University of Nevada, Reno

An Examination of Student Outcomes and Student Satisfaction in a Flipped Learning Environment: A Quasi-Experimental Design

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Education

by

Angela M. Lee

Dr. Leping Liu, Professor, Dissertation Advisor

May, 2016

UNIVERSITY OF NEVADA RENO

THE GRADUATE SCHOOL

We recommend that the dissertation
prepared under our supervision by

Angela M. Lee

entitled

An Examination of Student Outcomes and Student Satisfaction in a Flipped Learning Environment: A Quasi-Experimental Design

be accepted in partial fulfillment of the
requirements for the degree of

DOCTOR OF PHILOSOPHY

Leping Liu, PhD, Advisor

Bill Thornton, PhD, Committee Member

Robert Quinn, EdD, Committee Member

Jill Packman, PhD, Committee Member

Johnson Makoba, PhD, Graduate School Representative

David W. Zeh, Ph.D., Dean, Graduate School

May 2016

Abstract

Flipped learning has become a hot topic in education, in part because of the media portrayal of flipped learning in existing news stories. Although there has been a rise in popularity and implementation, there has been a lack of empirical research in the field of flipped learning. The purpose of this exploratory study was to address some of the issues related to previous research regarding student outcomes and satisfaction, gender differences, and lack of research in sociology courses.

A two-by-two quasi-experimental design was established. Results were grouped by Learning Environment, which was expressed as the traditional learning group and the flipped learning group; and Gender was categorized as female and male. The Dependent Variables consisted of the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, Higher-Ordered Unit Exam and student Satisfaction Scores. There were 111 participants in the current study.

A two-way MANOVA was conducted to determine if any interaction effects or main effects existed based on the Dependent Variables. The interaction effect of Learning Environment by Gender was examined before inspecting the individual main effects. The main effect for Gender based on Dependent Variables was reviewed. The interaction effect (Learning Environment by Gender) and main effect for Gender on the combined Dependent Variables was not significant. The main effect for Learning Environment based on the combined Dependent Variables was significant ($V = .238$, $F\ (6, 90) = 4.692$, $p < .001$, $\eta^2_p = .238$). The results from the quantitative analysis and qualitative findings mirrored previous literature.

Dedication

To my loving and supportive family, Chris and Zachary. “No [person] is an island, entire of itself” (Donne).

Acknowledgments

I would like to take this opportunity to acknowledge and thank my committee, who worked with me and offered their time and advise to help me complete this process. I would also like to express my appreciation for my students' candid responses.

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Chapter 1: Introduction

What are we ‘flippin’ doing? It has been reported that approximately 2,600 educators and administrators moved their schools toward flipped learning classrooms over the last three years (Project Tomorrow, 2015). Although not a new approach, the emergence of flipped learning has become a hot topic in the American education system in part because of its popularization through the media. *Google Trends* (2015) showed a large spike in interest in flipped learning since 2012. Figure 1 illustrated the growing popularity of flipped learning. Along the line of trend, the number of human-interest news headlines including “flipped learning” logged through *Google Trends* has witnessed a boost in popularization. In October of 2014, 100 headline news articles were written about flipped learning demonstrating a popularized interest. Figure 2 pointed to the focus of special interest news stories for flipped learning.

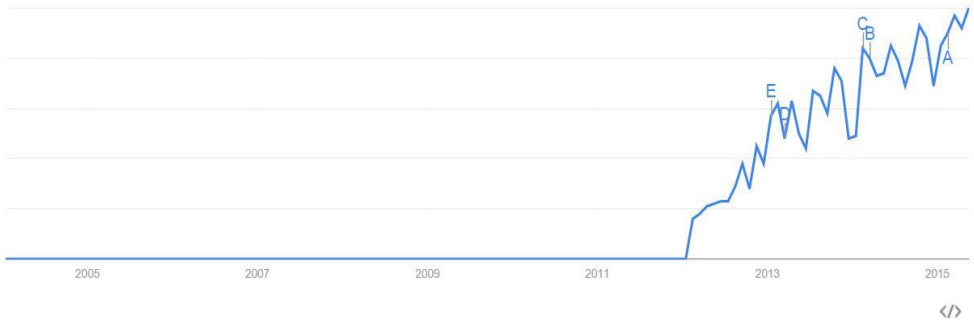

Figure 1. Google Trends Search: Overall Trends in Flipped Learning Interest over Time.

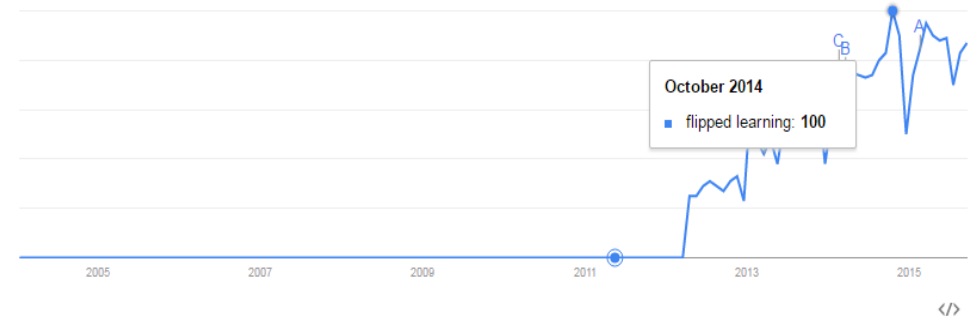

Figure 2. Google Trends Search: Number of News Headlines Including Flipped Learning in October 2014.

According to several studies, a flipped learning environment had the potential to positively affect student outcomes as well as student satisfaction (Bergman & Sams, 2012a; Davies, Dean, & Ball, 2013; Della Ratta, 2015; Hung, 2015; Lage, Platt, & Treglia, 2000; McLaughlin et al., 2014). The current study proposed to explore whether students in flipped learning courses differ using specific outcome measures and a satisfaction measure, compared to students in a traditional lecture course.

An examination of previous sources resulted in several interrelated broad themes of flipped learning application, across multiple education levels, and various topics (see Appendix A for comprehensive list). The first major theme was tech-trend style that included how-to information for developing an inverted classroom, review of the components, current trends in the field, and the future of flipped learning (Alvarez, 2012; Arnold-Garza, 2014; Ash, 2012; Bergman & Sams, 2012a & 2014; Bristol, 2014; Moore, Gillette, & Steele, 2014; Wallace, Walker, Braseby, & Sweet, 2014). The second theme dealt with, several works presented as practitioner articles that included news-style editorials and assessments of case studies from specific examples of flipped classrooms or schools, (e.g., Aronson, 2013; Berrett, 2012; Gunyou, 2015; Scott, 2014; Wallace,

2014). The third broad application of flipped learning was the use of survey approaches to explore student satisfaction (e.g., Critz & Knight, 2013; Gaughan, 2014; Hutchings & Quinney, 2015; Lane-Kelso, 2015; Mok, 2014; Velegol, Zappe, & Mahoney, 2015). The final application of flipped learning was the use of quasi-experimental methods to measure differences in student outcomes (e.g., Baepler, Walker, & Driessen, 2014; Della Ratta, 2015; Ferreri & O'Connor, 2013; Kong, 2014; McLaughlin & Rhoney, 2015; Szafir & Mutlu, 2013; Wong, Ip, Lopes, & Rajagopalan, 2014). In addition to these four broad themes, researchers indicated that flipped learning provided students with an active learning environment as well as the ability to engage in lower-ordered and higher-ordered learning both inside and outside the classroom (Bishop & Verleger, 2013; Jamaludin & Osman, 2014; Lage & Platt, 2000; Roach, 2014; Strayer, 2007 & 2012).

Statement of the Problem

In 2014, the Flipped Learning Network (FLN) and Sophia Learning, an organization that provides online college courses and free resources for educators, conducted an online study of educators' understanding related to flipped learning (FLN, 2014). Ninety-six percent of educators stated that they had heard of the term "flipped learning" compared to only 73% of educators in 2012 (FLN, 2014). Although, interest increased since 2012, there have been three recurring issues found in the previous research. First, researchers posited that there has been a lack of empirical and concurring outcomes and satisfaction in the field of flipped learning (Bishop & Verleger, 2013; Fulton, 2012a; Hutchings & Quinney, 2015; Lane-Kelso, 2015).

Second, research lacked evidence from empirical findings related to gender effects on flipped learning. For example, the number of articles regarding "gender" and

"flipped classrooms/learning" were limited: using the library guides *ERIC, Education Research Complete, Education Full-Text,* and *PsychINFO* two articles were located (see Chen, Yang, & Hsiao, 2015; Touchton, 2015); and the same terms were used in *Google Scholar* with similar results.

Finally, Forsey, Low, and Glance (2013) postulated that flipped learning has not caught on in the social sciences to the extent that it has in other disciplines. There is an absence of inquiry in social sciences related to flipped learning. Although interest grew, the academic rigor in the field has been limited with respect to student learning outcomes, student satisfaction, and the effects of gender, and application in social sciences.

Purpose of the Study

This exploratory study intended to address some of the issues related to student outcomes and satisfaction, gender differences, and lack of research in sociology courses. In particular, the study addressed concerns related to the lack of empirical findings and the ambiguity of findings regarding student outcomes and satisfaction. In addition, the study provided an empirical application in social science instruction. There were three major purposes to this current study. The first purpose was to analyze the results from two comparable groups in a two-by-two quasi-experimental design who completed one unit of an introductory sociology course on seven Dependent Variables (Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, Higher-Ordered Unit Exam, and Satisfaction Scores). The second purpose examined if mean differences on Gender and Learning Environment, thereby adding to the existing literature on gender and flipped learning. The third purpose probed students' perceptions related to Learning Environment because there were discrepancies in the previous studies.

Research Questions

Investigators have attempted to evaluate the impact of flipped learning, and groups such as Sophia (2015) have indicated that thousands of schools and educators have implemented flipped learning (Arnold-Garza, 2014; Educase, 2012; Enfield, 2013; Findlay-Thompson & Mombourquette, 2014; Overmyer, 2012; Strayer, 2012). However, the findings have been ambiguous showing significant and non-significant results. These questions were developed to address the purposes of this undertaking regarding flipped learning.

To address the research question, a two-by-two design was established. Results were grouped by Learning Environment, which was expressed as the traditional learning or control group and the flipped learning or treatment group. Figure 3 gave a pictorial display of the Learning Environment.

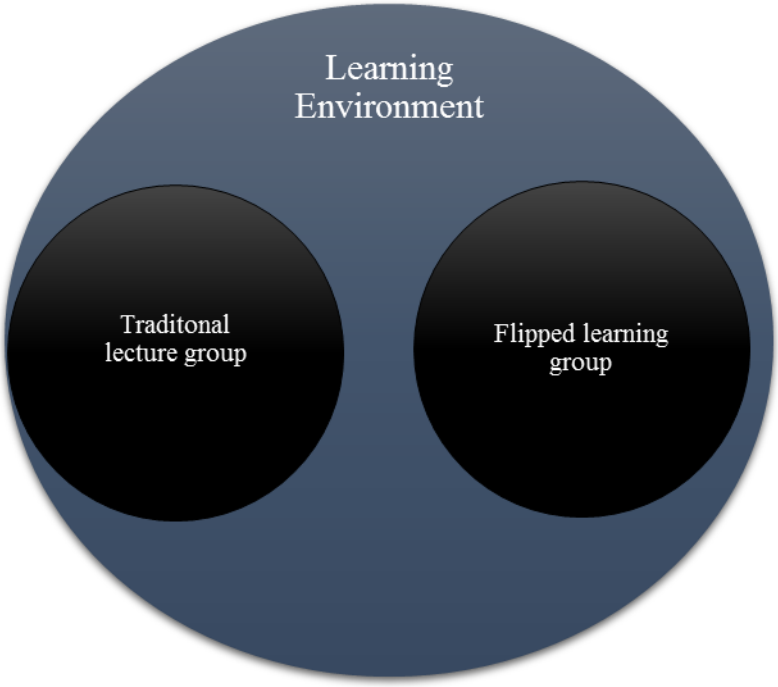

Figure 3. Assignment of Group by Learning Environment.

Gender, reported by students, was categorized as female and male. The grouping variables were Learning Environment and Gender. The Dependent Variables consisted of the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam and student Satisfaction Scores.

The general research question in this study was:

1. Using a two-by-two quasi-experimental design, do groups (by Learning Environment and by Gender) differ significantly based on selected Dependent Variables?

The overall research question was broken down and tested as three separate questions:

   a. Are there significant differences between Gender groups based on the Dependent Variables?
   b. Are there significant differences between groups established by Learning Environment based on the Dependent Variables?
   c. Is there significant interaction effects between Learning Environment and Gender based on the Dependent Variables?

The variables for this question, discussed in detail in chapter three, were:

   i. Learning Environment: traditional lecture course (control) and flipped learning environment (treatment)
   ii. Gender: female and male
   iii. Dependent Variables: Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam and Satisfaction Scores

2. What themes emerged based upon students' responses to specific open-ended qualitative questions?

To gain an insight into the experiences of the students, the second question sought to determine students' opinion about their emersion into the learning environments (see Appendix B and Appendix C).

Definition of Terms

Active learning – is an instructional strategy designed to engage students in their own learning process (Prince, 2004).

Flipped classroom – is an approach in which students are pre-exposed to classroom materials before attending class (Brame, 2013).

Flipped learning – is an educator-guided learning environment in which students engage in active learning behaviors inside and outside class, with activities planned to help students achieve higher- and lower-order learning skills inside and outside class (working definition).

Learning outcomes – statements or goals about what learners should gain through learning activities.

Pillars of flipped learning – the Flipped Learning Network included four pillars which used in conjunction with the flipped classroom constitute flipped learning. The pillars are: flexible environment, learning culture, intentional content, and professional educator (FLN, 2014).

Taxonomy – a means of categorization along a continuum (Anderson, Krathwohl, & Bloom, 2001).

Limitations to the Study

One issue that arose was that the individuals in groups were not randomly selected. To adjust the study for this limitation, course sections were randomly assigned to groups and a pretest and posttest assessment was administered to examine students' sociological knowledge. All of the participants were drawn from enrollment in the author's sociology courses.

Another limitation to the study was the time frame. Data were collected over one single instructional unit instead of an entire semester. Data collected over time could have depicted different results. For instance, the learning curve of a different pedagogical approach could have been worked out.

Organization of the Study

The first chapter provided an overview of the themes in flipped learning, a discussion of the issues in the field, and rationale for this research. Additionally, the questions, definitions of key terms, and limitations offered further insight into the current research project.

The second chapter included a brief history of flipped classroom/learning. An overview of active learning and taxonomy presented a theoretical foundation before considering specific examples of flipped learning in the literature. The literature synthesized around the major themes (see Appendix A): a) tech-style reports; b) practitioner articles; c) survey research from quantitative and qualitative studies; and d) outcome findings from quasi-experimental designs. Specific attention was paid to gender in the flipped learning environment, findings from sociology courses, and examples in the field.

Chapter Three focused on the methodology of the current study including the sampling requirements, participants, and group assignment. Next, the specific instruments and measurements were explicated. Then, variables were explained before divulging the specific blueprint of this study. The structure included a discussion of quasi-experimental methods as well as the procedures for experiences and materials the control and treatment group received. The strategy for data collection was elucidated. Finally, the way the data were tested through two-way multivariate analysis of variance (two-way MANOVA). The analyses included the testing of assumptions and post hoc measures. Finally, analyses for the open-ended responses were addressed.

Chapter Four provided the results from the quantitative analyses and the findings from student repsones to the open-ended questionnaires. This chapter began wih a preliminary examination of the data, the MANOVA assumtions, and reliability of the instruments. Next, the two-way MANOVA, post hoc ANOVAs, and Kruskal-Wallis H analyses were conducted and reported. Then, the qualitative findings were discussed by major themes and subthemes.

The final chapter was Chapter Five. The focus of this chapter was the conclusions and implications of the entire study. An introduction to the chapter and brief discussion of the study began the chapter before moving toward specific conclusions by the research questions. Next, implications from this study were applied to the broader field of flipped learning. Then, the limitations that grew out of this study were considered. Finally, recommendations for futre research rounded out the chapter.

Chapter 2: Literature Review

Introduction

There has been a lack of empirical research regarding flipped learning, nevertheless educators and administrators have implemented this pedagogical approach into classrooms and schools. The effects of Gender, along with examination of social science classrooms, were almost absent from the literature.

The purpose of the current information-gathering enquiry was to ferret out any differences that may exist in the Dependent Variables, due to Learning Environment. In addition to probing the mean differences of Learning Environment and Gender on the Dependent Variables were assessed. Databases were selected using the university library subject guide for education (see Appendix D). The search terms consisted of flipped learning and flipped classrooms, using the roots of the words (e.g., flip, learn, class).

This chapter began with a synopsis of the history of flipped learning. An overview of active learning and taxonomy was applied before synthesizing specific findings from the field of flipped learning research. An amalgamation of the general themes, tech-trends, practitioner articles, survey research, and quasi-experimental outcomes, from the flipped learning literature was scrutinized. Finally, literature specific to gender and social sciences in flipped learning was evaluated.

Flipped Learning

In a tech-trend report, Horn (2013) wrote that 2012 was the innovation of the flipped classroom, citing *New York Times* articles and the work of Bergmann and Sams (2012b), who went on to establish the Flipped Learning Network (Hamdan, McKnight, McKnight, & Arfstrom, 2013). The ambiguity in the research extended to definitions and

incarnation of flipped learning (Lafee, 2013). The Flipped Learning Network ([FLN], 2014) defined this pedagogical technique by stating:

> Flipped Learning is 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 where the educator guides students as they apply concepts and engage creatively in the subject matter. (p. 1)

In tech-trend, practitioner, and research articles alike, several authors referenced this definition and the acronym of F.L.I.P. as a guiding force for implementation (Abeyserkera & Dawson, 2015; Arnold-Garza, 2014; Callison, 2015; Clark, 2015; Chen, Wang, & Chen, 2014; Dubrowa, 2014; Estes, Ingram, & Liu, 2014; Francl, 2014; Siegle, 2014; Nederveld & Berge, 2014; Roehl, Reddy, & Shannon, 2013; Wong, Ip, Lopes, & Rajagopalan, 2014; Yarbro, Arfstrom, McKnight, & McKnight, 2014). FLN (2014) wrote the F.L.I.P was outlined by a flexible environment (F), a shift in the learning culture (L), intentional content (I), and the professional educator (P).

History of Flipped Learning

The implementation of flipped learning was due to technological advancements such as software to record lectures, narrate PowerPoints, and even download previously created videos; and the changing population of students to a millennial generation (Vaughan, 2014). The history of flipped classrooms consisted of three general phases: a) previously recorded videos; b) self-recorded videos and lectures; and c) a combination of both.

Previously recorded videos. Brighton School of Business and Management ([BSBM], 2012) indicated that Open University launched previously recorded videos in the United Kingdom in 1969. According to Sumner (2009), Open University became the symbol of the second generation of distance education and thought to be the first and most successful flipped classroom (Overmyer, 2014). Open University integrated radio and television in addition to completing homework and reading at home (The Open University, 2015). In the late 1990s, Open University converted to online web-based classes, and television shows hosted by the British Broadcasting Corporation (BBC) and instructional videos became part of the "classroom" experience. Open University used previously recorded programming in the open classroom structure (The Open University).

Khan Academy, an open learning resource website, provided videos, practice exercises, and learning tools for educators and students (Khan Academy, 2015). Khan Academy offered instructional videos from a wide range of fields and grade levels that were previously recorded and available for use. Khan noted that the flipped classroom frees up class time using pre-recorded videos from Khan Academy or even YouTube, which offers a large variety of instructional videos as well (Fink, 2011).

Self-recorded video and lectures. Sams and Bergmann (2013) mentioned that often the essential component of flipped classrooms was instructor created videos. However, how the educators used the face time was the essential part of learning (Ng, 2014). The use of instructional videos freed up class time to create a dynamic, student-centered, active learning environments (Bergmann & Sams, 2012; Khan, 2011). Forsey et al., (2013), indicated that recorded lectures were commonplace in massive open online

courses (MOOCs), and that students found these lectures to be favorable to learning in the flipped classroom. Mattis (2014) recorded lectures for a flipped learning group and lectured for an equal amount of time in the control group. The findings denoted that accuracy increased and mental effort decreased in the flipped learning group (Mattis).

Combination of previously and self-recorded materials. Lage, Platt, and Treglia (2000) suggested that educators used a combination of videos from the internet and recorded lectures because of the advances in recording software. Strayer (2007) restructured courses from PowerPoint and webpages to recorded lectures and videos about a textbook. Vaughan (2014) recorded lectures and upload the files as video for students to play and pause during the outside class portion of the activities. Mason, Shuman, and Cook (2013) implemented a similar approach. Each of these researchers indicated positive effects upon student outcomes through combinative methods.

Theoretical Foundations

As traditional learning shifted to a more technology-based approach to instruction, theoretical frameworks to research should be applied (Kates, Byrd, & Haider, 2015). The foundations for this study incorporated active learning and the ordered learning realized in taxonomy literature.

Active Learning

Around the world, students outperformed American students in 21st Century skills as well as mathematics and sciences (Stronge, Grant, & Xu, 2015; Hanushek, Peterson, & Woessmann, 2014; Peterson, Woessmann, Hanushek, & Lastra-Anadon, 2011). In part, some of the disadvantages of student learning were due to the passive learning environments most often encountered in the American education system (Weiss &

Pasley, 2004). According to Baepler, Walker, and Driessen (2014), active learning traced back to a physics course at North Carolina State University and developed out of the tenets of constructivism (Kates et al., 2015). Baepler et al. went on to indicate that research has shown that students in active learning spaces perform better than students in traditional classrooms. Freeman et al. (2014), through a meta-analysis, found students in passive lecture courses were more likely to fail than students in active learning courses. Roehl, Reddy, and Shannon (2013) stated that the use of an active learning, flipped classroom allowed educators to engage with millennial learners-who tend to be more hands on and interact with technology at a younger age than other groups of learners.

Prince (2004) defined active learning as "instructional method that engages students in the learning process" (p. 1). In addition, Prince pointed out that collaborative learning was a method for small groups of learners to work together, and in these groups students attempt to develop and meet goals (i.e., collaborative and cooperative). A final type of active learning was problem-based in which students solve problems relevant to lessons to increase higher-order learning. Prince went on to explore research in active learning, finding that students appeared to have better attitudes towards learning, were more motivated, and writing improved. Curwen (2013) wrote about habits that should grow in active learning environments:

1. Students should be proactive in their learning, taking responsibility;
2. Have clear goals before beginning, what the student expects to gain;
3. Achieve a win-win situations by engaging in collaborative and cooperative ways;
4. Listen and understand as part of collaboration; and
5. Hone skills and understanding by continually engaging in learning.

Active learning has had examples in the field of flipped classrooms and flipped learning environments. Morgan et al. (2015) established a flipped gynecological classroom in college courses. In the model, students viewed 10-minute videos regarding gynecological oncology topics outside class and inside class students engaged in active learning processes such as discussions about specific cases, students replied to short answer questions via laptops, and completed assessments. They uncovered the majority of students viewed the videos and attended class, and in evaluations students conveyed the activities were useful and beneficial. Hung (2015) attempted to understand if flipped learning, and implementing an active learning *WebQuest*, could help English language learners prosper. Traditional lecture course students compared to a flipped learning group in a quasi-experimental design and the findings showed significant differences between groups. Supporting Prince's results, Hung found flipped learning students reported feeling more satisfied and more confident in their learning. Like Hung, Harrington, Basch, Schoofs, Beelbates, and Anderson (2015) probed student outcomes in a quasi-experimental design. The two groups were randomly assigned to a traditional lecture or flipped learning class. However, there were no differences between groups; students' outcomes across both groups were not significantly different. These two studies represented the ambiguous suppositions throughout the field of flipped learning.

Taxonomy

The origins of taxonomy developed out of psychology informally at an American Psychological Association meeting (Bloom, 1994). The three domains of categorization were cognitive, affective, and psychomotor; but originally, student behaviors were categorized under the cognitive domain. Taxonomy was not advanced as a theory, but as

a set of detailed objectives that should be used in conjunction with a theory and educators' skills. Anderson, Krathwohl, and Bloom (2001) examined and adapted the taxonomy cultivated approximately 50 years earlier. The adaptation created a two-dimensional continuum of knowledge and cognitive processes. At each level of the cognitive processes, the knowledge dimensions occurred. Figure 4 gave an overview of the adaptations of taxonomy by Anderson et al. In the original model, knowledge was just one item on the continuum (CCUE, 1956).

	The Cognitive Process Dimension					
The Knowledge Dimension	1. ***Remember***	2. ***Understand***	3. ***Apply***	4. ***Analyze***	5. ***Evaluate***	6. ***Create***
A. ***Factual Knowledge***						
B. ***Conceptual Knowledge***						
C. ***Procedural Knowledge***						
D. ***Metacognitive Knowledge***						

Figure 4. Taxonomy Table Adapted by Anderson et al. (2001, p. 28).

According to Weigel and Bonica (2014), the traditional situation of the professor at the lectern, dispensing his or her knowledge to students may not be the most effective method of teaching 21st Century students. According to Nederveld and Berge (2014), a flipped classroom experience freed educators to help students develop higher-order learning as compared to a traditional classroom (analyze, evaluate, create; see Anderson et al., 2001). Overmyer (2014) stated that the flipped classroom allowed for both orders of learning; at home students read, watched videos, and reviewed lectures and by such

they began lower-order learning; and in class, students engaged in higher-order cognitive work.

Taxonomy, as a means for engaging students in higher-order learning, was realized in the flipped classroom literature. Garver and Roberts (2013) operated a study in which students used clickers in a flipped classroom. The findings demonstrated that students engaged in every type of higher-order learning, unlike the students in traditional lecture courses. Table 5 provided a synopsis of how taxonomy was adapted for the current study.

For the purposes of this study, knowledge was included at each level of the cognitive dimensions and the foci were these six elements: remember, understand, apply, analyze, evaluate, and create. Remembering and understanding were considered lower-order learning and paved the way for the higher-order learning processes of apply, analyze, evaluate, and create.

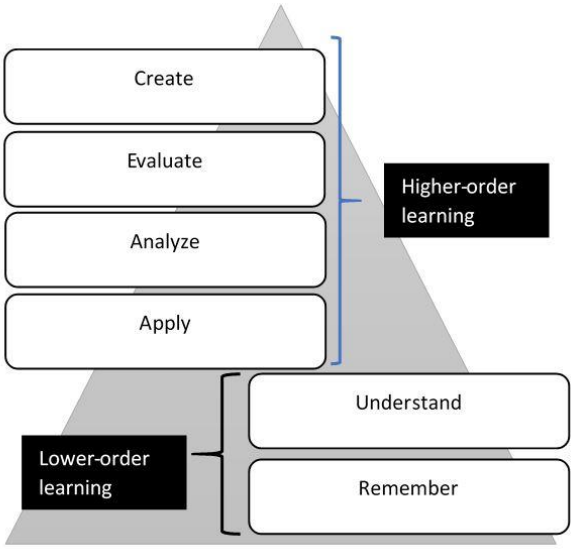

Figure 5. Taxonomy Adaptation for Flipped Learning.

In a flipped learning environment, the active learning occurred in two phases: inside and outside class. In this study, active learning developed through the implementation of erudition behaviors. The design activated students at home through readings, videos, and recorded lectures. Inside class, students engaged in discussion, mini-lectures for demanding or obfuscated content, group assignments, collaboration, and problem-solving practice. Outside class content helped students construct knowledge while inside class activities facilitated higher-order learning. Lower-ordered learning was measured through rote memory quizzes, and higher-order learning through applied and evaluative questions on a unit exam. Figure 6 depicted the active learning environment of outside and inside class activities for the current study.

For the current enquiry, flipped learning was defined as an educator-guided learning environment in which students engage in higher-ordered learning behaviors inside and lower-ordered learning outside class. Activities were planned to engross students in lower- and higher-ordered learning. Instructor recorded lectures, previously recorded videos, music, and assignments supplemented readings and opened class time to hands on learning.

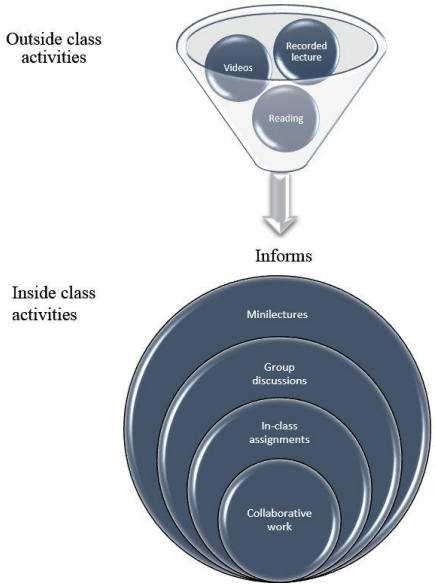

Figure 6. Active Learning for a Flipped Classroom Environment.

Literature Synthesis: Flipped Learning Themes

A review of the flipped learning literature showed some general themes. This synthesis began with tech-trends reports and practitioner articles. In keeping with the purposes of this study, the focus of the review narrowed to student outcomes and satisfaction, quasi-experimental design and survey research, respectively. As proposed, this section ended with an examination of the literature in gender and social science in flipped learning.

Tech-trends Reports

Tech-trend reports provided a canvas with which to examine the changing technological landscape which can be applied to different topics/disciplines and various educational levels (Deloitte, 2015). These reports included how-to guides for implementing flipped learning, components in the field, and benefits and drawbacks.

How-to guides. For success in flipped learning, educators should ensure they have administrative support, the time to create then environment, a strong knowledge of technology, and support from an IT department (Bergmann & Sams, 2012b). Steed (2012) asserted that educators start small, only flipping a single learning unit (Raths, 2014).Several authors suggested that educators should answer some major questions before establishing a flipped learning environment. Educators should know what the best use of in class time will be (Bergmann & Sams, 2012b, Sams & Bergmann, 2013). Raths (2014) declared that educators must develop a strategy determining what will be flipped and the tools that will be used.

Abeysekera and Dawson (2015) listed out eight characteristics of flipped learning which taken together equated to inside and outside class features. Video delivery of content was considered an outside class component and was thought to be influential, therefore should be highly developed (Abeysekera & Dawson, 2015; Moore, Gillett, & Steele, 2014; Siegle, 2014; Thomson, Bridgstock & Williams, 2014). To supplement videos, Sweet (2014) recommended incorporating micro-lectures during class for difficult topics and concepts. Grounding the work in theoretical foundation, was another suggestion that was made (Abeysekera & Dawson, 2015; Arnold-Garza, 2014; Baker, 2000; Educase, 2012: Hamden, McKnight, McKnight, & Arftrom, 2013; Milman, 2012; Nederveld & Berge, 2014; Ng, 2015; Wallace, Walker, Braseby, & Sweet, 2014). A final component was a change in role definitions; educators become guides and students direct learning (Arnold-Garza, 2014; McNulty, 2013; Wallace et al., 2014).

Benefits and drawbacks. With many scholars citing a lack of strong quantitative, or empirical research in flipped classrooms, it is difficult to imagine any benefits.

However, several writers have offered benefits as well as drawbacks to this pedagogical shift.

Alvarez (2012) indicated that one benefit was more class time. The extra face-to-face class time has the potential to encourage efficiency (Arnold-Garza, 2014; Fulton, 2012b; Jacot, Noren, & Berge, 2014; Herreid & Schiller, 2013). If students reviewed lectures and took notes at home as much as half-an-hour of class time could be used for active learning (p. 20). Additionally, students who missed had access to the notes, students had more face-to-face help with difficult tasks and concepts, and more assignments were submitted and were higher quality. McDonald and Smith (2013) noted that "onus" to learn became the students' responsibility and other tech-trend authors (Fulton, 2012b; Nederveld & Berge, 2014) supported this assessment. Berrett (2012) stated that flipped learning in colleges promotes a more productive lecture model.

Jacot et al. (2014) posited that due to the cost-effective nature of flipped learning, institutions would likely implement the educational approach without regard for learning strategies, access, or abilities. Additionally, educators will execute a flipped learning environment even when research has revealed that there was no improvement on student learning outcomes (Mitgang, 2010, Schmoker, 2012). Nielsen (2012) mentioned several drawbacks to flipped learning. For one, a digital divide exists for students who have access to the required technology and those who do not (Lafee, 2013; Mitgang, 2010; Nielson, 2012; Siegle, 2014). In a flipped learning environment, educators who were inadequate teachers were allotted more time to engage in their own ineffective approach (Nielson, 2012, para. 4; Schmoker, 2012). Student responsibility for their own learning was a benefit to flipped learning; however, Roehl, Reddy, & Shannon (2013) asserted this

was a drawback especially if outcomes, goals, and directions were unclear. One final drawback was that not all students were satisfied with flipped learning (Roehl et al., 2013).

Here is flipped learning, and this is where it will go. In a tech-trend article from Educase (2012), there was a suggestion that flipped learning environments were in community colleges, state schools such as Penn State, and even at Ivy League institutions like Harvard. Fulton (2012a) pointed out that educators at the K-12 levels have flipped learning in a variety of disciplines. Several authors agreed that flipped learning has occurred throughout educational levels and across subjects (Grayson, 2012; Ng, 2015).

Because of the popularity of flipped learning it was hypothesized that this trend is going to continue forward with more educators integrating this pedagogical approach at all levels, and if one educator implements a flipped classroom others follow suit (Educase, 2012; Fulton, 2012a). Grayson (2012) pointed out that technological advances in software and hardware would further encourage the use of flipped learning. Although there were drawbacks, none of the 42 reports indicated that flipped learning was going to fade away or lose popularity among educators.

In summary, the tech-trend reports focused on how a flipped learning environment should be structured and the necessary components. Some benefits and drawbacks were provided but like much of the literature in this field there was ambiguity. The behaviors such as student accountability were listed out as a benefit and drawback. The final piece found in tech-trend reports was that flipped learning can be found at various educational levels and fields. Also, flipped learning would not disappear.

Practitioner Articles

The second journal theme found in the flipped learning literature was practitioner articles. Practitioner pieces focused on news-style editorials and assessment of case studies from specific samples in the field of flipped learning.

News-style editorials. Ash (2012) interviewed practitioners in flipped learning at the K-12 and higher education levels. The writers' reports proposed that flipped learning did nothing to increase student achievement, contrary to the Clintondale example below. Interviews with educators at other K-12 institutions met with similar results, although flipped learning did free up class time to engage in active learning (Ash, 2012). Berrett (2012) questioned educators and evaluated flipped learning at multiple higher institutions. The consensus was that students worked together, engaged in class, and actively learned (Berrett, 2012). Several of the interviewees declared that students believed the videos, recorded lectures, and other outside class tools helpful to learning (Brunsell & Horejsi, 2013). Although, the educators reported these benefits this was not supported empirically.

Assessment of case studies. Several authors in the flipped learning literature attempted to assess and report the findings from specific cases. Clintondale High School was acknowledged by several writers because of the large number of students' who received free/reduced lunch (73%) and 65% of the student population held a minority member status (Alvarez, 2012). Before flipped learning, approximately 50% of students were failing (Alvarez, 2012). After execution of the approach, students' scores increased and the failure rate was in the teens (13-19%). Clintondale was perceived as a successful trial for flipped learning (Alvarez, 2012). In Byron High School, flipped learning

included watching videos and leaving the textbooks behind (Fulton, 2012c). Through this process, ACT scores increased from 21.2 to 24.5; however, no indication was provided about whether this impacted a significant number of students. At Okanagan Mission Secondary School in British Columbia, students' and parents' reports were overwhelmingly positive (Pearson, 2012a, para. 2); no information was provided regarding student learning outcomes (Pearson, 2012b).

Aronson (2013), reported on flipped learning in a biology class at the University of Washington. It was common for approximately 17% of introductory students to fail and only a small portion (14%) earned "A" grades (Aronson, 2013). After flipped learning had been enacted failure reduced by 4%, and 24% of students received an "A" grade (Aronson, 2013). None of the assessments offered clear statistical differences, description of the design, or other research criteria necessary to evaluate the findings.

Specific case study examples. Flumerfelt and Green (2013) conducted a case study with at risk high school students. In the flipped learning approach, students were provided with outside class videos and active learning work and in the classroom students engaged with the group. All the students completed homework (up from 75%). Students were more successful (higher grades) and even discipline decreased by 66% (Flumerfelt & Green, 2013). However, the number of disciplinary actions before flipped learning occurred was not provided.

Harvey (2014) developed a flipped learning, college Latin course, in which students listened to recorded lectures outside class and practiced during class. Once students reviewed recorded lectures, they would complete quizzes at home. Examinations were administered in the classroom. Student scores increased from the traditional lecture

semester and the flipped learning semester. However, there were no statistical results reported to understand the implication of the differences between groups. Harvey (2014) declared that there appeared to be greater retention and student opinions were positive toward flipped learning.

In short, practitioner journal articles converged on news-style editorials and assessment of case studies. The news-style articles were fixed on interviews from educators had implemented flipped learning. However, none of the editorials provided definitive results. Instead the news articles provided the educators' introspectives. The assessment of the cases where flipped learning had been carried out lacked in-depth statistical findings. Higher scores and grade were the major take away from the assessments.

Survey Research

This proposed study explored student satisfaction. As a result, previous literature conducted in this area was directly related. Prior authors performed a variety of survey methods to examine educators' perceived usefulness and student opinions about flipped learning. The major approaches included educator attitudes toward the use of specific software in flipped learning, quantitative Likert-type instruments, and open-ended response questionnaires.

Educator attitudes toward incorporating flipped learning. Only a couple of examples about educator attitudes were found in the articles reviewed because the focus was on student satisfaction. In 2014, Wallace surveyed teacher preference for using Edmodo in flipped learning. The results established that educators believed that Edmodo, a communication, collaboration, and coaching application for K-12 teachers, was useful

for students between the ages of 8-14 for posting messages, sharing folders, and viewing assignments and quizzes (Wallace, 2014, p. 295). In a study in Oman, Lane-Kelso (2015) questioned six high school teachers about their perceptions of flipped learning. Educators reported that flipped learning only benefited slow learners and that technology was a consistent barrier because of outdated equipment (Lane-Kelso, 2015).

Quantitative, Likert-type instruments. Quantitative results did not provide a definitive conclusion regarding students' perceptions of the flipped learning environment. The consequence was that some students acknowledged they were satisfied with flipped learning and others were not.

Student satisfaction in the flipped learning environment. Graduate students in a nursing program were introduced to a flipped learning environment where they were exposed to class content before meeting (Critz & Knight, 2013). Students indicated that they were satisfied with the flipped learning environment. Enfield (2013) incorporated recorded lectures and videos into a flipped learning cinema and television arts course. Gaughan (2014) used instructor created videos in an undergraduate history class to explore student perceptions of flipped learning. Across studies, students believed the videos were helpful, increased understanding, and allowed students to control their learning (Enfield, 2013; Gaughan, 2014; Critz & Knight, 2013; McLaughlin et al., 2014). In a Likert-type questionnaire, nursing students preferred the applied learning of the flipped classroom compared to a lecture course (McLaughlin et al., 2013).

When questioned about their learning experiences, students in flipped learning classrooms believed that they learned more in this pedagogical approach than in the

traditional classroom (Baepler et al., 2014; Butt, 2014; Davies et al., 2013). Students held this belief even when no differences in outcomes existed (Lape, Levy, & Yong, 2015).

In an attempt to help students discuss race and racism, Roberts, Bell, and Murphy (2008) used a flipped learning environment to foster conversation. The high school students familiarized themselves with stories outside class and conversation groups within. In this unique case study, the students were able to express their opinions about the lack of Black History events, influential black leaders, and attitudes toward racism. Roberts et al. (2008) thought that the organization of flipped learning opened this dialog and students enjoyed the process.

Flipped learning not satisfying to students. The research by Clark (2015) showed that although students reported they were satisfied with the flipped learning environment, there were no significant differences when compared to students in a traditional lecture environment. Reinforcing these findings, Enfield's (2013) higher performing students reported low levels of satisfaction (strongly disagree) affirming that the course supported students who were not academically strong. Satisfaction was reduced when students encountered technological problems (Lukassen, Pedersen, Nielsen, Wahl, & Sorensen, 2014; Vaughan, 2014). Students indicated that directions and grading criteria were inconsistent in flipped learning classrooms (Ferreri & O'Connor, 2013). Contrary to other survey research, students did not like the videos; and felt that having lectures in class to ask questions was more beneficial (Butts, 2014; Findlay-Thompson & Mombourquette, 2014).

Open-ended response questionnaires. Bergman and Sams (2012a) cited Lage, Platt, and Treglia (2000) as the first group to conduct research in flipped learning, and

using open-ended questionnaires. Lage et al. (2000) inverted a college microeconomics course, and enrolled students responded to an open-ended instrument. In this early work, students commented on the active learning environment, use of videos, and personal accountability (Lage et al., 2000). Additional researchers used open-ended responses and this resulted in several similar rejoinders. Students responded by indicating which factors were most important to their learning: individual and group interaction; instructor; use of videos/recorded lectures; allows students to learn at their own pace; and incorporating deadlines.

Crews and Butterfield (2014) provided freshmen, juniors, and seniors in all different fields with surveys to understand student experiences in face-to-face and online learning. Students conveyed that interactions within the classroom (e.g., discussion) were most important to their learning experiences (Crews & Butterfield, 2014; Clark, 2015; Findlay-Thompson & Mombourquette, 2014; Galway, Corbeet, Takaro, Tairyan, & Frank 2014; Jungic, Kaur, Mulholand, & Xin, 2015). The instructor was an essential factor because he/she established the interactive learning environments (Crews & Butterfield, 2014; Clark, 2015; Gunyou, 2015; Roach, 2014). Gunyou (2015), created a flipped learning introductory business course by incorporating YouTube videos, online quizzes, and active learning group sessions. The use of YouTube videos and recorded lectures allowed individualized control of learning according to students (Gunyou, 2015; Jungic et al., 2015; Mok, 2014; Roach, 2014; Sinouvassane & Nalini, 2016). McGraw and Chandler (2015) fashioned a flipped learning graduate biology class. Even though quizzes were insignificant for the overall grade, students felt that videos and deadline for the tests helped motivate them to remain engaged in active learning (McGraw &

Chandler, 2015). Other researchers indicated that students found the outside class activities helpful and useful as well (Mok, 2014; Moran & Milsom, 2015).

In general, there were three reporting tendencies in the survey research: educator attitudes, student satisfaction through Likert-type instruments, and responses from open-ended questionnaires. In the few brief cases, educators were reluctant to convert to a flipped learning approach. Student reported that they were satisfied with flipped learning believing that the approach allowed for self-paced learning. Contrarily, in multiple studies students indicated that they were not satisfied and thought that only "slow" learners benefited. In responses from open-ended questionnaires, several themes were extrapolated. Students commented on the active learning environment; interactions; instructor; the use of videos/recorded lectures; and schedules and deadlines. When students thought these elements were well developed, their assessments were positive.

Quasi-Experimental Outcomes

The first inquiry in this study set out to investigate outcome differences between students in flipped and traditional learning groups. Previous researchers conducted quasi-experimental design research to determine if differences existed between a flipped learning and traditional lecture environment. Scientists used a combination of videos and recorded lectures in the design of flipped learning groups and in some cases compared previous semesters to a treatment semester. Across grade-levels and disciplines they observed students performed equally well, significantly better than, or the findings were ambiguous in the flipped learning group as compared to the control or traditional classrooms.

No significant differences between groups. Davies, Dean, and Ball (2013) set up a quasi-experimental design in collegiate technology courses with three groups: traditional, independent study, and flipped learning. All posttest grades increased, however, the independent learning group preformed significantly worse than the traditional and flipped learning group. No significant differences existed between the traditional and flipped learning course (Davies et al., 2013). Baepler et al. (2014) conducted an experiment in college chemistry classes, comparing traditional students in one semester to flipped learning students in subsequent semesters. They discovered that students in an active flipped learning environment performed as well as students in the traditional course (Baepler et al., 2014). Velegol, Zappe, and Mahoney (2015) conducted a quasi-experimental design in an undergraduate engineering course by comparing a traditional lecture to a flipped learning semester. The use of a flipped learning design did not have an impact on final test scores (Velegol et al., 2015).

Students in flipped learning environment earned significantly higher grades than in the control group. Garver and Roberts (2013) arranged a quasi-experimental situation in an undergraduate statistics course and compared a flipped learning group to students in previous, traditional courses. A comparison of final exam scores showed that students preformed significantly better in the flipped learning approach (Garver & Roberts, 2013). In a similar design of a pharmacology course, students in the flipped learning group preformed significantly better on midterm tests than students in a traditional class (Geist, Larimore, Rawiszer & Sager, 2015). In another pharmacology course with a between semester control and treatment (flipped learning) group, Pierce and Fox (2012) observed that students in the flipped learning semester did significantly

better on a final assessment. Talley and Scherer (2013) used a between semester quasi-experimental design to examine differences in an undergraduate psychology course. They determined that students in the flipped learning group earned higher functioning scores than in previous semesters.

Wilson (2013) compared two psychology semesters to determine if a new flipped learning method would improve student scores on coursework, exams, and pretest and posttest assessments. Wilson found students in the new learning method performed better (higher scores) in all areas except the pretest in which all students functioned similarly. In an undergraduate nursing course, students spent half of the semester engaged in flipped learning and the second half in traditional course structure (Della Ratta, 2015). Students preformed significantly better than in previous semesters where only traditional learning occurred (Della Ratta, 2015; Wong, Ip, Lopes, & Rajagopalan, 2014).

Ambiguous differences between groups. In the study by Geist et al. (2015), college healthcare students performed better on midterms when in the flipped learning group; however, there were no significant difference on final exam scores. In Kong's (2014) work, even though there were significant gains these were due to the addition of more materials for the flipped learning group, not any learning differences. Touchton (2015) observed that students in an undergraduate statistics course produced significantly higher quality work but that these discoveries were not important because the magnitude was small (p. 38).

Jensen, Kummer, and Godoy (2015) compared students in flipped and traditional learning groups from an undergraduate program at a private university. They found no significant differences between groups and implied that if educators create active

learning, flipped learning has no impact (Jensen et al., 2015). Tune, Sturek, and Basile (2013) created a flipped learning design for first year graduate students in a mammalian physiology course. With all outcomes taken together, students in the flipped learning group earned higher assessment scores. Although exams on the renal system were higher, they were not statistically significant between groups.

In a college history course, a flipped learning group was compared to students in a traditional class (Murphree, 2014) on a pretest and posttest instrument and overall letter grade. Student grades went from a "C" to a "B" average; however, Murphree considered this an anecdotal difference. The pretest and posttest findings were less clear. Murphree indicated 67% of the sample answered posttest questions correctly but no discussion regarding the differences between groups were addressed. Pretest and posttest assessments were offered by and scored by the university, and students were not required to complete these assessments. This made scoring and relating the two groups difficult (Murphree).

In conclusion, the quasi-experimental designs in the literature produced three major outcomes. In several of the articles, there was an indication of "no group differences." More simply, students in the experimental or flipped learning group performed as well as students in the traditional lecture classes. The second major finding was that students in the experimental group scored significantly higher on learning outcomes measures than the students in the control group. The third and final trend was that the reported findings were ambiguous. For instance, student in the experimental group earned higher scores on one exam and the same on all other measures.

Gender in Flipped Learning

The second part of the first research question, probed the Dependent Variables for any Gender differences. In the literature reviewed on flipped learning, few investigators evaluated the effects of gender.

Chen, Yang, and Hsiao (2015) declared that gender has been an important factor in educational research. For instance, women enroll in online courses at a higher rate than men (Chen et al., 2015, p. 5). They used gender as a factor for predicting student perceptions in a high school pre-calculus class. Gender was significant only when examined with topic interest. In other words, young women were significantly less interested in pre-calculus topics than their male counterparts (Chen et al., 2015). Touchton (2015) investigated gender in an advanced statistics course through a quasi-experimental design. He stated that gender was a factor in enrollment in science, technology, engineering, and mathematics (STEM) fields, with male enrollment higher even though females scored higher. The females in the sample significantly outperformed males (Touchton, 2015).

Sociology in Flipped Learning

Data collection occurred in introductory sociology courses. Therefore, it was of import to scrutinize research already conducted in this area. Like gender and flipped learning, social sciences have been understudied in this field.

According to Forsey et al. (2013), by the end of the term student attendance at lectures dwindles considerably. Anecdotally, this has been the experiences around the sociology water cooler. Forsey et al. (2013) indicated that sociologists and the American Sociological Association have been reluctant to implement flipped learning preferring the

traditional classroom experience. Forsey et al. (2013) used sociology face-to-face classes to establish a flipped classroom. Through the investigation, they wanted to understand student perceptions about the flipped learning. They found that approximately 53% of students agreed that the classroom met their needs and 82% thought it was a good educational experience (Forsey et al., 2013). In focus groups, students stated that they were satisfied with the experience, they felt more productive in the flipped classroom, but students struggled with technology and felt this approach would result in lost content. Ravenscroft and Luganga (2014) conducted a study in an introductory sociology course. Compared to previous years, students in the flipped learning semester scored higher and were more engaged.

Kim, Kim, Khera, and Getman (2014) included three flipped learning environments in their design: engineering, sociology, and humanities. Students in the three courses completed surveys and a sample of students were interviewed. In all three courses, students reported being satisfied with the flipped learning environment and described that this approach was oriented toward student learning. As in the general literature in flipped learning, the students' qualitative accounts affirmed that they were exposed to materials before class motivating them to prepare. The structure afforded plenty of time to complete assignments, and that feedback was active and helpful (Kim et al., 2014). Based upon so few examples, it appeared that flipped learning in sociology classes was similar to the larger body of research.

Summation

In the proposed exploratory research, flipped learning was defined as an educator-guided learning environment in which students engage in higher-ordered learning

behaviors inside class and lower-ordered learning outside class. The use of instructor-recorded lectures, previously recorded videos, music, movies, assessments, assignments, quizzes, and a unit exam absorbed students in lower- and higher-ordered learning in active environments.

The review of the literature began with an overview of the history of flipped learning, theoretical backgrounds (active learning and taxonomy) were examined, and then research in flipped learning which applied to the field were discussed. Then, the literature synthesis included a broad look at tech-trend reports that focused on how flipped learning was implemented and their characteristics; the advantages and weaknesses found in this approach; the prevalence of flipped learning throughout all levels of education and disciplines; and the penchant for retention of this teaching style. The practitioner articles provided some insight into educator preference and circumstantial conclusions from specific schools and classrooms where flipped learning had been applied.

Narrowing the concentration, the synthesis included outcomes from quasi-experimental designs and satisfaction reports from survey research. Survey research was explored to address student satisfaction. Students reported that they learned more from interactions in an active learning environment when the instructor presented a well-developed course and the use of prerecorded videos/lectures allowed students to control the pace of their learning while deadlines kept them motivated and engaged. However, students were disenchanted with flipped learning because of technological issues, inconsistencies in directions and grading, and that overall, flipped learning only aided

less academically advanced students. Findings specific to gender and social sciences in flipped learning mimicked the deductions discovered throughout the literature review.

The conclusions from quasi-experimental designs were similar to findings in the three previous categories. There were three broad results: there were no significant differences between groups; students in flipped learning outperformed their counterparts in traditional classrooms; and ambiguous findings. In the no differences category, students performed equally well in lieu of the course structure. When significant differences were presented, students in the flipped learning structure were exposed to pre-recorded lectures and videos before class meetings. Some conclusions were ambiguous because students in both groups scored equally well on some measures such as midterms but then flipped learning groups outpaced on the finals. Active learning in either structure resulted in higher scores contributing to the ambiguity.

In total, 136 tech-trend, practitioner, quasi-experimental design, and survey research artifacts were reviewed. Tech-trend reports (42) and practitioner articles (17) made up the bulk of the writings and the inferences from the outcomes (22) and satisfaction literature (44) were equivocal while gaps existed in gender and sociology classrooms. In the current study, the use of a quasi-experimental design was used to examine group and gender differences on outcomes measures and satisfaction scores. This method occurred throughout one learning unit in an introductory sociology course, contributing to the findings in this field of flipped learning.

In the next chapter, the emphases concentrated on the development and design of this current study concentrating on sampling requirements, participants, and random assignment of groups. The instruments and measurements were discussed and reviewed

before the variables were explained. The structure included the development of the procedures for the control and treatment group. Data collection processes were appraised. Finally, analyses consisted of two-way multivariate analysis of variance (two-way MANOVA) which was assessed by the research questions. The analyses included assumptions and processes for post hoc methods. Finally, the review process for open-ended questions was assessed.

Chapter 3: Methods

Introduction

This chapter began with a description of the research design including techniques used for reducing threats to validity before addressing the setting and participants. A description of the variables segued into an examination of the instrumentation and measurement. A brief review of the procedures from previous literature provided a framework for the processes and techniques used in the current study. An examination of the assumptions and the findings from the analyses were provided before discussing the mode for collecting data and how that data were analyzed. An overview of the post hoc procedures for the specific tests was explained.

For this study, a two-by-two quasi-experimental design was established to examine the results by Learning Environment and Gender (grouping variables) on selected Dependent Variables. The purpose of this study was to explore the mean differences between Learning Environment and Gender based on the Dependent Variables, which was conducted in introductory sociology courses.

Research Design

According to Creswell (2014), quasi-experimental designs are appropriate when random assignment is not possible (e.g., classroom research). Because the groups are pre-arranged in classrooms, individual random assignment cannot be established. Salkind (2010) indicated quasi-experimental designs have less power than true experiments and because of the lack of randomization researchers should use pretests and posttests (repeated-measures) or matching designs.

In this study, a two-by-two quasi-experimental design was used to examine possible group differences. A true experimental situation was not appropriate because participants were not randomly selected. However, instead of individual assignment, random group assignment by course was implemented and the treatment was manipulated in the flipped learning environment and controlled in the traditional classroom. In order to address the threat to validity, participants completed a Pretest and Posttest assessment.

Setting and Participants

The research took place at a Western college in the United States. In order to add to research in the field, the study was conducted in sociology courses. Enrolled students in sociology courses represented a convenience sample. All students completed the same assignments, quizzes, exams, and other work as part of the course. Students in the enrolled courses completed all of the coursework typical to an introductory sociology course, whether or not they participated in the study. However, individuals had the opportunity to opt out of the study at any time. For instance, students completed all of the work as part of the course but if they opted out of the study, their information was not used in any of the analyses of the study. At this institution, students were required to take a minimum of three social science credits, which could come from anthropology, economics, psychology, sociology, or women's studies. Therefore, potential students came from a variety of disciplines because of the core requirement of social sciences for all degree seeking students.

There is no steadfast statistical rule for the number of participants needed for a quantitative study; however, there are popular rules of thumb (Garson, 2009). Cattell (1978) stated this ratio could be 3:1, or three participants per variable. However, the Rule

of 5 is a subjects-to-variables (STV) ratio in which there should be at least five cases for each dependent variables in the study; several authors indicated that this ratio should not be lower than five-to-one (Garson, 2015; Gorsuch, 1983; MacCallum, Widaman, Preacher, & Hong, 2001; MacCallum, Widaman, Zhang, & Hong, 1999) . In the case of this proposed study, there was a Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, Higher-Ordered Unit Exam and a Satisfaction Score. The STV ratio of 5:1 was used, this equated to seven variables, and the minimum number of subject for this ratio was 35.

Demographic Data

The demographic data included gender, age, grade level, and major field of study, for the participants. Of the 111 participants (N = 111), 58 were female and 44 were male. Nine participants did not provide a gender category and were displayed as missing. Ages ranged from 17 to 42 and 23 students left their age blank. The majority of participants were listed as freshmen and sophomores. Ten students did hold a junior or senior grade level. Participants provided information for their major field of study (major). Twenty-four students did not provide information about their majors. Major field of study was compressed into overall majors. The major for “Business” included economics, general business, pre-business, business management, accounting, and marketing. The “Education” major comprised various areas, such as secondary education, early childhood education, and special education. The major for “Liberal arts” incorporated human development and family studies, language, psychology, sociology, social work, theater, journalism, and fine arts. The “Professional” major integrated nursing, medical and premedical, dental studies, and veterinary sciences. Finally, the “Science” major

contained biology, biochemistry and molecular microbiology and immunology, general science, neuroscience, and environmental science. Table 1 provided and information about students from self-reports.

Table 1

Demographic Information: Gender, Age, Grade Level, and Major.

Demographic Variable	Participant Reponses	*N*	Percentage
Gender			
	Male	44	39.60
	Female	61	55.00
	Missing	6	5.40
	Total	111	100.00
Age			
	17	1	.90
	18	18	16.20
	19	16	14.40
	20	23	20.70
	21	4	3.60
	22	6	5.40
	23	4	3.60
	24	3	2.70
	25	2	1.80
	26	2	1.80
	27	1	.90
	29	2	1.80
	31	1	.90
	32	1	.90
	34	1	.90
	37	2	.90
	42	1	.90
	Missing	23	20.70
	Total	111	100.00
Grade Level			
	Freshman	68	61.30
	Sophomore	31	27.90
	Junior	7	6.30
	Senior	3	2.70
	Missing	2	1.80
	Total	111	100.00
Major			
	Business	22	19.80
	Education	5	4.50
	Liberal arts	20	18.00
	Professional	12	10.80
	Science	22	19.80
	Undecided	5	4.50
	Missing	25	22.50
	Total	111	100.00

Instrumentation and Measurement

Student outcome measures occurred in three different ways: pretest and posttest assessment, three lower-order learning quizzes, and a higher-ordered unit exam. Each process was discussed below along with the nature of higher/lower scores. The second portion of the first research question focused on student self-reported satisfaction from a Likert-type questionnaire. The final question delved deeper into student perceptions using an open-ended instrument.

Pretest and Posttest. The assessment consisted of a 10-item, multiple-choice instrument designed to examine students' knowledge about sociology. Appendix F provided the Pretest in its entirety. The assessment was developed as a Computer Assisted Report (CAR) of student sociological understanding (Truckee Meadows Community College, n.d.). Pretest and Posttest were used in other flipped learning literature (e.g., Davies et al., 2013; Geist et al., 2015; Jensen et al., 2015; Kong, 2014; Mattis, 2014). The knowledge-based instrument helped alleviate the threats to validity innate in a quasi-experimental design due to the lack of randomization and provided repeated-measures data. Students completed the Pretest assessment on the first day of classes and again at the end of the learning unit (as the Posttest). The questions and answers were the same on both administrations. However, using a learning management system (LMS) the questions and answers were rearranged. Then the Posttest was printed and administered to students. The entire Posttest was provided in Appendix G.

Pretest and posttest results, from previous research, were significant between the traditional lecture group and flipped learning group (Musallam, 2010; Strayer, 2012; Vansteenkiste et al., 2009). In these studies, the researchers found a large effect size

(Musallam, 2010) and significant portion of variance was explained (Strayer, 2012; Vansteenkiste et al., 2012) due to group (traditional versus flipped). Students typically began the courses at the same level of understanding (e.g., Geist et al., 2015). Then, posttest scores were higher once students had begun to explore the content due to familiarity with the topics.

Chapter quizzes. Students completed three brief 10-item quizzes to cover the content of the learning unit on social divisions and inequality, specifically Stratification, Sex/Gender, and Race/Ethnicity. Quiz questions were developed directly from course content and test banks. Test bank developers indicate lower-ordered questions as "remember" or "understand." The general characteristics were factual and definitive. For instance,

1. Ethnic cleansing is a euphemism for _____.
    a. Affirmative action
    b. Assimilation
    c. Genocide
    d. Colonialism

Quizzes ensured students kept up with readings, lectures, and/or videos and students engaged in lower-ordered learning: understanding and remembering. Researchers reported significant differences between groups through quiz scores (Garver & Roberts, 2013; Geist et al., 2015; Mason et al., 2013; McLaughlin & Rhoney, 2015; Velegol et al., 2015). Higher scores demonstrated that students understood/remembered course content.

Higher-Ordered Unit Exam. After students completed the three chapters making up the unit on social division and inequality, an exam over the entire unit was

administered. The Higher-Ordered Unit Exam consisted of three chapters (Stratification, Sex/Gender, and Race/Ethnicity) and corresponding supplemental readings, lectures, and videos. The Higher-Ordered Unit Exam included 65 multiple-choice questions. The Higher-Ordered Unit Exam questions consisted of applied and evaluative questions focusing on higher-order learning (Anderson et al., 2001) and questions were gathered from multiple test banks in the field. The test bank designers labeled these questions as apply or evaluate. Higher scores were indicative of higher-order learning. For example:

1. Tina is member of the working poor. When she can find work, it tends to be temporary work that requires her to travel far from where she lives. Often she ends up working a double shift just to make as much money as she can at the time because she does not know how long the job will last. What was her likely voting behavior in the last election?
    a. She voted mostly for Democrats.
    b. She voted mostly for Republicans.
    c. She voted for independent and write-in candidates only.
    d. She did not vote.

Student Satisfaction Scores

In addition to exploring student results, students' satisfaction with the course and learning were investigated. In keeping with this focus, two instruments were used to collect information about student satisfaction: a Likert-type scale and open-ended instruments.

CUCEI instrument and measurement. The first instrument used to measure satisfaction was the College and University Classroom Environment Inventory (CUCEI),

which was developed by Fraser, Treagust, and Dennis (1986). The instrument was designed to assess student evaluations of the classroom environment. The CUCEI was originally developed in Australia to explore evaluations of the learning environment of undergraduate students. Although originally used in traditional classroom environments, the 49-item instrument has since been used in flipped classroom research (Bormann, 2014; Butzler, 2014; Findlay-Thompson & Mombourquette, 2014; Hantla, 2014; Prashar, 2015; Strayer, 2007; 2012). According to previous researchers, the CUCEI instrument was internally consistent and acceptable to measure evaluations across the 49-items (Cronbach's α = .70 to .90; Butzler, 2014; Fraser & Treagust, 1986; Fraser et al., 1986; Strayer, 2012). The entire survey instrument was provided in Appendix E.

In regards to the first research question; the CUCEI was used to measure students' satisfaction with their learning and the classroom (Questions 4, 11, 18, 25, 32, 39, and 46; see Appendix E). The four options were strongly agree (4), agree (3), disagree (2), and strongly disagree ([1], see Appendix E). The entire 49-item instrument was administered to students. However, only the satisfaction scale items were used in analyses. Scores were summed for each of the seven items for each participant. Satisfaction Scores ranged from 7 to 28. Higher scores on satisfaction measures represented greater students' self-reported satisfaction (as demonstrated in the proposed scoring processes in the variable section). These items were:

4: The students look forward to coming to classes.

11: Students are dissatisfied with what is done in the class.

18: After the class, the students have a sense of satisfaction.

25: Classes are a waste of time.

32: Classes are boring.

39: Students enjoy going to this class.

46: Classes are interesting.

Question numbers 11, 25, and 32 were negative statement items and therefore were reverse coded (Fraser & Treagust, 1986; Fraser et al., 1986).

Open-ended questionnaire. Examples of open-ended questionnaires have been used in flipped learning research to understand what students thought about their immersion in course/classroom and their behavior towards activities. Open-ended instruments allowed students to respond to the frequency with which they came to class, watched videos, read, and/or completed assignments.

The final instrument allowed students to respond with their perceptions of the learning environment. Appendices B and C were for the students in the traditional lecture (control) and flipped learning (treatment) groups, respectively. In this questionnaire, students provided demographic information: gender, grade level, age, and major. Students offered information about their use of videos, recorded lectures, and their participation in class and attending lecture (control group), or class time engagement (treatment group). Students expanded their choices through open-ended qualitative questions. This information answered the second research question and was used to create themes.

Variables

As with quasi-experimental studies, a set of independent variables are used to establish groups to measure or explore any differences among Dependent Variables. In this section, the independent variables were discussed including how groups were

randomly assigned and scoring for the IVs. Then, the Dependent Variables were explained. In addition, the proposed implications inferred from research were proffered.

Independent variables. There were two categorical independent variables proposed for this study: Learning Environment and Gender. Group assignment occurred through a random process and Gender was established from self-reports by the participants.

Learning Environment. Four sociology courses were randomly assigned to a control (traditional lecture) or treatment (flipped learning) group. This independent variable was group by Learning Environment. This equated to two classes in the control and two classes in the treatment group. In order to achieve this, courses were assigned a non-identifying pseudonym. In this case, the courses were SocA, SocB, SocC, and SocD. With the assistance of a colleague in sociology, two number ones (1) and two zeros (0) were written on separate paper squares and placed in a bag. For the current studyT. Beginning with SocA, one of the four squares was drawn from the bag. This occurred for each of the four classes without replacement. That is, classes were assigned randomly to either the control (traditional lecture) or the treatment (flipped learning) group. The breakdown was SocA = 1, SocB = 0; SocC = 0, and SocD = 1. Herein after, there were only two groups (Learning Environment) in the study: the traditional lecture course (0; control) and the flipped learning environment (1; treatment).

***Gender*.** Part of the flipped learning environment included the use of instructional videos, recorded lectures, and/or supplemental videos. Spotts, Bowman, and Mertz (1997) conducted survey research among 367 educators' and faculty members' use of instructional technologies and found that females used video more frequently than their

male counterparts did. Lin (2011) discovered that females achieved higher comprehension and vocabulary scores using video-mediated learning, and found that males' scores increased only when exposed to easier video integration modes. There has been a lack of analysis in flipped learning and gender.

In order to add to the research in the area of gender and flipped learning, information regarding student Gender was collected. Students disclosed their gender as female or male (see Appendix B and Appendix C). This data was considered an independent variable and coded one (1) for female and zero (0) for male.

Quantitative Dependent Variables. The Dependent Variables consisted of the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam and Satisfaction Scores. Data were collected from a pretest, posttest, three quizzes, and a unit exam created by the researcher. Students completed a 49-item instrument, which included a satisfaction subscale, at the end of the unit as well. All Dependent Variables were part of a typical classroom experience. In other words, students completed assessments and quizzes, and finished exams as part of the classroom experience irrelevant of their participation in the study.

Pretest and Posttest. The Pretest and Posttest assessments were 10-point measures. Each student scores 0-20 on the combined assessments. Scores were assessed from 0-10 per attempt (pre/post). Zero indicated that no correct responses were selected and 10 signified all choices were correct. The Pretest and Posttest were used to protect against threats to validity.

Quiz variables. Quizzes were worth 10 points each or one point per item. There was one quiz over each of the three chapters (Stratification, Sex/Gender, and

Race/Ethnicity) in the unit. Students scored 0-10 points per quiz. A zero score was due to inaccurately answering all of the questions and 10 points denoted all answers were correct.

Higher-Ordered Unit Exam. The unit exam consisted of 65 applied and evaluative questions. Students' scores ranged from 0-65 because each multiple choice item was worth one point each. As with the two other performance variables, a zero score indicated no correct answers were provided by the student and a 65 meant all answers given were accurate.

CUCEI instrument. Participants completed a Likert-type questionnaire with 49-items: CUCEI (see Appendix E). Each entry consisted of a score from one to four. One identified a response of strongly disagree and four was strongly agree. Students completed the instrument containing all 49 items. However, only seven of the 49-items focused on the variable of satisfaction pertaining to this study: Questions 4, 11, 18, 25, 32, 39, and 46. Furthermore, several of the items found in the CUCEI were negative statements and were reverse coded before analyses were completed. In the inventory, Questions 11, 25, and 32 were negative items and reverse coded (Fraser & Treagust, 1986). Student Satisfaction Scores ranged between 7 and 28 after the items were summed. Higher scores implied higher self-reported satisfaction.

Qualitative variables. Students' qualitative responses were collected through open-ended questions. Students explained which factors/materials facilitated learning, which items were least helpful, how the professor could improve learning, and how the student could improve learning. The responses from these four questions were the qualitative data collected from students. Within these categories, themes were teased out

from student responses and were discussed in chapter 4. Student responses were the data in this section of analysis.

Procedures

As part of the course, students completed all coursework, quizzes, and exams. Measures from one learning unit, over social inequality, was used in the analyses for each participant. On the first day of class, all students were introduced to the learning management system ([LMS]; e.g., Blackboard). The students were shown how to access materials through the LMS, submit assignments, and complete quizzes. Then the specific procedures for the control group and treatment group were addressed in the classroom. Inside and outside class activities were explained to the groups. There were differences between the treatment group or flipped learning group and the control group or traditional lecture group.

Control Group inside Class Activities

The control group students were to come to class prepared with their at-home activities complete. The class was opened to questions directed by the students and their at-home activities were submitted online through the LMS. Then, there was an ensuing lecture of that section. This lecture was identical in content to that of the treatment group except that it occurred face-to-face instead of as a recording, and throughout the lecture, students were asked questions to spur discussion, creating an active learning environment. After the chapters were sufficiently covered, one week per section, approximately, the students completed an inside class unit exam. Before the unit exam, students were supplied a study guide in the form of a set of applied questions to study from.

Control Group outside Class Activities

The traditional lecture group engaged in many of the same outside class activities as the treatment group. The control group completed assigned readings from the textbook and supplemental materials such as journal articles and news stories. The students in the control group viewed the same movies and listened to the same music. This group was not exposed to the learning materials, such as recorded lectures, before class. Participants completed at-home activities from the supplemental materials that were submitted online as homework. For example, students addressed the theme/themes brought up in a music video and applied one of the major sociological theories to support the argument. Participants in the traditional lecture group completed the same fact/concept based quizzes as the flipped learning group, and the quizzes were administered through the LMS.

Treatment Group inside Class Activities

First, students were asked if there were any questions about the recorded lecture, readings, or other materials. Students were asked if they had any questions about the at-home responses from the paused responses in the recorded lectures. Then students submitted their responses on the final day of the weekly sections (e.g., Wednesday or Thursday). The class opened to student-directed questions from the readings and supplemental materials. In this form students asked questions about the material provoking large group discussions. Then, they were asked specific questions about the materials. Mini-lectures were conducted for more difficult concepts such as the section on Gini coefficients. These elements created an active learning environment for students (Anderson, et al., 2001).

Once questions were answered and materials were reviewed, the participants broke into groups of four and complete activities based upon the supplemental materials and content. Activities were various. Students analyzed music videos, critiqued articles, wrote group research questions, and developed experiments, for instance. After the section chapters concluded, participants completed an in-class exam covering the three chapters. The materials were the same as those completed by students in the control/traditional lecture group. The unit exam focused on higher-ordered, applied questions. Students were provided a set of applied question examples with which to study for the exam.

Treatment Group outside Class Activities

The treatment group engaged in content knowledge acquisition outside of class. Content delivery consisted of several different forms. The flipped learning group read the assigned textbook chapters and supplemental articles; watched sociological videos and movies for content clarity through various websites; listen to music with sociological themes; and listen to the instructor's recorded lectures and videos. The students were required to pause the lectures at certain points and answer active learning questions. For instance, in the race/ethnicity lecture, students were told to pause and answer "Is there institutionalized discrimination in the educational system? Provide specific examples." There were three to six paused responses in each lecture. Students submitted these answers in class on the last day for that section (e.g., Wednesday for a Monday/Wednesday course).

At the end of each section/chapter, students completed a 10-item quiz. The quizzes were fact/concept based questions. The participants finished the quizzes through

the LMS by 11:59 pm at the end of the section. For example, participants completed the quiz over stratification on a Wednesday, the last day of review and lecture. More specifically, all content for that section was covered before students completed a quiz, as was the case in the traditional lecture group.

Data Collection

Data were collected throughout the progression of the learning unit as discussed in the procedures. Students completed a Pretest on the first day of class (see Appendix F). Student scores from the Stratification Quiz, Sex/Gender Quiz, and Race/Ethnicity Quiz were collected after the conclusion of the unit. The Higher-Ordered Unit Exam scores were collected at the close of the unit as well. The Pretest, Posttest, and Higher-Ordered Unit Exam was administered inside class and the Stratification Quiz, Sex/Gender Quiz, and Race/Ethnicity Quiz were completed outside class through the LMS; this was the same for both groups.

Once participants concluded the learning unit on social divisions and inequality, they completed the Posttest, CUCEI, and the open-ended questionnaire (see Appendices B, C, E, and G). The CUCEI and questionnaire were uploaded as non-graded surveys through the LMS and participants completed the instruments online to protect anonymity and increase the likelihood of honest reporting.

On the first day of classes, students in the control and treatment groups completed a Pretest designed to assess basic sociological knowledge inside class. The students completed the 10-item test on a Scantron form, which was processed through a Scantron Test Scorer. The same method was used for the Posttest and Higher-Ordered Unit Exam. The Stratification Quiz, Sex/Gender Quiz, and Race/Ethnicity Quiz was scored through

the LMS, and survey instruments were completed through the LMS as well. All of the hardcopy forms remain locked in a secure cabinet and online forms are housed within the secure LMS. Once the scores were recorded, a unique non-identifying ID number was given to all participants. No master code or other method for identifying participants was retained. Students who answered the open-ended questionnaire were evaluated simply as participant quotes.

Students completed the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam. The Posttest questions were identical however, to minimize the threat from testing effects, question and answer order were rearranged (Black, 2002). An example of the reordered questions and subsequent answers were placed in Appendix G. The Dependent Variables were scored from these results and the independent variables were the Learning Environment (traditional lecture or flipped learning) by Gender (female or male). Gender information was obtained from the student self-reports. In order to answer the second part of the first research question, students in both groups completed the CUCEI. The CUCEI was used to explore student satisfaction through the seven satisfaction subscale items. The open-ended instrument allowed students to provide information about their own learning and in this study was used to answer the second research question.

Data Analysis

Multivariate analysis of variance (MANOVA) is an extension of analysis of variance (ANOVA), which allows researchers to examine differences among among groups based on a dependent variable (DV) and the effects from a single categorical independent variable (IV). Multivariate analysis of variance (MANOVA) extends the

analyses to multiple DVs, or the combined dependent variables. Analysis of variance does not address patterns in the analyses because each test of the DV is run independently (Mertler & Vannatta, 2013). The incorporation of multiple DVs increases researchers' ability to find group differences. Two-way MANOVA expands traditional MANOVA through incorporating two or more categorical IVs. Two-way designs are meant to combine different combinations of the DVs for different linear main and interaction effects.

A two-way MANOVA was employed to examine Learning Environment and Gender differences on the combined Dependent Variables. The next sections provided information about the assumptions, how the data were run, and post hoc procedures before discussing how the open-ended questions were assessed.

MANOVA Assumptions

When there is more than one independent variable and the variables are categorical, multivariate analyses are appropriate for the data (Mertler & Vannatta, 2013). In the case of this study the independent variables, Learning Environment and Gender, were categorical. There were multiple continuous Dependent Variables. To reduce the risk of Type I errors, multivariate analyses were appropriate (Carifio & Perla, 2007; Mertler & Vannatta, 2013). The major assumptions examined were: assumption 1) two or more dependent variables at the interval or ratio level; assumption 2) an independent variable consisting of two or more categories; assumption 3) independence of observations; assumption 4) adequate sample size; assumption 5) no multivariate outliers; assumption 6) multivariate normality; assumption 7) linear relationship between pairs of

dependent variables; assumption 8) homogeneity of variance; and assumption 9) no multicollinearity.

Normality. Multivariate normality is the implication that the distribution of means is normal through all linear combinations and across cells (Tabachnick & Fidell, 2013). According to Mertler and Vannatta (2013), the first step to establish normality is to run histograms with normality plots and bi-variate scatterplots through univariate tests. Additionally, univariate homoscedasticity is tested using Levene tests.

MANOVA is robust to Type I errors if normality is violated, but power could be reduced (Mertler & Vannatta, 2013). Having at least 20 degrees of freedom (df) for the error term is the level at which MANOVA is robust (Carifio & Perla, 2007; Mertler & Vannatta, 2013; Tabachnick & Fidell, 2013). This can be assessed through the df in the MANOVA table, error term.

Linearity. Linearity is the assumption that relationships are linear across dependent variables. Violations reduce power (Carifio & Perla, 2007; Mertler & Vannatta, 2013; Tabachnick & Fidell, 2013). To test for this violation/assumption scatterplots and Pearson correlation coefficient models should be created. For multivariate linearity, scatterplot matrices demonstrate linearity.

Homogeneity of variance. Homogeneity is the assumption that the participants sampled were drawn from the same population. With equal sample sizes, MANOVA can be robust to Type I errors (Carifio & Perla, 2007; Mertler & Vannatta, 2013; Tabachnick & Fidell, 2013). Box's M test for equality of variance should be used. If Box's M is not significant, homogeneity can be assumed.

Absence of outliers. According to Tabachnick and Fidell (2013), MANOVA is not robust to outliers. Using regression, Mahalanobis distances can be saved and examined for multivariate outliers. Then probability scores for Mahalanobis are calculated through a compute function in SPSS. Extreme outliers should be removed to correct the problem (Mertler & Vannatta, 2013).

Absence of multicollinearity. Multicollinearity exists when IVs are intercorrelated and compete for the same variability on the DVs (Tabachnick & Fidell, 2013). To test for violations to the assumptions, tolerance and variance inflation factor can be gained through the regression coefficient tables (Mertler & Vannatta, 2013).

Two-way MANOVA for Data Analysis

Tabachnick and Fidell (2013) stated that researchers can discover what has changed by examining multiple dependent variables simultaneously and two-way designs allow for the inclusion of multiple IVs. For the purposes of this study, a two-way MANOVA was used to analyze the data to answer the first research question. The first independent variable was Learning Environment: control (traditional lecture) and experimental (flipped learning). The second IV was Gender: female and male. The Dependent Variables were the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam and Satisfaction Scores. Thus, the proposed study explored the main effects for Learning Environment and Gender, respectively, and the interaction effects on the Dependent Variables.

Before analyzing the data collected through the study, data were tested to ensure the basic assumptions were met. Once the analyses were run, Box's M statistic test was examined for significance. If M is not significant Wilk's Lambda would be used to

explore differences in the multivariate model. If it is significant Pillai's Trace would be considered. Interaction effects, Learning Environment by Gender, on the Dependent Variables were appraised before exploring main effects.

Post Hoc Procedures

According to Tabachnick and Fidell (2013), comparisons come in two variations, planned and in lieu of an omnibus F, or post hoc after the analysis. In a two-way MANOVA with two levels, post hoc analyses through MANOVA measures (e.g., Tukey, REGWQ, etc.) were not appropriate for this study. Once the analyses were conducted, if there was one or more mean differences between the groups a series of follow-up ANOVAs were conducted. If MANOVA indicated a significant main or interaction effect, then ANOVAs ensued. A one-way ANOVA for each of the Dependent Variables was conducted. If there were significant main effects in the subsequent ANOVAs the expected means as well as the direction of difference was examined. More specifically, the ANOVAs were used to determine which group and Gender had an effect on the Dependent Variables. If there were significant interaction effects, the output will compare means, and an interaction showed that the means were not parallel. Thus, there was up to seven follow-up ANOVAs, if there were any significant findings.

Open-ended Analysis

The purpose of the second research question was to explore students' perceptions of the learning environment from their own descriptions. Using Appendices B or C, depending on group, students opted to describe what materials helped them learn, which factors were not helpful, what the facilitator could do to improve learning, and what the student could do. These categories informed the development of themes from the

qualitative responses. Student responses were uploaded into the qualitative software package *NVivo*. A basic query for word frequency sorted any patterns or occurrences out of student responses. Responses were read and re-read to tease out any commonality or patterns among participant feedback. From the reexamination, findings developed. Data consisted of student responses in the form of quotations.

Summary

For the purpose of this research, a two-by-two quasi-experimental design was used. Sociology courses were randomly assigned. The purpose of this design was to explore whether any differences existed between Learning Environment and Gender based on the Dependent Variables. Results were measured through the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam and Satisfaction Scores.

In Chapter 4, each process of the analysis was explained. Before addressing the findings, whether assumptions were met was evaluated, and reliability tests were run. Then, the results from the multivariate tests were examined. Tables and graphs provided a pictorial representation of the data and findings. The qualitative data from the open-ended questions were addressed thematically.

Chapter 5 began with an introduction to the chapter and a summary of the study including the purposes and research questions. Then, the conclusions by research question were discussed. Next, implication for the current study, along with the relevance to previous research was considered. Afterwards, the limitations that arose during the study were discussed before brief recommendations were made. Finally, a short summary

of the study led to how the findings of the current study added to the academic community.

Chapter 4: Analyses and Results

Introduction

This chapter began with a discussion of a preliminary examination of the data, and the tests for multivariate analysis of variance (MANOVA) assumptions. Then, reliability estimates were computed using SPSS. The results, for the research question, based upon statistical tests were discussed. Finally, the students' free responses were summarized.

This exploratory study intended to address some of the issues related to student outcomes and satisfaction, gender differences, and lack of research in sociology courses. In particular, the study addressed concerns related to the lack of empirical findings and the ambiguity of findings regarding student outcomes and satisfaction. Quantitative data were collected from a Pretest, Posttest, Stratification quiz, Sex/Gender quiz, Race/Ethnicity quiz, and a Higher-order Unit Exam. Satisfaction data was derived from student responses to the College and University Classroom Environment Inventory (CUCEI), in which the subscale for satisfaction was used in the analyses. Students provided responses to the four open-ended questions which addressed perceptions about their learning. The last four questions, found in Appendix B and C, provided the students an option to respond about their learning.

Preliminary Examination of the Data

The Dependent Variables included a Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam over Social Division and Inequality. Although students completed coursework throughout the semester only data from one learning unit was used for the study. The second type of data

collected was a satisfaction measure taken from the CUCEI. Students completed the entire 49-item College and University Classroom Inventory (CUCEI) related to the classroom environment. The CUCEI included subscales for Personalization, Involvement, Student Cohesion, Innovation, Task Orientation, Individualization, and Satisfaction. However, only the seven Satisfaction subscale items were used in the analyses. The seven subscale items were summed for each participant to provide a single Satisfaction Score for each participant. The CUCEI instrument, in its entirety, was enclosed in Appedix E. The Pretest, Posttest, Stratification quiz, Sex/Gender quiz, Race/Ethnicity quiz, Higher-Ordered Unit Exam, and Satisfaction Scores made up the Quantitative Measures for this study.

A preliminary examination of the data provided means, standard deviations, and skew statistics. The means by Learning Environment indicated that students in the flipped learning group had higher mean scores based on the Dependent Variables than did the traditional lecture group. The one exception was the Higher-Ordered Unit Exam, in which students in the traditional lecture group had higher mean scores. Skew was addressed in the discussion of the assumptions in the following section. Table 2 supplied the means, standard deviations, and skew statistics for the Learning Environment based on the Dependent Variables.

Table 2

Descriptive Statistics: Means, Standard Deviations, and Skew.

Dependent Variables	Learning Environment	*M*	*SD*	Skew
Pretest	Traditional	3.97	1.44	.90
	Flipped	4.82	1.97	.43
Posttest	Traditional	7.97	1.32	-.50
	Flipped	8.38	1.73	-.65
Stratification Quiz	Traditional	7.44	1.95	-.92
	Flipped	7.80	1.73	-.51
Sex/Gender Quiz	Traditional	8.89	1.70	-1.36
	Flipped	9.00	1.58	-1.59
Race/Ethnicity Quiz	Traditional	8.17	1.68	-.66
	Flipped	9.30	1.06	-1.98
Higher-Ordered Unit Exam	Traditional	54.53	8.20	-1.71
	Flipped	51.73	8.07	-.73
Satisfaction Scores	Traditional	20.50	2.59	-.39
	Flipped	20.96	3.10	-.96

MANOVA Assumptions

Nine assumptions of MANOVA were listed in Lund Research (2013): assumption 1) two or more dependent variables at the interval or ratio level; assumption 2) an independent variable consisting of two or more categories; assumption 3) independence of observations; assumption 4) adequate sample size; assumption 5) no multivariate outliers; assumption 6) multivariate normality; assumption 7) linear relationship between pairs of dependent variables; assumption 8) homogeneity of variance; and assumption 9)

no multicollinearity. These assuptions were described in detail in Chapter 2. According to the researchers, MANOVA is robust to violations of the assumptions except for multivariate outliers (Field, 2009; Mertler & Vannatta, 2013; Tabachnick & Fidell, 2013).

The Dependent Variables were interval, affirming the first assumption. In other words, there was a meaningful distance between one score and another. Second, the independent variables were categorical. The participants in the Learning Environments were coded as a zero for the traditional lecture group and a one for the treatment, or flipped learning group. Gender was coded as one for female and zero for male. Therefore, the second assumption was met. The independence of observations meant that the responses from one participant did not determine the responses of others. In other words, responses from each participant were independent ($A \not\Rightarrow B$), upholding the third assumption. Assumption four dealt with sample size. A Rule of 5, was a subject-to-variable ratio that for each variable there should be a minimum of five participants. There were a total of seven dependent variables in the current study. In this research, there were 111 participants under study, which provided an adequate sample size. Variance inflation factor (VIF) quantifies how much of the variances are inflated and is used as an estimate to determine multicollinearity (Field, 2013). Variance inflation factors tend to fall between 1 and 10, with 10 representing high or significant collinearity (Field). Through an examination of the VIF, values fell between 1.000 and 1.004. Assumption nine was met; the VIF estimates indicated that there was no multicollinearity.

The data were skewed and did not distributed normally. Transformations did not provide any relief to this violation. However, there were least 20 degrees of freedom (df)

for the error term, at which MANOVA is robust (Mertler & Vannatta, 2013; Tabachnick & Fidell, 2013). Transformations were not used in the analyses because they did not improve the situation by normalizing the data. Scatterplots and correlation coefficients were analyzed to determine linearity. This assumption was violated. Nevertheless, MANOVA is robust to this violation as well. Levene's test of homogeneity is used to test if the sample have equal variances (Field, 2009). Across most of the observations, there was homogeneity. Assumption eight was partially supported. Levene's test statistic indicated through the results that the Posttest and the quiz over Race/Ethnicity were not homogeneous ($p < .05$). Contrarily, there were no significant ($p > .05$) differences in the results of the Pretest, Stratification Quiz, Sex/Gender Quiz, Higher-Ordered Unit Exam, and the Satisfaction Scores. Table 3 provided details from the results of Levene's test of homogeneity.

Table 3

Levene's Test of Homogeneity for the Quantitative Measures.

Dependent Variables	Estimates derived from	Levene Statistic	df1	df2	Sig.
Pretest	Based on mean	3.49	1	90.00	.065
	Based on median	3.41	1	90.00	.068
	Based on median adjusted df	3.41	1	84.04	.068
	Based on trimmed mean	3.23	1	90.00	.076
Posttest*	Based on mean	10.25	1	90.00	.002
	Based on median	4.58	1	90.00	.035
	Based on median adjusted df	4.58	1	85.62	.035
	Based on trimmed mean	9.01	1	90.00	.003
Stratification Quiz	Based on mean	0.13	1	90.00	.715
	Based on median	0.17	1	90.00	.685
	Based on median adjusted df	0.10	1	89.54	.685
	Based on trimmed mean	0.22	1	90.00	.638
Sex/Gender Quiz	Based on mean	0.77	1	90.00	.381
	Based on median	0.01	1	90.00	.751
	Based on median adjusted df	0.10	1	89.54	.751
	Based on trimmed mean	0.57	1	90.00	.453
Race/Ethnicity Quiz*	Based on mean	17.66	1	90.00	.000
	Based on median	5.25	1	90.00	.024
	Based on median adjusted df	5.25	1	84.50	.024
	Based on trimmed mean	16.27	1	90.00	.583
Higher-Ordered Unit Exam	Based on mean	0.22	1	90.00	.638
	Based on median	0.35	1	90.00	.554
	Based on median adjusted df	0.35	1	82.21	.554
	Based on trimmed mean	0.30	1	90.00	.583
Satisfaction Scores	Based on mean	0.12	1	90.00	.734
	Based on median	0.24	1	90.00	.627
	Based on median adjusted df	0.24	1	86.62	.627
	Based on trimmed mean	0.13	1	90.00	.722

Note: * signified a statistically significant result.

Tabachnick and Fidell (2012) indicated that MANOVA is not robust to multivariate outliers. The existence of multivariate outliers required complex sets of analyses. Mahalanobis distances were calculated using SPSS. First, Mahalanobis distances were obtained for each of the observations based upon the Dependent Variables: Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, the Higher-Ordered Unit Exam, and Satisfaction Scores and the two Independent Variables (Learning Environment and Gender). Then, the probability of the Mahalanobis distances were computed. Tabachnick and Fidell (2012) indicated that the rule of thumb for determining if outliers exist was significance beyond $p < .001$. Table 4 demonstrated that minimum probabilities for each of the seven dependent variables were greater than the rule of thumb ($p < .001$). Thus, the results indicated that no multivariate outliers existed.

Table 4

Mahalanobis Distance: Probabilities to Determine Multivariate Outliers.

	Dependent Variables						
	Pretest	Posttest	Stratification Quiz	Sex/Gender Quiz	Race/Ethnicity Quiz	Higher-Orderd Unit Exam	Satisfaction Scores
p_mah	.45	.45	.46	.46	.46	.45	.39

Note: Lowest probability scores listed in Table

Reliability

The split-half reliability method randomly splits the instrument into two tests. Then, the two resulting tests are correlated. The results provide an estimate of internal consistency (Field, 2009; Garson, 2009). A rule of thumb for internal consistency is a

value of .6 or greater demonstrates an acceptable reliability (Field). Because the split-half method reduces the number of items in each "new test," the estimate of reliability tends to be a low estimation (Garson). A Guttman split-half reliability rule of thumb can be lower in exploratory studies (Garson).

For this study, Guttman split-half reliability was estimated for each individual measure. The instruments, Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam, were developed by the researcher for this exploratory study. That is, the Dependent Variables were not from an established instrument. However, according to Garson (2009) this could be acceptable. The quiz over Sex/Gender resulted in the lowest coefficient, while the Pretest approached the rule of thumb. Table 5 listed the Quantitative Measures and the coefficients from the Guttman split-half estimates.

Table 5

Guttman Split-Half Coefficients: Inter-Item Scores on Observations.

Dependent Variables	Coefficient
Pretest	.583
Posttest	.577
Stratification Quiz	.495
Sex/Gender Quiz	.448
Race/Ethnicity Quiz	.574
Higher-Ordered Unit Exam	.517
Satisfaction Scores	.791

Fraser, Treagust, and Dennis (1986) created the CUCEI and tested it over several iterations. Through Cronbach's alpha reliability statistics, they reported an internal

consistency of $\alpha = .70$ for the CUCEI in its entirety. For this study, students completed the entire CUCEI. All 49-items were used to compute a reliability estimation as a comparison to the established reliability estimated provided by the developers of the CUCEI. The computed Cronbach's alpha ($\alpha = .862$) estimates surpassed the results found by Fraser et al. The subscale for satisfaction was highly reliable as well ($\alpha = .791$). This instrument is highly reliable and had established reliability in previous studies (Bormann, 2014; Butzler, 2014; Findlay-Thompson & Mombourquette, 2014; Hantla, 2014; Prashar, 2015; Strayer, 2007; 2012).

Quantitative Results

In the previous section, assumptions were tested and results from those analyses were discussed. No multivariate outliers were found through analysis; therefore, no observations were removed before the MANOVA was performed. Other violations were found but MANOVA is robust to these. In order to address the violation of the assumptions and possible reduction in power, both MANOVA and Kruskal-Wallis were conducted and compared for each research question.

To address the research question, a two-by-two design was established. Results were grouped by Learning Environment, which was expressed as the traditional learning or control group and the flipped learning or treatment group. Gender, reported by students, was categorized as female and male. The grouping variables were Learning Environment and Gender. The Dependent Variables consisted of the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam and Satisfaction Scores.

The general research question in this study was:

1. Using a two-by-two quasi-experimental design, do groups (by Learning Environment and by Gender) differ significantly based on selected Dependent Variables?

The overall research question was broken down and tested as three separate questions:

   a. Are there significant differences between Gender groups based on the Dependent Variables?
   b. Are there significant differences between groups established by Learning Environment based on the Dependent Variables?
   c. Is there significant interaction effects between Learning Environment and Gender based on the Dependent Variables?

Two-Way Multivariate Analysis of Variance

According to Mertler and Vannatta (2013), an analysis of Box's M statistic should proceed a review of the multivariate tests. If a Box's test is significant, it would be followed through Pillai's Trace multivariate statistics. Wilks' Lambda would be reviewed and discussed if Box's M is not significant. As stated previously, transformations were not used in the analyses and no multivariate outliers existed.

A two-way MANOVA was conducted to determine if any interaction effects or main effects existed based on Quantitative Measures. Box's *M* statistic tested the homogeneity of variance-covariance and was used to determine which multivariate test was used. Box's *M* statistic was significant ($M = 95.70$, F (63, 15607.30) = 1.33, $p = .040$); therefore, Pillai's Trace (*V)* test was examined.

The interaction effect of Learning Environment by Gender was examined before inspecting the individual main effects. The results were not significant ($V = .037$, F (6,

90) = .751, $p > .10$, $\eta^2_p = .037$). In other words, there was not a significant interaction effect between Learning Environment and Gender based upon the Dependent Variables. Therefore, post hoc analyses were not performed.

Next, the main effect for Gender on scores from Dependent Variables was reviewed. Pilliai's Trace indicated that Gender approached significance. However, there were no main Gender effects based on the combined Dependent Variables ($V = .084$, F (6, 90) = 1.371, $p > .05$, $\eta^2_p = .084$). No follow up post hoc analyses were conducted.

The analysis for the main effect for Learning Environment based upon the combined Dependent Variables was examined. The results indicated there was a significant main effect. The Learning Environment groups were significantly different based on Dependent Variables ($V = .238$, F (6, 90) = 4.692, $p < .001$, $\eta^2_p = .238$). The results necessitated follow up post hoc analyses.

Post Hoc One-Way ANOVAs

In review, based on the results of the multivariate tests, there were no significant interaction effects between Learning Environment and Gender. The main effect for Gender was not significant. The main effect for Learning Environment was significantly different. Therefore, seven one-way ANOVAs were performed with Learning Environment as the grouping variable. That is, one ANOVA for each of the Dependent Variables was conducted: Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam and student Satisfaction Scores.

The first ANOVA was conducted with Learning Environment as the grouping variable and Pretest as the Dependent Variable. The groups were not significantly different based upon the Pretest (F (1, 107) = 1.514, $p > .10$, $\eta^2_p = .014$). The traditional

lecture group and flipped learning group had equivalent mean scores on the Pretest (Group T1 = Group F1).

The next one-way ANOVA was conducted with Learning Environment as the grouping variable and Posttest as the Dependent Variable. The groups were not significantly different based on the Posttest (F (1, 104) = .449, $p > .10$, $\eta^2_p = .004$). The traditional lecture group and flipped learning group had equivalent mean scores on the Posttest (Group T2 = Group F2).

The third one-way ANOVA was conducted with Learning Environment as the grouping variable and the Stratification Quiz as the Dependent Variable. The groups were not significantly different based upon the Stratification Quiz (F (1, 98) = .624, $p > .10$, $\eta^2_p = .006$). The traditional lecture group and flipped learning group had equivalent mean scores on the Stratification Quiz (Group T3 = Group F3).

The next post hoc analysis was conducted with Learning Environment as the grouping variable and the Sex/Gender Quiz as the Dependent Variable. The groups were not significantly different based upon the Sex/Gender Quiz (F (1, 101) = .065, $p > .10$, $\eta^2_p = .001$). The traditional lecture group and flipped learning group had equivalent mean scores on the Sex/Gender Quiz (Group T4 = Group F4).

The fifth post hoc analysis was conducted with Learning Environment as the grouping variable and the Race/Ethnicity Quiz as the Dependent Variable. The groups were significantly different based upon the Race/Ethncity Quiz (F (1, 101) = 12.969, $p < .001$, $\eta^2_p = .116$). The mean scores for the traditional lecture group (M = 8.26) were significantly lower than the mean for the flipped learning group (M = 9.30; Group T5 ≠ Group F5).

The next one-way ANOVA was conducted with Learning Environment as the grouping variable and the Higher-Ordered Unit Exam as the Dependent Variable. The groups were significantly different based upon the Higher-Ordered Unit Exam (F (1, 102) = 4.494, $p < .05$, $\eta^2_p = .042$). The mean scores for the flipped learning group were lower (M = 51.75) than those scores of students in the traditional lecture group (M = 54.69; Group T6 ≠ Group F6).

The final post hoc analysis ANOVA was conducted with Learning Environment as the grouping variable and the Satisfaction Scores as the Dependent Variable. The groups were not significantly different based upon the Satisfaction Scores (F (1, 93) = .851, $p > .10$, $\eta^2_p = .009$). The traditional lecture group and flipped learning group had equivalent mean Satisfaction Scores (Group T7 = Group F7). Table 6 provided a summary of the mean scores and standard deviations by Learning Environment for each of the Dependent Variables.

Table 6

Summary of Means and Standard Deviations on Dependent Variables by Learning Environment.

		Traditional classroom			Flipped learning	
Dependent Variables	*N*	*M*	*SD*	*N*	*M*	*SD*
Pretest	36	4.07	1.44	56	4.77	1.99
Posttest	36	7.93	1.26	56	8.30	1.82
Stratification Quiz	36	7.50	1.90	56	7.72	1.83
Sex/Gender Quiz	36	8.93	1.61	56	9.02	1.58
Race/Ethnicity Quiz*	36	8.26	1.65	56	9.30	1.05
Higher-Ordered Unit Exam*	36	54.69	7.99	56	51.75	8.00
Satisfaction Scores	36	20.50	2.59	56	20.96	3.10

Note: * denotes as significant relationship.

Adjusted means are corrected averages that compensate for data imbalances or small sample sizes. On the other hand, unadjusted means are the average for raw data without any compensation analyses or computations (Mertler & Vannatta, 2013). The adjusted and unadjusted group means for the seven Dependent Variables presented similar descriptive results as those found in the multivariate analyses. The summary of the adjusted and unadjusted means were presented in Table 7. Overall, students in the flipped learning group had higher mean scores than students in the traditional lecture group. The one exception was the Higher-Ordered Unit Exam in which students in the traditional lecture group performed better (higher scores).

Table 7

Adjusted and Unadjusted Means by Learning Environment on the Dependent Variables.

	Traditional lecture group		Flipped learning group	
	Adjusted M	Unadjusted M	Adjusted M	Unadjusted M
Dependent Variables				
Pretest	4.03	3.97	4.89	4.82
Posttest	7.95	7.97	8.35	8.38
Stratification Quiz	7.50	7.44	7.88	7.80
Sex/Gender Quiz	8.94	8.89	9.07	9.00
Race/Ethnicity Quiz*	8.19	8.17	9.33	9.30
Higher-Ordered Unit Exam*	54.63	54.53	51.86	51.73
Satisfaction Scores	20.38	20.50	20.82	20.96

Note: * denotes as significant relationship.

The adjusted and unadjusted means for Gender on the Dependent Variables demonstrated that males had higher mean scores on the majority of the Dependent Variables compared to their female counterparts. One difference occurred in Satisfaction Scores. Females reported higher levels of satisfaction. Although, these results were not significant, as per the findings from the multivariate analyses. The adjusted and unadjusted means by Gender on the Dependent Variables were provided for in Table 8.

Table 8

Adjusted and Unadjusted Means by Gender for the Dependent Variables.

	Male		Female	
	Adjusted M	Unadjusted M	Adjusted M	Unadjusted M
Dependent Variables				
Pretest	4.78	4.86	4.13	4.24
Posttest	8.04	8.08	8.26	8.31
Stratification Quiz	8.02	8.05	7.36	7.40
Sex/Gender Quiz	9.34	9.35	8.68	8.69
Race/Ethnicity Quiz	8.89	9.00	8.63	8.76
Higher-Ordered Unit Exam	53.83	53.57	52.65	52.33
Satisfaction Scores	19.91	19.95	21.29	21.35

Kruskal-Wallis H Results

The assumptions of a Kruskal-Wallis H included ordinal or continuous dependent variables, categorical independent variables, independent observations, and similar variability. These basic assumptions were met. Although robust, several of the

assumptions for MANOVA were violated. As a method for addressing the loss of power, Kruskal-Wallis H analyses were conducted on the effects of the Learning Environment based on the Dependent Variables. The results indicated that there was a significant difference by Learning Environment on the Race/Ethnicity Quiz (χ^2 (1) = 10.14, $p < .01$). The main effect for Learning Environment resulted in a significant mean difference based on the Higher-Ordered Unit Exam (χ^2 (1) = 10.143, $p < .05$). There were no significant differences by Learning Environment based on the remaining Dependent Variables. These findings mirrored the two-way MANOVA and subsequent post hoc tests. Table 9 displayed the results from the Kruskal-Wallis H tests.

Table 9

Results from Kruskal-Wallis H by Learning Environment on the Dependent Variables.

Dependent Variables	Chi-square	*df*	Sig.
Pretest	2.33	1	.127
Posttest	1.95	1	.162
Stratification Quiz	.70	1	.403
Sex/Gender Quiz	.05	1	.833
Race/Ethnicity Quiz*	10.14	1	.001
Higher-Ordered Unit Exam*	5.64	1	.018
Satisfaction Scores	1.11	1	.292

Note: * denotes as significant relationship.

The same non-parametric analyses were performed using Gender as the sorting variable. These findings did not mirror the two-way MANOVA. There was a significant mean difference by Gender based on the Pretest (χ^2 (1) = 3.87, $p < .05$). There was a significant mean difference by Gender based on the Sex/Gender Quiz (χ^2 (1) = 4.00, $p <$

.05). In other words, when grouped by Gender there were significant mean differences based on the Pretest and the Sex/Gender Quiz, which was not found in the MANOVA results. There were no other mean differences based on the Dependent Variables. Table 10 provided the results from the Kruskal-Wallis H for Gender on the Dependent Variables.

Table 10

Results from Kruskal-Wallis H: Main Effect of Gender on the Dependent Variables.

Dependent Variables	Chi-square	*df*	Sig.
Pretest*	3.87	1	.049
Posttest	.00	1	.986
Stratification Quiz	2.45	1	.118
Sex/Gender Quiz*	4.00	1	.045
Race/Ethnicity Quiz	.13	1	.722
Higher-Ordered Unit Exam	.18	1	.675
Satisfaction Scores	3.14	1	.076

Note: * denotes as significant relationship.

The mean ranks matched the means from the two-way MANOVA. For instance, students in the flipped learning group had higher mean ranks than did students in the traditional lecture group, except for ranks on the Higher-Ordered Unit Exam. The overall mean ranks between Learning Environment and Gender on the Dependent Variables were recorded in Table 11.

Table 11

Mean Ranks by Learning Environment and Gender on the Dependent Variables.

	Learning Environment				Gender			
Dependent Variables	N	Traditional	N	Flipped	N	Male	N	Female
Pretest	45	49.60	64	58.80	44	57.98	58	46.59
Posttest	43	48.56	63	56.87	44	51.44	58	51.54
Stratification Quiz	43	47.76	57	52.57	41	55.28	58	46.27
Sex/Gender Quiz	43	50.38	58	51.46	42	56.39	58	46.23
Race/Ethnicity	43	40.84	58	58.53	42	51.64	58	49.67
Higher-Ordered Unit Exam	43	60.85	61	46.61	44	52.91	58	50.43
Satisfaction Scores	37	44.32	58	50.34	39	41.67	55	51.64

Summary of Quantitative Results

Using a two-way MANOVA, the research question was answered. The research question was divided into three subquestions and analyzed through multivariate statistics. First, the interaction effects of Learning Environment by Gender on the Dependent Variables were reviewed from Pillai's Trace. The results indicated that there were no significant interaction effects. Then, the main effects for Gender on the Dependent Variables was computed. No significant main effects were found. Finally, the effect of Learning Environment was analyzed. The results revealed that differences did exist by Learning Environment. Based upon the MANOVA findings, seven one-way ANOVA tests were conducted. The subsequent post hoc tests exposed that there was a group difference with Learning Environment as the grouping variable on the Dependent Variables, Race/Ethnicity Quiz and the Higher-Ordered Unit Exam.

Due to violations of some of the MANOVA assumptions, non-parametric tests were conducted to reduce any threats to power and to compare results. With Learning Environment as a sorting variable, the combined Dependent Variables were analyzed using Kruskal-Wallis H. the findings paralleled the MANOVA results. The test statistics revealed that results grouped by the Learning Environment were significantly different based on the Dependent Variables of the Race/Ethnicity Quiz and the Higher-Ordered Unit Exam. The mean rank scores reflected the mean scores of the multivariate tests. None of the remaining Dependent Variables were significantly different by the grouping variable.

Unlike the results from the two-way MANOVA, in which the main effect for Gender on the Dependent Variables only approached significance, the Kruskal-Wallis H resulted in Gender differences. Specifically, results arranged by Gender were significantly different based on the Pretest and Sex/Gender Quiz. Males had higher mean rank scores than females in both of these significant results.

Qualitative Findings

Students completed an open-ended questionnaire at the end of the unit. This data was used to address the second research question "What themes emerged based upon students' responses to specific open-ended qualitative questions?" In addition, this data was used to gain a deeper insight into student perceptions about the Learning Environment. Some students commented on other classes, which they had completed, the day they were enrolled in the sociology course for this study, or the instructor names. This information was omitted and bracketed information was inserted to protect participant identity, such as [Instructor] for faculty names.

Students were asked to respond to four questions:

1. What factors and/or materials facilitated your learning the most?
2. What was the least helpful?
3. What should the professor do to help improve your learning experience?
4. What could you do to help improve your learning experience?

These questions were provided in Appendix B and Appendix C, questions 6, 7, 8, and 9. From student questionnaires, there were 299 free responses from the four questions. The responses were entered into a word document that was uploaded into the *NVivo* qualitative software package. Then, a word frequency query was created finding all repeated words including stem words and synonyms. Words had to be at least four letters long. Figure 7 presented the word cloud from student responses.

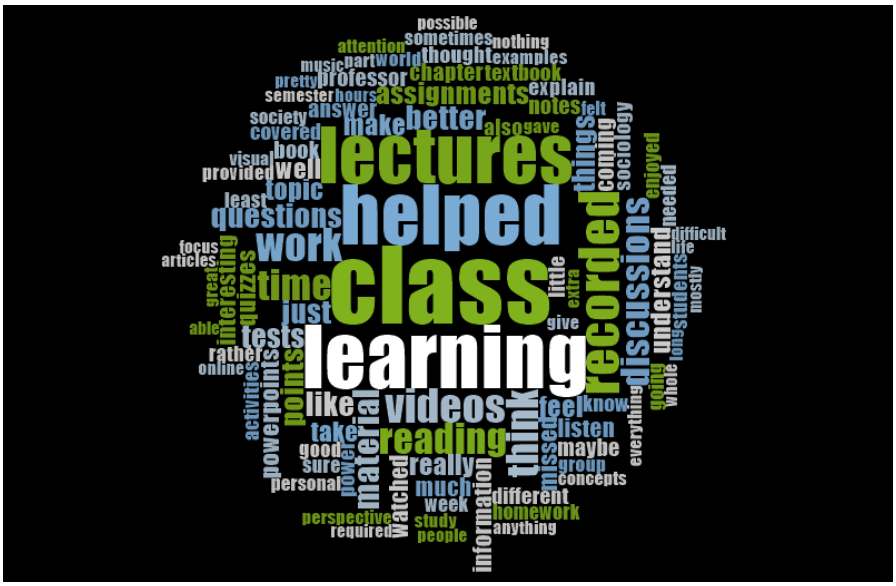

Figure 7. Word Cloud: Word Frequency Query from Open-Ended Student Responses.

This process was the first approach to analyzing the qualitative data. Several words occurred frequently. For instance, students wrote about learning (305), class (223), recorded lectures (184), reading (171), helped (158), lectures (146), and work (112).

However, these were just frequencies and the research question attempted to understand which themes emerged from the specific open-ended questions. Therefore, analyses by question were a better method for teasing out patterns and themes from student responses. The major themes were factors that contributed to learning, materials and elements that hindered learning, ways for the professor to improve learning, and personal accountability for learning. Then, within each of the major themes subthemes were gleaned from student responses. The themes and subthemes were discussed in the sections below. Samples were taken from representative observations, which were similar across student responses to support the themes and subthemes.

Factors that Contributed to Learning

Students responded to a question about which factors or materials they thought were most helpful for facilitating their learning. Patterns developed from student responses about what factors they believed helped them learning. The subthemes from student responses that were perceived as most helpful to learning were the materials, class attendance, and in-class discussions. One final category did not address the question. Instead, students wrote about which topics they learned about most.

The first major subtheme concentrated course materials and assignments. Students believed that items such as the lectures, book, and assignments were most helpful. For example, students stated that “The lectures helped,” “The quizzes and the assignments helped facilitate the material,” and “The info in the book played a large role.” The second major subtheme that arose from patterns in the student responses was the importance of class attendance. Students in the flipped learning group classified the recorded lectures as attendance and were helpful to learning. Students indicated that “What facilitated my

learning the most would have to be attending class and doing my notes." In the flipped learning group, students concluded that "The recorded lectures…helped out a lot." As the third subtheme, students discussed that in-class discussion were the most helpful for learning. Students also expressed an enjoyment for the in-class discussions. For instance, students conveyed that "The in class discussions really helped me gain a sense of understanding about the subject" and "I very much enjoyed the in class discussions."

In the final category within the theme of factors that were helpful to learning, students communicated about what they learned during the study. There were no specific patters to what was learned though, e.g., "What I've learned is how people react, more stereotypes and how false they are most of the time," "I learned that sociology is more or less about the things that happen every day," and "I think I learned the most about sex and gender the most compared to the rest of the other things we disused."

Materials and Elements that Hindered Learning

Students were asked to address which items were least helpful in the facilitation of the course. Some subthemes developed out of this category, such as students did not think the readings/book were helpful, the music and videos, the homework, and group work. Another subtheme related back to the first major theme; a handful of students stated that all of the materials were helpful.

The most common comment was that the book and/or additional readings did not facilitate learning, even if the texts were related to the topic and interesting. Students conveyed that "The extra readings did not help as much," "The book, to me, was least helpful," and "Even through some article were interesting, they did not help to reinforce my understanding of Sociology." Several students commented on the music lyrics and

videos. They indicated that they did not like them, they were not useful, or they struggled to relate the content: “Some of the videos I found out were not very useful they were interesting but didn’t see that it had an effect on me.” In the third subtheme, students remarked on the homework being least helpful in learning the materials, e.g., “The least helpful was the yellow wallpaper assignment.” Some thought it was busy work or tedious: “Probably the smaller tasks like the collage & yellow assignment. Those seemed like tedious tasks that didn't facilitate much learning besides busy work.” However, several of the participants in this subcategory did not like that the work was due in the morning. For instance, they noted that “having to turn in assignments in the morning for an afternoon class.”

In the fourth subtheme, some students mentioned that they did not prefer group work and found it to be the least helpful by writing “The least helpful for me was the group assignments. I'm not a big people person so getting together and trying to learn that way did not benefit me.” The final subtheme related back to perceptions about helpfulness found in the first major them. Several students remarked that all of the materials were helpful and facilitated learning. They stated that “I can't think of anything that was the least helpful because all of it was valuable information that can be applied in the real world.”

Ways for the Professor to Improve Learning

The next question was an attempt to understand how student thought the professor could do more to facilitate learning. This question dealt with assignment of accountability when coupled with the final theme. The subthemes were a recommendation that no changes be made on the part of the professor, that participation be encouraged/forced,

more in-class activities, and more videos and visual aids. The most dominant subtheme was not suggesting any changes on the part of the professor. In this area, students communicated that “Continue the lectures, in-class assignments…nothing. You cover all different types of learning styles,” and “Nothing, it's our responsibility to learn outside of the class.”

As the second common pattern, students wanted everyone to participate in the class. Some students thought that participation should be encouraged, or forced if needed: “Find a way to get more of the class involved,” and “Make the quieter students talk more.” For the third subtheme, several students suggest more in class activities to help facilitate learning. The suggested that “I think the professor can add more pattern work, or more social experiments to get more into depth on what we are learning about our society.” Even though there was data to suggest that students did not prefer the music and videos, others expressed that more of these materials should be included. Within the fourth subtheme, students called for more videos, music, or visual aids by stating “More visual aids and videos to get the point across such as examples and situations.”

Personal Accountability for Learning

The final question in the open-ended questionnaire asked students what they thought they could do to improve their own learning. This addressed personal accountability for learning. The subthemes pieced out as attending class and paying attention more, reading or studying more, asking more questions, and completing the work which was related to time management. As found in other subthemes, free response questions allowed participants to voice their opinion or concerns. Therefore, a personal preference category developed where only one participant voiced that idea. Students

commented most frequently on more class attendance or paying more attention in class as something that could be done at the individual level to aid in the learning experience. Students mentioned that “Showing up to class more and putting myself into the class rather than just wanting a good grade” and “Have attended class more for a better in class grade.”

The responses for the second theme coalesced around the idea of reading and studying more. Students observed from their own behavior that they could have done more, such as “I could have read the book more thoroughly than I did” and “To improve my learning experience, I could reread the material when I would have trouble understanding a topic.” In the third subtheme, students stated that they could improve their learning through the process of asking more questions during class, especially when the content was more difficult to grasp: “I think being more involved in class. I could have participated more often and shared my thoughts.” The fourth subtheme merged around the ideas of completing more of the work and time management. Students wrote that “Just stay on top of the work and not procrastinate.” In the final subtheme, students made comments about themselves. However, there were no specific patterns that developed. For instance, students observed that “I feel I did what I could to learn what was offered to me, and really excelled from it,” “don’t be lazy,” or “Get more sleep.”

Summary of Qualitative Findings

The major themes consisted of factors that contributed to learning, materials and elements that hindered learning, ways for the professor to improve learning, and personal accountability for learning. Within these major categories subthemes developed based upon patterns in student responses. Students had clear ideas about what helped them learn

and what did not, the role the instructor played in the classroom, and how the student could improve her/his learning. Appendix H provided a summary of the themes, subthemes, and representative brief examples from student responses that indicated what students' ideas were.

Student in the traditional lecture group and flipped learning group did not express responses that would allow one to distinguish any differences based upon the Learning Environment. Only five of the 64 students in the flipped learning group mentioned the recorded lecture, which was one of the different structural differences between the groups. Instead, students focused on personal learning style preferences. For instance, for as many students who thought the textbook was helpful, just as many thought it did not facilitate learning. This lack of differences and the ambiguous findings from the multivariate tests indicated that flipped learning may not be as influential as an active learning environment.

Summary

After the assumptions for the two-way MANOVA were addressed, the analyses turned to the MANOVA and test statistics to determine if the research questions had been answered. The findings showed that there was not a significant interaction effect between Learning Environment and Gender on the Dependent Variables. Although not significant, it was important to note that males had higher means scores for the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and the Higher-Ordered Unit Exam. Females had higher satisfaction scores. The lack of significant results did not merit the execution of post hoc analyses.

The main effect of Learning Environment was significantly different based on the Dependent Variables, supporting the first subquestion. Therefore, subsequent post hoc analyses were conducted. A series of seven, one-way ANOVAs was executed by Learning Environment on each of the Dependent Variables. The results revealed that there was a significant main effect by Learning Environment based on the Race/Ethnicity Quiz and the Higher-Ordered Unit Exam scores. Students in the flipped learning group had higher scores than those students in the traditional lecture group, even though the findings were not significant.

Multivariate analysis of variance is robust against some violations to the assumptions. However, to add a level of rigor, Kruskal-Wallis H analyses were performed. These results were similar to the two-way MANOVA.

For the qualitative analysis, student responses were uploaded into the *NVivo* software package and frequency counts were computed. However, these were just frequency counts. The research question was developed to understand which themes developed out of the specific open-ended questions. Therefore, an analysis by opened-ended questions was a better method for developing subthemes from student responses. The major themes were factors that contributed to learning, materials and elements that hindered learning, ways for the professor to improve learning, and personal accountability for learning. Then, within each of the major themes subthemes were gleaned from student responses. Samples were taken from representative observations, which were similar across student responses to support the themes and subthemes.

In chapter 4, the results of the statistical tests were reported, as well as the findings from the qualitative questions. Chapter 5 began with an introduction to the

chapter and a summary of the study including the purposes and research questions. Then, the conclusions by research question were developed. Next, the implication for the current study were discussed and applied to previous work in the field. Then the limitations from the study were discussed before brief recommendations were made. Finally, a short summary of the study, led to how the findings of the current study added to the academic community.

Chapter 5: Discussion and Conclusions

Introduction

This chapter began with a summary of the current study including the purpose, data collection processes, and participants. Then, the conclusions by research questions were discussed and related to previous research in flipped learning. Implications provided a discussion about the findings from this study and relation to the previous research in the field. Limitation that arose during the study were addressed before suggesting some recommendations. Finally, the chapter was summarized.

The overriding purpose of this exploratory study was to address some of the issues related to student outcomes and satisfaction in a flipped learning environment. A lack of research had been conducted on gender differences and flipped learning in social sciences. Data collected from two comparable groups was analyzed from students' responses and outcomes in introductory sociology courses. Learning Environment and Gender were examined as independent variables and the effects on the Dependent Variables. Finally, through open-ended instruments, student perceptions about their learning environment were discussed. The purposes came about because of the ambiguous nature and lack of empirical results and findings in the flipped learning literature (Bishop & Verleger, 2013; Fulton, 2012a; Hutchings & Quinney, 2015; Lane-Kelso, 2015).

Data collection occurred through Learning Environment, by two groups a flipped learning group and a traditional lecture group. Data included scores from a Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, Higher-Order Unit Exam, and summed Satisfaction Scores from the CUCEI satisfaction subscale. Learning

Environment was randomly assigned and Gender identification came from student reports. There were 111 participants, 44 male and 61 female-with six participants not providing a gender preference. Participants range in age from 17-42 and 23 others did not disclose an age (see Table 1). After data collection, MANOVA assumptions were tested. The data did violate some of the assumptions; however, MANOVA was robust to these violations.

Conclusions

Results were grouped by Learning Environment, which was expressed as the traditional learning or control group and the flipped learning or treatment group. Gender, reported by students, was categorized as female and male. The grouping variables were Learning Environment and Gender. The Dependent Variables consisted of the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, and Higher-Ordered Unit Exam and Satisfaction Scores.

The general research question in this study was:

1. Using a two-by-two quasi-experimental design, do groups (by Learning Environment and by Gender) differ significantly based on selected dependent variables?

The overall research question was broken down and tested as three separate questions:

   a. Are there significant differences between Gender groups based on the Dependent Variables?
   b. Are there significant differences between groups established by Learning Environment based upon the Dependent Variables?

c. Is there significant interaction effects between Learning Environment and Gender based on the Dependent Variables?

Conclusion by the First Research Question

The research question was supported through the two-way MANOVA. The results demonstrated that no interaction effects by Learning Environment and by Gender on the Outcome Measures ($V = .037$, F (6, 90) = .751, $p > .10$, $\eta^2_p = .037$). Much of the previous research did not examine interaction effects because gender was not included as an independent variable. Therefore, there was no determination if these findings were reaffirmed in the literature. The third subquestion was not supported, and there was a failure to reject the null hypothesis.

There was not a main effect for Gender on the Dependent Variables ($V = .084$, F (6, 90) = 1.371, $p > .05$, $\eta^2_p = .084$).). The second subquestion was not supported because there were no mean differences by Gender based on the Dependent Variables. In other words, the researcher failed to reject the null hypothesis. In the current study, there were non-significant Gender differences. Females had higher Satisfaction Scores as compared to their male counterparts. Males performed better on the Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz and the Higher-Ordered Unit Exam. However, none of the results were significantly different. In previous research, gender differences were found (Chen et al., 2015; Touchton, 2015). Touchton (2015) found that females outperformed males in the study. Also, Chen et al. (2015) discovered that gender differences existed but only in specific topics. The current study did not reflect these findings.

Confirmation for the research question came from the results of the main effect of Learning Environment on the Dependent Variables. There was a significant mean difference by Learning Environment based on the Dependent Variables (V = .238, F (6, 90) = 4.692, $p < .001$, η^2_p = .238). These findings necessitated post hoc analyses to determine which Dependent Variables were significantly influenced. The post hoc analyses consisted of seven, one-way ANOVAs for each of the Dependent Variables. The results revealed that the Learning Environment had a significant effect on the Race/Ethnicity Quiz (F (1, 101) = 12.969, $p < .001$, η^2_p = .116) and the Higher-Ordered Unit Exam (F (1, 102) = 4.494, $p < .05$, η^2_p = .042). The Learning Environment did not significantly affect any of the other Dependent Variables. The first subquestion was supported; Learning Environment did influence the Dependent Variables.

It is important to note, these results countered one another. The significant findings for the Race/Ethnicity Quiz demonstrated that mean scores for the traditional lecture group (M = 8.26) were significantly lower than for the flipped learning group (M = 9.30; Group T5 ≠ Group F5). While the means scores for the Higher-Ordered Unit Exam resulted that scores for the flipped learning group were lower (M = 51.75) than those scores of students in the traditional lecture group (M = 54.69; Group T6 ≠ Group F6). Previous research was unidirectional. In other words, previous findings indicated there were no differences, the flipped classroom performed better, or the traditional group had higher scores (Baepler, et al., 2014; Davies et al., 2013; Della Ratta, 2015; Garver & Roberts, 2013; Geist et al., 2015; Talley & Scherer, 2013; Wilson, 2013; Wong et al., 2014).

These, results reaffirmed previous research in which only certain components of the classroom experience were affected by the Learning Environment (Geist et al., 2015; Kong, 2014; Touchton, 2015). Furthermore, students in the flipped learning group performed better on (higher mean scores) on each of the Outcome Measures except the Higher-Ordered Unit Exam, even though those differences were not significant overall. Students in the traditional lecture group had higher mean scores on the exam. According to previous researchers, an active learning environment would support non-significant findings (Jensen et al., 2015; Murphree, 2014; Ng, 2014; Tune et al., 2013).

Previous researchers indicated that satisfaction was positively impacted by flipped learning. In Enfield (2013) and Clark (2015), students in the flipped learning environment reported higher satisfaction; there were no significant differences. In the current study, students in the flipped learning environment had higher mean scores for satisfaction. However, these differences were not significant.

To summarize, the research question was partly supported. There were mean differences by Learning Environment based on the Dependent Variables. The results from the current study reflected the findings in the previous literature. Many of the differences were not significant even when there were different mean scores (Baepler et al., 2014; Butts, 2014; Clark, 2015; Crews & Butterfield, 2014; Findlay-Thompson & Mombourquette, 2014). Additionally, this study, like the previous research had some ambiguity when compared to the research in flipped learning and that only specific topics were significant (Bishop & Verleger, 2013; Fulton, 2012a; Hutchings & Quinney, 2015; Lane-Kelso, 2015).

Conclusions by the Second Research Question

This exploratory study examined not only quantitative Dependent Variables, but also sought out to understand student perceptions of the learning environment and answer the second research question: What themes emerged based upon students' responses to open-ended qualitative questionnaires? The major themes which developed out of the questions from the instrument were: 1) factors that contributed to learning; 2) materials and elements that hindered learning; 3) ways for the professor to improve learning; and 4) personal accountability for learning. Then within these major topics, subthemes developed out of the student responses. The findings here were appraised by theme in relation to previous findings.

Students commented about which factors contributed to learning. Gaughan (2014) reported that in-class discussions were the most influential for her students. In Strayer (2007), students reported that it was important to do the work, attend class, and pay attention. In this current study, when class attendance and in class discussion were combined, this was the most influential. For instance, 33% of the responses were about the importance of class materials. On the other hand, almost 48% of the responses focused on coming to class and participating in, in class discussion. Furthermore, Forsey, Low, and Glance (2013) indicated that students reported attending class was important to learning and met their learning needs, while creating a positive educational experience. In other open-ended questionnaire research, authors indicated class interactions were the most important factors that facilitated learning (Crews & Butterfield, 2014; Clark, 2015; Findlay-Thompson & Mombourquette, 2014; Galway, Corbeet, Takaro, Tairyan, & Frank 2014; Jungic, Kaur, Mulholand, & Xin, 2015).Furthermore, Roberts et al. (2008) found

that students preferred in-class discussions, especially when discussing sensitive issues such as race and ethnicity.

In the second major theme, students remarked about the materials and elements that hindered learning. Gaughan's (2014) findings showed similar results. For instance, students enjoyed class discussions but did not think they learned from reading the book. Through the current study, the majority of student thought the book was boring or did not facilitate learning in the way the class discussion and attendance did. Stduents reported that they did not care for the homework and music. Students in Gaughan's study stated that there were too many videos and too much homework. Students reported that homework did not help them learn (Strayer, 2012).

In the third major theme, students discussed ways for the professor to improve learning. In the subthemes, students commented that no changes be made, participation should be encouraged, and there should have been more in class activities. The comments from Strayer (2007) focused on the teacher being a friend but having little respect that he did not care about his students, and yelled a lot. The findings in the current study mirrored some found in Gaughan's (2014), such as students asking for more vides, less homework, more in class discussion, and more activities. In the current study, students did not find the instructor disrespectful. However, they did want less homework and more class participation.

The final major theme coalesced around student perceptions of personal accountability. Students believed they could attend class and pay attention more, read or study more, and complete their assignments. As in the previous major themes, Lage, Platt, and Treglia (2000), in the original flipped classroom, indicated that students

commented on personal accountability in their open-ended responses. In focus groups, students in Strayer's (2007) study commented on personal accountability as well. The comments included spend time and complete the work, do what was expected by the professor, and value your own learning. Gaughan's (2014) findings overlapped: students should read more, focus on learning, participate more, and attend classes more often. In the current study, no students remarked upon the value of their own learning. Contrary to this, two students stated that there was nothing else they could have done to improve their own learning but did have comment for the professor or other students.

In summary, the qualitative findings allowed students to express their beliefs about the learning environment. The second research question was answered, in that through patterns in student responses subthemes developed. Student commented similarly as in the previous open-ended flipped learning research.

Implications

This exploratory study seemed to ask as many questions as it answered. From the two-way MANOVA, the research question was answered. The implications from the findings demonstrated that flipped learning had a positive impact on student learning outcomes. However, because the majority of the dependent variables were not significant there were no straightforward answers. The following section described the implications of this study has for the field.

Field of Flipped Learning

The previous research in flipped learning has been ambiguous or lacking (Bishop & Verleger, 2013; Fulton, 2012a; Hutchings & Quinney, 2015; Lane-Kelso, 2015). The current study did not provide a different set of results than the previous works. Students

performed significantly better on the chapter quiz over Race/Ethnicity and the Higher-Ordered Unit Exam. The means for students in the flipped learning group, although not significantly different, showed they performed better than their counterparts in the traditional lecture group did. The single exception was the unit exam in which the traditional lecture group did better (e.g., higher mean scores).

Therefore, a lack of significance and non-full support of the research question was attributed in part to the active learning and higher-ordered learning environment to which both groups were exposed. The sample size was appropriate and there was a medium effect size (Race/Ethnicity Quiz: $\eta^2 = .116$; Higher-Ordered Unit Exam: $\eta^2 = .042$). With an effect size such as this, any differences due to group would likely be captured (Cohen, 1991) and was inferred as group differences.

The research on summed Satisfaction Scores showed a similar lack of cohesive results (Baepler et al., 2014; Clark, 2015; Critz & Knight, 2013; Enfield, 2013; Gaughan, 2014; Lape, Levy, & Yong, 2015; Lukassen, Pedersen, Nielsen, Wahl, & Sorensen, 2014; Vaughan, 2014). For instance, students reported higher levels of satisfaction with the flipped learning group than the traditional lecture group (Butt, 2014; Davies et al., 2013; Roberts, Bell, & Murphy, 2008). Even though Satisfaction Scores were higher, there were no significant mean differences Learning Environment on the Satisfaction Dependent Variable, which was similar to previous research (Clark, 2015; Ferreri & O'Connor, 2013; Findlay-Thompson & Mombourquette, 2014).

Field of Sociology and Gender

There were some implications for research in the field of sociology and gender. Data were collected from students in sociology courses. There were mean differences by

Learning Environment based on the Dependent Variables. The implication was that students in flipped sociology courses performed better. Forsey et al. (2013) used sociology face-to-face classes to establish a flipped classroom. Through the investigation, they wanted to understand student perceptions about the flipped learning. They found that approximately 53% of students agreed that the classroom met their needs and 82% thought it was a good educational experience (Forsey et al., 2013). In focus groups, students stated that they were satisfied with the experience, they felt more productive in the flipped classroom, but students struggled with technology and felt this approach would result in lost content. Ravenscroft and Luganga (2014) conducted a study in an introductory sociology course. Compared to previous years, students in the flipped learning semester scored higher and were more engaged.

Although the research in flipped learning and gender was limited there were some significant findings. Chen, Yang, and Hsiao (2015) declared that gender has been an important factor in educational research. For instance, women enroll in online courses at a higher rate than men (Chen et al., 2015, p. 5). They used gender as a factor for predicting student perceptions in a high school pre-calculus class. Gender was significant only when examined with topic interest. In other words, young women were significantly less interested in pre-calculus topics than their male counterparts (Chen et al., 2015). Touchton (2015) investigated gender in an advanced statistics course through a quasi-experimental design. He stated that gender was a factor in enrollment in science, technology, engineering, and mathematics (STEM) fields, with male enrollment higher even though females scored higher. The females in the sample significantly outperformed males (Touchton, 2015). In the current study, these findings were not reflected.

In the flipped learning and traditional lecture groups, students were engaged in active learning activities such as group assignments, in-class applied learning, and in-class discussion. Students were exposed to lower-ordered learning experiences through reading and note taking, and higher-order learning through an active and applied environment (e.g., applied exams, critiques, and analyses). According to Ng (2015), when students were exposed to flipped learning but the classroom environment was similar, there were no differences. Furthermore, Baepler, et al. (2014) stated that the active learning environment was more important to student outcomes and students would perform better in active learning. This was affirmed and reaffirmed by other authors (Freeman et al., 2014; Hung, 2015; Morgan et al., 2015; Prince, 2004). The active learning and ordered-learning contributed to this lack of difference found in the current study.

Based upon the findings from the current study and previous research, flipped learning can be applied to various academic fields. Researchers setting out to implement a flipped learning environment should take note of findings from previous research in flipped learning and active learning. If researchers want to focus on flipped learning, the active learning environment should not be included in the design.

Qualitative Implications

Students provided in-depth answers about their experiences in the learning environment. Whether students were in the flipped learning or traditional lecture group, particiants indicated that they preferred the active learning components of the classroom and thought that these elements were most influential for learning. For example, the majority of responses concentrated on class participation and discussions. Contrarily,

passive learning tools were perceived as the least helpful. In other words, approximately 46% of the 54 responses regarded passive learning, such as reading and listing to music, were not beneficial to learning.

Furthermore, when students were asked what the instructor could do and what the student her/his-self could do to improve learning, the majority of student responses centered on active learning components. For instance, students recommended that the instructor make participation compulsory, add more discussions, and in class group activities. Additionally, students suggested that they should attend class more, ask questions, and participate in discussions more frequently.

Although there were some significant group differences, the qualitative findings and a comparison to previous research implied that active learning may have had more to do with the non-significant findings, as compared flipped learning had on the significant outcomes. According to previous research, when active learning was implemented, this had more of an impact on student outcomes than flipped learning did findings (Jensen, Kummer, & Godoy, 2015; Murphree, 2014; Ng, 2014; Tune, Strurek, & Basile, 2013).

Although, groups were arranged by Learning Environment, students did not answer differently depending upon whether they were in the flipped learning group or traditional learning group for the current study. No comparable differences occurred between the two Learning Environment groups. One of the major structural differences was the inclusion of recorded lectures for the flipped learning groups. Of the 64 students in the flipped learning group, only five commented about the recorded lecture, such as "The recorded lectures and coming to class everyday helped out a lot." Instead, students' comments pertained to the preference or learning styles. For instance, many students

commented that reading was helpful to learning, but just as many students stated that reading was not helpful: “The info in the book played a large role,” “I think it would be the book, it was confusing,” and “I felt like the extra videos on YouTube were not as helpful because they did not cater to my style of learning.” These findings, coupled with the multivariate analyses, indicated that the active learning environment maybe more important to differences between groups than the implementation of a flipped learning environment.

Limitations

In this section, the major limitations were addressed. During the course of the current exploratory study, four major limitations were found. The first limitation surrounded the instruments. Split-half reliability was conducted for the seven dependent variables: Pretest, Posttest, Stratification Quiz, Sex/Gender Quiz, Race/Ethnicity Quiz, The Higher-Ordered Unit Exam. The coefficient estimates were lower than the recommended rule of thumb. The rule of thumb for internal consistency is a value of .6 or greater demonstrates an acceptable reliability (Field, 2009). The instruments for these dependent variables had not been previously established as with the satisfaction subscales.

The second limitation arose from some of the student responses to the open-ended questionnaires and centered on the technological components of the study. Approximately eight students remarked about their inability to use the LMS or their difficulty accessing or using the recorded lectures, videos, or music files. For instance, comments included “maybe explain canvas. I ran into difficulty with it several times such as finding the PowerPoints. (my first year at this college, my last college website was a

lot diff.)" and "My computer didn't have the right software so I had to go to the library every chance I got to do the homework." It is important to note, the LMS was explained during the first week, and individuals who needed additional assistance asked after class. The only technological needs were the Internet and PowerPoint.

The third limitation related to researcher bias. Because of the teaching style of the researcher, the traditional lecture group and the flipped learning group were both exposed to active and ordered-learning. This structure could have led to the lack of significant findings and the ambiguous results from the Race/Ethnicity Quiz and Higher-Ordered Unit Exam. An additional researcher bias was that the researcher was also the instructor for the courses under the study. This could have contributed to both the lack of results and the ambiguous findings by Learning Environment based on the Dependent Variables.

The final limitation related to the findings. The research question was only partly supported. This can be explained in part through the use of active learning environments. To determine if the affects were attributable only the flipped learning, active learning should not have been included in the design.

Recommendations

Before policy makers or educators decide to change to an entirely flipped learning approach further studies need to be conducted in the field. Based upon the findings in this current study and the relationship to previous research, it was recommended that further research be conducted in this field across disciplines. Because this research added to the already ambiguous research, future studies should:

1. Emphasize active and passive learning,
2. Include active processes to flipped learning and traditional lecture groups, and

3. Compare flipped learning and traditional lecture groups without active learning processes.

This would help improve the results to determine which factors actually impact student learning. Additionally, research should be conducted over an entire semester or school year to allow for the nuances of a different pedagogical approach to wear off for the students and educators.

Summary

The purpose of the current study was to determine if Learning Environment and Gender had a significant impact on the Dependent Variables. The first research question, "Using a two-way quasi-experimental design, are there differences between Learning Environments and Gender on the Outcome Measures?" was partly satisfied. There were group differences on two of the seven dependent variables, with individuals in the flipped learning group earning higher scores on the Race/Ethnicity Quiz, and students in the traditional lecture group performing better on the Higher-Ordered Unit Exam. Through the second research question, student perceptions were examined by themes and the consensus was that active learning processes were most important to students. While not an intended outcome, this added to the body of literature about the influence of active learning in the classroom environment.

The findings here contributed to the overall research in flipped learning and added to the some of the breaks in previous research. First, this study was conducted in sociology courses and little previous research existed in this academic field. Finally, gender had been under studied in flipped learning research. This study showed that satisfaction was perceived differently by females and males, irrelevant of learning group assignment.

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Appendix A

Major Trends in Previous Research

Authors	Year	Application (e.g., study type)	Level of Education	Topic
Abeysekera & Dawson	2015	Tech-trend	College/university	Non-specific field/discipline
Alvarez	2012	Practitioner article	High school	Non-specific field/discipline
Arnold-Garza	2014	Tech-trend	Non-specific level	Non-specific field/discipline
Aronson	2013	Practitioner article	College/university	Biology
Asef-Vaziri	2015	Survey research	College/university	Operation management
Ash	2012	Practitioner article	Non-specific level	Non-specific field/discipline
Baepler, Walker, & Driessen	2014	Quasi-experimental design	College/university	Chemistry
Baker	2000	Tech-trend	Non-specific level	Non-specific field/discipline
Bergman & Sams	2012b	Quasi-experimental design	High school	Chemistry
Bergmann & Sams	2012a	Tech-trend	Non-specific level	Non-specific field/discipline
Bergmann & Sams	2014	Tech-trend	Non-specific level	Non-specific field/discipline
Berrett	2012	Practitioner article	Across levels	Across fields/disciplines
Billings-Gagliardi & Mazor	2007	Survey research	College/university	Health/medicine
Bishop & Verleger	2013	Meta-analysis	Across levels	Across fields/disciplines
Bliuc, Goodyear, & Ellis	2007	Content analysis	Across levels	Across fields/disciplines
Bristol	2014	Practitioner article	College/university	Health/medicine
Brunsell & Horejsi	2013	Practitioner article	College/university	Education

Butt	2014	Survey research	College/university	Actuarial
Carpenter & Pease	2012	Tech-trend	Non-specific level	Non-specific field/discipline
Chen, Wang, & Chen	2014	Survey research	College/university	Non-specific field/discipline
Chen, Yang, & Hsiao	2015	Survey research	K-12	Mathematics
Clark	2015	Survey research	High school	Mathematics
Crews & butterfield	2014	Survey research	College/university	Across fields/disciplines
Critz & Knight	2013	Survey research	College/university	Health/medicine
Davies, Dean, & Ball	2013	Quasi-experimental design	College/university	Technology skills
Della Ratta	2015	Quasi-experimental design	College/university	Health/medicine
DuBrowa	2014	Practitioner article	College/university	Education
Educase	2012	Tech-trend	Across levels	Across fields/disciplines
Elmore	2012	Tech-trend	Across levels	Across fields/disciplines
Enfield	2013	Survey research	College/university	Cinema of television arts
Engin	2014	Survey research	College/university	Composition
Ferreri & O'Connor	2013	Survey research	College/university	Health/medicine
Findlay-Thompson & Mombourquette	2014	Survey research	College/university	Business
Flumerfelt & Green	2013	Practitioner article	K-12	At risk youth
Fomin	2013	Tech-trend	College/university	Across fields/disciplines
Forsey, Low, & Glance	2013	Quasi-experimental design	College/university	Social science
Francel	2014	Survey research	College/university	Business

Freeman et al	2014	Meta-analysis	Across levels	SEM
Fulton	2012c	Practitioner article	High school	Mathematics
Fulton	2012a	Tech-trend	Across levels	Across fields/disciplines
Fulton	2012b	Tech-trend	Across levels	Across fields/disciplines
Galway, Corbette, Takaro, Tairyan, & Frank	2014	Survey research	College/university	Health/medicine
Gannod, Burge, & Helmick	2008	Survey research	College/university	Technology skills
Garver & Roberts	2013	Quasi-experimental design	College/university	Mathematics
Gaughan	2014	Survey research	College/university	History
Geist, Larimore, Rawiszer, & Sager	2015	Quasi-experimental design	College/university	Health/medicine
Glen & Willy	2013	Tech-trend	Across levels	Across fields/disciplines
Goodwin & Miller	2013	Meta-analysis	Across levels	Across fields/disciplines
Grant	2013	Practitioner article	College/university	Music
Grayson	2010	Tech-trend	Non-specific level	Non-specific field/discipline
Gunyou	2015	Survey research	College/university	Business
Hamden, McKnight, McKnight, & Arfstrom	2013	Tech-trend	Non-specific level	Non-specific field/discipline
Harbro, Artstrom, McKnight, & McKnight	2014	Tech-trend	Non-specific level	Non-specific field/discipline
Harvey	2014	Practitioner article	College/university	Language

Hawks	2014	Practitioner article	College/university	Health/medicine
Herreid & Schiller	2013	Tech-trend	Non-specific level	Non-specific field/discipline
Herreid, Schiller, Herreid, & Wright	2014	Tech-trend	College/university	Sciences
Holmes, Tracy, Painter, Oestreich, & Park	2015	Survey research	College/university	Social work
Horn	2013	Tech-trend	Non-specific level	Non-specific field/discipline
Hunt	2013	Practitioner article	College/university	Cinema of television arts
Hutchings & Quinney	2015	Survey research	College/university	Social work
Jacot, Noren, & Berge	2014	Tech-trend	Non-specific level	Non-specific field/discipline
Jamaludin & Osman	2014	Survey research	College/university	Technology skills
James, Chin, & Williams	2014	Survey research	College/university	Maritime
Jensen, Kummer, & Godoy	2015	Quasi-experimental design	College/university	Sciences
Johnson	2012	Tech-trend	K-12	Mathematics
Jungic, Kaur, Mulholland, & Xin	2015	Survey research	College/university	Mathematics
Kim, Kim, Hkera, & Getman	2014	Survey research	College/university	Eclectic
Kong	2014	Quasi-experimental design	K-12	Critical thinking
Lafee	2013	Tech-trend	Across levels	Across fields/disciplines
Lage, Platt, & Treglia	2000	Survey research	College/university	Economics
Lane-Kelso	2015	Survey research	College/university	Education

Lape, Levy, & Yong	2015	Quasi-experimental design	College/university	Eclectic
Leung, Kumta, Jin, & Yung	2014	Practitioner article	College/university	Health/medicine
Love, Hodge, Grandgenett, & Swift	2014	Quasi-experimental design	College/university	Mathematics
Lujan & DiCarlo	2014	Unclear	College/university	Health/medicine
Lukassen, Pedersen, Nielsen, Wahl, & Sorensen	2014	Survey research	College/university	Health/medicine
Lynch	2014	Tech-trend	College/university	English
Maloy, Edwards, & Evans	2014	Survey research	College/university	Community engagement
Marin, Hargis, & Cavanaugh	2013	Survey research	College/university	English
Mason, Shuman, & Cook	2013	Quasi-experimental design	College/university	Engineering
Mattis	2014	Quasi-experimental design	College/university	Health/medicine
McDonald & Smith	2013	Tech-trend	College/university	Health/medicine
McGraw &Chandler	2015	Survey research	College/university	Sciences
McLaughlin & Rhoney	2015	Quasi-experimental design	College/university	Health/medicine
McLaughlin et al.	2014	Survey research	College/university	Health/medicine
McLaughlin et al.	2013	Survey research	College/university	Health/medicine
McNulty	2013	Tech-trend	Across levels	Across fields/disciplines
Milman	2012	Tech-trend	K-12	Across fields/disciplines
Mitgang	2010	Tech-trend	K-12	Across fields/disciplines
Mok	2014	Survey	College/university	Technology

		research		skills
Moore, Gillette, & Steele	2014	Tech-trend	K-12	Mathematics
Moran & Milsom	2015	Survey research	College/university	Counselling
Murphree	2014	Quasi-experimental design	College/university	History
Nederveld & Berge	2014	Tech-trend	Workplace	
Ng	2015	Tech-trend	Across levels	Across fields/disciplines
Nielsen	2012	Tech-trend	Non-specific level	Non-specific field/discipline
O'Flaherty & Phillips	2015	Meta-analysis	Non-specific level	Non-specific field/discipline
Pearson	2012a	Practitioner article	K-12	Mathematics
Pearson	2012b	Practitioner article	K-12	Sciences
Pearson	2013	Practitioner article	High school	Across fields/disciplines
Persky & Dupuis	2014	Quasi-experimental design	College/university	Health/medicine
Pierce & Fox	2012	Quasi-experimental design	College/university	Health/medicine
Prasahr	2015	Survey research	College/university	Business
Raths	2014	Tech-trend	Across levels	Across fields/disciplines
Ravenscroft & Luhanga	2014	Survey research	College/university	Social science
Roach	2014	Survey research	College/university	Economics
Roberts, Bell, & Murphy	2008	Survey research	K-12	Race/Racism
Roehl, Reddy, & Shannon	2013	Tech-trend	Across levels	Across fields/disciplines
Sams & Bergmann	2013	Tech-trend	Across levels	Across fields/disciplines

Schlairet, Green, & Benton	2014	Tech-trend	College/university	Health/medicine
Schmoker	2012	Tech-trend	Across levels	Professional development
Schneider, Kozdras, Wolkenhauer, & Arias	2014	Survey research	K-12	Professional development
Scott	2014	Practitioner article	K-12	Across fields/disciplines
See & Conry	2014	Survey research	College/university	Professional development
Siegle	2014	Tech-trend	Across levels	Across fields/disciplines
Sinouvassane & Nalini	2016	Survey research	College/university	Health/medicine
Smith & McDonald	2013	Tech-trend	College/university	Health/medicine
Steed	2012	Tech-trend	College/university	Business
Strayer	2012	Mixed methods	College/university	Mathematics
Sweet	2014	Tech-trend	Across levels	Across fields/disciplines
Talley & Scherer	2013	Quasi-experimental design	College/university	Psychology
Thomson, Bridgstock, & Willems	2014	Tech-trend	College/university	Across fields/disciplines
Touchton	2015	Quasi-experimental design	College/university	Mathematics
Tucker	2012	Tech-trend	Across levels	Across fields/disciplines
Tune, Sturek, & Basile	2013	Quasi-experimental design	College/university	Health/medicine
Vaughan	2014	Survey research	College/university	Education
Velegol, Zappe, & Mahoney	2015	Quasi-experimental design	College/university	Engineering

Velegol, Zappe, & Mahoney	2015	Survey research	College/university	Engineering
Velegol, Zappe, & Mahoney	2015	Tech-trend	College/university	Engineering
Wallace	2014	Survey research	K-12	Across fields/disciplines
Wallace, Walker, Braseby, & Sweet	2014	Tech-trend	Across levels	Across fields/disciplines
Westermann	2014	Survey research	College/university	History
Wilson	2013	Quasi-experimental design	College/university	Mathematics
Wong, Ip, Lopes, & Rajagopalan	2014	Quasi-experimental design	College/university	Health/medicine
Young, Bailey, Guptill, Thorp, & Thomas	2014	Survey research	College/university	Health/medicine

Appendix B

Perception Survey: Open-ended Questionnaire for the Flipped Learning Environment.

Demographic information: circle the option that best applies to you.

Gender:
Male
Female

1. Did you watch the videos and recorded lectures Professor Lee prepared for the class?
   Yes, all of them | Yes, most of them | Some of them | Few of them | None of them

2. Explain the reason you did or did not watch the videos or recorded lectures as frequently as you answered as you answered in question #1. Make your explanation has honest as possible.

3. Answer this question if you watched any of the videos or recorded lectures. Did watching the videos or recorded lectures help to prepare you for class discussions and quizzes?
   All of the time | Most of the time | Some of the time | Little of the time | None of the time

4. Please explain how and why the videos or recorded lectures helped.

5. How much would you say you learned about sociology?
   A huge amount | A great deal | Some | Very little | Nothing at all

6. In thinking about question 5, what factors and/or materials facilitated your learning the most?

7. What was the least helpful?

8. What should the *professor* do to help improve your learning experience?

9. What could *you* do to help improve your learning experience?

Appendix C

Perception Survey: Open-ended Questionnaire for the Traditional Learning Environment.

Demographic information: circle the option that best applies to you.

Gender:
Male
Female

1. Did you watch attend the lectures with Professor Lee in the classroom?
   Yes, all of them | Yes, most of them | Some of them | Few of them | None of them

2. Explain the reason you did or did not attend as frequently as you answered as you answered in question #1. Make your explanation has honest as possible.

3. Answer this question if you attended any of the lectures. Did attending lectures help to prepare you for quizzes?
   All of the time | Most of the time | Some of the time | Little of the time | None of the time

4. Please explain how and why the lectures helped.

5. How much would you say you learned about sociology?
   A huge amount | A great deal | Some | Very little | Nothing at all

6. In thinking about question 5, what factors and/or materials facilitated your learning the most?

7. What was the least helpful?

8. What should the *professor* do to help improve your learning experience?

9. What could *you* do to help improve your learning experience?

Appendix D

Library Search Guides: List of Databases

- Academic Search Main Edition
- Academic Search Primer
- Ageline
- Agricola
- AHFS Consumer Medication Information
- Alt HealthWatch
- America: History & Life
- Anthropology Plus
- Art Full Text (H. W. Wilson)
- Audiobook Collection (EBSCOhost)
- Business Source Complete
- Business Source Elite
- CINAHL
- Communication & Mass Media Complete
- Communication Abstracts
- Criminal Justice Abstracts
- eBook Collection (EBSCOhost)
- eBook Comprehensive Academic Collection (EBSCOhost)
- Education Full Text (H. W. Wilson)
- Education Research Complete
- E-Journals
- Environment Complete
- ERIC
- Film & Television Literature Index With Full Text
- General Science Collection
- GreenFILE
- Health And Psychosocial Instruments
- Health Source – Consumer Edition
- Health Source: Nursing/Academic Edition
- Historical Abstracts
- Library, Information Science & Technology Abstracts
- MainFILE
- Masterfile Premier
- Mental Measurements Yearbook With Tests In Print
- MLA Directory Of Periodicals
- MLA International Bibliography
- Music Index
- Newspaper Source
- Petroleum Abstracts TULSA® Collection
- Philosopher's Index
- Professional Development Collection

- PsycARTICLES
- PsycCRITIQUES
- PsycINFO
- Regional Business News
- Science Reference Center
- Social Work Abstracts
- SPORTdiscus
- Teacher Reference Center
- The Nation Archive
- Google Scholar

Appendix E

Opinions Survey: College and University Classroom Environment Inventory (CUCEI).

Indicate your choice by circling the statement that best matches your opinion.

STRONGLY AGREE if you strongly agree that it describes what this class is actually like.

AGREE if you agree that it describes what this class is actually like.

DISAGREE if you disagree that it describes what this class is actually like.

STRONGLY DISAGREE if you strongly disagree that it describes what this class is actually like.

1. The instructor considers students' feelings.
   STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

2. The instructor talks rather than listens.
   STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

3. The class is made up of individuals who don't know each other well.
   STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

4. The students look forward to coming to classes.
   STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

5. Students know exactly what has to be done in our class.
   STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

6. New ideas are seldom tried out in this class.
   STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

7. All students in the class are expected to do the same work, in the same way and in the same time.
   STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

8. The instructor talks individually with students.
   STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

9. Students put effort into what they do in classes.
   STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

10. Each student knows the other members of the class by their first names.
    STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

11. Students are dissatisfied with what is done in the class.
    STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

12. Getting a certain amount of work done is important in this class.
    STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

13. New and different ways of teaching are seldom used in this class.
    STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

14. Students are generally allowed to work at their own pace.
    STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

15. The instructor goes out of his/her way to help students.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

16. Students "clockwatch" in this class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

17. Friendships are made among students in this class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

18. After the class, the students have a sense of satisfaction.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

19. The group often gets sidetracked instead of sticking to the point.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

20. The instructor thinks up innovative activities for students to do.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

21. Students have a say in how class time is spent.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

22. The instructor helps each student who is having trouble with the work.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

23. Students in this class pay attention to what others are saying.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

24. Students don't have much chance to get to know each other in this class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

25. Classes are a waste of time.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

26. This is a disorganized class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

27. Teaching approaches in this class are characterized by innovation and variety.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

28. Students are allowed to choose activities and how they will work.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

29. The instructor seldom moves around the classroom to talk with students.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

30. Students seldom present their work to the class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

31. It takes a long time to get to know everybody by his/her first name in this class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

32. Classes are boring.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

33. Class assignments are clear so everyone knows what to do.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

34. The seating in this class is arranged in the same way each week.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

35. Teaching approaches allow students to proceed at their own pace.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

36. The instructor isn't interested in students' problems.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

37. There are opportunities for students to express opinions in this class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

38. Students in this class get to know each other well.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

39. Students enjoy going to this class
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

40. This class seldom starts on time.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

41. The instructor often thinks of unusual class activities.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

42. There is little opportunity for a student to pursue his/her particular interest in this class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

43. The instructor is unfriendly and inconsiderate towards students.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

44. The instructor dominates class discussions.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

45. Students in this class aren't very interested in getting to know other students.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

46. Classes are interesting.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

47. Activities in this class are clearly and carefully planned.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

48. Students seem to do the same type of activities every class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

49. It is the instructor who decides what will be done in our class.
STRONGLY AGREE AGREE DISAGREE STRONGLY DISAGREE

Appendix F

Pre-test Instrument: Knowledge about Sociological Concepts and Terminology.

1. C. Wright Mills claimed that the "sociological imagination" transformed:
    a. Common sense into laws of society
    b. Scientific research into common sense
    c. Personal problems into public issues
    d. People into supporters
2. Making use of the sociological perspective encourages:
    a. The belief that society is mysterious
    b. People to be happier with their lives as they are
    c. Accepting conventional wisdom
    d. Challenging commonly held beliefs
3. Which of the following historical changes is among the factors that stimulated the development of sociology as a discipline?
    a. The power of tradition
    b. The migration of people from the country to the cities
    c. A belief in the fates
    d. The rise of religion
4. Which is one of the early theories of sociology?
    a. Psychoanalysis
    b. Structural-functional
    c. Behavioral
    d. None of the above
5. Karl Marx was an early theorist in psychology
    a. True
    b. False
6. Sociology is the systematic study of behavior in the context of social institutions.
    a. True
    b. False
7. Which theory posits that people in society are in a continuous struggle over scarce resources such as money or power?
    a. Conflict
    b. Feminism
    c. Symbolic interactionism
    d. Structural functional
8. Which research method employs the use of public records such as census data?
    a. Survey research
    b. Participant research
    c. Experiments
    d. Secondary data
9. When conducting research, all biases and previously held beliefs are removed?
    a. True
    b. False
10. Which item consists of a symbol?
    a. Eggs
    b. Pots
    c. Flag
    d. None of the above

Appendix G

Re-ordered Post-test Instrument: Knowledge about Sociological Concepts and Terminology.

1. Which is one of the early theories of sociology?
    a. *Structural-functional*
    b. Behavioral
    c. Psychoanalysis
    d. None of the above
2. Which of the following historical changes is among the factors that stimulated the development of sociology as a discipline?
    a. The rise of religion
    b. A belief in the fates
    c. The power of tradition
    d. *The migration of people from the country to the cities*
3. Which item consists of a symbol?
    a. Pots
    b. *Flag*
    c. Eggs
    d. None of the above
4. C. Wright Mills claimed that the "sociological imagination" transformed:
    a. People into supporters
    b. *Personal problems into public issues*
    c. Scientific research into common sense
    d. Common sense into laws of society
5. Which theory posits that people in society are in a continuous struggle over scarce resources such as money or power?
    a. Symbolic interactionism
    b. *Conflict*
    c. Structural functional
    d. Feminism
6. Which research method employs the use of public records such as census data?
    a. Experiments
    b. Survey research
    c. Participant research
    d. *Secondary data*
7. Making use of the sociological perspective encourages:
    a. *Challenging commonly held beliefs*
    b. Accepting conventional wisdom
    c. People to be happier with their lives as they are
    d. The belief that society is mysterious
8. Karl Marx was an early theorist in psychology
    a. True
    b. *False*
9. When conducting research, all biases and previously held beliefs are removed?
    a. True
    b. *False*
10. Sociology is the systematic study of behavior in the context of social institutions.
    a. *True*
    b. False

Appendix H

Summary Table from the Qualitative Findings: Themes, Subthemes, and Examples from Student Responses.

	Major Qualitative Themes			
Subthemes	Factors that contributed to learning	Materials and elements that hindered learning	Ways for the professor to improve learning	Personal accountability for learning
Items	The lectures helped, and also the book.			
Class attendance	Coming to class.			
In-class discussions	The class interactions helped me the most.			
What students learned	I came in knowing nothing about sociology, now I know about past & present sociologists and the study of the theories.			
Reading was not helpful		At home reading		
Music and videos		I felt like the extra videos on YouTube were not as helpful because they did not cater to my style of learning.		
Homework		Papers/Essays		
Group work		I did not like the		

	group participation projects.		
Everything was helpful	Everything was helpful.		
No changes be made		Honestly, don't changing anything.	
Encourage participation		Get students to participate.	
More in-class activities		I believe have more group work.	
More videos or visual aids		The professor could maybe incorporate more educational videos into the class.	
Attend class and pay attention			Pay attention more.
Read/study more			I could spend more time reading all of the material.
Ask more questions			Ask more questions and pay a little bit more attention.
Complete the course work			Just stay on top of the work and not procrastinate.