of learning resources and the improved cognitive skills (Du & Taylor, 2013; Yilmaz, 2017). They perceived it to be a more effective learning style as it allowed them to develop a deeper understanding of the material (Sparks, 2013; Wanner & Palmer, 2015).

The general consensus of studies indicated students preferred the flipped classroom over the traditional approach. Nevertheless, not all opinions of the flipped classroom were positive. In one study 97% agreed the in-class activities contributed to their learning, but only 60% said they enjoyed the flipped format, 50% agreed other faculty members should consider implementing the technique, and a mere 37% said they preferred it over the traditional classroom (Galway et al., 2015). Some studies have shown students like watching the self-paced videos at home whereas other research has found students still prefer the conventional face-to-face lecture. Learners conveyed in-class lectures were more clear and authentic (Balan et al., 2015; Chen & Jones, 2007). Others found it difficult to connect the material in the videos to the activities in the classroom (Briggs, 2014). Students also stated they could not concentrate during the videos and were easily distracted (Du & Taylor 2013). Time restrictions on completing the learning activities and homework exercises in class was also voiced as a downside of the flipped method (Duxbury et al., 2016; Yilmaz, 2017). Students preferred being able to work the problems at their own pace at home. Chen and Jones (2007) discussed students may prefer the traditional classroom simply because it has always existed and they are most comfortable with it. On the other hand, Balan et al. (2015) argue students do not like the increased responsibility for their

learning in a flipped classroom. In a 2015 study by McCallum et al., 85% of the students acknowledged the flipped method improved their learning but only 60% said they would choose it over the traditional method. This suggests some students are not willing to invest the additional time and effort in the flipped classroom to reap the potential learning benefits. The literature seemed to demonstrate the majority of students prefer the flipped classroom over the traditional classroom. This is primarily due to the interactive nature of the learning experience. Yet, some students prefer certain features of the traditional classroom such as face-to-face instruction.

Advantages of Inversed Learning

The literature provides evidence there are many benefits to inversed learning. Although subjective in nature, qualitative studies performed have highlighted various aspects of the flipped classroom that are advantageous to student learning. The blended approach applies the best features of asynchronous distance learning and couples it will the positive traits of the traditional face-to-face classroom. Although the research is inconclusive as to whether the teaching style significantly improves exam scores, it does indicate it fosters a more effective learning environment which leads to a deeper understanding of the content.

Student-Centered Learning

One of the primary advantages of the flipped classroom is the ability to create a student-centered learning space. Rather than the focus being on the instructor's teaching, the focus is on the student's learning. Classrooms are transformed into learning laboratories where students must take ownership of their education (Bergmann & Sams, 2012). In a flipped classroom students are just as active in the process as the teacher (Zainuddin & Halili, 2016). The traditional classroom is based on one-way communication. Student-centered learning facilitates

collaboration between the students and teachers and allows information to flow both ways (Honeycutt, 2016). Jaijairam (2012) described this atmosphere as having a meaningful impact on student learning. Students are generally more engaged in a student-centered classroom. In one study researchers used the Teaching Dimensions Observation Protocol (TDOP) to assess the student engagement and involvement in class (Clark et al., 2016b). Students in flipped engineering courses were significantly more active in learning through discussions and problem-solving exercises. Student engagement often kindles intrinsic motivation. Wlodkowski and Ginsberg (2017) defines motivation to learn as "the tendency to find learning activities meaningful and worthwhile and to benefit from them" (p. 5). Morever, motivation is considered one of the central elements impacting student performance (Zainuddin & Halili, 2016). Learners in a student-centered classroom feel more empowered as they are given a sense of autonomy. This can lead to increased self-efficacy and decreased reliance on the instructor (Baytiyeh, 2017; Scafuto et al., 2017). Students begin to think for themselves when the emphasis is on their learning. In the 2014 study by Kim et al., students in a flipped classroom set goals for themselves, monitored progress, and completed self-assessments to gauge their learning. Due to the heightened level of responsibility, student-centered learning requires participants to exercise self-discipline and have a great deal of organizational skills (Lieberman, 2017; Wanner & Palmer, 2015). Nellen and Franklin (2015) advised application of the flipped classroom in upper level classes as it requires a higher level of maturity.

Flexibility

Flexibility in learning is also a key trait of the flipped classroom. As the initial transmission of information takes place independently outside of the classroom, students are able to control the pace of learning. Without temporal or spatial constraints, learning is self-directed

(Sun & Wu, 2016). The flipped classroom gives students the ability to listen to a lecture at their own pace, pausing to take notes and reflect on the information (Clark, 2015; Gilboy et al., 2015; Larsen, 2015). Instructors essentially hand students the remote control, allowing them to rewind the lecture if they are confused or fast forward the lecture if they understand the material (Bergmann & Sams, 2012). Many times in a traditional classroom, students are frantically taking notes while attempting to listen to the teacher at the same time. They are unable to process all the information and can miss vital learning concepts. Self-paced learning allows students to process the information at their own speed and then formulate specific questions for discussion during the next class meeting (Berg et al., 2015). Further, students can also become distracted or disengaged during a lecture. As previously noted, the new generation of learners tend to have shorter attention spans than older generations. Studies show students' attention begins to decrease 10 minutes after a lecture begins and they only retain approximately 20% of the entire lesson (Gilboy et al., 2015). In a flipped learning environment students can pause the lecture until they are able to refocus. Thus, this aspect of the flipped classroom can be helpful to individuals with weakened attention span.

Flexibility in learning is also noted in the classroom activities. In a student-centered setting, it is not necessary for the entire class to work on the same activities at the same time. Certain students may be ready to move on to the more complex material while other students need extra time to comprehend and apply the basic concepts. The flipped classroom allows students to work in a "mastery learning environment" in which students do not move on until they demonstrate a full understanding. Bergmann and Sams (2012) found 80% of their students could master all key concepts when allowed to learn at their own pace verses 20% mastery in the traditional classroom. Larsen (2015) described this approach as "organized autonomy."

Students learn at their own speed but in a controlled environment with face-to-face support. Unlike a traditional or online class where students often fall behind, the flipped classroom offers structure and accountability.

Various learning needs can also be accommodated in the flipped classroom. In a traditional format instructors struggle to meet the basic requests of all students such as temperature of the room, amount of lighting, or level of noise. However, when watching the videos at home, students can tailor their learning environment to suit their personal preference (Berg et al., 2015). More importantly, content delivery and hands-on application can be offered in an assortment of ways. Instructors usually formulate teaching habits based on their own learning style or how they were taught (Keri, 2002). Traditional classrooms use a singular mode of delivery and application, commonly lecture and assigned homework exercises. However, some claim this instructional method is not compatible with all learning styles (Brame, 2013).

For years educators have been encouraged to design courses with greater variety to respond to the different learning styles of students. The flipped format allows instructors the opportunity to match the teaching method to the learning objective and adjust for different learning styles (Borthick et al., 2003; Roach, 2014). The term "learning style" refers to the concept that people differ in which instructional approach is most effective for them (Pashler, Mcdaniel, Rohrer, & Bjork, 2008). There are three primary types of learning styles: visual, auditory, and kinesthetic (Kirschner, 2017). Bergmann and Sams (2012) stated one uniform teaching approach is not effective as students learn in different ways. Keri (2002) identified significant differences between the learning styles of men and women. According to Kerri men preferred applied learning using concrete thinking and women gravitated toward collaborating learning through conceptual thinking. This is driven by the fact the brain of each gender is

anatomical, functional, and biochemical different in all stages of life (Zaidi, 2010). Sikkema and Sauerwein (2015) also observed learning styles were influenced by culture. In a 2005 study by Beyth-Marom et al., a correlation between learning style and preferred learning environment (asynchronous, synchronous, or blended) was noted. The findings indicate certain groups of students may respond more favorably to the flipped classroom.

Not all scholars agree instructional techniques should be tailored to the students' learning styles. Recently opponents have claimed there is no scientific evidence to support the learner style hypothesis (Kirschner, 2017; Pashler et al., 2008). Kirschner (2017, p. 166) stated "there is quite a difference between the way that someone prefers to learn and that which actually leads to effective and efficient learning." As such, academics have been replacing the term "learning styles" with "learner preferences." Often students can learn in a multitude of ways but prefer one or two specific teaching styles. Both Synder (2000) and Devaraj and Raman (2014) uncovered academic achievements were not dependent on matching learning styles with instructional mode. Additionally, Sikkema and Sauerwein (2015) concluded students could switch between different learning modes and still be successful. The multimodal dimension of the flipped classroom means students are challenged to learn in numerous ways, some of which they prefer and some they do not.

Active Learning

In addition to the self-paced learning outside the classroom, students also significantly benefit from the face-to-face time in the classroom. Most educators agree problem-based learning is preferable and more effective than the standard lecture (Bishop & Verleger, 2013; Borthick et al., 2003). The AICPA has continuously encouraged accounting educators to transition courses from a theory-driven to a skills-based format where students they can apply

knowledge to realistic scenarios (Grantz & Gruber, 2014). However, lengthy curriculum and accreditation requirements do not allow time for both information transmission and problem-solving in class in a traditional setting. Because the receipt of fundamental information occurs outside of the classroom, more time is available for reinforcement of the material through active-learning exercises in the flipped format (Roach, 2014). Hands-on learning is likely the most essential characteristic of the flipped classroom.

Active learning engages the mind. Instead of listening to how something works, students experience it for themselves. Lieberman (2017) remarked active learning requires students to participate in hands-on exercises that are slightly beyond their ability level. Students begin to think in new and creative ways. Educators are able to capture the students' attention and simultaneously reinforce concepts from the preclass learning tasks. Accounting students often complain of boredom in class due to the dryness of the subject matter. Jaijairam (2012) argued students have difficulty understanding accounting concepts due to the format in which they are presented not the content. Baytiyeh (2017) and Clark (2015) discovered students in flipped classrooms were actually eager to learn. Hands-on activities break up the monotony of the traditional classroom and make it more enjoyable (Honeycutt, 2016). When students are enthusiastic about learning, they are more inquisitive which can foster a deeper comprehension and ability to retain information for a longer period of time. Student may not initially want to participate in active learning (King, 1993). One way to engage students is with game-based learning. When Smalt (2000) integrated a financial literacy simulation game into an undergraduate accounting course, an increase in academic performance was detected. Moreover, 90% of the class believed the game had positively influenced their perception of the accounting field. Clickers are also a nonintrusive means of engaging students. Students are more likely to

participate because their responses can remain anonymous. Further, clickers allow the instructor to assess learning accomplishments and modify subsequent activities to address issues (Kokina & Juras, 2017).

According to Grants and Gruber (2014) knowledge gains and application is intertwined. In reference to the flipped classroom Toqueer (2013) noted "students are able to actively create their knowledge in a meaningful manner that allows them to both better understand and process the learned content" (p. 142). Learners must have context to fully comprehend new information. Knowledge is only formulated when it is applied to what it is already understood. Gilboy et al. (2015) noted this is most effectively accomplished through active learning. King (1993) analogized the brains of students in a traditional classroom to empty containers, passively waiting for the instructor to fill them up. According to the constructivist theory, it is not possible to gain knowledge in this way. The theory is built on the idea learners construct a personalized understanding of the world using previous experiences and knowledge (Pritchard & Woollard, 2010). Undergraduate students commonly have limited work experience relevant to their field, so their application to prior knowledge and situations is not practical. The in-class activities in the flipped classroom gives students a frame of reference they can use in place of real-world experience to make meaning of the new information (Matherly & Burney, 2013).

Collaborative Learning

Class time in a flipped format includes teamwork and collaboration among peers. An older but effective approach often used to spark cooperative learning is the "jigsaw" technique. Students are assigned to groups and each group examines a different aspect of the same problem. Subsequently, new groups are formed with a representative from each of the previous groups who presents the original groups' conclusions to the various aspects of the problem. Each

students is one piece of the puzzle, thus everyone's participation is necessary (Tewksbury, 1995). Research indicates when students are given the opportunity to share knowledge it increases motivations, develops critical thinking skills, and improves communication skills (Marchetti, 2018; Pollock et al., 2011). Student thinking is challenged by alternative viewpoints resulting in the defense of their position. Additionally, group work encourages peer-teaching that can be beneficial to both students involed. Students are more likely to ask a peer for help than the instructor as there is less pressure and intimidation (Wass, Harland, & Mercer, 2011). Teaching others solidifies a person's own understanding of the material (Berrett, 2012). Beyth-Marom et al. (2005) identified a positive correlation between the academic success of students and the level of collaboration with peers.

Students collaborate with peers and also have the chance to work individually with the instructor during the in-class activities. In a traditional classroom personalized education can be a significant challenge for teachers. This is particularly difficult in the college setting with large class sizes and diverse students abilities (Devaraj & Raman, 2014). Bergmann and Sams (2012) compared the conventional teaching model to an assembly line in which students are offered standardized education. The group receives uniform lectures and time restrictions do not allow for instructors to address the specific needs of each student. In a flipped environment the instructor is available to work with students on an individual basis during class time. The interactive approach allows the teacher to identify students who are struggling, the students who tend to fall behind in a normal setting, and offer personalized instruction (Kim et al., 2014; Larsen, 2015). Wang and Schrager (2017) noted one of the advantages of personalized education is the ability to diagnose a student's deficiencies and prescribe treatment during the semester rather than perform an autopsy at the conclusion of the course. Educators can provide

assistance to the students who need it the most when they need it the most. Basic knowledge transfer is an activity students can easily perform on their own. The application aspect of the learning process is the time students need support. Students often do not realize what parts of a concept they do not understand until they try to work a problem (Schmidt & Ralph, 2016). In a flipped setting the instructor is present to immediately answer questions and correct misconceptions during the more challenging phase (Brame, 2013).

Research has recognized cognitive functionality develops quicker when learners have assistance (Borthick et al., 2003), Completing exercises together in-class can reduce the level of frustration students often experience when working independently at home and boost the students' confidence level. The concept of the zone of proximal development (ZPD) introduced by pychologist Lev Vygotsky indicated students are able to complete a task with assistance before they are able to master it on their own. A task may be beyond the student's level of independent capability initially but achievement is feasible with guidance from a more knowledgeable and experienced individual. Eventually the student will be able to complete the task on his or her own as the level of assistance is decreased. Still, it is important to let the students struggle with a problem before providing assistance. Teachers should give students time to think for themselves before offering a solution as this is how critical thinking is developed (Wass et al., 2011). Students tend to flourish in learning environments with high demands and challenging tasks when appropriate support is offered (O'Flaherty & Phillips, 2015). The collaborative aspect of the flipped classroom can advance student learning potential by providing the opportunity to work together with more capable peers and the instructor. Students in prior studies thought small group discussions in class allowed more opportunities to ask questions, gave them additional support, and helped them find new ways of approaching

problems (Clark, 2015; Larsen, 2015; Sun & Wu, 2016). They also viewed the instructor as being more approachable and had a greater incentive to prepare for class (Kim et al., 2014; McCallum et al., 2015).

Development of Higher-Order Cognitive Skills

With lectures moved outside of the classroom, face-to-face time can be used for deepening students' understanding of the more challenging concepts. A traditional classroom usually consists of a lecture in which basic ideas are explained with examples occasionally weaved in to demonstrate the concepts. There is little time to discuss more complex topics or to critically think through difficult scenarios (Nellen & Franklin, 2015). Today's students have a desire to understand why information is relevant and how it will be used in the future. However, they are unlikely to investigate this outside the classroom with no assistance. The flipped format frees up class time to expand on basic ideas and develop a more comprehension understanding of the material. It promotes a learning style that extends beyond the college classroom to real-world contexts (Pilato & Ulrich, 2014). Wass et al. (2011) found students' grasp of complicated topics were more thorough as evidenced by their responses to thought-provoking questions and contribution to insightful discussion.

In addition to the emerging evidence of improved academic performance and student satisfaction, there is also the belief inversed learning can strengthen higher order cognitive skills. The instructional strategy is based on the principle of student engagement. Research has proven the more engaged students are during the learning process the more information they will comprehend and retain (Brame, 2013; Gilboy et al., 2015). Nonetheless, our current education system continues to emphasize memorization and regurgitation. In contrast to a conventional learning environment the inversed learning model emphasizes the use of higher order thinking

skills (Schwankl, 2013). Deep thinking is necessary in a flipped classroom to apply the knowledge gained to problem solving exercises. The in-class activities challenge students to demonstrate higher levels of Bloom's taxonomy. The lower level objectives (remembering and understanding) can be achieved through reading and listening to a lecture. Therefore, these activities are moved outside the classroom. The higher learning objectives (applying, analyzing, and evaluating) are applied in the classroom with peer and teacher support (Franklin & Myers, 2016). Critical thinking requires students to dissect information, reconfigure it, and apply it to new problems (Buchholz & Kass, 2015). Rather than memorizing facts that are later forgotten, students develop thinking skills that can be transferred to a variety of situations and last a lifetime.

Studies have evidenced the overall improvement in cognitive skills for both low-performing and high-performing students when some degree of flipping is incorporated into a classroom (Casagrand & Semsar, 2017; Clark, Kaw, & Besterfield-Sacre, 2016a). Kealey et al. (2005) observed a positive correlation between critical thinking skills and success in the accounting classroom. This research indirectly suggests the implementation of the flipped classroom and enhancement of critical thinking could lead to lower failure rates in accounting courses and better academic performance. However, Sparks (2013) questioned the measurement of cognitive gains from the flipped classroom. Sparks claimed increases is critical thinking in other studies was based on student and teacher perceptions rather than statistical analysis. O'Flaherty and Phillips (2015) insisted the lack of empirical evidence does not insinuate a lack of correlation.

Preparation for Accounting Profession

Preparing students for a future career is the chief objective of higher education.

Therefore, instruction should be designed with that final goal in mind. Upper-level accounting courses should be used to train students for the accounting profession (Brink, 2013). Conventional teaching does not adequately prepare students for the rapidly changing business environment (Albrecht & Sack, 2001). Much of this stems from the dependency on memorization instead of development of a real-world skill set. In the past, accountants were primarily responsible for the preparation of financial information. Due to advancement in technologies, those tasks are now automated. Modern accountants are expected to interpret and analyze financial information rather than prepare it. As such, critical thinking is a necessity. Even so, most college accounting courses continue to concentrate on the preparation of financial statements verses understanding what the numbers mean (Albrecht & Sack, 2001). The lack of exposure to realistic scenarios does not prepare students for how to deal with the unpredictability of the accounting world. Assessing various alternatives and making decisions is also a key part of the accounting profession. In the flipped classroom students can be taught to think through situations, consult the accounting literature, and apply judgement to case studies (Froman, 2001). One of the most notable accomplishments for an accounting professional is passing the uniform CPA exam to obtain state licensure. Public accounting firms expect students to complete the exam prior to the start of employment or shortly thereafter, even though average pass rates are only 50% (Franklin & Meyers, 2016). Changes to the exam were implemented in April 2017, shifting the focus of the exam from lower level cognitive skills to analysis and application (Franklin & Morrow, 2017). Students taught with inversed learning could potentially be more successful on the CPA exam due to the emphasis on critical thinking and development of higher order skills in the flipped classroom.

Challenges to Inversed Learning

As with any new instructional technique, there were challenges to successful implementation noted in the literature. In the case of the flipped classroom some of these roadblocks were due to student behavior and others were a result of the instructor. To effectively use the flipped format educators must be aware of these challenges and preemptively plan ways to address these issues. Many of the problems can be overcome through experimenting with different approaches and a willingness to persist beyond the first attempt.

Challenges Initiated by Students

Students are often skeptical of the flipped classroom because it is new and different (Honeycutt, 2016). In the 2015 study by Galway et al., students expressed difficulty adjusting to the new format. When students are resistant and do not recognize the benefits of the flipped format, learning gains will be limited (Toqeer, 2013). Some students are hesitant to embrace the new method because they do not like the student-centered focus. They prefer to be passive listeners rather than active participants (Balan et al., 2015; Berrett, 2012). Similarly, they do not want to take ownership for their own learning. Negative reactions can result from the increased pressure on the student (Du & Taylor, 2013). McGraw and Chandler (2015) noted students experienced difficulties with self-discipline in the flipped environment.

The most significant barrier to an effective flipped classroom is the lack of student completion of preclass tasks. Student participation and readiness is critical to the inversed pedagogy (Du & Taylor, 2013). The effectiveness of in-class discussions and exercises dramatically decreases if students are not exposed to the fundamental concepts in advance (Kim et al., 2014). Because the format is based on scaffold learning, students will not comprehend the advanced topics in class if they did not obtain the basic knowledge before class. Beyth-Marom

et al. (2005) found less than half of students watched videos prior to class. Twenty-five percent of students in the 2014 study by Kim et al. did not prepare for class causing low participation in class activities. Educators can give students low-value incentives to mitigate this risk, such as short quizzes. These assessments can not only motivate students to complete preclass activities but can also increase retention with information retrieval and improve future exam scores (Brink, 2013; McGraw & Chandler, 2015; Schell & Mazur, 2015).

Although the majority of students consider collaboration with peers a benefit of the flipped classroom, not all students agree (Roach, 2014). Due to divergent personalities and learning styles, some students prefer to work alone and feel intimidated in the team setting with the focus on the students rather than the teacher. Students in Duxbury's et al. 2016 study voiced the teamwork aspect actually inhibited their learning. Although group work is commonly used in a flipped classroom, it is not a requirement for active learning (Honeycutt, 2016). Students can be engaged in learning independently. To be effective team work must have structure to overcome personality conflicts (Honeycutt, 2016). Marchetti (2018) described cooperating learning as "positive interdependence and individual accountability." Educators should work with students to find a balance between individual and collaborative learning in the flipped classroom.

Challenges Initiated by Instructors

The adoption of inversed learning has been slow among college educators despite the success stories and potential for enriched learning. Recent data confirm instructors are clinging to passive teaching instead of embracing active learning. According to Jaschik (2018) 55% of faculty still use the conventional method in the college classroom, 27% use conventional teaching with some integrations of clickers, and only 18% are designed for student-centered

learning. Students and teachers are reluctant to institute significant changes. From a teacher's perspective, one of the biggest challenges to implement a flipped approach is the upfront time commitment to record the lectures and plan the in-class activities (Larsen, 2015; Lieberman, 2017). They perceive blended learning to be twice the work. Many who initially attempted the flipped format did not continue using it due to the extra time and effort required (Berrett, 2012).

Lack of resources and learner support, both for students and teachers, were also found to create challenges (Schwankl, 2013). Most college educators teach the way they were taught and are not aware of the new and innovative pedagogies (Heinerichs, Pazzaglia, & Gilboy (2016). Additionally there has historically been no clear guidance for the implementation of the flipped classroom. In response, the Flipped Learning Global Initiative was created to help those in transition to the new methodology. They are raising awareness on the research that proves the benefits of inversed learning as well as aids in the avoidance of common pitfalls (McKenzie, 2018). Educators interviewed by Wanner and Palmer (2015) concurred the traditional teaching style is not effective, but the flipped method is too labor intensive. The job of instructors is to develop curriculum and format learning to best suit the current and future needs of the students. Design should not be determined based on convenience (Chen & Jones, 2007).

CHAPTER 3

RESEARCH METHOD

The focus of this research was whether a significant difference existed in student performance in a flipped classroom compared to a traditional classroom. Specifically, the purpose of this study was to determine how undergraduate students in an intermediate accounting course at a regional university respond to an inversed ("flipped") classroom structure as it relates to financial accounting. A supplementary objective of the research was to determine if certain groups of students respond differently to the treatment. The objective of a research design is to outline the strategic plan for collecting data to address the research questions in the most accurate manner and allow for reliable, valid conclusions to be drawn from the procedures (McMillan & Schumacher, 2010). A quasi-experimental, quantitative approach was used to investigate whether the academic performance of accounting students who received instruction in a flipped classroom significantly differed from the academic performance of accounting students who received instruction in a conventional learning environment. A quantitative research design is appropriate when investigating the relationship between measureable variables through statistical analysis. In a quasi-experimental design there is no randomization in the assignment of participants to groups. Because grouping in this study was determined by registration of the students, it was not possible to use a pure experimental research design which would have allowed for random selection of students for the control and treatment groups.

The study was completed over two 15-week semesters. Students enrolled in one section of an intermediate accounting course (ACCT 3010) during the spring 2018 semester received instruction in a traditional classroom environmental (control group). Lectures were presented in a face-to-face format and students were required to complete case studies and exercises

independently outside of the classroom. Students enrolled in two sections of the intermediate accounting course (ACCT 3010) during the fall 2018 semester were taught using the inversed pedagogical model (treatment group). Homework assignments involved watching prerecorded lecture videos, consisting of the same material and taught by the same instructor as the traditional method. Class time was dedicated to the application of the concepts introduced in the video lectures through hands-on learning activities. Students worked either independently or in small groups to complete exercises, problems, and case studies. Class discussions were also facilitated by the instructor. Through the use of in-class activities and discussions the key points of the lecture were reemphasized and students had the opportunity to ask the instructor questions, clarify areas of uncertainty, and practice skills taught in the video. The researcher for this study also served as the instructor for both the control and treatment groups. This chapter describes the design of the study, research questions and null hypotheses, instrumentation, population and sample, and data collection and analysis procedures.

Research Questions and Null Hypotheses

The study was designed to investigate the following research questions:

Research Question 1

Is there a significant difference in academic achievement as measured by scores of each of the 4 exams (Exam 1, Exam 2, Exam 3, and Exam 4) between students in the control group (traditional classroom instruction) and students in the treatment group (flipped classroom instruction)?

Ho1: There is no significant difference in mean scores for Exam 1, Exam 2, Exam 3, and Exam 4 between the control group and the treatment groups.

Research Question 2

Is there a significant difference in academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4) between students in the control group (traditional classroom instruction) and students in the treatment group (flipped classroom instruction) in regard to gender?

Ho2: There is no significant difference in mean total exam scores between the control and treatment groups in regard to gender.

Research Question 3

Is there a significant difference in academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4) between students in the control group (traditional classroom instruction) and students in the treatment group (flipped classroom instruction) in regard to preferred learning style (visual, auditory, and kinesthetic)?

Ho3: There is no significant difference in mean total exam scores between the control and treatment groups in regard to preferred learning style.

Research Question 4

Are prior grade point average (GPA) and the method of instruction (traditional/flipped) statistically significant predictors of academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4)?

Ho4: There is no significant correlation between prior GPA, method of instruction, and total exam score.

Research Question 5

Are American College Test (ACT) scores and the method of instruction (traditional/flipped) statistically significant predictors of academic achievement as measured by

total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4)?

Ho5: There is no significant correlation between ACT score, method of instruction, and total exam score.

Research Question 6

Are prior grade point average (GPA), American College Test (ACT) scores, gender, preferred learning style (visual, auditory, kinesthetic), and the method of instruction (traditional/flipped) statistically significant predictors of academic achievement as measured by total exam scores (sum of Exam I, Exam 2, Exam 3, and Exam 4)?

Ho6: There is no significant correlation between prior GPA, ACT score, gender, preferred learning style, the method of instruction, and total exam score.

Instrumentation

The instrument used to measure academic performance in the present study was a series of four examinations. The exams were created by the course instructor who is also the researcher in this study. The exams were intended to measure the students' knowledge of the content covered in each learning module. Questions were formulated using test banks for each chapter created by the publisher of the course textbook. Additional questions were obtained from test banks of other intermediate accounting textbooks used in prior semesters. To ensure consistency between the control and treatment group, exams were designed with the same format and degree of difficulty using the same questions. Exams were proctored by the instructor and students were given the full 80 minutes of class time to complete the exams. To reduce subjectivity in grading a uniform key with an allocation of points to each question was used. To enhance reliability and validity the exams were administered to students enrolled in the same intermediate accounting course (ACCT 3010) during the semester prior to the commencement of

the study. Modifications were made based on average class performance on each question and student feedback.

Population and Sample Size

The population for this study was undergraduate students enrolled in an intermediate accounting course (ACCT 3010) at one regional university in the southeastern region of the United States. ACCT 3010 is a required course for all accounting majors at the university. The financial accounting class is the first upper-level accounting course students typically take after declaring their major. It is taught by only one instructor who is also the researcher for this study. Pre-existing groups were used to select subjects for the study. Intact groups were formed as a result of student registration. Students self-selected the section of the course with no knowledge of the course format.

The control group consisted of 43 students enrolled in one section of ACCT 3010 in the spring 2018 semester. This was the only section of ACCT 3010 offered during the spring 2018 semester. The class met twice each week for 80 minutes per class. The control group included 26 male students and 17 female students. Thirty-seven of the students were traditional-aged students (under 25 years) and 6 were nontraditional aged students (25 years and older). The group included 37 domestic students and 6 international students.

The treatment group consisted of 67 students enrolled in two sections of ACCT 3010 during the fall 2018 semester. Three sections of ACCT 3010 were offered in total during the fall 2018 semester, two during the day and one weekly night class. Students in the weekly night class were not subject to the treatment and were excluded from the study. Students in the day sections met twice a week for 80 minutes per class at times comparable to the control group. The treatment group included 32 male students and 35 female students. Fifty-nine of the

students were traditional-aged students (under 25 years) and 8 were nontraditional aged students (25 years and older). The group included 58 domestic students and 9 international students. Only students who signed an informed consent form were included in the study. Students who were participants in the control group and repeated the course in the fall 2018 semester were excluded from the treatment group.

Data Collection

The study required collection of three types of data. Students' GPAs prior to beginning the financial accounting course and ACT scores were used to determine the equivalency of the control and treatment groups and as covariates in regression analysis. GPA and ACT scores were obtained from the institution's official database of student records. Demographic information was also used to sort students into subgroups to determine if certain groups responded differently to the treatment. Demographic information, including preferred learning style, was collected using a survey students were asked to complete during class and return to the instructor. Scores on each of the four exams were used to measure academic performance. As the researcher was also the instructor of the course, data were collected by the researcher throughout the course of the semester and exam scores were accessed through the instructor's gradebook. Permission to access student records, including GPA, ACT scores, and exam scores, was obtained from the university's Institutional Review Board (IRB). Additionally, a signed Informed Consent Form was obtained from all participants in the study. Data in the study were coded to remove personal identifiers from the information and maintain confidentiality.

Data Analysis

The following statistical analyses were performed to address the research questions using version 25 of IBM-SPSS software. The .05 level of significance was used for all statistical

analyses.

Analysis 1: An independent t-test was used to establish the equivalency of the control group and the treatment group, in regards to pre-existing skills and knowledge of the participants. The independent t-test determined if the mean ACT score of the control group significantly differed from the mean ACT score of the treatment group. Further, the test was used to determine if the mean GPA of the control group differed significantly from the mean GPA of treatment group. Because equivalency was established, use of covariants (ANCOVA) was not required in further analyses of the data.

Research Question 1: A multivariate analysis of variance (MANOVA) test was used to determine the effect of the two independent variables (conventional classroom and flipped classroom) on the dependent variables (Exam 1, Exam 2, Exam 3, and Exam 4). When significant differences in exam scores between conventional and flipped classroom instruction were noted, follow-up procedures were performed to identify where the differences occurred between the groups. The Bonferroni method was used for post-hoc analysis.

Research Question 2: A 2x2 analysis of variance (ANOVA) was used to evaluate the relationship between the two genders and the two classroom environments. The test determined if there were significant differences between academic performance of males and females based on the total of the four exam scores, between the control groups and treatment groups. Post-hoc procedures were deemed to be unnecessary as each independent variable has only two components.

Research Question 3: A 3x2 analysis of variance (ANOVA) was used to evaluate the relationship between the three learning styles and the two classroom environments. The test determined if there were significant differences between academic performance of visual leaners,

auditory learners, and kinesthetic learners between the control and treatment groups. When significant differences were noted, post-hoc procedures were performed to identify where the differences specifically occurred between the groups. The Tukey (HSD) method was used for pairwise comparisons.

Research Question 4: A multiple regression analysis was used to predict academic performance of students. The analysis included one continuous predictor (GPA) and one categorical predictor (method of instruction). Indicator variables were assigned to the two types of instruction modes, the traditionally structured classroom (control group) and flipped classroom (treatment group). Academic performance was defined as the total exam score (sum of Exam 1, Exam 2, Exam 3, and Exam 4).

Research Question 5: A multiple regression analysis was used to predict academic performance of students. The analysis included one continuous predictor (ACT score) and one categorical predictor (method of instruction). Indicator variables were assigned to the two types of instruction modes, the traditionally structured classroom (control group) and flipped classroom (treatment group). Academic performance was defined as the total exam score (sum of Exam 1, Exam 2, Exam 3, and Exam 4).

Research Question 6: A multiple regression analysis was used to predict academic performance of students. The analysis included two continuous predictor (GPA and ACT score) and three categorical predictor (gender, preferred learning style, and method of instruction). Indicator variables were assigned to the two types of instruction modes, the traditionally structured classroom (control group) and flipped classroom (treatment group). Indicator variables were also assigned to the two gender groups (male and female) and the three preferred learning styles (visual, auditory, and kinesthetic). Academic performance was defined as the

total exam score (sum of Exam 1, Exam 2, Exam 3, and Exam 4).

Summary

This study was performed using a quasi-experimental, quantitative approach to investigate whether the academic performance of accounting students who received instruction in a flipped classroom significantly differed from the academic performance of accounting students who received instruction in a traditional learning environment. Academic performance as a function of gender and preferred learning style was also considered. Additional covariates of GPA and ACT scores were incorporated in the analysis to determine effect on total exam scores under the two teaching methods. A quantitative study was deemed to be appropriate as quantitative research is designed to objectively measure and describe occurrences using numbers and statistical analysis. The quasi-experimental design was applied because participants were not randomly selected. Instead, participants were determined by pre-existing groups. Chapter 3 described the research design and methodology for conducting this study. Chapter 4 includes a description of the findings from the data analysis. Chapter 5 provides a summary of the findings, final conclusions, and recommendations for practice and future studies.

CHAPTER 4

FINDINGS

The purpose of this study was to determine how undergraduate students in an intermediate accounting course at a regional university respond to an inversed or "flipped" classroom structure as it relates to financial accounting. A quasi-experimental, quantitative approach was used to investigate whether the academic performance of accounting students who receive instruction in a flipped classroom (treatment group) significantly differs from the academic performance of accounting students who receive instruction in a conventional learning environment (control group). Moreover, subgroups of students within the treatment group were examined to determine their response to the intervention. The present study was completed over two 15-week semesters. Participants of this study included 110 students enrolled in an intermediate accounting course (ACCT 3010) during the spring 2018 or fall 2018 semester. Names and identifiable information were removed from the data to ensure anonymity of the students. In this chapter data were presented and analyzed to answer six research questions and six null hypotheses.

Equivalency of Groups

In a quasi-experimental design there is no randomization in the assignment of participants to groups. Because grouping in this study was determined by registration of the students it was not possible to use a pure experimental research design that would have allow for random selection of students for the control and treatment groups. Instead participants were determined by pre-existing groups. Students' GPAs prior to beginning the financial accounting course and ACT scores were used to determine the equivalency of the control and treatment groups. GPA and ACT scores were obtained from the institution's official database of student records.

Independent-samples *t*-tests were used to establish the equivalency of the control group and treatment group in regards to pre-existing skills and knowledge of the participants. An independent-samples *t*-test was conducted to evaluate whether the mean college GPA prior to beginning the financial accounting course differed between the control and treatment groups. Student GPA was the test variable and the grouping variable was the method of classroom instruction (traditional and flipped classroom). The test was not significant, $t(98) = -1.24$, $p = .217$. Students in the traditional classroom ($M = 3.04$, $SD = .77$) had similar GPAs prior to beginning the financial accounting course as those in the flipped classroom ($M = 3.21$, $SD = .55$). The 95% confidence interval for the difference in means was -.43 to .10. Figure 2 shows the distribution of GPAs for the two groups.

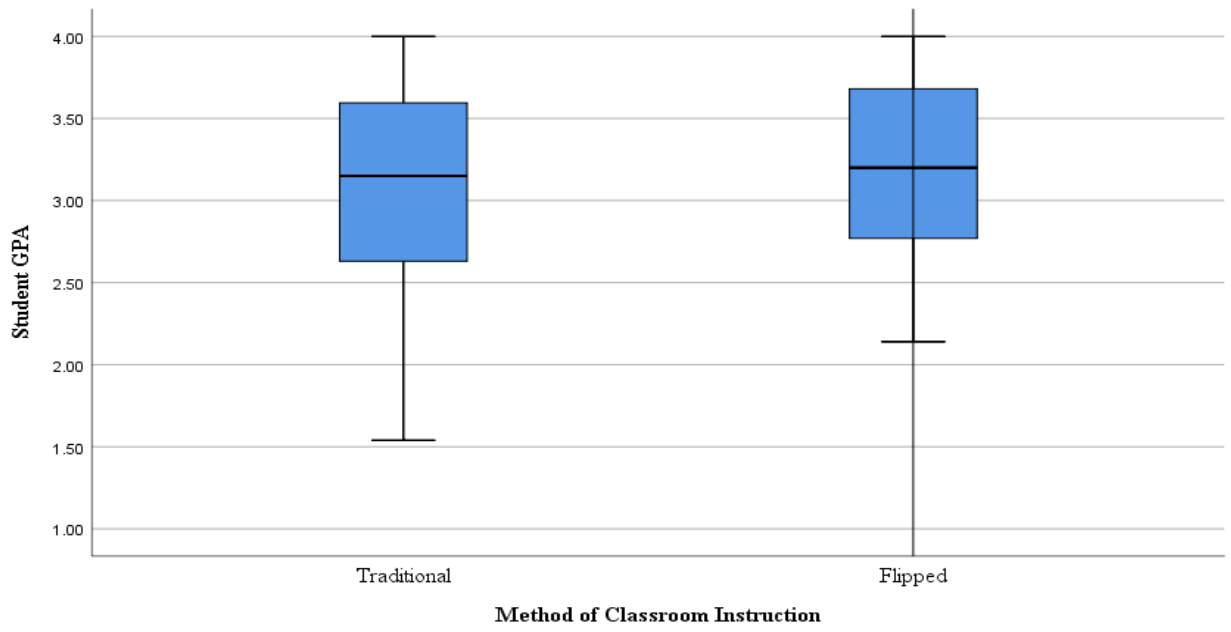

Figure 2. Distribution of student GPAs

An independent-samples *t*-test was also conducted to evaluate whether the mean ACT

scores differed between the control and treatment groups. ACT score was the test variable and the grouping variable was the method of instruction (traditional and flipped classroom). The test was not significant, $t(76) = .64$, $p = .526$. Students in the traditional classroom ($M = 23.29$, $SD = 3.49$) had similar ACT scores as those in the flipped classroom ($M = 22.77$, $SD = 3.64$). The 95% confidence interval for the difference in means was -1.10 to 2.14. Figure 3 shows the distribution of ACT scores for the two groups.

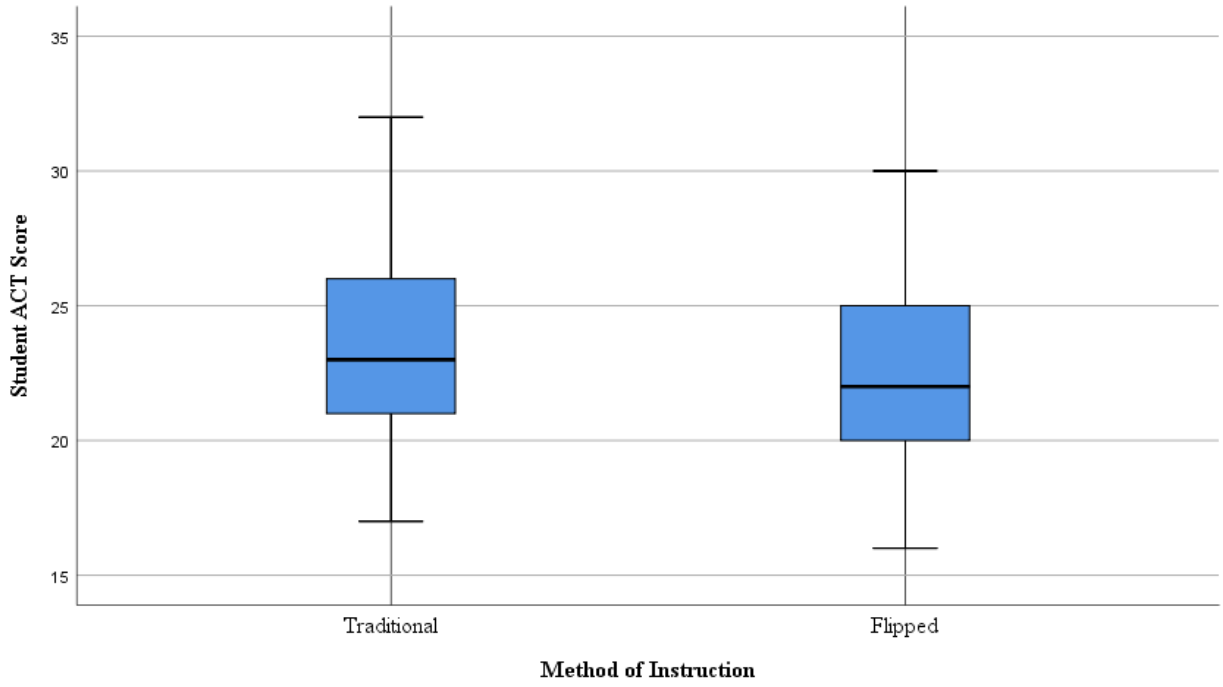

Figure 3. Distribution of student ACT scores

Research Questions

Research Question 1

Is there a significant difference in academic achievement as measured by scores of each of the 4 exams (Exam 1, Exam 2, Exam 3, and Exam 4) between students in the control group (traditional classroom instruction) and students in the treatment group (flipped classroom

instruction)?

Ho1: There is no significant difference in mean scores for Exam 1, Exam 2, Exam 3, and Exam 4 between the control group and the treatment groups.

A one-way multivariate analysis of variance (MANOVA) was conducted to evaluate the effect of the two types of classroom instruction (traditional and flipped) on the four dependent variables (Exam 1, Exam 2, Exam 3, and Exam 4). Significant differences were noted between the two classroom environments on the dependent variables, Wilks' $\Lambda = .84$, $F(4, 99) = 4.65$, $p = .002$, $\eta^2 = .16$. Table 1 contains the means and standard deviations on the dependent variables for the two groups.

Table 1.

Means and Standard Deviations of Individual Exam Scores by Method of Instruction

Exam	Method of Instruction	M	SD
Exam 1	Traditional	37.19	6.06
	Flipped	38.43	7.28
Exam 2	Traditional	73.07	15.95
	Flipped	71.02	18.68
Exam 3	Traditional	57.95	21.00
	Flipped	67.70	19.01
Exam 4	Traditional	73.60	16.77
	Flipped	77.51	19.11

Note: Exam 1 was worth 50 points. Exams 2, 3, and 4 were each worth 100 points.

Analysis of variances (ANOVA) on the dependent variables were conducted as follow-up tests to the MANOVA. Using the Bonferroni method, each ANOVA was tested at the .0125

level (.05/4). The ANOVA on Exam I was not significant, $F(1, 102) = .84$, $p = .363$, $\eta^2 < .01$. The ANOVA for Exam 2 was not significant, $F(1,102) = .34$, $p = .563$, $\eta^2 < .01$ The ANOVA for Exam 3 was not significant, $F(1,102) = 6.05$, $p = .016$, $\eta^2 = .06$. The ANOVA for Exam 4 was not significant, $F(1, 102) = 1.16$, $p = .285$, $\eta^2 = .02$. Although the follow-up procedures did not identify a significant difference on any of the four independent variables, it is likely the significant variation noted in the MANOVA was due to Exam 3 as the greatest variation in means between the control and treatment groups was on that particular exam. Furthermore, the p value for Exam 3 ($p = .016$) is only slightly higher than the significance testing level (.0125).

A comparison of the means of each exam for the control and treatment group are displayed in Figure 4. Exam 1 was worth 50 points and Exams 2, 3, and 4 were each worth 100 points. The difference in total point value of the exam resulted in lower mean scores for both the control and treatment group for Exam 1 in comparison to the other three exams. The mean scores of the treatment group were higher than those of the control group on three of the four exams. Although not statistically significant, students in the treatment group scored 3% (2 points) lower on Exam 2 than those in the control group. The difference in the means of Exam 3 was not statistically significant between the control and treatment group; however, the students in the treatment group scored 17% (10 points) higher on Exam 3 than the students in the control group.

Research Question 2

Is there a significant difference in academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4) between students in the control group (traditional classroom instruction) and students in the treatment group (flipped classroom instruction) in regard to gender?

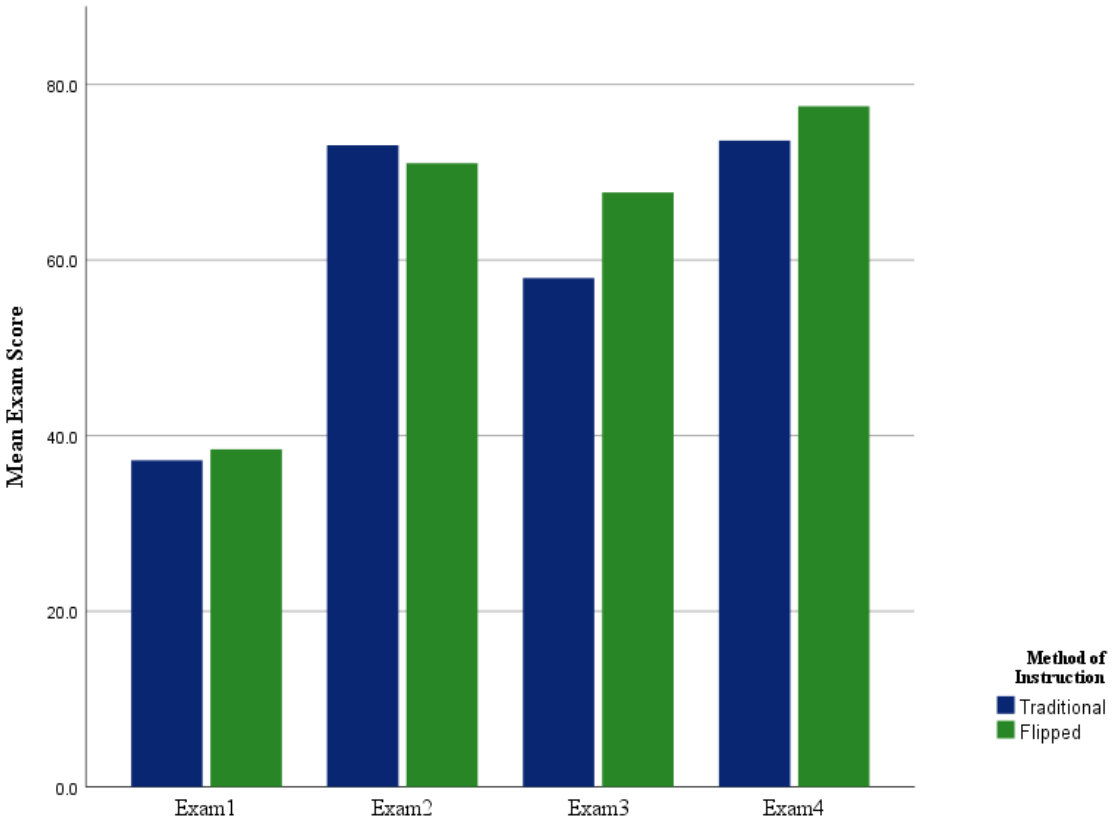

Figure 4. Mean exam scores for control and treatment groups

Note: Exam 1 was worth 50 points. Exams 2, 3, and 4 were each worth 100 points.

Ho2: There is no significant difference in mean total exam scores between the control and treatment groups in regard to gender.

A 2 x 2 analysis of variance (ANOVA) was conducted to evaluate the effects of the two methods of classroom instruction and the students' gender on their total exam score. The mean and standard deviations for total exam scores as a function of the two factors are presented in Table 2. The ANOVA indicated no significant interaction between the type of classroom instruction and gender, $F(1, 106) = .05$, $p = .817$, partial $\eta^2 < .01$ and no significant main effect for classroom instruction $F(1, 106) = .02$, $p = .882$, partial $\eta^2 < .01$. Therefore, the null

hypothesis was retained. However, significant main effect was noted for gender, $F(1, 106) = 5.68$, $p = .019$, partial $\eta^2 = .05$. The gender main effect indicated that females tended to have higher academic achievements than males.

Table 2.

Means and Standard Deviations for Total Exam Score by Gender and Method of Instruction

Gender	Method of Instruction	M	SD
Male	Traditional	226.14	58.40
	Flipped	230.75	70.86
Female	Traditional	257.88	43.63
	Flipped	256.87	61.05

Research Question 3

Is there a significant difference in academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4) between students in the control group (traditional classroom instruction) and students in the treatment group (flipped classroom instruction) in regard to preferred learning style (visual, auditory, and kinesthetic)?

Ho3: There is no significant difference in mean total exam scores between the control and treatment groups in regard to preferred learning style.

A 3 x 2 analysis of variance (ANOVA) was conducted to evaluate the effects of the two methods of classroom instruction and the students' preferred learning style on their total exam score. The mean and standard deviations for total exam scores as a function of the two factors are presented in Table 3. The ANOVA indicated no significant interaction between the type of

classroom instruction and preferred learning style, $F(2, 104) = .52$, $p = .594$, partial $\eta^2 < .01$ and no significant main effect for classroom instruction $F(1, 104) = .04$, $p = .840$, partial $\eta^2 < .01$. Therefore, the null hypothesis was retained. However, significant main effect was noted for preferred learning style, $F(2, 104) = 3.40$, $p = .037$, partial $\eta^2 = .06$.

Table 3.

Means and Standard Deviations for Total Exam Score by Preferred Learning Style and Method of Instruction

Learning Style	Method of Instruction	M	SD
Visual	Traditional	243.47	56.56
	Flipped	257.38	61.54
Auditory	Traditional	278.75	60.46
	Flipped	287.25	54.57
Kinesthetic	Traditional	232.42	53.96
	Flipped	221.21	67.99

Post-hoc analysis of the main effect for preferred learning style consisted of all pairwise comparisons among the three categories of preferred learning styles. The Tukey HSD procedure was used to control for Type I errors across the pairwise comparisons. The results of the analysis, summarized in Table 4, indicated auditory learners tended to have higher academic achievement than kinesthetic learners. There was no significant difference between auditory learners and visual learners. Further, there was no significant difference between visual learners and kinesthetic learners.

Table 4.

Post Hoc Analyses of Pairwise Comparisons by Preferred Learning Style

Learning Style	Learning Style	Mean Difference	Significance
Visual	Auditory	-.32.39	.346
	Kinesthetic	26.34	.078
Auditory	Kinesthetic	58.73	.032

Research Question 4

Are prior grade point average (GPA) and the method of instruction (traditional/flipped) statistically significant predictors of academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4)?

Ho4: There is no significant correlation between prior GPA, method of instruction, and total exam score.

A multiple regression analysis was conducted to evaluate how well the two factors predicted the total exam score. The predictors were college GPA prior to beginning the financial accounting course and method of classroom instruction (traditional or flipped). The linear combination of the predictors was significantly related to the total exam score, $F(2, 97) = 26.67$, $p < .001$. The sample multiple correlation coefficient was .60, indicating that approximately 36% of the variance of the total exam score in the sample can be accounted for by the linear combination of these factors.

Indices to indicate the relative strength of the individual predictors are indicated in Table 5. The bivariate correlation between student GPA and the total exam score was positive. The

bivariate correlation between the method of classroom instruction and the total exam score was negative. One of the bivariate correlations was statistically significant ($p < .05$). Only the partial correlation between GPA and the total exam score was significant. That variable accounted for 34% (.581 squared) of the variance of the total exam scores, while the other variable contributed only 2% (36% to 34%). The regression equation for predicting the total exam score was:

$$Z_{Predicted\ Student\ Total\ Exam\ Score} = 54.53\ Z_{GPA} - 16.17\ Z_{Method\ of\ Instruction} + 72.83$$

Table 5.

The Bivariate and Partial Correlations of the Predictors with Mean Total Exam Score.

Predictors	Correlation between each predictor and the total exam score	Correlation between each predictor and the total exam score controlling for all other predictors.
GPA	.58*	.59*
Method of Instruction	-.06	-.16

*$p < .01$

Research Question 5

Are American College Test (ACT) scores and the method of instruction (traditional/flipped) statistically significant predictors of academic achievement as measured by total exam scores (sum of Exam 1, Exam 2, Exam 3, and Exam 4)?

Ho5: There is no significant correlation between ACT score, method of instruction, and total exam score.

A multiple regression analysis was conducted to evaluate how well the two factors predicted the total exam score. The predictors were student ACT score and method of classroom

instruction (traditional/flipped). The linear combination of the predictors was not significantly related to the total exam score, $F(2, 75) = 2.90$, $p = .061$. The sample multiple correlation coefficient was .27, indicating that approximately 7.2% of the variance of the total exam score in the sample can be accounted for by the linear combination of these factors.

Indices to indicate the relative strength of the individual predictors are indicated in Table 6. The bivariate correlation between student ACT and the total exam score was positive. The bivariate correlation between the method of classroom instruction and the total exam score was negative. Only one of the bivariate correlations was statistically significant ($p < .05$). Only the partial correlation between ACT and the total exam score was significant. That variable accounted for 7.1% (.267 squared) of the variance of the total exam scores, while the other variable contributed merely .1% (7.2% to 7.1%). The regression equation for predicting the total exam score was:

$$Z_{Predicted\ Student\ Total\ Exam\ Score} = 4.15\ Z_{ACT} - 2.70\ Z_{Method\ of\ Instruction} + 145.13$$

Table 6.

The Bivariate and Partial Correlations of the Predictors with Mean Total Exam Score.

Predictors	Correlation between each predictor and the total exam score	Correlation between each predictor and the total exam score controlling for all other predictors.
ACT	.27*	.27*
Method of Instruction	-.04	-.03

*$p < .05$

Research Question 6

Are prior grade point average (GPA), American College Test (ACT) score, gender,

preferred learning style (visual, auditory, kinesthetic), and the method of instruction (traditional/flipped) statistically significant predictors of academic achievement as measured by total exam scores (sum of Exam I, Exam 2, Exam 3, and Exam 4)?

Ho6: There is no significant correlation between prior GPA, ACT score, gender, preferred learning style, the method of instruction, and total exam score.

A multiple regression analysis was conducted to evaluate how well the five factors predicted the total exam score. The predictors included GPA prior to beginning the financial accounting course, ACT score, gender, preferred learning style, and method of classroom instruction (traditional/flipped). The linear combination of the predictors was significantly related to the total exam score, $F(5, 72) = 10.53$, $p < .001$. The sample multiple correlation coefficient was .65, indicating that approximately 42% of the variance of the total exam score in the sample can be accounted for by the linear combination of these factors.

Indices to indicate the relative strength of the individual predictors are indicated in Table 7. The bivariate correlations between student GPA, ACT score, and gender and the total exam score were positive. The bivariate correlations between preferred learning style and method of classroom instruction and the total exam score were negative. Two of the bivariate correlations were statistically significant ($p < .05$). Two of the five partial correlations were significant. Both GPA and gender were identified as significant predictors of total exam score. The two variables accounted for 34% (.586 squared) and 1% (.096 squared) respectively of the variance of the total exam scores, while the other variable contributed only 7% (42% to 35%). The regression equation for predicting the total exam score was:

$$Z_{Predicted\ Student\ Total\ Exam\ Score} = 50.77\ Z_{GPA} + 2.16\ Z_{ACT} + 20.51\ Z_{Gender} - 3.43\ Z_{Learning\ Style} - 15.11\ Z_{Method\ of\ Instruction} + 32.66$$

Table 7.

The Bivariate and Partial Correlations of the Predictors with Mean Total Exam Score.

Predictors	Correlation between each predictor and the total exam score	Correlation between each predictor and the total exam score controlling for all other predictors.
GPA	.59*	.61*
ACT	.27	.18
Gender	.10**	.23**
Learning Style	-.10	-.12
Method of Instruction	-.04	-.17

*p < .01, **p<.05

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter contains a summary of findings, conclusions, and recommendations for practice and further research. The purpose of this study was to determine how undergraduate students in an intermediate accounting course respond to an inversed ("flipped") classroom structure as it relates to financial accounting. The focus was whether the academic performance of students in a flipped classroom significantly differed from students who received instruction in a traditional learning environment. The study was completed over two 15-week semesters. Students enrolled in one section of an intermediate accounting course during the spring 2018 semester received instruction in a traditional classroom environmental (control group). Students enrolled in two sections of the same intermediate accounting course during the fall 2018 semester were taught using the inversed pedagogical model (treatment group). Pre-existing groups were used to select subjects for the study. Intact groups were formed as a result of student registration. Students self-selected the section of the course with no knowledge of the course format. Students' GPAs prior to beginning the financial accounting course and ACT scores were used to determine the equivalency of the control and treatment groups. Academic achievement was measured by student performance on four exams administered during each semester.

Six research questions and six null hypotheses were developed. A one-way multivariate analysis of variance (MANOVA) was conducted to evaluate the effect of the two types of classroom instruction (traditional and flipped) on the four individual exams. Analysis of variances (ANOVA) on the dependent variables were conducted as follow-up tests to the MANOVA using the Bonferroni method. A 2 x 2 ANOVA was conducted to evaluate the

effects of the two methods of classroom instruction and the students' gender on their total exam score. A 3 x 2 ANOVA was conducted to evaluate the effects of the two methods of classroom instruction and the students' preferred learning style on their total exam score. Multiple regression analyses were conducted to evaluate how well certain factors (including prior GPA, ACT scores, gender, preferred learning style, and the method of instruction) predicted the total exam score. This study could be beneficial to readers who are considering the implementation of an alternative pedagogical technique to enhance student engagement in the classroom.

Summary of Findings

The statistical analyses reported in Chapter 4 were directed by the six research questions presented in Chapter 1 and detailed in Chapter 3. Equivalency was established between the control and treatment groups using students' GPAs prior to beginning the financial accounting course and ACT scores. Students in the traditional classroom were found to have similar GPAs (M = 3.04, SD = .77) as those in the flipped classroom (M = 3.21, SD = .55). Further, ACT scores of students in the traditional classroom (M = 23.29, SD = 3.49) were found to be comparable to those in the flipped classroom (M = 22.77, SD = 3.64).

The first research question addressed whether there was a significant difference in the four exam scores between the traditional and flipped learning environments. Significant differences were noted between the two classroom environments (p = .002) when the MANOVA test was conducted. However, the follow-up ANOVA did not identify a significant difference on any of the four individual exams. The mean exam scores of the students in the flipped classroom were higher than those of the traditional classroom on three of the four exams. It is possible the significant variation noted in the MANOVA was due to Exam 3 as the greatest deviation in means between the control group (M = 57.95) and the treatment group (M = 67.70) was on that

particular exam. Although the difference in the means was not statistically significant, the students in the flipped classroom scored 17% (10 points) higher on Exam 3 than the students in the traditional classroom. Moreover, the p-value for Exam 3 ($p = .016$) is only slightly above the significance testing level (.0125). Scores also improved by 3% (1.25 points) on Exam 1 and 5% (3.91 points) on Exam 4. Students in the flipped classroom did not perform as well on Exam 2 as the students in the traditional class. Scores of students in the control group were 3% (2 points) higher on Exam 2 than students in the treatment group. These findings were consistent with those of Clark (2015), Baytiyeh (2017), and Briggs (2014). In each of these studies grades on average were slightly higher for the experimental group, but the difference was determined to be insignificant. Clark et al. (2016b) also observed mixed results after flipping multiple engineering courses.

The second and third research questions aimed to identify significant differences in total exam scores between students in the control and treatment groups as a function of gender and preferred learning style. The ANOVA testing showed no significant interaction between the type of classroom instruction and gender ($p = .817$). These results indicate males and females do not respond differently to the flipped learning environment. Students had the opportunity to earn a total of 350 exam points throughout the semester. Although statistically insignificant males in the flipped classroom ($M = 230.75$) earned almost 5 points more than males in the traditional classroom ($M = 226.14$). Conversely, there was only a 1 point difference in the average total exam scores of females in the flipped classroom ($M = 256.87$) verses females in the traditional classroom ($M = 257.88$). Regardless of classroom format, females tended to have significantly higher academic performance than males.

ANOVA testing also revealed no significant interactions between the classroom format

and the preferred learning style. The statistical analysis showed visual, auditory, and kinesthetic learners responded to inversed learning in similar manners. Even though a significant interaction between method of instruction and preferred learning style was not found, it is still important to note the improvement in academic performance for certain groups. Total exam scores of visual leaners in the flipped classroom (M = 257.38) exceeded those of visual learners in the traditional classroom (M = 243.47) by almost 14 points. Additionally, auditory learners in the flipped classroom (M = 287.25) outperformed auditory learners in the traditional classroom (M = 278.75) by 8.5 points. On the other hand, average total exam scores were 11 points lower for students in the inversed environment (M = 221.21) compared to kinesthetic learners in a conventional setting (M = 232.42). This finding was unexpected as kinesthetic learning by definition involves students engaging in hands-on activities. Kinesthetic students typically learn better by doing rather than listening or watching demonstrations. Active learning is at the center of the flipped classroom and one would expect kinesthetic learners to excel in this type of learning environment. Post-hoc procedures showed auditory learners had significantly higher exam scores than kinesthetic learners in both the traditional and flipped classrooms.

The regression analysis indicated that student GPA and gender were significantly related to the students' total exam score. The two variables accounted for 35% of the variance of the total exam scores, while the other variables (ACT scores, preferred learning style, and method of instruction) contributed only 7% of the variation. Both GPA and gender were found to be significant predictors of a student's academic performance in the classroom.

Conclusions

The aim of this research was to compare two different instructional methods and evaluate their effect on student success in an intermediate accounting classroom. The curriculum of an

intermediate accounting course is the foundation for subsequent courses required in an undergraduate accounting program. Brown, Danvers, and Doran (2016) noted students' potential for success in future courses and in the profession was dependent on their ability to absorb and retain the content of these cornerstone courses. Based on the findings in this study, the inversed pedagogical technique can positively impact a student's learning experience in the classroom.

Significant differences in academic performance were identified between the two classroom environments. Although the follow-up ANOVA procedures did not identify a significant difference on any of the four individual exams, exam scores improved on three of the four exams. Specifically, scores increased by 3% on Exam 1, 17% on Exam 3 and 5% on Exam 4. It is important to note the greatest gains were observed on the last two exams of the semester. Honeycutt (2016) cautioned instructors that students are often skeptical of the flipped classroom because it is new and different. Further, Galway et al. (2015) found students had difficulty adjusting to the new format. Based on the findings in this study, students need time to become familiar with inversed learning before improvements in performance will be evident. This may explain why the literature is inconclusive as to whether there is a positive correlation between implementation of the flipped classroom and improved academic performance. A short-term study may not provide students with sufficient time to adapt to the new instructional method and reap the full benefits. It is also important to note the most significant gain was on Exam 3 that has historically resulted in the lowest average test score of the four exams. This finding raises an important question. Is the flipped classroom more effective when the course content is more complex and requires higher level cognitive skills?

No significant differences were found in regards to how males and females respond to the flipped classroom. Moreover, no significant differences were found in regards to how

individuals with different preferred learning styles respond to the inversed instructional method. One explanation for this is the multimodal dimension of the flipped classroom can accommodate various learning needs. This supports the claim of Large, Platt, and Treglia (2000) that inversed learning could be used to meet the needs of students with all types of learning styles. Ge (2012) also noted the variation in teaching tools would allow instructors to meet the needs of diverse students with a variety of capabilities and competency levels. Another reason differences were not observed in the response to the treatment could be because students can learn in many different ways and the teaching approach does not have to be tailored to their preferred learning style (Devaraj & Raman, 2014; Kirschner, 2017; Synder, 2000). Sikkema and Sauerwein (2015) found students could switch between different learning modes and still be successful.

Generally the academic performance of students in the flipped learning environment was better than the academic performance of students in the traditional learning environment. Total exams scores in the flipped classroom were on average were 6 points higher for students in the flipped classroom. Although not a formal research question, overall improvement in total exam score is a key observation. Historical evidence has shown accounting courses often have high failure rates (Kealey, Holland, & Watson, 2005). In the present study failure rates declined by approximately 18% in the flipped setting compared to the traditional classroom. Lowering failure rates of a course can enhance student confidence in their ability to be successful in the class. By increasing pass rates and creating a better perception of the accounting field, students may be more likely to selecting accounting as a major.

The improvement in academic performance reinforces the need for student engagement in the classroom. Student engagement in the learning process is essential. Learning does not occur in a vacuum. Students in other studies expressed an appreciation for at-home learning

where the pace of the videos can be controlled (Du & Taylor, 2013; Gilboy et al., 2015; Wanner & Palmer, 2015). Still, the lack of collaboration and support of online learning caused other students to feel isolated and disconnected (Duncan et al., 2012; Falloon, 2012; Ge, 2012). A blended approach combines autonomous and independent learning with collaborate and active learning. Students in the flipped classroom were given the opportunity to process the content through the application of information in class rather than passively listening to a lecture or attempting to apply the information at home without support.

The present study measured success in terms of academic performance using scores on four exams administered each semester. Students may have gained other skills that have the potential to benefit them in future courses or a professional career. Assessment of the other implications of the flipped classroom were not within the scope of this study. However, one of the primary benefits of the flipped classroom is active learning. Studies by Brame (2013) and Gilboy et al. (2015) showed the more engaged students are during the learning process the more information they comprehend and retain. Other studies have indicated an improvement in cognitive thinking skills when some degree of flipping is incorporated in a classroom (Casagrand & Semsar, 2017; Clark, Kaw, & Besterfield-Sacre, 2016a). It is reasonable to conclude students improved their ability to apply, analyze, and evaluate information to problem solve. Critical thinking and problem solving abilities are crucial for today's students and future professionals.

Although the academic performance of students in the treatment group was generally better than those in the control group, there is potential for greater improvement in subsequent studies. Larson (2015) stated the success of the flipped classroom is dependent on the instructor's ability to modify the classroom and meet the students' diverse needs. Creating an effective flipped classroom can take multiple attempts. Schell and Mazur (2015) noted

instructors frequently do not see the results they want the first time. This was the instructor's first attempt at flipping a classroom and additional gains in exam scores may have been discovered if the instructor had more experience with the inversed method. Du and Taylor (2013) also noted the success of the flipped classroom is contingent on student readiness and participation. This is one of the most significant challenges to successful implementation of inversed learning. Kim et al. (2014) observed a dramatic decrease in the effectiveness of the flipped classroom when students were not exposed to the fundamental concepts in advance. It cannot be assumed that students in the treatment group watched all lecture videos prior to attending class. When students are resistant and do not recognize the benefits of the flipped format learning gains will be limited (Toqeer, 2013). If students did not complete all preclass tasks before coming to class, some of the benefits of the instructional mode may have been negated. Finally, individualized instruction is cited as one of the chief elements of the flipped classroom. In a flipped environment the instructor is available to work with students on an individual basis in the classroom during the application phase. In this study each section of the flipped classroom had approximately 40 students. Thus, the instructor was not able to offer individualized instruction to all students each day. Davaraj and Raman (2014) observed this as a common obstacle with implementation of the flipped classroom in a college setting. It is reasonable to conclude some of the benefit of the inversed learning model may have been lost due to the class size.

Recommendations for Practice

One of the goals of this study was to provide college educators with an innovative approach to teaching that would improve student comprehension and enrich the overall learning experience. As recommended by the Pathways Commission on Accounting Higher Education,

inversed learning rejuvenates the curriculum and exposures students to real-world issues in the classroom. Further, it allows for use of technology and promotes a learning space that emphasizes problem solving and critical thinking.

Based on the findings in the study, the pedagogical technique can be effective and faculty should consider putting the approach into practice. Educators cannot continue to teach in the traditional manner and expect students to be engaged. Courses should be designed to best suit the learning needs of the current and future students. Inversed learning does not require the instructor to flip the entire course initially. Implementation requires a significant upfront commitment and educators should allow sufficient time to set up the course. Slow integration can also be beneficial as the instructor has the opportunity to determine what aspects work in their classroom and make modification gradually over time. Because the course format does require a high level of organization and discipline, it is best suited for upper level course with mature students.

Students may be resistant and have difficulty adapting to the inversed model. Wlodkowski and Gingsberg (2017) found student attitude toward learning is a central component of their success. Casagrand and Semsar (2017) also found student attitude is a reliable indicator of student buy-in to the flipped approach. The effectiveness of the inversed learning model is limited to the extent to which students embrace the idea. It is the responsibility of the instructor to foster a positive learning environment and get student buy-in at the onset of the course. Faculty should invest ample time in the introduction of the new format. This should include clearly communicating the students' responsibility and the benefits of inversed learning.

Low-value incentives should be given for both the preclass learning tasks and the in-class activities. Students must complete the preclass work for the flipped classroom to yield the

intended results. Motivating students to listen to lecture videos or read assigned material is cited as one of the biggest hurdles instructors face with the flipped classroom (Beyth-Marom et al., 2005; Du & Taylor, 2013; Kim et al., 2014). The effectiveness significantly declines if students are not exposed to the fundamental concepts prior to attending class. Moreover, the opportunity to reach higher levels of cognitive thinking are reduced. Because the flipped classroom is based on a scaffold learning approach, students will not be able to comprehend more advanced topics discussed during class time if preclass tasks were not completed. Students must also attend class and participate in hands-on activities to reap the potential learning benefits. The ability to ask questions, gain real-time feedback, and collaborate with peers are some of the key traits of the flipped classroom. Without low-value incentives for attendance and/or participation, the course may morph into an online learning environment. Short quizzes are a simple way to hold students accountable. Quizzes can be given both before attending class using online learning tools and again in the classroom at the conclusion of each module.

Although college professors are subject matter experts, they typically lack advanced knowledge of instructional strategies. Professional development of educators is crucial for effective implementation of the flipped classroom on college campuses. Faculty should use resources available at their institution to acquire proper training. If internal resources are not available, educators should consider professional development through external parties such as the Flipped Learning Network or the Flipped Learning Global Initiative. Acquiring a strong understanding of the fundamental principles of the flipped classroom may improve the effectiveness of the teaching technique for practitioners. Perhaps most of all it is important to remember the flipped classroom is not a "cure-all." Educators should set realistic expectations. Desired results may not be seen the first time. Creating an effective flipped class can take

numerous attempts as the instructor and students adjust to the new classroom environment.

Recommendations for Future Research

The findings and conclusions of this study have led to the following recommendations for further research:

1. A qualitative study to explore what aspects of the flipped classroom enhance the learning experience and improve academic performance. A limitation of this study is the results of the research do not provide insight into why students perform differently in these two environments;
2. Replication of this study in other courses taught by other instructors to evaluate similarities and differences in findings. Such a study could provide insight as to whether the results of this study were influenced by the content of the course and/or the instructor or if the findings can be generalized across other college courses;
3. Replication of this study after the instructor gained more experience with the inversed teaching method. It is important to understand if the instructor's level of familiarity with the format impacts the effectiveness of the flipped classroom;
4. A study to compare the academic performance of students in a flipped classroom with a small class size to students in a flipped classroom with a larger class size. The average class size for sections within this study was 40 students per class. The class size used in this study may have altered the effectiveness of the inversed teaching method;
5. A study to determine why females achieve higher academic success than their male counterparts;
6. A study to examine the interaction between preferred learning style and gender and the impact on student academic performance.

7. A study to evaluate the enhancement of critical thinking skills associated with the implementation of the flipped classroom. Assessment of critical thinking skills was not within the scope of this study. Prior studies have suggested inversed learning could strengthen these skills, but the literature lacks empirical evidence; and
8. A longitudinal study to determine if students who receive instruction in an inversed learning environment for intermediate level accounting courses demonstrate higher academic performance in advanced level accounting courses. Material covered in intermediate accounting is the foundation for many of the subsequent courses students are required to take in an undergraduate accounting program. Prior studies have indicated students taught in a flipped classroom comprehend and retain information for a longer period of time. Findings in such a study could confirm or dispute this claim. Further, the study could be expanded to examine differences in pass rates on the Certified Public Accountant (CPA) exam between students who have been taught in a traditional format verses those taught in a flipped classroom.

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APPENDIX

Student Demographic and Learning Style Survey

Student's Name _____ Time/Days Class Meets_____

Student's Enumber _____ Semester: _____

Please answer the following demographic questions.

1. What is your gender? (Male, Female, or Other) _____
2. What is your age at the time of completing this survey? _____
3. Are you a U.S. Student or an International Student?
   _____
4. Is English your first language? _____
5. Have you taken this course before? If yes, please list the name of the school and semester. _____

Please answer the following questions in relation to your learning style.

1. What type of learner do you consider yourself to be? (Please use the learning style questionnaire attached to assist in answering this question).

   - Visual (Learns by seeing or watching demonstrations)
   - Auditory (Learns through verbal instructions from self or others)
   - Kinesthetic (Learns by doing and direct involvement)

   _____
2. Do you typically learn best in a face-to-face classroom or online course? Why?
   _____
3. In a face-to face classroom, describe how you prefer to receive instruction or learn new concepts?
   _____

4. Have you previously participated in an inverse (“flipped”) classroom?

    a. If yes, please describe your experience.
    _____
    ____

    b. If no, please describe your initial thoughts about learning in this type of environment.
    _____

Learning Style Assessment

Read each sentence carefully and consider if it applies to you. On the line in front of each statement, indicate how often the sentence applies to you, according to the chart below. Please respond to all questions.

1	2	3
Never applies to me.	Sometimes applies to me.	Often applies to me.

SECTION ONE:

_____I enjoy doodling and even my notes have lots of pictures and arrows in them.
_____I remember something better if I write it down.
_____I get lost or am late if someone tells me how to get to a new place, and I don’t write down the directions.
_____When trying to remember someone’s telephone number, or something new like that, it helps me to get a picture of it in my mind.
_____If I am taking a test, I can “see” the textbook page and where the answer is located.
_____It helps me to look at the person while listening; it keeps me focused.
_____Using flashcards helps me to retain material for tests.
_____It’s hard for me to understand what a person is saying when there are people talking or music playing.
_____It’s hard for me to understand a joke when someone tells me.
_____It is better for me to get work done in a quiet place.

***Total*_____**

SECTION TWO:

_____ My written work doesn't look neat to me. My papers have crossed-out words and erasures.
_____ It helps to use my finger as a pointer when reading to keep my place.
_____ Papers with very small print, blotchy dittos or poor copies are tough on me.
_____ I understand how to do something if someone tells me, rather than having to read the same thing to myself.
_____ I remember things that I hear, rather than things that I see or read.
_____ Writing is tiring. I press down too hard with my pen or pencil.
_____ My eyes get tired fast, even though the eye doctor says that my eyes are ok.
_____ When I read, I mix up words that look alike, such as "them" and "then," "bad" and "dad."
_____ It's hard for me to read other people's handwriting.
_____ If I had the choice to learn new information through a lecture or textbook, I would choose to hear it rather than read it.

Total_____

SECTION THREE:

_____ I don't like to read directions; I'd rather just start doing.
_____ I learn best when I am shown how to do something, and I have the opportunity to do it.
_____ Studying at a desk is not for me.
_____ I tend to solve problems through a more trial-and-error approach, rather than from a step-by-step method.
_____ Before I follow directions, it helps me to see someone else do it first.
_____ I find myself needing frequent breaks while studying.
_____ I am not skilled in giving verbal explanations or directions.
_____ I do not become easily lost, even in strange surroundings.
_____ I think better when I have the freedom to move around.
_____ When I can't think of a specific word, I'll use my hands a lot and call something a "what-cha-ma-call-it" or a "thing-a-ma-jig."

Total_____

SCORING:

Now, add up the scores for each of the three sections and record below. The maximum score in any section is 30 and the minimum score is 10. Note the preference next to each section.

Section One score: _____ (Visual)
Section Two score: _____ (Auditory)
Section Three score: _____ (Kinesthetic)

VITA

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