A CAUSAL-COMPARATIVE INQUIRY
INTO THE SIGNIFICANCE OF IMPLEMENTING A FLIPPED CLASSROOM STRATEGY
IN NURSING EDUCATION

by
Rhonda Sue Faretta

Liberty University

A Dissertation Presented in Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

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ABSTRACT

The purpose of this causal-comparative design study was to examine the application of the theory of Vygotsky’s social constructivism (1978) and McMillan and Chavis’s (1986) definition of sense of classroom community in the context of a flipped classroom. The researcher aimed to determine if a pathophysiology course taught with the flipped classroom method would result in a statistically-significant difference in nursing students’ academic performance and sense of classroom community when compared to a pathophysiology course taught with the lecture classroom method. Two questions were addressed during this study: (a) Is there a statistically-significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course? (b) Is there a statistically-significant difference in nursing students’ sense of community (as measured by the Classroom Community Scale®) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course? After collecting and comparing final exam scores, demographics, and the Classroom Community Scale® from each group, the researcher analyzed the data utilizing t Tests and Mann-Whitney U Tests. The study determined that no statistically-significant differences existed in either lecture or flipped classroom groups in academic performance or sense of community. Further true experimental research is needed to determine if nursing students who are taught using the flipped classroom method experience better outcomes in academic performance and sense of community when compared to nursing students in lecture classrooms.

Keywords: flipped classroom, sense of community, active learning, academic performance, social constructivism
Dedication

“After that, he poured water into a basin and began to wash his disciples’ feet, drying them with the towel that was wrapped around him. He came to Simon Peter, who said to him, ‘Lord, are you going to wash my feet?’ Jesus replied, ‘You do not realize now what I am doing, but later you will understand’” (John 13:5-7, NIV)

First and foremost I am thankful to God for granting me the wisdom, the courage, and the strength to complete this journey and demonstrating the greatest example of servant leadership and the importance of trusting in God. I also thank God for giving me the kind of family and friends that have helped me to succeed by being there with words of support and encouragement. I dedicate this dissertation to the memory of those family and friends who are no longer here on this earth. To my father, Lee Paskel DeFord, a man who never got the opportunity to see his daughter rise from poverty, immaturity, and ignorance; I dedicate this work in your memory. To my dearest friend and nursing mentor, Bruce Pearce, who passed away as I was nearing the end of my doctoral journey, “I did it Bruce!”; I dedicate this work as a lasting impression you made on the profession of nursing.

The living dedication is to my mother, Phyllis DeFord, a woman of strength and honor, I owe you more than I can ever repay; I dedicate this dissertation to you, may you always know the depths of love I have for you within my heart.
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List of Abbreviations

Accreditation Commission for Education in Nursing (ACEN)

American Association of Colleges of Nursing (AACN)

Classroom Community Scale® (CCS®)

Flipped Learning Network (FLN)

Higher Learning Commission (HLC)

Institute of Medicine (IOM)

International Review Board (IRB)

Kuder Richardson 20 (KR-20)

National Council Licensure Examination for Registered Nurses (NCLEX-RN)

Registered Nurse (RN)

Sense of Community (SoC)

Tests of Essential Academic Skills (TEAS)

Zone of Collaborative Development (ZCD)

Zone of Proximal Development (ZPD)
CHAPTER ONE: INTRODUCTION

Introduction

The need for nursing professionals continues to grow. More than a half million nurses will be needed as replacements within the profession in the next 10 years, creating a serious shortage of qualified Registered Nurses (RN; Bureau of Labor Statistics, 2012). Unfortunately, there is also a shortage of nurse educators, meaning that nursing enrollment in RN programs cannot meet the demand for graduating more nurses (American Association of Colleges of Nursing, 2013). The pressure on nursing faculty to ensure current students enrolled in entry-level RN programs graduate and earn their RN license is significant (Billings & Halstead, 2012).

Student success is focused on the ability for nursing students to sustain their academic performance (minimum GPA standards for program progression), assisting them in ultimately joining the RN workforce, and filling the employment shortage. Nursing faculty have many roles; among them is the responsibility to choose teaching strategy models that reinforce the curriculum, engage students, build critical thinking, and create success for the student (Billings & Halstead, 2012).

It is apparent that faculties are facing an immense challenge as the shortage and demand grows. In 2010, two influential reports increased the demand on nursing faculty, calling for more graduated nurses and transformation of nursing education (Benner, Sutphen, Leonard, & Day, 2010; Institute of Medicine, 2010). Benner and colleagues (2010) stressed that there is a gap between the actual practice of nursing and the education that is being provided by nursing schools. In addition, the authors stressed that just filling the spaces with nurses is not going to solve the nursing shortage; rather, it will expound the problem and put patients at risk. The real solution is to transform nursing education. The Institute of Medicine (IOM, 2010) suggested that
nurse educators need to educate nursing students in new and improved ways that ensure a higher quality of graduating student who is prepared to deal with the even more complex types of patients seen in practice. The healthcare system has grown more complex, and nurses have even more responsibility, newer responsibilities, new challenges, and new opportunities (Benner et al., 2010). With this change in healthcare, there is a need for nursing education to grow and transform. In this transformation, educators must turn to the empirical literature to discover new and innovative ways to engage students and improve outcomes. By allowing evidence-based practice to infuse nursing education, educators can improve nursing education.

Best practices in the classroom are those that promote improved clinical reasoning and critical thinking, staying away from rote memorization and the over-use of automated presentation software (Benner et al., 2010). Methods in the classroom such as active learning, think-pair-share, discussion, concept mapping, audience response systems (clickers), and case studies are among some of the best practices that researchers and nursing education experts espouse as ways for transformation (Billings & Halstead, 2012; Bowles, 2006; Caputi, 2010; DuHamel et al., 2011; Evans, 2011; Herbert & Lohrmann, 2011). However, further research on these methods is needed.

The effects of two teaching strategy models on nursing students’ academic performance and sense of community is examined in this study. In this chapter the stage is set for this study. In this chapter, the researcher introduces the background of nursing education, its paradigm shift, and the call for transformation. The chapter then discusses the flipped classroom model, a new and innovative teaching strategy model that challenges the lecture strategy currently being utilized. In addition, introduced in this chapter is the theoretical framework and outlines of the
problem, purpose, and significance of this study. This chapter also contains the research questions, hypotheses, variables, and definitions.

**Background**

**History of Nursing Education**

Nursing education began in the 1800s, with schools of nursing based in hospitals; these schools used the teacher-centered approach to learning, teaching, and service (Billings & Halstead, 2012). In the 1960s, nursing educators adopted teaching models from cognitive and social theorists, where learning was no longer about rote memorization knowledge; instead, learning was constructed through social experiences that were seen as important (Caputi, 2010; DeYoung, 2009). By the 1980s, Knowles’ andragogy had influenced nurse educators. Adult students were recognized as being different than young students, and the focus was on the student, not the teacher (Caputi, 2010; DeYoung, 2009; Knowles, 1984). Today, nurse educators have adopted a more eclectic approach to teaching strategy, utilizing philosophies and strategies from behaviorism, cognitivism, socialism, and adult learning theories as their guide for curriculum development (Caputi, 2010; DeYoung, 2009). Despite these developments, recent reports have indicated that nursing education still lacks the ability to prepare nursing students for the realities of bedside care (Benner et al., 2010). Furthermore, educators are being asked to use relevant student-centered approaches to education (Billings & Halstead, 2012).

Within nursing education, there is a move to adopt active learning methods in the classroom to complement lecture and encourage active student participation while promoting learning (Billings & Halstead, 2012; Bowles, 2006; DuHamel et al., 2011; Evans, 2011; Herbert & Lohrmann, 2011). Active learning was described in 1991 by Bonwell and Eison as the act of a student who is reading, writing, discussing, and engaging at the levels of analysis, synthesis, and
evaluation as they go about solving problems. Years before Bonwell and Eison (1991) presented their ideas on active learning, Piaget (1980), Dewey (1958), and social constructivist Vygotsky (1978) supported ideas such as creative and constructive learning, which take place best in a social environment where dialogue and a hierarchy of knowledgeable others work together to construct new ideas. Together, these theorists laid the foundation for the idea of active learning in the classroom. Research has demonstrated that a nursing classroom that allows for the greatest amount of time to be spent in constructing new ideas through experiences and dialogue, allows for greater learning to take place (Billings & Halstead, 2012; Bowles, 2006; DuHamel et al., 2011; Evans, 2011; Herbert & Lohrmann, 2011). However, more research is needed to expand evidence-based practices in the classroom.

**Flipping the Classroom**

Flipping the classroom, also referred to as inverting or reversing the classroom, is an approach that has existed for more than 30 years (Missildine, Fountain, Summers, & Gosselin, 2013). By the 1990s, educational philosophies began to change from a focus on those who instructed as the ‘sage on the stage’ to educators who embraced the idea of becoming the ‘guide on the side’ (King, 1993). All of these changes in the 1990s provided the catalyst necessary for Lage, Platt, & Treglia (2000) to publish their article on inverting the classroom, what is now being called the flipped classroom (Bergmann & Sams, 2012; Lage et al., 2000).

The flipped classroom was first defined as “events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa” (Lage et al., 2000, p. 32). The philosophical premise of the flipped classroom is that students will acquire knowledge outside of the classroom so that inside the classroom they will be able to assimilate that knowledge by engaging in activities that promote higher-order complex thinking and problem
solving (Lage et al., 2000). In order to flip the classroom, the instructor provides some type of lecture material outside of the classroom setting in the form of either audio or video podcasts to replace the in-class lecture (Bergmann & Sams, 2012). The instructor has the option of recording their own lectures or using other lectures that exist on mediums such as YouTube (Moroney, 2013). In addition, the students complete reading assignments and employ a variety of other study techniques that have been developed by each student. All of these activities are completed before the student enters the classroom.

Inside the classroom, students participate in a variety of activities that assist them in knowledge assimilation and higher-order thinking (Bergmann & Sams, 2012; Missildine et al., 2013). The activities include case studies, critical thinking scenarios, one-minute papers, concept maps, decision making exercises, think-pair-share, and problem-solving exercises (Ferreri & O’Connor, 2013; Freed, Bertram, & McLaughlin, 2013; Hamdan, McKnight, McKnight, & Argstrom, 2013). Each of these activities is considered elements of active learning, where students are interactive in the learning process. Each of these activities requires not only interaction, but participation, social dialogue, input, and output from every student. In many instances, the students are placed into small groups so that they can work together more efficiently (Ferreri & O’Connor, 2013; Hamdan et al., 2013).

The flipped classroom brings together two theoretical bodies, which in the past have always been looked at as separate presences in the classroom: the constructivist ideas of active learning in the classroom, and the behaviorist ideas of transferring knowledge through lecture outside of the classroom (Bishop, 2013). Behaviorism has made a major impact on education since the 1950s when Skinner (1953) purported that behavior is explained through observable causes. Behaviorism has informed several useful educational strategies including breaking down...
new knowledge into smaller, more manageable units, providing frequent feedback in the form of
reinforcement (positive or negative), and providing teacher-centered instruction such as lectures.
While a plethora of literature has called for the repudiation of behaviorist principals from nursing
education (Romyn, 2001), the flipped classroom model does not disavow the behaviorist
principal. The flipped classroom provides an integration of both social constructivism and
behaviorism in the classroom, which together may promote academic performance and sense of
community.

Social constructivism promotes knowledge construction through problem solving in a
social atmosphere by way of active participation (Vygotsky, 1978). Central to social
constructivism is the student-centered classroom, student interaction, and the application of
knowledge. The Zone of Proximal Development (ZPD)—which suggests that there are things
that a student is capable of doing on their own and things that a student cannot do on their own,
but can master with the assistance of others—is also a foundational element of this theory
(Vygotsky, 1978). This ZPD where the student needs assistance to go to the next level of
understanding is supported by social interaction with peers and the faculty guide (Vygostky,
1978). Vygotsky (1978) viewed interaction as an effective way for students to develop new skills
and strategies.

Thus, the flipped classroom is based on the premise that combining strategies from both
behaviorism and social constructivism best serves students, and that educators should embrace a
more eclectic idea for instruction (See Figure 1). In the flipped classroom, behaviorist (Skinner,
1953) principles are applied outside the classroom as students watch video lectures or listen to
audio podcasts in preparation for class, learning new content with the intent to improve academic
achievement. Inside the classroom, constructivist principles such as social dialogue (Vygotsky,
1978) and reflection (Dewey, 1958) promote the formation of new ideas and community. A sense of community (Rovai, 2002b) is built through shared student interactions, creating feelings of spirit, trust, interaction, and learning. Similar to the idea of social interaction, Rovai (2002b) explained that sense of community occurs when a group of people experience spirit, trust, interaction, and common expectations such as learning (Rovai, 2002b). This concept of sense of community in the higher education classroom is derived from the work of McMillan and Chavis (1986), who postulated that sense of community is built through four elements of membership, influence, reinforcement, and shared emotional connection.

![Flipped Classroom Diagram](image)

*Figure 1. Learning Theories of the Flipped Classroom.*

Drawing from John Dewey’s work, Garrison, Anderson, and Archer (2000) described the concept of practical inquiry that provides a framework for creating effective active learning and activities inside the flipped classroom. Garrison et al. (2000) suggested that there are four phases for practical inquiry, including trigger, exploration, integration, and resolution. Using this model (Garrison et al., 2000), the classroom experience may be described as a triggering event, where a problem provided by the instructor is to be solved by the students. The response to the triggering
event involves a phase of exploration where students join together in pairs or teams and fluctuate between individual and social thought processes. This experience leads to integration of those thought processes through reflection and discourse that leads to meaning and eventually, the phase of resolution. True understanding for nursing students may not take place until the students arrive in the clinical setting and have the opportunity to test the new ideas and solutions to problems.

**More Research Needed on the Flipped Classroom**

The flipped classroom model and the model of Garrison et al. (2000) have been shown to promote positive outcomes in the classroom (Ilyas, Rawat, Bhatti, & Malik, 2013; Malik, Khurshid, Rehana, & Nazim, 2013; Samana, 2013; Tran, 2013; Yang, Yeh, & Wong, 2010). These models promote an environment that is student-centered, which allows each student to actively participate in the learning experience through social dialogue, challenging higher-order thinking, and knowledge assimilation. Furthermore, these models promote a student’s sense of community.

While the flipped classroom is being implemented among K-12 (Bergmann & Sams, 2012; Fulton, 2012) and higher learning settings (Berrett, 2012; Flumerfelt & Green, 2013; Fulton, 2012a; Pierce & Fox, 2012; Prober & Heath, 2012; Wilson, 2013), the empirical evidence to support the flipped classroom is limited, even more so in nursing education (Missildine et al., 2013; Strayer, 2012). The need for empirical support of this teaching strategy model is evident.

**Problem Statement**

Both the Institute of Medicine (IOM, 2010) and the Carnegie Foundation (Benner et al., 2010) purport that nursing education is in need of transformation, including new and
innovative models of teaching that ensure a higher quality of graduating student that is prepared to deal with the complex issues that face a Registered Nurse (NR). In addition, nursing schools have the pressure to prepare students academically for the National Council Licensure Examination for Registered Nurses (NCLEX-RN). When providing an education that engages nursing students while promoting enhanced academic performance and improved sense of community, faculty can avoid high attrition and graduate new nursing students capable of passing their NCLEX-RN exam and being effective RNs. To achieve this goal, nurse educators need to employ evidence-based, innovative teaching strategies to engage nursing students. Promising literature has supported the effectiveness of the flipped classroom. There has been a recent influx of empirical evidence on the flipped classroom, which has focused primarily on the K-12 environment (Bergmann & Sams, 2012a; Berrett, 2012; Butrymowicz, 2012; Flumerfelt & Green, 2013; Herreid and Schiller, 2013; Tucker, 2012), with limited studies in higher learning (Ferreri & O’Connor, 2013; Findlay-Thompson & Mombourquette, 2014; Moravec, Williams, Aguilar-Roca, & O’Dowd, 2010; Pierce & Fox, 2012; Wilson, 2013). Researchers have documented the lack of empirical data in nursing investigating the flipped classroom as an effective teaching strategy model (Missildine et al., 2013; Strayer, 2012). The researcher aimed at filling this gap in the literature. Based on studies to date that have examined the flipped classroom in comparison to lecture, the researcher hypothesized that the new and innovative method, flipped classroom, is capable of improving a student’s sense of community and academic performance.

**Purpose Statement**

The purpose of this causal-comparative study was to determine if differences existed among nursing students’ academic performance and/or sense of community in a pathophysiology
course, to provide empirical support for the use of the flipped classroom in nursing education programs. The findings of this study revealed no statistically-significant differences between lecture and flipped classroom among nursing students in a pathophysiology course in either area of study, academic performance, or sense of community.

**Significance of the Study**

The literature is scarce regarding flipping the classroom and nursing students (Missildine, et al., 2012; Strayer, 2012). Despite this scarcity, two of the earliest studies among nursing students found mixed results, suggesting that further study is necessary. Nursing students were found to score higher on examinations (Missildine et al., 2013). However, nursing students were also found to be less satisfied with the innovative classroom method of flipping (Missildine et al., 2013; Strayer, 2012). Furthermore, although students in general were not satisfied with the innovative method, nursing students did show a tendency to become more open to the idea of new and innovative methods in the classroom (Strayer, 2012). While Missildine and colleagues (2013) revealed mixed findings related to flipping the classroom as it compares to lecture in the classroom, the findings of this study provided indications that the flipped classroom may be as effective as the traditional classroom in promoting academic performance. With the K-12 literature providing just a small amount of empirical studies that suggested improved academic performance (Berrett, 2012; Flumerfelt & Green, 2013; Fulton, 2012a; Pierce & Fox, 2012; Prober & Heath, 2012; Wilson, 2013) and improved student satisfaction (Herreid & Schiller, 2013; Pierce & Fox, 2012; Survey, 2012), this study comparing the flipped classroom method and lecture classroom method is essential in filling the gap in the literature among nursing students and higher education. In addition, this study will add to the body of knowledge, assisting educators and administrators in making decisions related to innovative methods in the
classroom and which best practices are truly statistically-significant differences which warrant such changes. Research has indicated that both faculty and students are experiencing overwhelming positive responses to the flipped classroom (Critz & Knight, 2013). In 2015, more nursing research was conducted; however, the findings continued to provide mixed results among nursing students and the flipped classroom (Geist, Larimore, Rawiszer, & Al Sager, 2015; Hanson, 2015; Harrington, Bosch, Schofs, Beel-Bates, & Anderson, 2015; Simpson & Richards, 2015). The only consistent finding was that the flipped classroom was an effective strategy among nursing students when considering academic performance outcomes (Harrington et al., 2015; Missildine et al., 2013). Because the question remained unanswered as to whether the flipped classroom method was a more effective classroom strategy when compared to lecture classroom, this study aimed to investigate further in order to determine whether differences existed between the academic performance of nursing students in the flipped classroom and a lecture classroom. Furthermore, because there is absolutely no literature to date that has explored the concept of nursing students and sense of community in relation to classroom methods, this study also aimed to explore if any differences existed between the flipped classroom and lecture classroom among nursing students in their sense of community.

**Research Questions**

The following two research questions guided the current study:

**Research Question 1:** Is there a statistically-significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course?

**Research Question 2:** Is there a statistically-significant difference in nursing students’ sense of community (as measured by the Classroom Community Scale®) when participating in
lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course?

**Hypotheses**

In this study, the two research questions had two corresponding research hypotheses and null hypotheses as follows:

\[ H_1: \text{Nursing students in a flipped classroom will experience a statistically-significant difference in academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.} \]

\[ H_2: \text{Nursing students in a flipped classroom teaching strategy will experience a statistically-significant difference in sense of community (as measured by the Classroom Community Scale®) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.} \]

\[ H_{01}: \text{There will not be a statistically-significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.} \]

\[ H_{02}: \text{There will not be a statistically-significant difference in nursing students’ sense of community (as measured by the Classroom Community Scale®) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.} \]

**Identification of Variables**

The independent variable within this study was teaching strategy model. Two levels of the independent variable were studied: lecture and flipped classroom. Lecture served as the comparison group within this study; it was defined as a face-to-face classroom environment that
included lecture for approximately 80% of the class time. The remaining 20% of the classroom time was devoted to questions being asked by the instructor with the goal to meet the objectives of the class. A 3-hour lecture included an average of 150 slides, many of them pictures and mnemonics, along with embedded videos. Active learning activities were also incorporated; these included critical thinking activities, case studies, concept mapping, interactive games or clickers, discussion, one-minute papers, think-pair-share, and problem-based learning (Billings & Halstead, 2012; Caputi, 2010). In addition to lecture in the classroom, students were responsible for completing individual homework assignments such as reading, case studies, and critical thinking exercises outside of the classroom.

Flipped classroom served as the treatment group within this study; this was defined as a reverse classroom learning environment where lectures were not delivered inside the classroom; rather, lectures were delivered outside of the classroom in a variety of multimedia modalities such as audio and video podcast lectures, lecture PowerPoints, case studies, think notes, assignments, reference articles, online links, or YouTube videos. All of these materials were available online through Blackboard 24 hours a day and 7 days a week to students. In addition, adaptive quizzing programs were available to students so that they could further prepare themselves to be knowledge competent and prepared before coming to class. Inside the classroom, students participated almost 100% of the time using collaborative active learning exercises that focused on building critical thinking such as case studies, concept mapping, interactive games or clickers, discussion, one-minute papers, think-pair-share, and problem-based learning (Billings & Halstead, 2012; Caputi, 2010). Furthermore, students were divided into work groups to allow for active participation, social constructivism, and group problem-solving where students helped each other and the instructor in making critical thinking decisions.
and judgments. At times, the group work and discussions called for a short lecture or brief explanation by the instructor, which was instrumental in providing students with clarification of their newly-formed ideas.

The content for lecture or flipped classroom were essentially the same. The major difference between lecture and flipped classroom existed within the classroom time and how much time was spent on activities versus lecture. Flipped classroom allowed for almost 100% participation in collaborative active learning during the class meetings. Based on the theoretical idea that social constructivism promotes learning, the flipped classroom allowed for a greater amount of time to be spent in collaboration between peers and instructor. In addition, the scaffolding (Wood, Bruner, & Ross, 1976) process in the flipped classroom method occurred before the classroom time began. This was accomplished through the implementation of various media activities and continued once inside the classroom through collaboration and active learning activities. The researcher assumed that more time spent participating in active learning in the flipped classroom would build knowledge and critical thinking that would impact the outcomes of academic performance and sense of community. The lecture class spent 80% of the time in lecture and 20% engaged in collaborative, active-learning activities.

This study included two dependent variables. The first dependent variable was academic performance, which the study generally defined as a student’s performance on a final exam. To measure this dependent variable, the researcher collected the final exam score of each participant. The final exam was written and analyzed by the instructor. The instructor has been a nurse educator for more than 13 years, and has been trained and certified in writing NCLEX-style exam questions. In addition, the instructor has reviewed, edited, and written NCLEX-style questions for three different publishers. The final exam was blueprinted by the instructor to
match the course objectives, and the Kuder-Richardson 20 (KR-20) for each group was .88 and .84, respectively. The closer a KR-20 reliability score is to 1.0 for an exam, the higher the reliability of that exam. A KR-20 of .80-.90 is considered a high reliability (Nunnally, 1978), suggesting that the classroom test is reliable.

The second dependent variable, sense of community, was generally defined as “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (McMillan & Chavis, 1986, p. 9). Furthermore, classroom community was also defined within four dimensions including spirit, trust, interaction, and learning (Rovai, 2002b). The Classroom Community Scale® (CCS®, Rovai, 2002a) was used to measure sense of classroom community in this study. The CCS® has been tested for both reliability and validity, and is a reliable and validated instrument (A. Rockinson-Szapkiw, personal communication, n.d.).

**Definitions**

*Academic performance* was defined as a student’s performance on a classroom final exam, which assesses students on their overall comprehension and application of new material in a specialized area.

*Active learning* was defined as a student who is reading, writing, discussing, and engaging at the levels of analysis, synthesis, and evaluation as they go about solving problems (Bonwell & Eison, 1991). This includes activities such as case studies, concept mapping, interactive games or clickers, discussion, one-minute papers, think-pair-share, and problem-based learning (Billings & Halstead, 2012; Caputi, 2010).

*Flipped classroom* was defined as a reverse classroom learning environment where lecture was not delivered inside the classroom; rather, a variety of media formats were presented
outside the classroom to prepare the student before coming into the classroom. Inside the classroom, students were almost 100% participatory with collaborative active learning exercises (Missildine et al., 2013; Strayer, 2012).

_Lecture_ was defined as a face-to-face classroom environment that includes primarily lecture for greater than 80% of the class time and the possibility of active learning activities for less than 20% of the class time.

_Sense of community_ was defined as a “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (McMillan & Chavis, 1986, p. 9). Sense of community has four dimensions: spirit, trust, interaction, and learning (Rovai, 2002b).

**Research Summary**

This causal-comparative design study examined and compared two different teaching strategy models as they relate to the theoretical framework and influenced academic performance and sense of community. The population in this study consisted of nursing students who were working toward their entry-level status (ASN degree) to graduate and take the NCLEX-RN for licensure as a Registered Nurse (RN). The participant selection in this study included nursing students at a midwestern 4-year university satellite campus, which offered a variety of programs including an associate’s degree in nursing. The researcher selected this location based on availability and the willingness of the school to participate in research. The ideal situation to study such a group is with a true experimental study (Campbell & Stanley, 1963), drawing upon random sampling and utilizing pretests and posttests (Gall, Gall, & Borg, 2007). However, due to circumstances beyond the researcher’s control, which are later discussed in Chapter Five, the researcher chose an ex-post facto (causal-comparative) design.
While this design is not the preferred or optimal method in allowing strong findings, it allows for an effective study when two groups who already exist, but differ in some way, and will allow for the comparison of those groups on a dependent variable, in this study, academic performance, and sense of community (Gay, Mills, & Airasian, 2011). Furthermore, causal-comparative research has doubled in the amount of usage among researchers in educational research since 2000, and has been deemed acceptable for exploratory research (Wells, Kolek, Williams, & Saunders, 2015). Lodico, Spaulding, and Voegtle (2010) supported the idea that “when many causal-comparative studies have been conducted by different researchers working with different samples in different settings and consistent results emerge from these studies, the combined evidence from these studies provides stronger evidence of causality” (p. 271). Using this knowledge, this researcher chose a causal-comparative design to study what already exists and provide the body of literature with another piece of evidence which fills in the gap related to the new and innovative flipped classroom teaching strategy.
CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

In the previous chapter, the researcher defined both active learning and a sense of community. Active learning was defined as the student who is reading, writing, discussing, and engaging at the levels of analysis, synthesis, and evaluation as they go about solving problems (Bonwell & Eison, 1991). This includes activities such as case studies, concept mapping, interactive games or clickers, discussion, one-minute papers, think-pair-share, and problem-based learning (Billings & Halstead, 2012; Caputi, 2010). Sense of community was defined as a “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (McMillan & Chavis, 1986, p. 9). Sense of community also has four dimensions including spirit, trust, interaction, and learning (Rovai, 2002b). Together, active learning and the building of a sense of community provide the structure for the flipped classroom, an environment that embraces social constructivism and interaction.

In 2010, both the report from the Institute of Medicine (IOM) and Benner et al. stressed the importance of nursing education making change and transformation toward bringing new graduate Registered Nurses (RNs) to the bedside, ready to deal with complex patient issues. The research has supported that active learning in the classroom is an essential part of nursing education in an effort to achieve positive outcomes such as academic performance and critical thinking (Billings & Halstead, 2012; Bowles, 2006; Caputi, 2010; DuHamel et al., 2011; Evans, 2011; Herbert & Lohrmann, 2011). In addition, the evidence has suggested that active learning results in greater classroom engagement (Feingold et al., 2008); however, the evidence has also suggested that nursing students do not view themselves as being engaged in student-centered and
active learning environments (Popkess & McDaniel, 2011). Nursing students who lack engagement tend to have poor academic outcomes (Salamonson, Andrew, & Everett, 2009).

Nurse educators are viewed as holding onto old pedagogies while avoiding new innovations in the classroom that may have the potential to improve outcomes (Bellack, 2008). Furthermore, nurse educators are reluctant to embrace new technologies (Freed et al., 2013) because of fear, stress, and anxiety. Benner et al. (2010) found that while experiential learning was most beneficial to students, it was almost nonexistent in the classroom and the concept of engaging the student was not established. In addition, the Carnegie Foundation report (Benner et al., 2010) found that instructors relied heavily on PowerPoint lectures packed with a plethora of slides. The focus of the slides is to get as much information to the student as possible, not on whether the student is able to apply that information. Instructors were seen as trying to make a difference by integrating games into the classroom as a form of engagement, but it was noted that while games may improve student attention, they are not able to elicit student engagement in intellectual and moral encounters (Benner et al., 2010). This focus on engagement in the classroom is not only tied to academic outcomes (Salamonson et al., 2009) but also relates to a student’s sense of community. Student engagement is directly related to a student’s sense of community (Royal & Rossi, 1996). In addition, a sense of community among students is moderately related to interactivity, stressing the importance of student engagement in dialogue (Rovai, 2002b).

It is apparent that a conflict exists toward making transformation take place in nursing education, but the change is needed and advocates must step forward to provide research, rationales, and instruction on how to make change happen in the classroom. In the interim, increasing empirical examination that explores new and innovative teaching methodologies in
the classroom is essential with a focus on active learning, academic performance, and sense of community through engagement and interactivity.

“I missed class today, is there anything I need to know?” is just one type of question that students may present to nurse educators. Other student issues that may arise include not understanding certain concepts or being unable to keep up with lectures that were content saturated and PowerPoint-driven. Together, these driving forces also fuel the need for improved ways to educate nursing students and help them grasp the various concepts required for clinical reasoning, critical thinking, and decision-making at the bedside. An extensive history exists in the literature which looks at various classroom instructional methods that enhance learning such as problem-based learning (Kowalczyk, 2011), active learning (Bowles, 2006; DuHamel et al, 2011; Evans, 2011; Herbert & Lohrmann, 2011), and blended learning (Means, Toyama, Murphy, Bakia, & Jones, 2010). Each of these methods provides ways of increasing student engagement, sense of community, and academic performance, while transitioning to student-centered learning where lecture is not the capstone of the learning environment. Students who are actively engaged in the classroom with their instructor and their peers will experience greater learning (McClenney, Marti, & Adkins, 2012). Furthermore, the literature has suggested that students who experience active and collaborative learning are more engaged in the classroom and experience greater outcomes such as improved grades (McClenney et al., 2012). Recent literature has revealed a somewhat-new classroom method that is emerging as an effective way to engage students in a student-centered environment that promotes increased active learning but also continues to embrace the value and importance of faculty instruction. This new method, called the flipped classroom, allows students to watch lectures outside of the classroom and engage in active learning in the classroom (Missildine et al., 2013; Strayer, 2012); making the
most of face-to-face classroom time. To date, the body of literature has failed to demonstrate that the flipped classroom promotes academic performance and a sense of classroom community.

According to the Institute of Medicine (IOM, 2010), nursing educators are encouraged to integrate technology in the classroom. In 2014, the Horizon Report released the Higher Education Edition, which reports the emerging technologies that will most likely make a major impact on education in the next five years (Johnson, Adams Becker, Estrada, & Freeman, 2014). The new paradigm in higher education includes a shift toward online, blended, hybrid, and collaborative learning models (Johnson et al., 2014). Each of these models uses technology as the medium for information transfer (Johnson et al., 2014). The report acknowledged that this new paradigm is the fastest-growing trend in higher education and will drive changes in the coming years (Johnson et al., 2014). In 2015, the new Horizon Report was released and the support for flipped classroom was evident. In 2014, there were 27 references to flipping the classroom in the Horizon Report (Johnson et al., 2014). The 2015 Horizon Report had 46 references to the flipped classroom; furthermore, it was noted that within the next year, more than 50% of higher learning faculty may be utilizing the flipped classroom, while 29% stated that they are currently using the method effectively (Johnson et al., 2015). The flipped classroom is a model of learning where the focus of learning is on the student and not on the instructor (Johnson et al., 2014). In the flipped classroom, the work of receiving information is done outside the classroom, and time inside the classroom is spent doing activities and peer collaboration (Johnson et al., 2014). Perhaps most important is the integration of technology which makes the flipped classroom possible (Johnson et al., 2014). The flipped classroom is projected to make a major impact on higher education across the globe in one year or less (Johnson et al., 2014). The
flipped classroom model allows for the integration of new and innovative learning methods, as well as technology integration in the classroom to enhance the educational experience.

This chapter will present the reader with a background of the flipped classroom, including a literature review, while considering its value and applicability within nursing curriculum and what gaps, if any, exist within the research. In addition, this chapter will present the theoretical framework, which the researcher will utilize as a lens through to synthesize the literature and inform the research analysis. Finally, this chapter will examine the two different teaching strategy models as they relate to the theoretical framework. Furthermore, this study will determine if any differences exist between lecture and the flipped classroom, identifying the gaps in the literature to justify the importance of this research.

Theoretical Framework

Constructivism brings together two basic premises that form a philosophical perspective, which suggests that experimental learning via real life experiences helps students to construct knowledge (Dewey, 1958; Piaget, 1980). The constructivism theory applies profoundly to nursing education and the calls for transformation (Brandon & All, 2010). The constructivist model puts the student at the center of the learning where students interact with each other, and groups interact with the educator who is both facilitator and mediator (Brandon & All, 2010). This type of interactivity sets the stage for the development of a sense of classroom community (Rovai, 2002a). Each learning experience involves the student utilizing previous knowledge, which is then added to new knowledge, expanding a student’s understanding so that more complex ideas can be integrated into their frame of reference (Brandon & All, 2010). Four major assumptions make up the constructivist educational philosophy (Brandon & All, 2010). First, every student comes to the classroom with previous knowledge that they have acquired a mindset
to accept new knowledge, thus allowing the student to gather new knowledge and transform their understanding. The second assumption is that assimilation and accommodation will assist the student in making new creations. When a student is faced with an assimilation that does not fit into his or her own existing understanding, higher learning must take place through accommodation. Rote memorization of facts is not true learning and the process is much more organic with the student’s capabilities of constructing new knowledge through hypothesizing, predicting, and manipulating is more effective. The process of reflection is the final assumption that constructivists believe make teaching meaningful (Brandon & All, 2010). The theoretical concept of constructivism is what fits in nursing education as nurse educators embrace the ideas of active learning in the classroom. This fit is grounded in the literature as researchers have repeatedly demonstrated the advantages to active learning (constructivism) in the classroom performance (Bowles, 2006; DuHamel et al., 2011; Evans, 2011; Herbert & Lohrmann, 2011).

The following discussion will elaborate on how social constructivism and the building of community formulate the theoretical framework for nursing education and the current study.

**Social Constructivism**

Constructivists have proposed that students gain new knowledge through individual and social constructions based on their experiences with the world (Jonassen, 1999). Social constructivists have focused on the cultural and contextual aspect of understanding that takes place within society and the act of constructing knowledge based on this perception (Kim, 2001). Social constructivism is based on three assumptions: reality, knowledge, and learning (Kim, 2001). Reality, knowledge, and learning each take place when individuals work together, both socially and culturally, to create new realities within a social process (Kim, 2001). In consideration of the assumptions of social constructivism theory, the flipped classroom may
enhance academic performance and sense of community. Because social constructivism is limited to its own definition, it is important to further define social constructivism from a theorist perspective, which Vygotsky (1978) provided.

**Vygotsky and the Zone of Proximal Development**

Social constructivist Vygotsky (1978) suggested that children are capable of constructing their own knowledge, and that development is not something that is separated from its social context. Language and socialization play a very important role in the development of a student (Vygotsky, 1978). Vygotsky theorized that learning begins long before school ever begins for a child. Children begin learning with their very first social interaction with another human being; this process continues all the way throughout life. Vygotsky called this first social level of learning inter-psychological; however, Vygotsky suggested that eventually a child’s cultural development becomes a more individual level of intra-psychological experience based on socialization. This process of learning through social interactions with others, taking the new knowledge, and processing it within oneself is not something that goes absent in adulthood; it continues to develop lifelong. Vygotsky (1978) suggested the importance of speech and its role in higher psychological functions; therefore, speech and communication have become an important element of social constructivism and higher learning, along with social interaction. Furthermore, Vygotsky suggested that speech and practical activity come together to make up intellectual development. In addition, Vygotsky stressed that culture is an important part of every person’s nature and that culture comes together in a learning environment and impacts the process. Knowing this, an individual can extrapolate that true learning is a socially-cultural experience that involves interactions with others. Students have a biological behavior, but also have social conditions where human activity or participation takes place. To summarize,
Vygotsky suggested that all the higher psychological functions come from relationships with other human individuals.

Within Vygotsky’s (1978) theory lies the thought that there are always those who are more knowledgeable than the student, such as in higher education, where there is a professor who provides new knowledge. Every student has the capacity or ability to solve problems independently; however, Vygotsky expanded this concept with the Zone of Proximal Development (ZPD; 1978). The ZPD is the distance between a student’s capability to demonstrate understanding or comprehension with a more-knowledgeable individual, professor, or peers, and the student’s capabilities on their own (1978). In Vygotsky’s words, the ZPD is defined as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers” (Vygotsky, 1978, p. 86).

The ZPD is the opportunity where learning can take place. When considering the ZPD, it is easier to consider a child student who is faced with a daunting task or skill that seems too difficult for the child to master; however, with guidance and facilitation of a teacher, along with engagement and motivation from that teacher, who has a higher level of knowledge, the student can then begin to experience mastery with the new knowledge. This suggests that students, whether child or adult, need to have a social learning situation where teacher and student or student and peer can take place. Another theoretical concept presented by Vygotsky is that of scaffolding, which occurs when the professor provides students with a variety of opportunities where they can explore and extend their current knowledge base. In order for this to take place, the professor has to engage the students, make the new skills or tasks understandable, and provide sufficient motivation for the students (Vygotsky, 1978). In addition, scaffolding requires
skills, tasks, or new knowledge to become progressively more complex to challenge the student toward higher thinking. To summarize, the best learning experience is that which involves a student interacting socially, culturally, and verbally with other, more-knowledgeable teachers or peers within a ZPD. The student is able to gain new knowledge that was otherwise not possible on their own, each experience scaffolding a little higher to challenge the student with more complex ideas.

Vygotsky (1978) viewed peer interaction as an effective way for students to develop new skills and strategies. Peer learning in nursing education has been recognized as an excellent way to reinforce critical thinking, communication, and self-confidence (Stone, Cooper, & Cant, 2013). The nursing literature has revealed a positive correlation between peer learning and a student’s ability to reduce learning anxiety, have increased confidence, and to demonstrate competency in their new knowledge (Stone et al., 2013). The difference between Vygotsky’s (1978) theory and current nursing literature related to peer learning is in the definition of a peer. Vygotsky’s idea of a peer would be the person with greater knowledge who is capable of helping another student fill the gap within the ZPD. In nursing literature, peers are simply another student of the same age or learning level who have the same experiences or knowledge (Stone et al., 2013). This difference is important because in a learning environment where peer learning is going to take place, it is important to assign students into groups where both more-knowledgeable and less-knowledgeable students are linked together. According to Vygotskian theory, this is the best situation for learning where those with more knowledge can help those with less knowledge (Vygotsky, 1978). In every learning environment, students differ in their levels of capability and understanding; therefore, a peer with a more-skillful knowledge base and ability to apply that knowledge base can help another student that has less knowledge and
experience. Each student has the ability to do certain things by themselves; however, there are things that the student cannot do and things that a student can do with help. The idea of peer and teacher collaboration with a student is to reach them at the ZPD and provide help for those things that a student can do with assistance. With each interaction between student and teacher and student and peer, the student begins to expand and grow in understanding and knowledge.

Literature has supported the idea that social constructivism provides a theoretical framework for the support of technology in education (Agbatogun, 2012; Cicconi, 2014). Nursing education has embraced the use of clickers in the classroom, also referred to as audience response systems, and research has supported this active learning method as an effective means of engaging students and achieving positive outcomes (Maren, Bremner, & Emerson, 2010; Meedzan & Fisher, 2009). Agbatogun (2012) discovered that a significant level of improvement occurred between pretest and posttest scores among students utilizing clickers in the classroom. Agbatogun (2012) postulated that the social interaction through the ZPD is supported through technology such as clickers, because these types of technological activities encourage the kind of interaction necessary for students to be engaged and sharing amongst their peers and with their teacher. Not all researchers and educators have supported the ideas of social constructivism in the classroom. Maddux and Johnson (2010) cautioned educators to perform a more critical analysis before simply accepting the ideas of constructivism in the classroom.

To summarize, learning environments which are most effective will support the interactions and communications between peers, students, and teachers. In addition, learning environments that also support the integration of technology have the potential to increase social constructivism in the classroom and achieve more positive outcomes. This may infer that a teaching strategy model such as the flipped classroom may influence academic performance and
sense of community among nursing students, in relation to the greater amount of time spent in the classroom where students are socially interacting with one another and learning is taking place.

**Behaviorism**

The concept of teacher-centered learning is grounded in the ideas of behaviorism (Torre, Daley, Sebastian, & Elinicki, 2006). One of the main teaching strategies within a behaviorist teacher-centered classroom is the lecture. The concept of lectures began in the medieval ages when books were scarce and the only learning could be gained by sitting and listening to a lecturer read the book. Perhaps the most well-known behaviorist is Skinner (1953), who is known for his work on operant conditioning where he postulated that learning is best achieved (behavior is modified) based on precursors and consequences. Reinforcements (positive and negative), Skinner purported, were capable to modifying and changing behavior. Behavioral principles are not solely based on modifying behavior through reinforcements; behavioral objectives can be created to describe certain behaviors that are necessary or required for a particular reward (Torre et al., 2006). By creating objectives which detail performance, condition, and criteria, students can have detailed expectations of the behaviors that professors expect of them (Torre et al., 2006).

In the traditional nursing classroom, where lecture is the sole educational delivery method, behaviorism principles reign absolute and the model is teacher-centered. In addition, the classroom instruction is based upon behavioral objectives that are set forth which describe the student expectations necessary to be accomplished for a passing grade. In the flipped classroom, the same objectives are present; however, lecture and teacher-centered learning no longer reign absolute. Instead, lecture remains but is transferred outside of the classroom as a study method
for students. Students who watch the lectures before coming to class are rewarded in various ways, but most importantly, students receive positive reinforcement by participating actively inside the classroom. The concept of behaviorism is set aside once inside the classroom where constructivist ideas reign absolute and students engage in a variety of active learning strategies which promote higher complex thinking.

In 1961, Skinner stated that “to acquire behavior, the student must engage in behavior” (p. 389). Skinner reflected that a student is not simply a passive participant, but that each student must engage in the learning experience through behavior and observing behaviors. Through this experience, students gain new knowledge through positive reinforcement in the classroom for desirable behaviors and negative reinforcement for undesirable behaviors (Skinner, 1961). Sigafoos and Green (2007) stressed that Skinner was a supportive advocate for technology integration in teaching, despite the lack of computers in 1968. Skinner also suggested that embracing technology is just one way of improving teaching (Sigafoos & Green, 2007).

The ideas and concepts of behaviorism are not forgotten in the flipped classroom; rather, those ideas are added to those of constructivism to create a new and innovative type of learning that allows a variety of students who learn in many different ways to potentially experience enhanced academic performance and a sense of classroom community.

Community

In 1986, McMillan and Chavis provided both a definition and theory of sense of community. The researchers defined a sense of community as “A feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (p. 9). McMillan and Chavis argued that four elements made up a sense of community. Membership, influence,
integration and fulfillment of needs, and shared emotional connection were argued to each be essential elements working together to construct an individual’s experience of community. Each element in McMillan and Chavis’s theory of sense of community includes dynamics within and between the elements. Membership is described as an element that has boundaries, emotional safety, a sense of belonging and identification, personal investment, and a common symbol system that supports the individual’s belief that they are influential on the community.

Reinforcement describes the concept of integration and fulfillment of needs, according to McMillan and Chavis (1986), and holds that the primary function of the community is to provide reinforcement such as rewards (status, success, capability) and the fulfillment of needs. In addition, reinforcement holds that individual values are integrated into the community and that each individual is capable of meeting their own needs while meeting those of others. The final element of community encompasses a shared emotional connection, where positive ways to interact are found, important events are shared, and problems are solved together in a positive manner. Furthermore, those individuals experiencing community through a shared emotional connection honor members, invest in the community, and experience a spiritual bond among the members. Each of these elements and their attributes work together providing the proper dynamics for an individual to experience a sense of community (McMillan & Chavis, 1986).

McMillan and Chavis (1986) explored sense of community as it relates to communities and neighborhoods; however, the authors supported that their findings are equally applicable to neighborhoods and to communities such as professional organizations or groups. While exploring psychological sense of community (real and ideal), Glynn (1981) found that there existed a positive relationship between an individual’s sense of community and his or her ability
to capably function within the community. Sense of community was perceived as a powerful force (McMillan & Chavis, 1986).

Rovai (2002a) acknowledged this powerful force and using the definition of sense of community, built by McMillan and Chavis (1986). Rovai further explored a sense of community as it relates to the classroom and impacts students. Rovai shared that classroom community can be fundamentally defined by four components: cohesion, spirit, trust, and interdependence. Spirit, according to Rovai (2002b) has the capability to reduce dropouts, improve satisfaction, and improve learning. The idea of spirit suggests that students in a community enjoy the friendships, cohesiveness, and bonds through which challenges, motivations, and a sense of connection grow (Rovai, 2002b). The element of spirit, when not present, has the potential to create the opposite effect of feelings of isolation, low self-esteem, loneliness, and students giving up and dropping out because they no longer feel important or connected (Rovai, 2002b). Another element, trust, is equally important as students begin to rely on one another in the community and embrace concepts of credibility and benevolence within the learning environment community.

Perhaps the most poignant aspect of trust is best described as cognitive dissonance. Cognitive dissonance occurs when there is an inconsistency between what an individual believes or in the knowledge or opinions that the individual holds (Festinger, 1957). When this type of cognitive dissonance occurs, it creates a type of psychological stress for students (Festinger, 1957). Rovai (2002b) suggested that the element of trust in the classroom allows students to explore their own cognitive dissonance in a safe environment where it is acceptable among members to be vulnerable and not always know the right answer or make mistakes in trying to find the answers. Feelings of connectedness, cohesion, and interdependence are formed when
members of a group begin to have strong feelings about the community, along with a sense of belonging where active participation within the group has the potential of reaping benefits for the student while satisfying their needs (Rovai, 2002a).

Rovai (2002a) suggested that a sense of classroom community equates to two identifiable traits: connectedness and learning. Connectedness encompasses the feelings of being connected, having cohesion, spirit, trust, and interdependence (Rovai, 2002a). Learning encompasses the feelings of those members within the community as it relates to their interactions with one another, while constructing knowledge and sharing beliefs and values within their educational goals (Rovai, 2002a).

While the majority of Rovai’s (2002a; 2002b; 2004) work has concentrated on sense of community and distance learning, the author acknowledged that sense of community exists in traditional classrooms and is viewed as more robust because of the interaction and face-to-face element. Rovai (2002b) shared that building a sense of community at a distance is possible when the course design promotes the right elements, including spirit, trust, interaction, and learning. Rovai and Jordan (2004) found that when comparing traditional classrooms, fully-online classrooms, and those classrooms that were blended with some online and some face-to-face, that blended classrooms had a significantly stronger sense of community. The flipped classroom is often referred to as a blended learning model (Burns, 2014; Perez, 2014) because it contains elements of online learning such as video lectures that students watch online and then classroom face-to-face time to explore the new knowledge through active learning exercises. Rovai and Jordan (2004) postulated that when students engage in environments that are blended with some online and some face-to-face experiences, students are able to engage with one another and with the instructor, providing greater socialization, stronger connections, more knowledge
construction through social dialogue, and a stronger sense that the overall purpose of being part of the community is being met such, as academic goals being achieved. Rovai (2002a) further postulated that research supports the idea that a strong sense of classroom community may have the ability to positively impact student academic performance. By integrating Rovai’s elements for a sense of community into the theoretical framework, the flipped classroom framework becomes complete (See Figure 2).

**Academic Performance and Sense of Classroom Community**

As the current researcher reviewed the dependent variables in this study—academic performance and sense of classroom community—the researcher utilized the theoretical framework (see Figure 2) to guide this study. Furthermore, this study was grounded in Vygotsky’s (1978) social-constructivism theory, which provided the theoretical framework that helped to explain why a learning environment that is based upon a model where the classroom is dedicated to social interaction and student engagement could create positive outcomes both academically and within the critical thinking spectrum. In addition, this research was also grounded in the concept of behaviorism and the need for learning outcomes and the relaying of information via lecture to students. The final foundation that supported this research was the building of communities in the classroom and the importance of a sense of community for students.
Past studies have grounded themselves within Vygotsky’s (1978) theory that students learn more effectively when working collaboratively through dialogue and activities. These studies have presented that students using these methods have higher academic performance (Malik et al., 2013; Yang & Wu, 2012). Kim, Sharma, Land, and Furlong (2013) shared that active learning strategies must engage the students to perform higher order thinking such as analysis, evaluation, and synthesis. Furthermore, these activities need to be performed in collaboration with peers, stressing dialogue, scaffolding, and social interaction (Kim et al., 2013).

Wighting (2006) explored the effects of computer use on high school students’ sense of community. Wighting reported that using computers within the classroom may add to a sense of classroom community. Furthermore, the author suggested that a sense of classroom community may be linked to academic success (Wighting, 2006). Tayebnik and Puteh (2012) explored the effects of creating a blended course with both online work and face-to-face components, revealing that students had a high satisfaction with this blended experience because it promoted
their sense of community. Springer (n.d.) explored survey data from 2002 and suggested that there appeared to be a connection between sense of community and both learning outcomes and retention among student students. Wighting (2011) found that when measuring sense of community and perceived learning among alternative licensure candidates, there was a positive low correlation. To demonstrate whether a sense of community and academic achievement were correlated, Wighting, Nisbet, and Spaulding (2009) explored a comparison of high school students and determined that there was a statistically-significant correlation. Foli, Karagory, Gibson, and Kirkpatrick (2013) explored the development of a sense of community among baccalaureate nursing students and revealed that nursing students are heavily influenced by their early courses, the faculty, and their peers when it comes to developing a sense of community.

In 1958, Dewey brought together both ideas of constructivism and community, describing a learning environment where the instructor is not a dictator but a leader. Furthermore, Dewey suggested that it was necessary to survey the students for capacities and needs, making the right conditions to satisfy their needs. In addition, Dewey envisioned that students and teachers shared in the learning through collaboration, something Rovai (2002a) might have perceived as membership. Dewey (1958) viewed education as a social process and states that “this quality [social process] is realized in the degree in which individuals form a community group” (p. 65). Dewey insisted that excluding the teacher from membership in this most important group is detrimental because the instructor has the ability to facilitate interactions and communications to be productive, promoting the group as a community of learning.

However, a number of researchers have suggested that active learning, which is the capstone of collaborative and peer learning, is not associated with student learning (Andrews, Leonard, Colgrove, & Kalinowski, 2011). Jackson and Mathews (2011) found that active
learning activities, while capable of promoting learning, can quickly turn into a negative experience, causing the opposite to occur. The authors suggested that the teacher has a great influence on the success of the active learning strategies and that understanding how to interact with a class is essential for positive results (Jackson & Mathews, 2011). This difference in findings suggested that continuing to study Vygotsky’s (1978) theory in relation to various teaching models is needed. On the other hand, the literature has leaned more heavily toward supporting Vygotsky’s theory and the concepts of active learning and the engagement of students with their instructors and among their peers. To date, no studies have refuted the concept of community as being beneficial in the classroom.

With Vygotsky’s (1978) theory and the concept of building community as a guide, the current study looked at how two teaching strategy models—lecture and flipped classroom—may differ in their ability to impact academic performance and sense of community. This study aimed to add to the already profound body of literature on best teaching models based on empirical research while filling the gap in both nursing education and higher learning as it relates to the flipped classroom.

**Nursing Education and the Call for Transformation**

**Nursing Education**

Bellack (2008), the associate editor of the Journal of Nursing Education, wrote an editorial which acknowledged how nurse educators fail to let go of the rock but instead hold onto the “how we’ve always done it” attitude and refuse to try new and innovative things in the classroom. In this editorial plea, Bellack asked nurse educators to consider a student-centered model, which focuses on the student’s preferences in the classroom, engaging nursing students, and meeting learning needs.
The nursing classroom is no stranger to the concept of active learning. It has been suggested that nursing students who utilize rote memorization and regurgitation of information simply know something about nursing (Bowles, 2006). Those students who engage in the classroom through a variety of activities in lieu of constant lectures know about something much deeper, allowing for the synthesis of new nursing content and subsequently, clinical reasoning (Bowles, 2006). Multiple studies have suggested that active learning in nursing and healthcare programs enhances clinical reasoning and improves students overall performance (DuHamel et al., 2011; Evans, 2011; Pepper, 2010; Royse & Newton, 2007). Multiple authors have written that active learning in the classroom is essential to keeping students engaged and interested in the material which enhances understanding and eventual critical thinking, clinical reasoning, or problem solving (Bastable, 2008; Billings & Halstead, 2012; Bonwell & Eison, 1991; Chickering & Gamson, 1987).

While active learning is prominent in the nursing education community as a teaching strategy model, it would be sensible to suggest that the flipped classroom is another way to promote active learning and allow more time for it in the classroom. A review of the literature is needed to ensure that nursing educators are choosing the right learning activities to engage students and promote a caring atmosphere. Furthermore, students need to learn in an environment that excites them about the new material as they begin to synthesize at a higher level of understanding. Stanley and Dougherty (2010) acknowledged the need for a paradigm shift in nursing education, and encouraged educators to let go of the ideas of content-laden classrooms and embrace the ideas put forth by Benner and colleagues (2010). Handwerker (2012) supported the ideas of Stanley and Dougherty (2010) regarding identifying the various changes that have taken place within curriculum status after Benner’s work (Benner et al., 2010).
Handwerker (2012) suggested that a thorough understanding of the roles of behaviorism and constructivism in nursing education is necessary. In addition, educators need to reevaluate the overused behaviorist pedagogy and begin utilizing more constructivist pedagogies (Handwerker, 2012). Ultimately, if active learning is going to be successful in the classroom and perhaps even in a flipped classroom model, educators must be capable of developing consistent higher-order learning activities while helping students to identify their strengths and weaknesses in their own learning (White et al., 2014).

**Drivers for Change**

For years, nursing education was teacher-focused, holding strong to ideas of content-laden curriculum and lecture with rote memorization. In 1988, the National League for Nursing acknowledged the problems within nursing education, and called for a complete overhaul of the educational paradigm including educators letting go of the long lectures saturated with content (Diekelmann, 1988). In 2003, the National League for Nursing came forward in a position statement, which shared that educators were attempting to make change happen through innovation, but were failing to truly create a paradigm shift that was much needed in nursing. The position statement called for dramatic reform and innovation, challenging educators to question their current paradigms and implement new and innovative models in teaching strategy (National League for Nursing, 2003). With a focus on seeing change occur in nursing education, and perplexed by the lack of true paradigmatic change, the Future of Nursing initiative was created with the assistance of the Institute of Medicine and the Robert Wood Johnson Foundation. These organizations were determined to explore via three national forums: what these programs teach nursing students, how they teach nursing students, and where they are taught (IOM, 2010).
The Call for Transformation

In 2010, the idea of transformation within healthcare and in nursing education emerged with reports from The Carnegie Foundation for the Advancement of Teaching (Benner et al.) and the Institute of Medicine. Nursing education is in need of a transformation that includes the integration of new innovative ways of teaching in the classroom that bridges the practice-education gap (Benner et al., 2010). Nursing educators need to become inspired to try new ideas in the classroom that engage students to reach to higher levels of understanding. Nursing education must be integrative and focused on the student’s ability to perform clinical reasoning with a variety of ways of working through problems, including the ability to use critical thinking (Benner et al., 2010). Interprofessional collaboration must be a major focus of nursing education, encouraging the sharing of different nursing perspectives among healthcare colleagues (IOM, 2010).

The Institute of Medicine (2010a) called for nurse educators to become lifelong students and encouraged the practice of cutting-edge capability in all areas, including teaching. At the same time, the IOM (2010a) report also called for 80% of all RN to be educated at the baccalaureate level by 2020. A push for this kind of transformation calls for nursing schools to make the shift from associate level to baccalaureate level at a fast pace. In addition, the hiring of qualified teachers is necessary for the baccalaureate programs amidst a constant nursing educator shortage. Such fast pace change carries the risk of losing the nursing student in the transition. Creativity and innovation in the classroom requires time and attention to current curriculum at a time when future curriculum makes its demands to meet the IOM call.

Since the call for transformation was released in 2010, the literature has been saturated with new ideas and innovations to change the paradigm of nursing. A plethora of literature has
been generated about the advantages of simulation in nursing education (Norman, 2012). Research has begun to focus on interprofessional education (Abu-Rish et al., 2012). Literature is exploring various technologies in the classroom to determine how we can better engage students (Broussard, 2012). New explorations of strength-based nursing (Gottlieb, 2013) and concept-based curriculums (Giddens, Wright, & Gray, 2012) are on the rise. Implementation of new ideas such as “reflection, questioning, discussion, coaching, role modeling, apprenticeship, project-based learning, narrative, and scaffolding” (p. 10) are all constructivist ideas encouraged by Benner in the call for transformation (Handwerker, 2012) and have been seen emerging in the nursing education literature. Furthermore, ideas such as unfolding case studies (West, Usher, & Delaney, 2012) and activities that require students to become engaged and collaborative in the learning environment are encouraged in the classroom (Handwerker, 2012).

**Nursing Education and Technology**

The concept of nursing and technology is developing a presence in the literature. Perhaps the most prominent research is related to clickers or audience response systems and simulation with human patient simulators. Clickers in nursing education have been found to be effective in engaging students, promoting learning, and encouraging a socially-constructive environment where interaction occurs and collaboration is the result (Filer, 2010; Marenco et al., 2010; Meedzan & Fisher, 2009). Filer (2010) agreed that the clickers enhance a students’ emotional experience and gives them a sense of comfort, while encouraging their participation and motivation in the classroom; however, Filer did not find a statistically-significant difference in mean quiz scores when implementing clickers as opposed to no clickers. Despite some of the differences in research findings related to nursing technologies in the classroom, Jones and Wolf (2010) suggested that teaching learning methods need to appeal to student students’ cyber senses.
The authors suggested that today’s students are culturally engrained with technology in their lives (Jones & Wolf, 2010). For example, students who participated in classroom experiences with various types of podcasts experienced higher scores on multiple-choice exams and case study assessments as compared to those in lecture courses, suggesting that podcasts provided a student tendency toward deeper understanding of lecture content (Abate, 2013). Ultimately, nursing educators cannot ignore statistics which demonstrate that 53% of nursing schools are using Web 2.0 tools in their curricula and 37% of nursing students are using these tools personally (Lemley & Burnham, 2009). Furthermore, authors have noted that even more schools of nursing are planning on implementing Web 2.0 tool in the curricula in the future (Lemley & Burnham, 2009). Podcasts were among the highest Web 2.0 tools to be considered for implementation (Lemley & Burnham, 2009), possibly suggesting that students in nursing want to have lectures readily available outside of the classroom. While the statistics are very appealing, other researchers have found that while clickers have a positive response from students and students prefer the use of technology in the classroom, podcasts have demonstrated a mixed result (Montenery et al., 2013).

The question is whether the concept of the flipped classroom meets the call of both the Carnegie Foundation study (Benner et al., 2010) and the IOM reports (2010; 2010a). As previously stated, a thorough review of the literature is needed if nurse educators are to make informed decisions about the paradigm shift that will impact the curriculum and programmatic outcomes. In addition, a review of the literature would assist in identifying gaps within the literature.
The Flipped Classroom

Historical Underpinnings

Lage et al. (2000) published work on inverting the classroom, which revealed a teaching method very similar to what many refer to today as the flipped classroom. Lage et al. found that by removing lectures from the classroom and using classroom time for activities that promote higher levels of learning, the instructor has the ability to engage a wide spectrum of students and appeal to a wide variety of learning styles. In addition, the authors learned that students prefer the inverted method over traditional classroom lecture methods (Lage et al., 2000). Lage and colleagues are viewed by many as having coined the phrase inverted learning, also now known as the flipped classroom.

Prior to Lage et al., other researchers had advocated for moving knowledge acquisition outside of the classroom and knowledge assimilation inside the classroom (Mazur, 1997). In addition, King (1993) wrote about the transformation from a “sage on the stage” to a “guide on the side.” King’s article transformed how educators viewed themselves in the classroom and encouraged educators to let go of podium-style lecturing and begin interacting with students through a variety of activities that engaged students and encouraged higher order thinking.

Flipping Education Upside Down

Bergmann and Sams (2012), two science instructors in Colorado, created perhaps the most influential research toward getting the flipped classroom idea to take hold. The two instructors encountered what many rural instructors experience, which is high absenteeism because of the distance to school (Bergman & Sams, 2012). In addition, many students were struggling with science classes and asking for additional help. Sams first found an interesting article on taking a PowerPoint slide, with video and audio, and turning it into a presentation.
Sams then shared this information with Bergmann, his fellow science instructor; together, the two began making science lectures and posting them online for students who missed class or needed extra help. Both instructors admitted that this decision came about because the demands on their time were beginning to exceed their availability, and they needed some way to reach students.

Because Bergmann and Sams (2012) posted their videos online, many viewers outside of their own students began to watch the videos and were intrigued with the idea of creating video lectures. Sams formed the idea that if they created the lectures and had students watch them outside of class, time would be available during class to provide the help that students need and cannot get at home while doing traditional homework. In other words, students would watch lecture at home and take notes then come to class and participate in a variety of homework type activities while the instructors are available to assist them. From the actions of two high school teachers, the flipped classroom grew exponentially in K-12 learning and eventually higher learning (Bergmann & Sams, 2012).

Before implementing the flipped classroom, Bergmann and Sams (2012) were already supporters of active learning in the classroom and did not spend the majority of their teaching doing lectures. Furthermore, both authors agreed that they were not the first to use screencast technology to teach students, but they were certainly among the pioneers to embrace the idea that a new way of teaching was emerging and were not afraid to try something innovative. Ultimately, Bergmann and Sams discovered that students in the flipped classroom perform better than students in the traditional classroom in exam scores (2012), yet no empirical literature has supported their claims.
The journey was not without difficulties, including technology issues, additional time for planning and implementing, and student issues. One serious problem the authors encountered was that students were learning for the test and were not mastering the content. The authors set out to recreate the flipped classroom into a flipped-mastery model that allows students to work at their own pace (Bergmann & Sams, 2012). According to the authors, “Flipping the classroom is more about a mindset: redirecting attention away from the teacher and putting attention on the student and the learning” (Bergmann & Sams, 2012, p. 10). The goal is personalized learning for the student and facilitation by the teacher with outcomes being met and mastered. In 2012, Bergmann and Sams published a book detailing the flipped classroom, the flipped-mastery model, struggles, victories, and instruction on how to flip a class. The flipped classroom by Bergmann and Sams was created for the K-12 classroom and the high school classroom. In recent years, both authors have been asked to present their classroom framework at a variety of colleges, suggesting that the flipped classroom is broadening horizons into higher learning.

**The F-L-I-P model**

As a result of their work, Sams and Bergmann started a not-for-profit organization, the Flipped Learning Network (FLN) to help educators implement a successful flipped classroom (Hamdan et al., 2013). The FLN defines flipped learning as a model where teachers change the direction of the learning from the classroom where large groups learn together, into the student’s home as an individual learning space (Hamdan et al., 2013). To implement such a strategy, technologies are integrated as a way of moving lectures outside the classroom (Hamdan et al., 2013). While the flipped classroom is often compared to online learning or blended learning, Hamdan and colleagues (2013) stressed that there are specific differences. Hamdan et al. provided the four pillars of flipped learning as a model. The authors acknowledged that every
flipped classroom will have differences; however, the model sets forth a clear methodology with a set of rules to guide the flipped classroom (Hamdan et al., 2013).

The four pillars of F-L-I-P include flexible environment, learning culture, intentional content, and professional educator (Hamdan et al., 2013). Flipped classrooms must be flexible environments where organized chaos is acceptable and students can guide the learning while educators assess learning (Hamdan et al., 2013). Flipped classrooms require a shift in learning culture, where the teacher no longer is at the podium delivering a scripted lecture; rather, the classroom is a place where students work at their own pace and within their zone of proximal development (Vygotsky, 1978 as cited in Hamdan et al., 2013). In addition, the flipped classroom requires intentional content that is determined by what needs to be delivered outside the classroom (i.e., video lecture) and what needs to be explored in the classroom through various activities (Hamdan et al., 2013). Furthermore, the flipped classroom requires professional educators who are comfortable with the idea of teaching “on the fly,” integrating technology to enhance learning, and making important decisions based on the students’ needs (Hamdan et al., 2013). The biggest challenge of the flipped classroom is not whether this model should be used, but whether this model would enhance instruction for the students (Hamdan et al., 2013). Implementing the flipped classroom just for the sake of being innovative and integrating technology does not best serve the student.

**Higher Learning**

The flipped classroom model is making its way into higher learning, and advantageous benefits have been noted, including more time in engaging classroom experiences (Milman, 2012). While the flipped classroom made its greatest appearance in K-12 learning, the empirical literature is more heavily engrained in higher learning, perhaps related to the need for
scholarship within academia. Most learning technology trends begin first in higher education and are eventually applied to K-12 learning (Johnson et al., 2014). In the case of the flipped classroom, the reverse is true, and very little empirical data exists for this method (Missildine et al., 2013; Strayer, 2012). There are challenges that exist with the flipped classroom, including the concept that students are not able to ask questions and engage with the lecture material as they are listening to the videos (Milman, 2012). On the other hand, empirical data has suggested that students utilize the videos repeatedly (Moravec et al., 2010). It is possible that listening to videos repeatedly, taking notes, and going over areas the student views as a weakness is instrumental to flipped classroom success. Despite these challenges and the lack of empirical research to support its use, the flipped classroom can be an added benefit among teaching models at any level of education (Milman, 2012). The flipped classroom is expected to impact higher education on a global level over the next year (Johnson et al., 2014) and adding to the empirical data is imperative.

**Review of Literature**

Although recently brought to the forefront in K-12 education by Bergmann and Sams (2012), the flipped classroom concept has been around for more than 30 years (Missildine et al., 2013). The topic of flipping the classroom is not exclusive to the K-12 learning environment; it has permeated through educational organizations and higher education (Hamdan et al., 2013). There is very minimal empirical literature in the K-12 arena, but considerably more in the higher learning arena. This disparity may be due to the need for scholarship among many universities in higher learning. The literature in nursing related to the flipped classroom is minimal at best (Missildine et al., 2013).
To complete this literature review, the researcher searched Academic Search Premier using the terms *flipped classroom*, *inverted classroom*, and *flipped or inverted classroom and nursing*. The original search returned 303 articles in which 32 included the terms related to the search. Over the course of 2 years, the researcher reviewed a plethora of articles, along with the original 32 articles. The researcher used Google Scholar Alerts to stay informed of current literature and to provide notification of any new empirical literature related to flipping the classroom. Many of the articles retrieved were not true experimental research related; rather, each article discussed various aspects of the flipped classroom, its applicability in K-12 learning, and a better understanding on what exactly the concept is all about, including benefits, disadvantages, trends, and gaps in the literature. Numerous articles were located, which provide experimental studies, both qualitative and quantitative, which shed some light on whether this pedagogical concept is useful in curriculum. In addition, six articles were found which provide surveys or polls, which provide a clearer picture of the academic community’s response to flipped classrooms. This concept is still in its research infancy and more investigation is needed; however, a close look at the literature thus far is imperative if the nursing community intends to utilize this method in nursing programs. Table 1 provides readers with a summary of the benefits, challenges, and faculty experiences related to the flipped classroom as revealed through a search of the literature.
### Table 1

**Literature Review Flipped Classroom**

<table>
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<tr>
<th>Benefits</th>
<th>Challenges</th>
<th>Faculty Experiences</th>
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<tr>
<td>Improved Academic Performance</td>
<td>Student Resistance</td>
<td>Positive Experience</td>
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<td>Improved Student Satisfaction</td>
<td>Student Preparedness</td>
<td>More Time with Students</td>
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<td>Increased Attendance</td>
<td>Student Responsibility</td>
<td>Faculty Satisfaction</td>
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<tr>
<td>Reduced Discipline Issues</td>
<td>Student Dissatisfaction</td>
<td>Greater Student Insight</td>
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<td>Positive Experience</td>
<td>Student Confusion</td>
<td>Individualized Instruction</td>
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<td>Greater Engagement</td>
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<td>Technology Challenges</td>
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<td>More Responsible for Learning</td>
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<td>Stress/Anxiety</td>
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<td>Value in Learning</td>
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<td>Heavy Workloads</td>
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<td>Moving at Student’s Pace</td>
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<td>Technological Resources</td>
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<td>Increased Cooperation</td>
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<td>Less Failure Rates</td>
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<td>Prefer the Flipped Classroom</td>
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**Benefits**

Implementation of the flipped classroom has made a major impact in education in recent years, both in K-12 education and higher learning. Thus far, many benefits are evident in the empirical literature including improved academic performance (Berrett, 2012; Flumerfelt & Green, 2013; Fulton, 2012a; Pierce & Fox, 2012; Prober & Heath, 2012; Wilson, 2013), improved student satisfaction (Herreid & Schiller, 2013; Pierce & Fox, 2012; Survey, 2012), increased attendance (Prober & Heath, 2012), and reduced discipline issues (Flumerfelt & Green, 2013). Research has found that both faculty and students are experiencing overwhelmingly positive responses to the flipped classroom (Critz & Knight, 2013). Faculty have found that students are more engaged in the classroom and take greater responsibility for their learning (Critz & Knight, 2013). In addition, students have found that the flipped classroom experience allows them to take charge of their learning and that their experiences in class were valuable to their learning (Critz & Knight, 2013).

The flipped classroom provides an opportunity for students to move at a pace that is their own (Fulton, 2012). It is possible that this independent learning (Fulton, 2012) may be the reason why some researchers are seeing success rates increased by 11% and failure rates reducing by as much as 33% (Flumerfelt & Green, 2013). Students are more cooperative and innovative with each other (Strayer, 2012), and discipline issues have been seen to reduce by as much as 66% (Flumerfelt & Green, 2013). Students have been cited as wishing that other instructors would consider using the flipped classroom method (Pierce & Fox, 2012). These same students have experienced statistically-significant improvement in academic performance with the flipped classroom method (Pierce & Fox, 2012). This has indicated that students appreciate the opportunities that the flipped classroom affords, such as video lectures, which can be watched at
the student’s leisure and repeated as necessary. Even more so, students appreciate when a classroom experience is not just engaging but improves their grades. Student satisfaction may be related to the fact that students have seen grades with a statistical significance of 6.73 points higher ($p < 0.01$; Wilson, 2013). The flipped classroom, a student-centered learning experience, promotes improved academic performance (Ferreri & O’Connor, 2013). However, the transition to a flipped classroom, while providing rewarding benefits such as grade improvement, can also create more work for the instructor. Research has supported the idea that the first year a course is flipped, the workload does increase; however, in subsequent teachings of the course, the workload remains the same as that of traditional classrooms (Ferreri & O’Connor, 2013).

With the flipped classroom, students are given opportunities to think in and out of the classroom (Herreid & Schiller, 2013) and gains have been suggested to be as much as twice of those educated with traditional classrooms (Berrett, 2012). With significant results demonstrating increased attendance by as much as 50% (Prober & Heath, 2012), this alone may explain why students have demonstrated improved test scores (Prober & Heath, 2012). When students are engaged in the learning environment with active learning, opportunities arise for students to experience a social constructivism approach where information is not simply delivered to the student but it is experienced through video lectures, peer interaction, and faculty interaction.

In nursing education, active learning is being brought to the classroom; however, the flipped classroom allows for a greater amount of time to be devoted to those active learning activities, which allow for dialogue and scaffolding taking place in a social constructivist atmosphere. The end result thus far has been improved academic performance (Berrett, 2012; Flumerfelt & Green, 2013; Fulton, 2012a; Pierce & Fox, 2012; Prober & Heath, 2012; Wilson, 2013), improved student satisfaction (Herreid & Schiller, 2013; Pierce & Fox, 2012; Survey,
2012), increased attendance (Prober & Heath, 2012), and reduced discipline issues (Flumerfelt & Green, 2013).

**Challenges**

While the flipped classroom literature has been seen as a compelling case for the innovative teaching strategy model, there are some challenges that the literature has noted. Among those challenges are issues such as student resistance, student preparedness, student responsibility, student dissatisfaction, and student confusion with the new method. Finding ways to overcome the challenges is an issue for administrators and faculty who desire to bring best practices into the classroom.

The flipped classroom requires a student to adapt to a new way of learning. Instead of the lecture format, where the student is a passive partner in the educational experience, the flipped classroom requires the student to become engaged in the learning process. Students experiencing this new way of learning may resist the cognitive demands that such a method requires (Herreid & Schiller, 2013). A method such as the flipped classroom no longer requires hours of tedious homework, but it does require the student to watch the video lecture before coming to the classroom. In addition, the classroom experience is no longer passive and requires the student to become engaged while sharing with other students their own knowledge and experiences. This type of learning may give students the perception of a greater demand on students and increased responsibility that students often view as unfair (Wilson, 2013). Students hold onto the concept that they are paying for their education and they want to be taught in the classroom, and not instructed on how to learn outside the classroom (Wilson, 2013).

The empirical literature has supported the idea that the flipped classroom increases student satisfaction; however, not all researchers have found this to be true. Nursing students in
an adult health education class experienced improved academic performance, but they were not satisfied with their flipped classroom learning experience (Missildine et al., 2013). Another group of nursing students were studied qualitatively; the participants revealed that the flipped classroom experience left them feeling confused about their learning outcomes and what to expect from the classroom (Strayer, 2012). Fortunately, researchers and educators have supported the idea that the risks, such as dissatisfaction, do not outweigh the benefits, such as improved academic performance (Benner et al., 2010; Berrett, 2012). Students must trust that educators are employing the best practices which are evidence-based and found to achieve the best outcomes. Furthermore, educators must be willing to take the risks to experience the benefits and help the students.

Taking risks in the classroom, such as employing the flipped classroom early in its infancy, is likely to bring about speculation. Tucker (2012) stated that the educational venue tends to be gravitated toward fads that come and go within the field. Furthermore, Tucker (2012) suggested that one of the greatest challenges of the flipped classroom is determining whether this new classroom method is simply a fad that will find its way into the field and quickly dissipate. In addition, there is a vast amount of classroom techniques and technologies that may be employed when flipping a classroom. Only future experiences in the classroom and empirical research can reveal what methods are effective and whether flipping the classroom is an empirically proven effective method (Tucker, 2012). Providing additional research that explores the flipped classroom in nursing will aid in dispelling this possibility of a fad and provide further clarification of what flipping the classroom entails and what chosen techniques and technologies are effective.
Faculty Experiences

As faculty step forward to employ a new teaching strategy model with the hopes of improving student outcomes, issues are likely to arise. The literature can reveal some of those issues and allow for advance planning and preparation in implementation. Furthermore, the literature can assist faculty in better understanding the new teaching strategy model and how to be successful in the implementation process.

Common complaints of the nursing instruction industry include heavy workloads, not enough time to get work done, and frustration over classroom methodologies that are not achieving the outcomes such as passing classroom grades, standardized exam benchmarks, and positive outcomes on competencies. Literature has supported the idea that faculty desire more time to spend with their students (Herreid & Schiller, 2013). The flipped classroom has provided faculty with the desired additional time to spend with students and achieved a level of satisfaction among faculty (Herreid & Schiller, 2013). Furthermore, the flipped classroom also frees up class time so that instructors have the opportunity to question student understanding, explore any confusion, and clear up any misconceptions (Tucker, 2012). By employing the flipped classroom method, instructors find themselves involved in a learning environment where teachers have better insight into students because they have the opportunity to observe the student in the actual learning environment (Fulton, 2012).

Because the flipped classroom is student-centered and allows for this type of learning environment, faculty are able to easily update and adapt curriculum to meet the needs of individual students (Fulton, 2012). While the literature creates a positive outlook for the flipped classroom among faculty, the realities of the challenges which faculty must deal with cannot be ignored. Perhaps the greatest challenge for faculty is the technology dilemma. This dilemma
occurs when faculty must find and navigate the software for recording class lectures and materials with the students, who must have computer access to participate in the learning environment.

**Technology stress.** Teachers have reported experiencing stress and anxiety when faced with new technologies. This stress and anxiety arises from the fast technological and methodological changes in nursing education, workloads that are increasing because of a nurse educator shortage, and the demands by administration to deliver curriculum in a non-traditional manner (Burke, 2009). Flipping the classroom requires faculty to acquire and navigate software to create videos which can be viewed outside the classroom before coming to class. Faculty and technology struggle to get along (Tucker, 2012) and it takes much preparation, training, and education for a faculty member to become comfortable making the change in the classroom from lecture to a flipped classroom (Bergmann & Sams, 2012; Tucker, 2012). Finding and then navigating software is difficult and faculty struggle to meet the demands (Herreid & Schiller, 2013).

**Heavy workloads.** In a role that already experiences a heavy workload with demands for students who perform at a higher level, increased content delivery, and not enough time to get the job done (Tucker, 2012), flipping the classroom may be viewed as too much work with very little to show in improved outcomes. Furthermore, as a new method of instruction is employed, new issues arise such as how to deal with the student who fails to watch the videos and comes to class unprepared (Herreid & Schiller, 2013). When faced with the daunting demands, the technology stress, and the potential new problems to face, it is understandable that faculty may not embrace a new classroom method such as the flipped classroom. As stated earlier, research has begun to dispel some of these arguments by suggesting that while the first time
implementing and flipping a class is an increased workload, subsequent teachings using the same method are no greater a workload than traditional means (Ferreri & O’Connor, 2013).

**Technology access.** Another technological concern aside from that of faculty experience is computer access, which is necessary to flip the classroom. Many schools are in a socio-economic area where many students do not have computer access or Internet access at home (Butrymowicz, 2012). Fortunately for many colleges, students have the expectation that Internet access with a computer is a necessary part of the program; therefore, either the student must have their own access or be willing to use those provided by the college. On the other hand, a responsibility does exist with the faculty member to ensure that every student has access to the available technologies utilized for the classroom. Twenty-five years ago, having computers in a classroom with technology integration would have been very unusual. Those schools that had such technology integration were among the privileged and fortunate (Ennis & Gambrell, 2010). In today’s classroom, it is commonplace for classrooms to have computers and for students to have their very own technology such as smart phones and tablets. Today, it is the expectation that technology will be integrated in the classrooms (IOM, 2010).

**Active Flipping**

Active learning was described earlier as providing part of the structure for a flipped classroom. Active learning is defined as the student who is reading, writing, discussing, and engaging at the levels of analysis, synthesis, and evaluation as they go about solving problems (Bonwell & Eison, 1991). This includes activities such as case studies, concept mapping, interactive games or clickers, discussion, one-minute papers, think-pair-share, and problem-based learning (Billings & Halstead, 2012; Caputi, 2010). The flipped classroom is defined as a reverse classroom learning environment where lecture is delivered outside of the classroom in a
video lecture format, while inside the classroom students are almost 100% participatory with collaborative active learning exercises (Missildine et al., 2013; Strayer, 2012). When exploring the definitions of each of these concepts, it is clear that active learning is a supporting structure for the flipped classroom, considering that entire classroom experiences are built around active learning experiences. There is a plethora of literature related to the concept of active learning, which provides indirect support for the utilization of the flipped classroom model.

Previously, researchers stated that active learning in the classroom involves a variety of activities, many of them collaborative in nature. These collaborative activities require a social constructivist’s classroom (Bowles, 2006; DuHamel et al., 2011; Evans, 2011; Herbert & Lohrmann, 2011). Case studies, concept mapping, interactive games or clickers, discussion, one-minute papers, think-pair-share, and problem-based learning are all collaborative activities that nursing experts (Billings & Halstead, 2012; Caputi, 2010) have used to provide the essential active learning component in the classroom. Activities such as think-pair-share, discussion, concept mapping, audience response systems (clickers), and case studies have been found to be some of the best practices that research supports as active learning methods that produce positive outcomes such as student satisfaction, improving critical thinking, and academic performance (Bowles, 2006; Chan, 2013; DuHamel et al., 2011; Evans, 2011; Herbert & Lohrmann, 2011; Mangena & Chabeli, 2005).

Feingold et al. (2008) found that nursing students with active learning experiences in the classroom, such as team-based learning, experienced greater classroom engagement. Billings and Halstead (2012) provided strong support for the idea that student engagement is best achieved when students experience active learning in the classroom. The literature has provided further
evidence that active learning has a positive influence on both student engagement and academic performance (Bowles, 2006; DuHamel et al., 2011; Evans, 2011; Herbert & Lohrmann, 2011).

The flipped classroom is composed of active learning activities that have evidential support of positive outcomes that occur when students are engaged in a social constructivist learning environment. Nursing educators are charged with the responsibility to select evidence-based pedagogies in the classroom that provide for best practices and outcomes. Nursing education is slowly embracing the concept of active learning, but remains slow to let go of old pedagogies such as the lecture model of teaching. Perhaps as more literature is available which explore new pedagogies such as the flipped classroom, educators will have more evidence to support being agents of change.

**Significance**

The flipped classroom has scarcely been explored among nursing students (Missildine et al., 2013; Strayer, 2012), but the empirical evidence that does exist in relation to K-12 (Bergmann & Sams, 2012; Berrett, 2012; Flumerfelt & Green, 2013; Herreid and Schiller, 2013; Tucker, 2012), and a few higher learning organizations (Ferreri & O’Connor, 2013; Findlay-Thompson & Mombourquette, 2014; Moravec et al., 2010; Pierce & Fox, 2012; Wilson, 2013) has suggested that the flipped classroom benefits students. The empirical evidence has failed to explore the importance of sense of community and the flipped classroom. The literature has already provided empirical significance that student-centered approaches like active learning in the classroom are effective among nursing students by promoting engagement (Billings & Halstead, 2012; Bowles, 2006; DuHamel et al., 2011; Evans, 2011; Herbert & Lohrmann, 2011) and building sense of community (McMillan & Chavis, 1986; Rovai, 2002a; Rovai, 2002b; Rovai & Jordan, 2004). The evidence presented in this literature review has revealed the a need
for further study in the field of nursing (Missildine et al., 2013; Strayer, 2012) to determine if the flipped classroom model can be equally or more beneficial in allowing nursing instructors to answer the call for transformation, while empowering nursing students to think like a nurse and begin making clinical reasoning decisions that promote positive patient outcomes. The purpose of this study was to examine both lecture and flipped classroom to determine if any differences existed in academic performance and sense of community. Furthermore, this study grounded itself within social constructivism and the concept of building community, while aiming to provide further understanding of the benefits of social constructivism in the classroom.

**Methodologies**

When first considering a study of the flipped classroom, the researcher deliberated the option of doing a qualitative study that would explore the phenomenological experiences of those students undergoing a flipped classroom learning environment for the first time. Because the researcher was teaching utilizing the flipped classroom and experiencing high levels of student support and satisfaction for this method, the researcher felt that a qualitative study would be biased.

The first step in conducting research is identifying the research problem (Creswell, 2012). A lack of empirical data supporting the use of the flipped classroom and the implementation of the technology and training necessary to prepare faculty for change was very evident to this researcher. Specifically, the researcher wanted to know if the flipped classroom could improve academic performance and promote a sense of classroom community, as each of these variables is essential for nursing student success.

Upon further investigation into the literature that currently existed on the flipped classroom, the researcher realized that the empirical literature was sparse and that the only
quantitative study at that time espoused an improvement in academic performance but not in student satisfaction (Missildine et al., 2013). The only other study at that time in nursing was qualitative, but failed to look at the phenomenological aspect (Strayer, 2012). To determine if differences existed between the lecture currently utilized and the flipped classroom model, the researcher chose to conduct a quantitative analysis using a pretest posttest control group design. In doing so, the researcher felt that this design would allow for the opportunity to determine if the groups are homogenous and if differences exist in the dependent variables. Unfortunately, circumstances beyond the researcher’s control prevented such a study; therefore, a causal-comparative (ex post facto) study design was chosen. Using this design allowed the researcher to examine whether differences existed between the two groups.

Built on a foundation of social constructivism and behaviorism, the flipped classroom rises from the foundation with a possibility of solving a pedagogical issue in nursing education: to let go of the old lecture pedagogy or embrace a new and innovative active learning pedagogy. The answer to this dilemma can only exist through the conducting of empirical research supported by a review of the existing literature. This chapter presented a compelling argument for the use of the active learning and the flipped classroom, setting the stage for the current research study.
CHAPTER THREE: METHODOLOGIES

Introduction

The purpose of this study was to examine the influence of both the lecture classroom and flipped classroom on nursing students’ academic performance and sense of community. The literature revealed a need for the study of the flipped classroom among nursing students to determine if this method is more effective than the traditional method of lecture. A current need exists for research examining teaching strategy models in the classroom that can further transform nursing education (Benner et al., 2010; Institute of Medicine [IOM], 2010). Among this transformation is the need for nursing students to be educated with new and innovative models and the integration of technology. The goal of transformation is to ensure a higher quality of graduating student that is prepared to pass the National Council Licensure Examination for Registered Nurses (NCLEX-RN) exam. Furthermore, transformation holds the promise of filling the nursing shortage and beginning to deal with the complex issues that face a new Registered Nurse (RN). Current research on the flipped classroom has centered mostly on K-12 learning environments (Bergmann & Sams, 2012; Berrett, 2012; Fulton, 2012a) and has recently begun to gain attention among the researchers and educators in higher education (Brown, 2012; Johnson et al., 2014; Missildine et al., 2013; Strayer, 2012). To date, few studies have demonstrated that the flipped classroom method is appropriate for nursing education and is effective in improving academic performance (Missildine et al., 2013; Strayer, 2012). Furthermore, no literature has yet explored the sense of community among nursing students as it relates to the flipped classroom or classroom teaching strategy models.

Approximately 100 new studies were published in 2015 on the flipped classroom; however, very few of those studies were empirical in nature or examined the nursing student
population. The findings remain inconclusive as to the ability of the flipped classroom to be statistically-significantly better than other options such as lecture (Harrington et al., 2015; Johnson et al., 2015). The purpose of this study was to determine if any differences existed in academic performance or sense of community between nursing students who participated in a lecture versus flipped classroom pathophysiology course. This chapter presents the methodology for this study including the design, research questions, and hypotheses. This chapter will also discuss the participants, setting, instrumentation, procedures, and analyses of each research question. As a final point, this chapter will present a detailed description of the study to provide opportunities for study replication in the future.

**Design**

The most rigorous design for this study is an experimental design (Campbell & Stanley, 1963). This is based on the premise that a true experimental study removes almost all internal and external threats to validity. When an experimental study is not possible, a quasi-experimental study is the next best choice. Thus, the researcher originally chose a quasi-experimental, pretest-posttest nonequivalent control-group design, because it is one of the most widespread in education literature, it is rigorous, and it would have allowed the researcher to conduct research with both a comparison group and an experimental group without randomization (Gall et al., 2007). Furthermore, nursing researchers have used the quasi-experimental, pretest-posttest, nonequivalent control group design and found it to be an effective method for conducting research (Choi, Lindquist, & Song, 2013; George & Muninarayanappa, 2013; Jameson, 2013; Pulsford, Jackson, O’Brien, Yates, & Duxbury, 2011).

In the originally planned study, the independent variable was manipulated using a comparison group (lecture) and treatment group (flipped classroom) method, and it was not
possible to randomly assign the sample (Campbell & Stanley, 1963; Gall et al., 2007). Due to the lack of random assignment, it was important to control for the selection threat to internal validity (Gall et al., 2007). To reduce this threat, a pretest was administered to statistically control for pre-existing knowledge and sense of community (Campbell & Stanley, 1963; Gall et al., 2007).

The original research study was conducted from 2014 to 2015; however, posttest data could not be collected due to circumstances beyond the researcher’s control. The study was closed, the data destroyed, and another site was sought for the study. The researcher faced difficulty when trying to find nursing education research sites that were willing to participate and be supportive of the research processes. This difficulty influenced the design choice implemented for the current research. It is possible that this experience demonstrated the phenomenon stated by the American Association of Colleges of Nursing (AACN; 2013). The AACN stated that there is not enough recognition nor funding for nursing education research, which impedes the progress of nursing researchers to develop and test new teaching strategies. Despite the difficulties incurred, a new methodology was chosen and a new study conducted. The researcher was not able to conduct the preferred method; therefore, another option was chosen because it was acceptable, would fill the gap in the literature, and was attainable.

The researcher located a new site in the midwestern United States where nursing students were already experiencing the phenomenon of both flipped classroom and lecture by a single instructor. Thus, a decision was made to conduct a causal-comparative study, a type of ex-post-facto design. It allowed the researcher to examine the educational phenomena in its naturally-occurring state where the relationships could be observed and compared. The purpose of this comparison was to determine whether one certain teaching strategy model, whether flipped classroom or lecture, had a better relationship with academic performance and sense of
community (Gall et al., 2007). While this research design lacks in robustness because of its non-experimental nature and lack of independent variable manipulation, the tentative evidence gained from causal-comparative research is valuable and provides the empirical evidence necessary to convince other researchers to investigate the phenomena with experimental designs (Gall et al., 2007). Furthermore, causal comparative designs provide the opportunity to study certain educational phenomena that are currently not able to be studied experimentally. Additionally, causal comparative designs help others to make educational decisions, provide much-needed guidance for future studies experimentally, and have a lesser financial burden (Gay et al., 2011).

To conduct the revised study, the researcher obtained approval from Liberty University International Review Board (IRB, see Appendix A). Upon this approval, an IRB application to the research site was submitted and obtained (see Appendix B).

To summarize, the researcher recognizes the inherent flaws of the research design. The researcher also recognizes that the exploratory nature of the causal comparative design can provide preliminary evidence about the usefulness of teaching strategies and their influence on academic performance and other variables related to achievement for nurse educators.

**Questions and Hypotheses**

This causal comparative study was guided by two research questions, as noted below:

**Research Question 1:** Is there a statistically-significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course?

**Research Question 2:** Is there a statistically-significant difference in nursing students’ sense of community (as measured by the Classroom Community Scale) when participating in
lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course?

The corresponding hypotheses were:

**H1:** Nursing students in a flipped classroom will experience a statistically-significant difference in academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.

**H2:** Nursing students in a flipped classroom teaching strategy will experience a statistically-significant difference in sense of community (as measured by the Classroom Community Scale®) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.

**H01:** There will not be a statistically-significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.

**H02:** There will not be a statistically-significant difference in nursing students’ sense of community (as measured by the Classroom Community Scale) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.

**Participants**

The chosen population for this study was associate’s degree nursing students. The chosen sampling frame for this study was from a satellite campus and enrolled at a four-year university in the midwestern United States in 2015. Because the student population was available to this researcher, the chosen sample was a convenience sample (Creswell, 2012). Two groups, from different semesters, were selected from the nursing program because they had each experienced
the phenomenon being studied. In this study, the term group was defined as a group of students who are progressing within a nursing program at an equal pace and attend the same classes together. The two groups completed their nursing pathophysiology course during different quarters within their program, each of them required to complete this course prior to their third semester of the program, during the second year. The program consists of four semesters (16 weeks long each) and the option of doing a summer course (8 weeks long). The first group (comparison group, lecture, $n = 7$) took their course in the spring of 2015 from January to April over 16 weeks. The second group (treatment group, flipped classroom, $n = 7$) took their course in the summer of 2015 from June to August over 8 weeks. Each group was taught by the same pathophysiology instructor. Each student had the opportunity to volunteer for the study and received an email inviting them to participate (see Appendix C), sign consent forms online (see Appendices D and E), and answered surveys online (see Appendices F and G) after completing their course. In addition, each student had an “opt out” opportunity within the email, subsequently explained in the consent forms (see Appendices D and E).

Statistical power indicates the likelihood that a researcher will reject the null hypothesis when the null hypothesis is in fact false (Warner, 2012). In this study, the goal was to achieve a power of .8 with an alpha set at .05 and moderate effect size (0.5). The effect size allows the researcher to identify the magnitude of the difference between groups; therefore, the larger the effect size is, the larger the difference between the groups (Gall et al., 2007). Based on these statistical power goals, sample size was suggested to be 64 participants (32 per group). It is noteworthy to mention that the minimum suggested sample sizes among experts for a quantitative causal-comparative analysis is $N = 30$ (Gall et al., 2007; Gay et al., 2011; Warner, 2012). Based on the average class size of the university satellite campus, the sample size
anticipated was 20 participants per group for a total of 40 participants; however, the numbers that actually participated in the course and subsequently agreed to participate in the study were much lower. The sample population consisted of 25 students, and the volunteer rate was 56% (N = 14). Thus, power was a concern in this study due to small sample size. In addition, selection threat to validity related to non-equivalent groups was also a concern in this study. To address this limitation, the researcher used the Fisher’s Exact Test analyses on the demographics, demonstrating homogeneity between groups (see Chapter Four for results and discussion).

**Setting**

**Four-Year University Satellite Campus College**

The study took place in a nursing program course at a four-year university satellite campus in the midwestern United States, accredited by the Higher Learning Commission (HLC) and the Accreditation Commission for Education in Nursing (ACEN). In addition, the school of nursing recently received their 5-year approval from the state board of nursing.

The main campus university currently has 17 different academic departments offering a variety of different programs, among them associate’s, bachelor’s, and master’s degrees in behavioral and social sciences, biology, business, education, health services, nutrition, nursing, philosophy, physical therapy, radiology, and surgical technologies. The satellite campus offers a variety of programs, including associate’s degrees in liberal studies and laboratory technician. In addition, the college offers programs for licensed practical nursing, applied science, and certified nurse aide courses. Among those programs is the Registered Nursing (RN) Associate of Science, which is the program in which this study was conducted. The RN program enrolls over 2,000 nursing students, with approximately 160 of those students located at the satellite campus, the research site for this study. The average attrition rate of the RN program is 18%. The NCLEX-
RN pass rates are 79.2% on average for the past five years. In 2014, the nursing program experienced a sudden drop in pass rates to 60%.

Within the department of nursing, there is a campus nursing director who reports to the regional nursing director at the main campus. Currently, the department has 16 faculty; of those, seven are full-time. All of the faculty have a master’s degree or higher in nursing. The admission criteria are rigorous for the nursing program and requires that a student must have graduated from an accredited high school or have a GED score of 2500. In addition, students must have a 2.7 grade point average on a 4.0 scale in courses prior to admission to the nursing program. Furthermore, students must earn an SAT score of 1000 or more. Also, students are expected to have successfully completed at least one year of high school algebra and biology with a “C” or better, and one year of chemistry with a “B” or better. Finally, students must have completed the Test of Essential Academic Skills (TEAS).

Table 2 provides a summary of the program progression and an understanding of where the nursing pathophysiology course exists within the program. To progress within the program, students must maintain a grade point average of 2.7 and a “B-” or better in all of their nursing courses. The entire nursing faculty team is focused on an improvement plan that emphasizes forward transformation and improving NCLEX-RN pass rates to greater than 90%.

The pathophysiology course uses previous knowledge of science and biology courses and expands on that knowledge, integrating concepts related to pathological conditions. The pathophysiology course was developed for both nursing and non-nursing students in the health professions. The course is taught by a nurse educator with a focus on patient-centered care and the nursing process.
Table 2

Description of Course Progression in Nursing Program

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Anatomy &amp; Physiology I</td>
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<tr>
<td></td>
<td>Rhetoric and Composition</td>
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<tr>
<td></td>
<td>Algebra</td>
</tr>
<tr>
<td></td>
<td>Psychology</td>
</tr>
<tr>
<td></td>
<td>Fundamentals of Nursing w/ Clinical</td>
</tr>
<tr>
<td></td>
<td>Anatomy &amp; Physiology II</td>
</tr>
<tr>
<td>2</td>
<td>Medical Surgical Nursing w/ Clinical</td>
</tr>
<tr>
<td></td>
<td>Mental Health Nursing w/ Clinical</td>
</tr>
<tr>
<td></td>
<td>Pharmacology</td>
</tr>
<tr>
<td></td>
<td>Medical Surgical Nursing II w/ Clinical</td>
</tr>
<tr>
<td></td>
<td>Maternity Nursing w/ Clinical</td>
</tr>
<tr>
<td>3</td>
<td>Pathophysiology *</td>
</tr>
<tr>
<td></td>
<td>Sociology</td>
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<tr>
<td></td>
<td>Child Health Nursing w/ Clinical</td>
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<tr>
<td></td>
<td>Medical Surgical Nursing III w/ Clinical</td>
</tr>
<tr>
<td></td>
<td>Professional Nursing</td>
</tr>
<tr>
<td>4</td>
<td>Critical Thinking</td>
</tr>
</tbody>
</table>

Notes. *Course being studied. Total course credits = 68.0. This table describes the entire program sequence.

Instructor

The same nurse educator instructed both pathophysiology classes examined in this study. The nurse educator, referred to as “the instructor,” has her Master’s in Nursing Education and has been teaching nursing for approximately 13 years. She has over 26 years of nursing experience in critical care, cardiac care, and family health. The instructor currently teaches using both the lecture model and the flipped classroom model. The instructor uses active learning in the classroom with all teaching modalities, whether lecture or flipped. The instructor’s
philosophy includes a love for teaching and a desire for every nurse to understand the importance of the first step of the nursing process: assessment. Furthermore, the instructor desires every student to know how to “be” a nurse and how to “think” like a nurse. Because of the latest literature in nursing and the fast wave of technology, the instructor feels that flipping is an effective way to engage students who otherwise during lecture just stare ahead of themselves and say that they could have simply read what you just told them and they look at you wanting more. The instructor describes herself as “giving something more that the students want” when she utilizes the flipped classroom (personal communication, Instructor, 2015). The instructor also stays active doing clinical with students and uses a team approach in her teaching at the bedside, extending her philosophy of active learning from the classroom (personal communication, Instructor, 2015). The campus nursing director and administration are supportive of the instructors’ use of both the flipped classroom model and lecture model. Using both models, the instructor has had a positive experience with her students, and has averaged a 4.5/5.0 on each classroom evaluation, which indicates students’ satisfaction with the learning environment. The instructor currently teaches a variety of courses including pathophysiology, advanced medical surgical, pharmacology, fundamentals, assessment, anatomy and physiology, maternal/child, and leadership. The instructor has experiencing teaching online and was a former Dean and Program Manager.

Learning Environment

In this study, the learning environment was established by the instructor for both comparison group (lecture) and treatment group (flipped classroom). Both groups attended class in the same classroom, two months apart from one another. The comparison group (lecture) participated in the pathophysiology course in the spring, which lasted 16 weeks in length. This
was the first time the instructor taught this course at this college; however, teaching the course itself was not new and the material was very well known by the instructor. The treatment group (flipped) was two months later in the summer and lasted eight weeks in length. Each class was 48 total hours and was worth three college credit hours. The instructor had chosen to flip this particular class because the time for teaching it was shorter and felt that flipping the course would be more conducive to the short time for learning.

The classroom housed up to 42 students, and the class was structured so that desks were easily moved into rows or pod-type stations with four to six students facing each other. The classroom technology was very basic with a computer, overhead projector, and whiteboard. The instructor verbalized the need for more technology such as clickers to enhance the classroom (personal communication, Instructor, 2015).

Lecture

In the lecture classroom setting, the instructor provided 3-hour class sessions. Each class session included PowerPoint lectures, group work, and quizzes. On a typical day, the class would engage in about 150 lecture slides including content, pictures, mnemonics, videos, and a variety of materials to keep students engaged. The lecture slides would take about two of the three hours, and the remaining time would be spent engaging students in group work such as discussions, case studies, active learning activities on the board, and games such as “Jeopardy!” The instructor would time the group work to coincide with moments when she felt the students were distracted or losing attention. The instructor used a plethora of questioning techniques to keep students engaged. The desks were lined up in a row and students were free to sit wherever they desired. The instructor stood in front of the room where the podium was located along with the computer, but found occasions to move around the room. The new classroom model for nursing
education is a mix between lecture and active learning (Mollenberg & Aldridge, 2010; Oermann, 2004); however, there is no evidence to support that this new paradigm is being adopted within the majority of nursing classrooms. The instructor acknowledges this as being best practice, and therefore uses it.

In this study, lecture was considered the traditional classroom model for nursing education, and there was an understanding that some active learning would occur within this type of classroom. However, the primary mode of teaching strategy was lecture. Outside of the classroom, the instructor provided a variety of activities that reinforced the classroom material and prepared students for lecture including reading, think notes, and case studies, which were to be kept in a binder and turned in at the completion of the course for points. Students were expected to come to class prepared for lecture and discussion.

**Flipped Classroom**

In the flipped classroom setting, the instructor provided a Blackboard medium where all lecture and resource materials were presented prior to the students coming to class. Every student was accountable for watching and reviewing all of the lecture and resource materials prior to class. The Blackboard contained PowerPoint slides, and the instructor encouraged the students to review these slides ahead of time. In addition, students were presented with podcasts for the lecture material, case studies, think notes, assignments such as reading, peer-reviewed journal articles, reference links, YouTube videos, and adaptive quizzes. Each of these items was meant to prepare students ahead of time so that when each student came to class, he or she was prepared to engage in a variety of group work including case studies, problem-solving activities, discussions, and critical-thinking activities. Because these students were all adults, and therefore, self-directed (Knowles, 1984), it was expected that the students would be reasonably faithful to
use the Blackboard, listen to the podcasts, watch the videos, use the think notes, and complete a variety of the activities including the adaptive quizzes. It was expected that students would arrive to the classroom already having new knowledge, which each of them would begin to apply to a variety of critical thinking exercises (case studies, problem-solving activities, discussions, and critical-thinking building activities).

Inside the classroom, the instructor served as a facilitator and guide on the side (King, 1993) while the students engaged in a variety of learning activities. For the learning activities, students were assigned to learning groups of varying sizes. Upon entering the classroom, students would get into their respective learning groups and participate in a variety of learning activities. For example, the instructor would engage the classroom in a discussion that would review all the major topics of discussion for the day. This discussion would be guided by specific questions by the instructor that each group would take several minutes to create a response and then come together as a classroom to discuss their various responses, providing peer feedback to one another. In another activity, each learning group would receive a case study scenario of a patient situation and a pathophysiological condition. Each team would work for a specific amount of time and then upon completion would send a group leader to the board to help create a concept map of the scenario and pathophysiological situation. Upon completing the concept map on the board, the entire class would discuss the various learning objectives related to the topics for the day. Each of these learning activities was built to provide students with an opportunity to work in groups and alone, using critical thinking skills along with various levels of understanding from basic knowledge to advanced application. Each flipped classroom experience resembles this pattern with student engagement and group work.
Instrumentation

After completing either the lecture or flipped classroom course, students completed two surveys, which provided both demographic information about the student and a score of the students’ sense of community. To measure the first dependent variable, academic performance, the researcher utilized final exam scores. The exam had 100 multiple-choice questions that were written, edited, and analyzed solely by the instructor. Providing a multiple-choice format increases the objectivity of the exam (Gall et al., 2007). In addition, the instructor was qualified to write this exam as she is both trained and certified in writing NCLEX-RN style multiple-choice questions and has more than 13 years of experience. Furthermore, the instructor has experience writing, editing, and reviewing NCLEX-RN style questions for a variety of publishers. The reliability of the final exam is important to the meaning of this research. The Kuder-Richardson 20 (KR-20) formula was used to calculate reliability. A KR-20 of .80-.90 indicates a high reliability (Nunnally, 1967), and the KR-20 for the final exams were .88 for comparison group (lecture) and .84 for treatment group (flipped classroom). Each test-taker, whether in the lecture group or the flipped classroom group, was allowed the same amount of time for the exam and the exams took place in the same rooms, with the same proctor, and the same set of rules for test-taking, promoting a set of standards that were consistent (Gall et al., 2007). Important also is construct validity; therefore, the final exam was blueprinted by the instructor to match the course objectives (Gall et al., 2007). The only differences between the two exams for the two groups were several questions that were eliminated after the comparison group (lecture) and prior to the treatment group (flipped classroom). The questions which were removed from the exam were done so before final exam scores were calculated for the comparison group (lecture) and before the treatment group (flipped classroom) took the exam;
therefore, neither group had those questions calculated into their final exam, allowing for each group’s exams to be the same, allowing for an equal comparison. The exams were not peer-reviewed by fellow faculty. The final exam was taken in the classroom, which was the same room used for all of the instruction for these two groups. Students used the paper and pencil method with the instructor as proctor. Students were not allowed to have anything on their desks, with the exception of a pencil and eraser. Students were not allowed to leave during testing and were required to finish the entire exam before exiting the room.

To measure the second dependent variable, sense of classroom community, the researcher chose the Classroom Community Scale® (CCS®; Rovai, 2002a). The CCS® was developed by Alfred Rovai (2002a). Rovai drew from McMillan and Chavis’s (1986) definition of community as having four dimensions of spirit, trust, interaction, and commonality of expectation and goals (learning). The CCS® contains 20 items, worded on a 5-point Likert-type scale including responses of strongly agree, agree, neutral, disagree, and strongly disagree, with some items worded negatively (Rovai, 2002a). Ten of the questions are related to feelings of connectedness, and the remaining ten are related to feelings of connectedness within the community of learning (Rovai, 2002a). To produce a score that demonstrates a sense of community, each of the Likert-Scale items are scored from 0-4 (Rovai, 2002a). The higher a participant scores on the scale, the stronger their sense of community, with the CCS® raw scores having a range of 0-80 (Rovai, 2002a). Rovai (2002a) found that the CCS® was reliable with a Cronbach’s coefficient α of .93, indicating excellent trustworthiness. Rovai shared that the items, based on face validity, appeared to measure what was necessary to demonstrate a sense of classroom community. Furthermore, the author revealed that the CCS® retained high content and construct validities (Rovai, 2002a). The author used a plethora of professional literature to ensure that the CCS® was based on the
concept of community. Three university professors of educational psychology reviewed the CCS® and provided additional support that the items within the scale were “totally relevant to sense of community in a classroom setting” (Rovai, 2002a, p. 204). Additionally, Rovai utilized a factor structure analysis to determine the dimensionality of the CCS® scale items. In the factor analysis of data, using the direct oblimin rotation method, Rovai revealed that test items were correlated with each other. Since its inception, the CCS® has been used extensively to study sense of community among students and continues today, proving this tool is a valid and reliable assessment of sense of community (Ni & Aust, 2008; Rovai, 2002a; Vora & Kinney, 2014). For this study, internal consistency reliability was established for the CCS® using the Cronbach’s alpha coefficient. The results of the Cronbach’s alpha was 0.92, indicating excellent reliability.

Permission was obtained from Dr. Rovai for the use of this scale within this study. The email communication between Dr. Rovai and the researcher can be viewed within Appendix H. The CCS® was placed online via SurveyMonkey™ for ease of administration and analysis.

Additional analyses for academic performance were conducted as a second layer of investigation because of the small sample size. To do this, the researcher accessed archival, final course grades for all students in both groups. Final grades were scaled so that 90-100 was an A, 80-89 was a B, 74-79 was a C, 66-73 was a D, and anything below 66 was an F.

**Procedures**

**Recruitment and IRB Processes**

The researcher obtained approval for this research from Liberty University International Review Board (IRB, See Appendix A). Upon this approval, an IRB application to the research site was submitted with all of the details herein relating to participation including risks and benefits. IRB site approval was obtained (See Appendix B) and upon approval, the instructor of
the course provided the researcher with an email distribution list for the first group. While the first group was being surveyed (July 2015), the second group was taking their course, which ended around the same time that the data collection for the first group was completed. Subsequently, the second group’s email distribution list was sent to the researcher, who then emailed the group in the same method as the first group (in August 2015). Each group was sent an email (see Appendix C) explaining the research study and requesting volunteers to participate. Each group received their email after completion of the course. The lecture group received their email more than two months after completing their course because of the timing of IRB approval. Follow-up emails were sent. The flipped classroom group received their email within two days of completing the course because IRB approvals had already been received. Each potential participant was sent the same email that contained a link to SurveyMonkey™. The link allowed each participant to read the informed consents (see Appendices D and E), and either accept or opt out of participating. Those accepting participation, continued on the same link and filled out a demographics form (see Appendix F) and the CCS® (see Appendix G). The final exam scores were collected by the researcher from the instructor through password-protected and file encrypted email and were stored in the researcher’s computer with two-tier password-protection. Additional analyses for academic achievement were completed using archival data after the completion of both classes. Final course grades were provided by the instructor for the 25 students in the two courses, all identifiers were removed, and statistical analysis was conducted.

All participants who agreed to participate were entered into a drawing for one of five $50.00 VISA gift cards. Winners were notified by email and subsequently mailed their gift certificate. Upon completion of each course (lecture and flipped), this researcher either met or
used email communication with the instructor to verify that the course was implemented as planned and to monitor if changes or issues had occurred. The purpose of the communication was for the researcher to gain insight into the site being studied as well as the course.

The data from the demographics and the CCS® were transferred into a non-identifiable format into SPSS Statistics Software Version 23 for data analysis.

**Data Analysis**

Data analyses in this study included both descriptive and inferential statistics (Warner, 2012). The researcher used SPSS Statistics Software Version 23 to run all statistical analyses. The researcher calculated descriptive statistics for demographics, final exam scores, and the CCS®.

An independent samples $t$-test was chosen as the most appropriate statistical method for analyzing both null hypotheses:

**H$_{01}$**: There will not be a statistically-significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.

**H$_{02}$**: There will not be a statistically-significant difference in nursing students’ sense of community (as measured by the Classroom Community Scale®) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.

The independent samples $t$-test was used to test the null hypotheses when looking at the difference in one mean of quantitative variables between groups (Gall et al., 2007; Warner, 2012). The researcher acknowledges that for a $t$-test to have a true significant finding, there must be a strong treatment effect and the extraneous variables must be controlled (Warner, 2012).
Therefore, the researcher took much care to limit threats to validity. Furthermore, the researcher conducted assumption tests a priori to using the $t$ tests.

Prior to conducting the $t$-test statistical analyses, the researcher tested for assumptions including normal distribution, the presence of extreme outliers, homogeneity of variance, and independent observations between groups to determine if a parametric analysis was permissible. Shapiro Wilk’s was used for testing assumptions of normality; this test revealed only one outlier, which was not removed due to a small sample size ($N = 14$), and the outlier was not considered extreme (Warner, 2012). Levene’s test was used to test homogeneity of variance. Homogeneity was also verified using the Fisher’s Exact tests to compare the two groups. The assumption testing revealed that the assumptions were met but tenable; therefore, an independent samples $t$-test was appropriate. In addition, the researcher conducted the Mann-Whitney $U$ test as a second layer of analyses to verify the results of the parametric analyses in light of the small sample size.

As is generally noted, educational researchers make the decision to reject the null hypothesis with a significance level of less than .05 (Gall et al., 2007; Warner, 2012). For this reason, the significance level of 5% ($p = .05$) was adhered to, and the Cohen’s $d$ calculation for effect size was performed and interpreted (Cohen, 1988). A small effect would be interpreted as 0.2, with a medium effect at 0.5, and a large effect at 0.8 (Cohen, 1988). Table 3 provides a summary of the research plan and methodology.

**Conclusion**

The aim of this study was to explore the effect of two different teaching strategies, flipped classroom and lecture, on nursing students’ academic performance or sense of community to determine if statistically significant differences exist. This chapter provided a
concise description of the research methodology that was employed. The next chapter will present the findings will be presented along with each null hypotheses being discussed.
### Summary of Research Plan and Methodology

<table>
<thead>
<tr>
<th>Theoretical Framework</th>
<th>Research Question</th>
<th>Data Needs</th>
<th>Data Sources</th>
<th>Analysis Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vygotsky, 1978 Social Constructivism</td>
<td>Is there a statistically significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course?</td>
<td>Academic Performance</td>
<td>Final Exam Scores</td>
<td>t test, Mann-Whitney U Test</td>
</tr>
<tr>
<td>McMillan &amp; Chavis, 1986; Rovai, 2002 Sense of Community: Connectedness, cohesion, spirit, trust, and interdependence among members</td>
<td>Is there a statistically significant difference in nursing students’ sense of community (as measured by the Classroom Community Scale) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology</td>
<td>Sense of Classroom Community</td>
<td>CCS®</td>
<td>t test, Mann-Whitney U Test</td>
</tr>
</tbody>
</table>
CHAPTER FOUR: FINDINGS

Introduction

The purpose of this causal-comparative design was to investigate the effect of flipping the classroom on academic performance and sense of community. Participants were nursing students enrolled in a pathophysiology course at a nursing school in the midwestern United States. The researcher sought to determine if nursing students taught with flipped classroom methods would have different academic performance or sense of classroom community when compared to nursing students taught with the lecture classroom method. Considering that nurse educators and administrators are faced with daily pressures to meet National Licensure Exam pass rates, maintain attrition levels, and meet the demands of the nursing shortage, this study aims to minimize those pressures. In addition, the studies of 2010 by the Carnegie Foundation (Benner et al., 2010) and the Institute of Medicine has called for transformation in nursing education, with a focus on integrating technology and new, innovative teaching strategies. This study contributes to the body of knowledge by providing educators and administrators with a review of the current literature surrounding flipping of the classroom. Furthermore, this study provides an initial look at sense of community among nursing students, a concept that has yet to be studied among this population. This chapter presents the findings of the study, beginning with the demographics and descriptive statistics. Each research question is addressed, including assumption testing and both parametric t-test analyses and non-parametric Mann-Whitney U tests to determine if any differences existed among the 14 students that were examined within this study when comparing two different teaching strategies as they relate to academic performance and sense of community.
Research Questions

The following research questions were used to guide this study:

**Research Question 1:** Is there a statistically-significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course?

**Research Question 2:** Is there a statistically-significant difference in nursing students’ sense of community (as measured by the Classroom Community Scale) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course?

Null Hypotheses

The two research questions had two corresponding null hypotheses as follows:

**H₀₁:** There will not be a statistically-significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.

**H₀₂:** There will not be a statistically-significant difference in nursing students’ sense of community (as measured by the Classroom Community Scale®) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.

Demographic Statistics

The population sampled consisted of 25 nursing students in two pathophysiology courses at a nursing school in the midwestern United States. The first group of students (n =14) participated in the Spring 2015 course using a lecture modality. These students participated in a 16-week course, attending class once a week. In addition, these students attended class to hear lectures and completed their reading assignments and case studies outside of class. The second
group of students \((n = 11)\) participated in the Summer 2015 course using a flipped classroom modality. These students participated over the course of 8 weeks, attending classes twice a week. These students reviewed course lecture materials via video and other multi-media venues outside of class and participated in a variety of active learning experiences (case studies, critical thinking exercises, discussion, and concept mapping) inside of class. While the duration of the courses differed, the amount of classroom time was equivalent. Each course worth 3 credit hours. The volunteer rate for the study among groups was 46.6% for the lecture group in the spring \((n = 7)\) and 63.6% for the flipped group in the summer \((n = 7)\).

Table 4 provides a breakdown of the demographics of participants disaggregated by group. This sample of 14 students consisted of 13 (93%) females and one male. The majority (nine students; 64%) were in their twenties, two (14%) were in their thirties, and two (14%) were in their forties. Twelve participants (86%) were White or Caucasian and two (14%) were Hispanic or Latino. Eleven (79%) of the participants stated they had only a high school diploma or GED prior to entering the course, and three (21%) stated they had prior college degrees including two with an associate’s degree and one with a bachelor’s degree. Eleven (79%) of the participants were actually enrolled in the nursing program, while the other three (21%) participants stated they were in other programs for healthcare besides nursing.

Because of the small sample size and cells containing zero, Chi-Square tests for homogeneity were unable to be applied to compare the two groups for similar distributions based on gender, age, race, highest degree, current program, course repetition, and overall current GPA as stated by the student (Warner, 2012). In the absence of such statistical analyses, the researcher made thorough examinations of the groups utilizing Table 4 and argues that based on this inspection, the two groups (lecture and flipped) were similarly distributed in all seven areas
demographically (see Table 4). The groups were considered comparable and homogenous; thus, minimizing the selection threat to validity inherent to the causal comparative design chosen for the study. In summary, the majority of students (> 50%) in the groups could be described as being female, in their twenties, Caucasian, with a high school diploma or GED, and currently in the nursing program, where they are taking this course for either a first or second time.

Table 4

Demographically Disaggregated Description of Groups

<table>
<thead>
<tr>
<th>Description</th>
<th>Lecture</th>
<th>Flipped Classroom</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>30-29</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>40-49</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>White</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Highest Degree</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School/GED</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Associate</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bachelor</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Current Program</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing/Pre-Nursing</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Other (Non-Nursing)</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td><strong>Repeat Course</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Overall GPA (self-report)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A average</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>B average</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
### Descriptive Statistics

The groups were compared on two dependent variables: academic performance, as measured by final exam scores, and sense of community, as measured by total scores attained on the Sense of Community survey (Rovai, 2002a). Table 5 provides a list of the descriptive statistics for the dependent variables for the 14 participants disaggregated by their lecture and flipped classroom participation. Overall, the participants \( N = 14 \) had a final exam score of 75.64 \( (SD 12.76) \) and a Sense of Community score of 51.57 \( (SD 14.01) \).

#### Table 5

**Descriptive Statistics for Dependent Variables**

<table>
<thead>
<tr>
<th>DV</th>
<th>Lecture Comparison Group ((n=7))</th>
<th></th>
<th>Flipped Comparison Group ((n=7))</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>Range</td>
<td>(SD)</td>
</tr>
<tr>
<td>Final Exam Score</td>
<td>74.86</td>
<td>73.00</td>
<td>44.00</td>
<td>15.58</td>
</tr>
<tr>
<td>Sense of Community(®)</td>
<td>48.29</td>
<td>51.00</td>
<td>45.00</td>
<td>15.29</td>
</tr>
</tbody>
</table>

**Research Question and Null Hypothesis One**

For research question one, the researcher ran an independent samples \(t\)-test using SPSS Statistics Software Version (SPSS) 23 to determine if any differences exist between those students in the lecture group and the flipped classroom group on academic performance, as measured by the final exam scores. The null hypotheses states that there will not be a
statistically-significant difference in nursing students’ academic performance (as measured by final exam scores) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course. The independent samples $t$-test allows for the comparison between means, and is considered appropriate when the two groups are independent groups (Warner, 2012) as is the case with this causal-comparative (ex-post facto) study.

**Assumption Testing**

The first step before conducting an independent samples $t$-test is to assess the assumptions, including the use of quantitative, interval/ratio; normal distribution; the presence of extreme outliers; and equal variances (Gall et al., 2007; Warner, 2012). This study was quantitative and involved the measurement of statistical outcomes with measurements using a ratio scale; thus, the first assumption was tenable.

Normality was examined using the Shapiro Wilk’s test, which revealed that both groups (lecture and flipped) had normally distributed scores as evidenced by a non-significant $p$-value ($p = .96$ and $p = .931$, respectively); therefore, it was concluded that neither group (lecture or flipped) violated assumptions of normality.

Figure 3 provides a box-plot representation of the final exam scores. The flipped classroom comparison group had one outlier within the data set; however, it was not removed because of the small sample size and it was not an extreme outlier (Warner, 2012). The researcher performed a subsequent test to observe whether the outlier might impact final outcomes of the statistical analysis, and no difference was noted. In either case, the researcher achieved a non-significant $p$-value; therefore, the outlier remained in the data set.

Lastly, before the researcher could run an independent samples $t$-test, the assumption of homogeneity of variance also needed to be met. The homogeneity of variance assumption was
tested using Levene’s test, which revealed that the assumption was not violated \( F(12) = 1.61, p = .23 \).

Results

Having found that all three assumptions were tenable and no violations had occurred, the researcher conducted an independent samples \( t \)-test to confirm that no statistically significant differences exist between the means of the control group (lecture) and the experimental group (flipped). No statistically significant difference was found between the two groups in academic performance. The test was not significant \( t(13) = .06, p = .95, d = 0.03 \), indicating that nursing students who are in a flipped classroom have similar academic performance as those who are in a lecture classroom. Because of the small sample size, the researcher also ran a non-parametric counterpart Mann-Whitney \( U \) test to verify the parametric analysis results (Gall et al., 2007). The Mann-Whitney \( U \) test revealed a non-significant result of \( U = 24.00, z = -.064, p > .05, r = -0.02 \). Therefore, the researcher again failed to reject the null hypothesis.
Research Question and Null Hypothesis Two

For research question two, the researcher conducted another independent samples t-test using SPSS to determine if any differences existed between those students in the lecture group and the flipped classroom group on sense of community as measured by CCS®. Specifically, the following null hypothesis was tested, there will not be a statistically-significant difference in nursing students’ sense of community (as measured by the CCS®) when participating in lecture teaching strategy compared to flipped classroom teaching strategy in a pathophysiology course.

Assumption Testing

Once again, an assessment of assumptions was necessary before conducting a parametric independent samples t-test. This study is quantitative, including the community score that can be treated as a ratio level measurement; therefore, once again this assumption was tenable.
To test normality among both groups, Shapiro-Wilks test was conducted. Shapiro-Wilks revealed that both lecture and flipped groups had a non-significant result ($p = .868$, $p = .957$, respectively), suggesting normality among both groups.

A box-plot diagram (See Figure 4) revealed one outlier within the lecture comparison group. The outlier was not extreme and the sample size in the study was small; therefore, the researcher did not remove the outlier (Warner, 2012). Furthermore, the researcher performed a subsequent statistical analysis to see if this might impact the outcome, which it did not, and a non-significant finding was still present.

![Box-plot Diagram of Total Sense of Community Scores](image)

*Figure 4. Box-plot Diagram of Total Sense of Community Scores.*

The researcher tested the assumption of homogeneity of variance using Levene’s test, which revealed that the assumption was not violated ($F (12) = .01, p = .40$).
Results

The independent samples *t*-test revealed that there was no statistically-significance difference between the control group (lecture) and the experimental group (flipped) in their total sense of community (*t* (12) = .87, *p* = .40, *d* = -0.46), indicating that nursing students who participated in a lecture classroom had similar sense of community experiences as those who participated in a flipped classroom. The researcher conducted the Mann-Whitney *U* test to verify the findings of the parametric analysis, and revealed similar findings (*U* = 20.00, *z* = -.58, *p* = .57, *r* = 0.22) of non-significance. Based on these results, the researcher failed to reject the null hypotheses that nursing students in a flipped classroom teaching strategy in a pathophysiology course did not have a statistically-significant difference in sense of community (as measured by the CCS®) when compared to those nursing students in a lecture teaching strategy in a pathophysiology course.

Although the difference was not significant, there is a difference in the means of the control group (lecture, 48.29) and the experimental group (flipped classroom, 54.86), where the experimental group (flipped classroom) was 6.57 points higher, which warrants further investigation, especially given the small sample size (See Figure 5).
In addition to the originally planned research data analysis of final exam scores and sense of community scores for the 14 participants, the researcher also examined overall course grade percentage data for all 25 students participating in the two pathophysiology courses. The overall final course grade percentage ($N = 25$) pooled mean was 79.28 ($SD$ 8.193), with final grade percentage possible ranging from 0-100 percent. Table 6 provides descriptive statistics disaggregated by lecture and flipped group comparisons for final course grades, providing the reader with a side-by-side comparison of the means in their learning environment.
Table 6

Descriptive Statistics for Course Grades

<table>
<thead>
<tr>
<th>DV</th>
<th>Lecture Comparison Group (n=14)</th>
<th>Flipped Comparison Group (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
</tr>
<tr>
<td>Final Course Grade</td>
<td>77.79</td>
<td>76.00</td>
</tr>
</tbody>
</table>

**Assumption Testing**

Before conducting additional analyses, the researcher explored assumption testing. This study was quantitative including ratio scale measurements; thus, the first assumption was tenable. The Shapiro Wilk’s test revealed normality as evidenced by a non-significant \( p \)-value \( (p = .35) \). Box plots revealed no extreme outliers; therefore, this, along with a small sample size, led the researcher to not remove any outliers. The assumption of homogeneity of variance was tested using Levene’s test and revealed that the assumption was not violated \( (F (24) = .58, p = .45) \).

**Results**

Having met the assumptions, the researcher conducted an independent sample \( t \)-test to determine if differences existed between lecture and flipped classroom comparing final course grade percentages. The analysis revealed a non-significant result \( (t (23) =-.1.03, p = .31, d = 0.41) \). Again, no statistically-significant differences existed between the two groups in academic performance as measured by the final course grade.

Figure 6 provides a bar graph comparison of the two groups final course grades. When comparing a larger sample size for academic performance \( (N = 25) \) and looking at final course grades, the differences between means where the experimental group (flipped) scored higher by
more than 3 points on their final grade than the control group (lecture), which warrants further investigation.

![Chart Title](chart.png)

*Figure 6. Bar Graph of Mean Comparisons between Final Course Grades.*

**Summary**

For research questions one and two, the researcher failed to reject the null hypotheses. The two groups—one participating in a lecture classroom and one participating in a flipped classroom—scored different in terms of their sense of community and academic achievement; however, the differences were not found to be significant. Further analysis of the final course grades of the two groups also demonstrated a non-significant result, providing additional support of the original findings.

In this study, a Type II error is a concern. When the researcher fails to find a difference that is actually there, this is a Type II error (Howell, 2011). The likelihood of a Type II was
examined as the researcher looked at statistical power (Cohen, 1988) for each analysis and found it to be low. This was not surprising given the small sample size and the small effect size for each analysis. As previously discussed, the researcher performed a calculation for effect size using Cohen’s $d$, and chose to use Cohen’s (1988) scale for identifying a small effect (0.2), a medium effect (0.5), and a large effect (0.8). In this study, the effect size was determined using Cohen’s $d$ (mean difference divided by the average of standard deviation). For research question one, which explored academic performance, the effect size was 0.03, a small effect. For research question two, the effect size was -0.47, a small to medium effect size.

Originally, the researcher explored having a power of .8 for a $t$-test with independent groups, two-tailed, with an effect size of 0.5, and a significance level of 0.05. Based on this statistical power analysis, the researcher needed 64 total participants (32 per group). Unfortunately, the response rate was not as anticipated; therefore, the final participants total was 14 (seven per group). Based on this new sample size, a new calculation was conducted using the same $t$-test with independent groups, two-tailed, with an anticipated effect size of 0.5, and a significance level of 0.05. This calculation resulted in a power of 0.13. Examining the power of each analysis, there is a probability that the researcher has used these results to correctly accept a true null hypothesis.

**Conclusion**

The results of this study are important to the body of literature in nursing education as it relates to a new, innovative classroom teaching strategy, the flipped classroom. Nurse educators and administrators are seeking to find clarity about this new and innovative teaching strategy to determine if it has the potential to influence academic performance and sense of community among nursing students as compared to the lecture teaching strategy, a method that is used in a
plethora of nursing classrooms (Bellack, 2008). The next chapter will discuss the practical implications of these findings. In addition, recommendations for future research will be discussed and the researcher will provide educators with some evidence-based guidance on best practices to be used in the classroom.
CHAPTER FIVE: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Discussion

This causal-comparative study was designed to explore the effect of two different teaching strategies (lecture and flipped classroom) in relation to academic performance and sense of community. Two groups from one school of nursing in the Midwest United States participated in this study. The control group \((n = 7)\) participated in a lecture style classroom and the experimental group \((n = 7)\) participated in a flipped classroom. Each participant volunteered for the study by signing a consent, filling out a demographics survey and a survey on sense of community, and having their final exam grades statistically analyzed. Independent samples \(t\)-tests and Mann-Whitney U Tests were conducted to compare the two group’s means. This chapter will provide a discussion of the statistical analysis results.

Null Hypothesis Number One

The first null hypothesis stated that nursing students in a flipped classroom would experience no statistically-significant difference in academic performance (as measured by final exam scores) when participating in the lecture teaching strategy as compared to the flipped classroom teaching strategy in a pathophysiology course. The study findings demonstrated that there was no statistically significant difference in academic performance when the two teaching strategies were compared. The null hypothesis was therefore not rejected. Despite this finding, there was evidence present that each method was almost equal in its ability to achieve academic performance.

The K-12 and higher learning flipped classroom literature (Bergmann & Sams, 2012; Berrett, 2012; Ferreri & O’Connor, 2013; Flumerfelt & Green, 2013; Findlay-Thompson & Mombourquette, 2014; Herreid and Schiller, 2012; Moravec et al., 2010; Pierce & Fox, 2012;
Tucker, 2012; Wilson, 2013) and the nursing community impression within the non-empirical literature (Missildine et al. 2013; Strayer, 2012) and emerging empirical literature (Geist et al., 2015), suggested nursing students who were highly engaged in a flipped classroom would academically outperform those in a lecture classroom. According to Vygotsky’s (1978) social constructivism theory, the more engaged a student can become and the more socially-constructed the classroom develops, the better the outcomes for the student. However, the results of this study were contrary to other study’s claims that demonstrate how flipped classrooms positively affect academic achievement in various educational disciplines (Berrett, 2012; Flumerfelt & Green, 2013; Fulton, 2012a; Pierce & Fox, 2012; Prober & Heath, 2012; Wilson, 2013) and nursing (Geist et al., 2015; Missildine et al., 2013; Schlairet, Green, & Benton, 2014).

The findings of this study corroborated at least one flipped classroom study conducted in nursing education (Harrington et al., 2015). Harrington et al. (2015) used an experimental design to compare 82 undergraduate nursing students in both flipped classroom and traditional classroom, measuring classroom exams, quizzes, and assignments overall to determine if a difference would be noted. No statistically-significant difference was found ($p = .092$); however, Harrington and colleagues stated that both groups averaged 86.3% overall, which was a satisfactory grade for passing, suggesting that both modalities are equally effective in producing positive academic performance outcomes (Harrington et al., 2015). The Harrington study further supports the suggestion that both teaching strategies (lecture and flipped classroom) are equally effective (Harrington et al., 2015). The comparison group (lecture) and the experimental group (flipped classroom) were only 0.43 points difference with both groups averaging 74.65%, a passing grade for the course.
Null Hypothesis Number Two

The second null hypothesis stated that nursing students in a flipped classroom teaching situation would experience no statistically-significant difference in sense of community (as measured by the CCS®; Rovai, 2002a) when participating in the lecture teaching as compared to the flipped classroom teaching in a pathophysiology course.

This researcher failed to reject the null hypothesis, suggesting that nursing students in a flipped classroom teaching strategy did not experience a statistically-significant difference in sense of community (as measured by the CCS®; Rovai, 2002a) when participating in the lecture teaching strategy as compared to the flipped classroom teaching strategy in a pathophysiology course. This finding appears to not support the social constructivist ideas which Rovai (2004) suggested would help students to build spirit, trust, interaction, and learning through flipping the classroom as a teaching strategy. However, it is important to recognize that the mean differences that did exist, while not statistically significant, were large enough to warrant future studies of this type with larger samples. Again, limitations of this study may have resulted in a type II error and is discussed later in this chapter. Therefore, drawing inferences from these findings must be done tenuously.

Sense of community is defined as “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together” (McMillan & Chavis, 1986, p. 9). Furthermore, student engagement has been noted to be directly related to a student’s sense of community (Royal & Rossi, 1996). Sense of community is a powerful force (McMillan & Chavis, 1986) and the literature provided empirical significance that student-centered approaches like active learning in the classroom are effective among nursing students by promoting engagement
Nursing students are preparing for a profession that will require them to become part of a community, where being engaged and feeling part of the team is essential to positive outcomes. Rovai (2002a) states that a sense of community includes such experiences as “…connectedness, cohesion, spirit, trust, and interdependence among members” (p. 201). Personal and professional development as a nurse includes the teamwork and engagement of each member through the sharing of new information, experiences, and interaction. This type of community, a sense of community, where feelings of being connected, cohesive, and having a sense of spirit, trust, and interdependence among members (Rovai, 2002a) may possibly begin in nursing school. Faculty and classmates are considered important influences on a nursing student’s experience of sense of community (Foli et al., 2013). When a student feels that he or she belongs and feels connected, a sense of community is built (McMillan & Chavis, 1986).

The study of sense of community among nursing students as it relates to teaching strategies is the first of its kind in nursing education when considering the flipped classroom as a teaching strategy modality for nursing students. Empirical research does not exist for nursing students and sense of community, yet there is a definite connection between the needs of the nursing profession and the possibilities for how building sense of community in nursing students can result in more positive outcomes in professional practice. Rovai (2004) suggested that constructivism occurs when knowledge is constructed by individuals through the variety of interactions he or she has with the environment, including peers and instructors. Activities in the classroom such as questioning, open-ended questions, social communication, and student-
centered processes are each parts of the constructivist attitude (Rovai, 2004). Rovai (2002b) suggested that students who become engaged in this type of learning environment will develop an overall sense of trust and positive interaction, which will translate into a student having a better experience within the environment, resulting in better outcomes for the student.

While this study demonstrated a non-significant finding, it is this researcher’s hope that this initial study of nursing students and sense of community will spark an interest in how students who have a greater sense of community during nursing school may translate into nurses who are ready for the interprofessional and intraprofessional challenges of their new profession.

**Findings Summary**

This study sought to fill the gap in the literature concerning the flipped classroom method and its potential influence on academic performance and sense of community. The final result of the study was failing to reject both of the research hypotheses. The researcher asked whether a difference might exist between lecture and flipped classroom teaching strategies when measuring the dependent variables of academic performance and sense of community. This study revealed that no differences existed in either of the dependent variables; however, there were important conclusions that could be drawn from the study.

**Null Hypothesis Number One**

The literature revealed that there was both support for and against the findings of this study, which states that no statistically significant differences exist between lecture and flipped classroom when measuring academic performance. However, the research also revealed that both comparison group (lecture) and experimental group (flipped classroom) scored almost equal on their final exams with only 4/10 of a percent being the difference between their mean scores. From this information, the researcher can conclude that both teaching strategies are equally
effective in achieving academic performance. This finding is also supported by other literature (Harrington et al., 2015; Wilson, 2013).

Based on this study and other findings, instructors should feel comfortable choosing flipped classroom as an effective teaching strategy that can provide students with academic success on quizzes and exams (Geist et al., 2015; Harrington et al., 2015; Missildine et al., 2013; Schlairet et al., 2014). Likewise, administrators should feel confident with supporting the use of this method in the classroom. As of this time, no empirical literature has made the claim that flipping the classroom is detrimental to the student. The literature does support that the flipped classroom is either statistically significantly better than or equivalent to the lecture method (Geist et al., 2015; Harrington et al., 2015; Missildine et al., 2013; Schlairet et al., 2014) among nursing students.

**Null Hypothesis Number Two**

This study was the first to investigate nursing students and their sense of community. The discovery that those nursing students who were participating in the flipped classroom scored 6.57 points higher on their sense of community when compared to those nursing students in the lecture classroom deserves attention from nurse educators, administrators and researchers. Although this finding was not statistically significant, the difference was large enough to warrant further investigation.

No literature exists to suggest that flipping the classroom would cause detriment to the nursing students’ spirit, trust, interaction, and learning. In addition, there is no literature suggesting that nursing students who experience the flipped classroom would have less sense of community than those experiencing lecture. In this study, students who participated in a flipped classroom (experimental group) had a higher sense of community than those in a lecture
classroom (control group). No literature exists that espouses negative impacts on sense of community occurring when nursing students are taught using the flipped classroom method. Based on this knowledge, and despite the non-significant finding of this research, nurse educators and administrators should feel at ease with utilizing the flipped classroom method as a teaching strategy.

**Implications**

The results of this study have significance for the practical implications of serving as a change agent, supporting the need for a standardized definition for flipped classroom instructional design, and encouraging nurse educators to seek professional development training. Nursing educators and administrators continually work to find new ways to help nursing students to progress within their programs and pass the National Licensure Exam for Registered Nurses (NCLEX-RN). Administrators and educators must adopt evidenced-based practices in order to meet these demands. No statistically significant differences existed in either academic performance or sense of community when comparing two different teaching strategies, lecture and flipped classroom. The literature provided support for this study’s findings, but also provided contradictory findings.

**Research Implications**

The goal of every research study is to determine if the results of the analysis will support or not support the hypotheses. A misconception exists that if the analysis supports the hypothesis, the research was a success. Likewise, if the analysis does not support the hypothesis, then the research was a failure (Gay, Mills, & Airasian, 2011). Gay, Mills, and Airasian (2011) share that this misconception is false and that whether the analysis supports or fails to support the
hypotheses, there are important implications for the researcher to investigate, guiding future studies to be revised in some form. In this study, one such implication was discovered.

For each hypotheses in this study, a definition was provided for the flipped classroom within chapter one. The flipped classroom was operationally defined within this study as a reverse classroom learning environment where lecture was not delivered inside the classroom; rather, a variety of media formats were presented outside the classroom to prepare the student before coming into the classroom. Inside the classroom, students were almost 100% participatory with collaborative active learning exercises (Missildine et al., 2013; Strayer, 2012). As the research was being conducted; however, it became apparent that a disparity existed between the operational definition within this study and the actual delineation of the method within the classroom. This disparity led the researcher to conclude that an operational definition is a necessity within research.

**Standardized operational definition.** Flipped classroom was defined as a reverse classroom learning environment where lecture was not delivered inside the classroom; rather, a variety of media formats were presented outside the classroom to prepare the student before coming into the classroom. Inside the classroom, students were almost 100% participatory with collaborative active learning exercises (Missildine et al., 2013; Strayer, 2012). A flipped classroom was described where the lecture is now outside of the classroom (using video or audio presentations online) and homework is inside the classroom where students and teacher work together to solve problems (Bergmann & Sams, 2012a).

This study contained a thorough definition of the flipped classroom; however, the causal-comparative ex-post facto methodology did not allow for any control or manipulation of the variables. While the definition of the flipped classroom was well defined within the study, the
actual flipped classroom that was studied did not follow the same definition, which may have impacted the results.

Having a standardized operational definition is an extremely important step before any research or any implementing of the method can take place. Without a true standardized operational definition, any outcomes being measured cannot be generalized or compared to one another. At this time, there are a number of definitions that exist within the literature; however, there must come a consensus on one operational definition. In research, this definition must hold true for all bodies of literature on the topic of the flipped classroom. This allows for the information to be reliable, allowing for generalizability. In academia; however, there is more flexibility for such a definition. Without doing at least this minimum attempt at a standardized operational definition, faculty may find themselves with dissatisfied students who are confused about the course expectations (Missildine et al., 2013; Strayer, 2012). However, for the purposes of research, a macro-level operational definition is necessary to provide for validity and generalizability of research.

Practical Implications

This study aimed to help minimize the pressures of nurse educators as they attempt to meet National Licensure Exam pass rates, maintain attrition levels, and meet the demands of the nursing shortage. While non-significant results were revealed within this study, several practical implications do exist. Flipping the classroom was found to be equally effective to lecture in promoting academic performance. Students who perform well academically in the classroom tend to do well on the state board licensure exam (Waterhouse & Beeman, 2003). Furthermore, students who do well in the classroom tend to want to come to class and stay in school (Clement,
Gwynne, & Younkin, 2001). Students who stay in school, pass their licensure exam, and become RNs, fill the nursing shortage we have in our country. These are perhaps the most important implications of this research. Lastly, students who have elements that are associated with a sense of community such as being engaged and belonging are known to stay in school and attend their classes (Clement et al., 2001). This research found that students who participated in the flipped classroom did have a higher sense of community rating (6.57 points higher). The higher a student’s sense of community rating, the more likely they are to have a true sense of community, which would lead to higher attrition rates. This study has important practical implications that have the potential to produce change and create transformation.

**Drivers for change.** Nurse educators are encouraged to expand their instructional methods to include new approaches for classroom teaching techniques. Nurse educators have known since the 1990s that active learning is essential in the classroom if students are to be engaged and learning is to be enhanced (Bonwell & Eison, 1991). In addition, nurse educators have also known that stepping away from teacher-centered learning environments to learner-centered is also essential for keeping students engaged and wanting to come to class. This driver for change must come not only from top administrators for schools of nursing, but also from nurse educators, where both are striving and working together for positive change and transformation.

When describing the building of a quality institution of education, Sallis (2002) states that, “Fear of the unknown, of doing things differently, of trusting others, and of making mistakes, are powerful defense and resistance mechanisms” (p. 32). It is quite possible that the flipped classroom is such a new and innovative teaching strategy that many administrators and nurse educators know very little about it. Whenever individuals are faced with the unknown or
change, it is natural to cling to that which is familiar and known, avoiding the uncomfortable feelings or fear that come with change. The best way to reduce fear is to fill the unknown gaps with knowledge and understanding. This study has provided another piece of evidence demonstrating flipped classroom as equally effective as lecture in promoting academic performance and sense of community.

**Professional development and training.** When faculty and administrators are not all in agreeance and understanding the flipped classroom, student dissatisfaction is quick to occur (Strayer, 2012). Implementing any new teaching strategy requires professional development and training for all staff and faculty involved, including specific policies, procedures, and protocols to follow when using the new teaching strategy. A method such as the flipped classroom would require the acquisition of video or audio software. The software would need to be easily accessible to faculty, along with the privacy to record lectures. In addition, faculty would need to have training and understanding about how to integrate the flipped classroom into their classroom syllabi. Furthermore, course loads would need to be adjusted to allow for a first-time attempt at flipping the classroom as the literature has identified that the first time attempt is time-consuming due to the creation of video lecture materials (Missildine et al., 2013; Strayer, 2012). Finally, faculty would need to be instructed on how to implement the flipped classroom inside the classroom where the nurse educator becomes a facilitator of group work, answering questions and providing feedback as new ideas are discussed and new concepts are learned ‘on the fly’.

**Limitations**

Several limitations were identified in this study including small sample size, design method, course length, internal and external validity issues, and questionnaires and testing issues, each discussed here in this section.
The most obvious limitation of this study is the lack of robust quality in the choice of a causal-comparative (ex-post facto) design and a very small sample size. True inferences about causality when utilizing this design must be done tentatively (Gall et al., 2007). Tenacity toward the causal-comparative design exists because it does not allow for an experimental investigation (Gall et al., 2007). Thus, there is no randomization of participant’s and no manipulation of the independent variable as there would be in an experimental study. The causal-comparative design allowed the current researcher to study already existing data as it occurred naturally, but the researcher has chosen to use extreme caution when interpreting the results and cautions the reader to do the same (Gay et al., 2011).

Methodology

Using a quasi-experimental design such as this in nursing education, where randomization is almost impossible, provides a robust method for looking empirically at the differences of these two teaching strategies (Howell, 2011).

The researcher used the method design of an ex-post facto (causal-comparative) design and searched for a nurse educator who was already flipping the classroom and had previously been providing a lecture-only format. From that inquisition, this study was born. Empirical studies need to be robust and experimental in nature, quasi-experimental at minimum, for a valid and reliable study (Howell, 2011). While this is true, in some areas this becomes difficult to achieve and empirical research is lacking in those areas. For example, this researcher originally had to go out of state to conduct a study because local schools felt that the researcher posed a threat or conflict of interest to the schools. Once accomplished, the research was later halted due to circumstances beyond the researcher’s control. These types of obstacles are not uncommon for researchers but require resolution. Nursing communities must come together in an effort to
produce nursing research within nursing education. Research that is limited by its methodology is not entirely invalid. In this study, the choice to use a less robust design is certainly a limitation; however, the results provide another piece of literature that may trigger other researcher’s curiosity to explore and investigate further the flipped classroom as it relates to academic performance and sense of community.

**Course Length**

Perhaps one of the more significant limitations is the confounding variable of length of course. The control group (lecture) pathophysiology course was 16 weeks in length, which is the normal course length based on a semester. The experimental group (flipped classroom) pathophysiology course was 8 weeks in length because it took place over the summer and not during a normal duration semester. Despite the difference in course length, each group followed the same course objectives and earned the same amount of course credit hours. To meet this requirement, the 16 week course group attended class only one day per week, where the 8 week course group attended class two days per week. Nonetheless, because the experimental group (flipped classroom) was only half the duration of the control group (lecture), this confounding variable that was not able to be controlled is considered a limitation of this study and could potentially influence the outcome.

**Internal and External Validity**

One of the most important threats to internal validity was that the two groups may not be equivalent in one area or another and generalizability might not be possible. Because of the small sample size, a Chi-Square analysis was not possible to examine homogeneity; therefore, the researcher used close observation to compare the two groups for similar distributions and the two groups (lecture and flipped) were noted to be similarly distributed. The groups were
considered comparable and homogenous; thus, minimizing the selection threat to validity inherent to the causal comparative design chosen for the study. While this threat was examined by the researcher, it was not entirely eliminated because of the chance of human error or bias. Because this design was a causal-comparative, readers must be cautious in making any inference to generalizability, and must make a tenuous generalizability to nursing students.

**Questionnaires and Tests**

Another threat to validity was the use of questionnaires and tests among the participants. A test is only as good as its reliability and validity factors (Gall et al., 2007). In this study, the researcher had to allow those exams which were already administered to provide a measurement of academic performance. To support the validity and reliability, the researcher attests that the instructor is a highly-experienced educator of 13 years with test-writing capability and training, along with excellent assessment skills including KR-20 (.88 and .84) reports on each final exam administered. Each exam was blueprinted to the course objectives and outcomes. The objectivity of the exam was strong because the instructor chose to utilize multiple-choice items which tend to be much more objective, providing a positive criteria for judging the quality of the exam (Gall et al., 2007). For both comparison groups, the standard conditions of how the exams were administered were identical including proctoring, timing, and instructions; another positive criteria (Gall et al., 2007).

**Recommendations for Future Research**

Further experimental studies are needed because differences among the results remain, and there is still a shortage of empirical literature on this topic. In addition, research studies are needed that explore the flipped classroom using robust experimental design methods.
In considering future methodology, researchers will want to contemplate quasi-experimental methods to study the flipped classroom. The most rigorous design for this study is an experimental design (Campbell & Stanley, 1963). Studies currently exist, which are true experimental (Harrington et al., 2015); however, the randomization of participants is very difficult to obtain in nursing education and should not discourage researchers from seeking another robust design option. A quasi-experimental, pretest-posttest nonequivalent control-group design is one of the most widespread in education literature and is a good option for researchers (Geist et al., 2015). It is rigorous and allows researchers to conduct research with control groups and experimental groups without the need for randomization. This method is used throughout nursing education and is highly respected (Choi et al., 2013; George & Muninarayanappa, 2013; Jameson, 2013; Pulsford et al., 2011).

Further research should first focus on generalizability of the studies. This study looked at one school site with a very small sample size. Similar studies have experienced the same issues with generalizability (Geist et al., 2015; Harrington et al., 2015). Researchers may want to consider longitudinal studies with multiple school sites participating and larger sample sizes to avoid this lack of generalizability among studies.

Research has supported the idea that teacher presence and preparation has a distinct influence on how the flipped classroom will be experienced by the students (Harrington et al., 2015; Missildine et al., 2013; Strayer, 2012). Future research studies must consider that lack of experience with the flipped classroom is not acceptable. Future research that explores the flipped classroom may want to employ instructors who are experienced with the flipped classroom and the various technologies and activities that the flipped classroom requires. Future research may want to explore the implementation of faculty professional education programs that
teach how to flip the classroom using a fully operationalized definition of the flipped classroom. Infrastructure, consistency, transparency, and stakeholders are all concepts that the literature has stated as being important when implementing the flipped classroom (Missildine et al., 2013; Post, Deal, & Hermanns, 2015). This study supports each of these concepts as being important to the implementation. Future studies may seriously consider each of these concepts in the methodology planning.

Research has found differing results about whether the flipped classroom is capable of producing better outcomes for students’ academic performance when compared to traditional lecture methods (Geist et al., 2015; Harrington et al., 2015; Missildine et al., 2013; Schlair et al., 2014; Strayer, 2012). The following research questions may want to be considered for future studies:

- When performing a literature review (qualitative and quantitative), what operationalized definition of the flipped classroom could be realized? Furthermore, what educational training may be necessary to fully prepare a faculty member to implement the flipped classroom?
- When comparing various classroom activities utilized inside the flipped classroom, which activities are the most effective in producing positive academic outcomes?
- Which methods, outside of the classroom, are most effective in ensuring student preparation when coming to class? In other words, are audio and video lectures the most effective technique or are there other viable options?
- When analyzing student satisfaction, is there a difference between students who participate in a program that is entirely flipped from its inception or is there a different
level of satisfaction in those students who participate in a program where the flipped classroom is used intermittently?

Is there a relationship between a nursing students’ sense of community during nursing school and their ability to function effectively as a team member on a nursing unit? Does a nursing students’ sense of community have a relationship with a nursing students academic performance, attrition rates, and satisfaction while in nursing school? These are just a few of the questions that future research may choose to investigate.

**Conclusion**

This study was designed to determine if the flipped classroom and lecture teaching strategies experienced any statistically significant differences in academic performance or sense of community among nursing students in a pathophysiology course. While no statistically significant difference was noted in academic performance when comparing lecture and flipped classroom, it was determined that each teaching strategy was almost equal in its ability as the means were less than one percent difference from one another. Based on this finding, it was concluded that lecture and flipped classroom are equally effective at promoting academic performance. Future researchers are encouraged to consider using experimental and quasi-experimental methods to further explore the flipped classroom as it relates to academic performance and sense of community.

This study has provided administrators and educators with the knowledge that flipped classroom can be considered an equally effective method in promoting academic performance and sense of community. This knowledge will hopefully encourage administrators and educators to consider implementing a new instruction strategy such as flipped classroom, knowing it is best practice and will promote positive outcomes.
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APPENDICES

APPENDIX A: IRB APPROVAL

LIBERTY UNIVERSITY
INSTITUTIONAL REVIEW BOARD

June 1, 2015

Rhonda Farella
IRB Approval 1907.060115: Exploring the Flipped Classroom: A Causal-Comparative Inquiry into the Significance of Implementing a New Teaching Strategy in Nursing Education

Dear Rhonda,

We are pleased to inform you that your study has been approved by the Liberty IRB with the understanding that you will not begin your research until you have received IRB approval from the University of Saint Francis. This approval is extended to you for one year from the date provided above with your protocol number. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,

[Name Redacted]

Fernando Garzon, Psy.D.
Professor, IRB Chair
Counseling

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APPENDIX B: SCHOOL SITE IRB APPROVAL

Institutional Review Board
June 8, 2015

To: Ronnie Faretta

Thank you for submitting your research proposal to the University of Saint Francis Institutional Review Board (IRB).

The Board members approved your proposal HSRC-20 on June 8, 2015.

I am enclosing the IRB Approval Form and the Study Closure Form for your records.

Good luck with your research!

Co-Chair, IRB

Co-Chair, IRB
APPENDIX C: PARTICIPATION REQUEST

Dear Participant,

Hello! My name is Rhonda Faretta, and I am a nursing educator and doctoral candidate working toward a doctorate in education (EdD) degree. As many of you know by now, pursuing your nursing education and higher education is a lifelong pursuit. For me, this pursuit has led me to pursue a doctoral degree in education, and I am at the stage where I must complete my dissertation with a research study. Many of you have experienced research already in your nursing education and have come to understand the importance of evidence-based practice in making nursing decisions.

With the acknowledgement and support of your instructor, [INSTRUCTOR NAME], and the Director of Nursing, [DIRECTOR OF NURSING NAME], you are being asked to participate in a study that will examine academic performance and sense of community in nursing students who participate in either lecture or the flipped classroom teaching strategy model. You have been selected to participate in this study because you fit the criteria and were enrolled and participated in a pathophysiology course at the research site where I will be conducting the study. Each of you participated in a pathophysiology course that was taught utilizing one of two teaching strategies (lecture or flipped classroom). Each of you have important information that when collected by a researcher can identify specific variables related to the teaching methods that were utilized. This information, once analyzed, has the ability to inform the future practice of nursing education as it relates to teaching strategies.

Because each of you have already participated in the course, this researcher desires to look back at the learning experience as it existed when you took the course and collect specific
data from each of you. Only those who sign a consent form will have their data included in this study. Any student desiring not to have their data included in the study may opt out of the study and decline participation. The data collected for this study will take place utilizing the SurveyMonkey™ data collection website. Only the researcher will be able to see the information you provide in the surveys. The SurveyMonkey™ link will guide you to three documents (one after the other and continuously) including a consent form, a demographic survey, and a Classroom Community Survey®. The entirety of these three documents will take about 10 minutes or less to complete.

All students who link into SurveyMonkey™ will have the option of participation or declining to participate. Only the researcher will have access to this data, which will be kept password protected. All data will have names removed and identification numbers replaced to protect the identity of each participant. In addition to the collection of these surveys, this researcher will obtain your final exam scores from the course to provide data comparisons and analysis.

To thank you for your participation and time, upon completion of the survey, all participants in the research study and who have signed consent forms will have their name entered into a drawing for one of five $50.00 VISA gift cards that will be given away. Winners will be contacted via email by the researcher to arrange for card pick-up at the school site.

As a participant in this study, you are free to voluntarily withdraw your participation at any time prior to September 1, 2015. The choice of participation is entirely yours and will involve several forms of data collection by this researcher as previously mentioned. Your participation or your withdrawal from participation will not impact in any way your standing in the nursing program nor any current or future relations with Liberty University.
Participating in a nursing research study may help to enhance your understanding of the importance of instructional strategies while reinforcing your understanding of the importance of evidence-based practice in nursing. In addition, you may experience making a difference in nursing education by participating in a study which may impact how nurse educators instruct in the classroom. Should you have any inquiries about this study prior to the first day of class, please feel free to contact me at [redacted]. In addition, participants may contact the chair for this study, Dr. Jennifer Courduff at [redacted]. Any further inquiries may be submitted to the Liberty University IRB at 1971 University Blvd., Lynchburg, VA 24515. Your time and consideration of this request are most appreciated.

To begin the process of accepting or declining participation and completing the surveys, please click on the link below. The original link will continue to connect you from the consents to the first survey and the second survey and will end at a google drive where both consents can then be saved or printed in PDF format. If you have any technical difficulties, please contact me at [redacted] for assistance.

https://www.surveymonkey.com/s/[redacted]

Sincerely,

Rhonda Faretta MSN/ED, RN, CCRN, Doctoral Candidate, Liberty University
Dear Participant,

You are being asked to participate in a study that will examine academic performance and sense of community in nursing students who participate in either lecture or the flipped classroom teaching strategy model. You have been selected to participate in this study because you fit the criteria and were enrolled and participated in a pathophysiology course at the research site where this study will be conducted. Each of you participated in a pathophysiology course that was taught utilizing one of two teaching strategies (lecture or flipped classroom). This consent form is presented to you utilizing the SurveyMonkey™ online data collection tool, and you will have the option to either accept participation in the study or decline participation.

As a participant in this study, you are free to voluntarily withdraw your participation at any time before September 1, 2015. The choice of participation is entirely yours and will involve several forms of data collection by this researcher. Your participation or your withdrawal from participation will not impact in any way your standing in the nursing program nor will it impact or affect in any way current or future relations with Liberty University. This form will outline the details of the study including inquiries, procedures, risks, benefits, compensation, and confidentiality.

Researcher

Rhonda S. Faretta, MSN/ED, RN, CCRN, Doctoral Candidate, Liberty University

Inquiries
At any time during the research, participants are encouraged to ask questions and be informed about the research being done. All inquiries can be emailed to Rhonda Faretta at rfaretta@liberty.edu. In addition, participants may contact the chair for this study, Dr. Jennifer Courduff at jlcourduff@liberty.edu. Any further inquiries may be submitted to the Liberty University IRB at 1971 University Blvd., Lynchburg, VA 24515, irb@liberty.edu.

**Procedures**

In this study, participants will provide their participation by signing a consent form, allowing this researcher to utilize his or her final exam scores, and completing two surveys (demographics and Classroom Community Survey®). The consent and surveys will take less than ten minutes to complete in their entirety and will take place upon the participant entering the SurveyMonkey™ LINK website.

Results regarding who is participating and from the demographics survey and CCS® will only be known to me. I trust that a student’s consent to participate will verify the assumption that the student will do his or her very best in providing accurate details in the surveys. Once again, participation in this study is voluntary and students may opt out at any time prior to September 1, 2015. The results from this research will be used in a dissertation for a doctorate of education degree and may be used in publications and speaking engagements.

**Participant Risks**

The only potential risk in this study is the possibility of a student’s scores on the final exams and CCS® being made known to others. To avoid this risk, only the instructor and researcher will see the final exam scores, and only the researcher will have access to the CCS®, all of which will then be labeled with anonymous, number identifiers to avoid scores being made known outside of the research study in reference to specific students. In addition, the name of the
school will not be included anywhere in the research report; rather, a pseudonym will be used to avoid identifying specific participants. No other risks are identified within this study that are outside of the student’s normal everyday life.

**Participant Benefits**

By participating in this study, the student may increase his or her understanding of the research process and the importance of evidence-based practice in nursing and nursing education. In addition, the student’s participating in the flipped classroom may receive the highlighted benefits of this type of instruction that is potentially more beneficial to their learning and experience. In addition, students may gain a greater understanding of the importance of peer collaboration and active learning. Finally, it is possible that future students, instructors, and administrators may benefit from the findings of this study should this research be approved, completed, and published upon completion. The benefits described herein are not a guarantee; rather, they are solely based on the personal experience of the participant and their perception. It is understood that not every participant may gain benefit or the same benefits from this research.

**Compensation**

Any student who agrees to participate in this study, regardless of opting out at a later date, will be entered into a drawing for one of five $50.00 VISA gift cards as a thank you from the researcher for your time and consideration of being a participant in this study.

**Confidentiality**

Participants can be assured that every effort will be taken to keep his or her information confidential. Data obtained in this study includes demographic information and test scores, all of which will be seen only by the instructor and researcher and then transferred into anonymous number identification so that participants cannot be identified. In addition, pseudonyms will be
used within the research report and the school will not be identified. Furthermore, any surveys or exams that the student takes or the researcher collects will be stored electronically and password protected. Any documents that require hard-copy storing will be kept in a fire-proof safe with only the researcher having code access.

**Disclosure**

Your electronic signature on this SurveyMonkey™ website signifies you agree to all the terms stated therein. In addition, your electronic signature is a statement that you have read and understand the contents of this document and have had the opportunity to ask any questions and decline participation should you so choose. Furthermore, by signing this consent you agree that you understand you can opt out of participating at any time prior to September 1, 2015, and your participation is purely voluntary. Thank you for your contribution to the science of nursing.

*Refer to SurveyMonkey™ electronic signature process*

<table>
<thead>
<tr>
<th>Participant Name</th>
<th>Participant Signature</th>
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</thead>
<tbody>
<tr>
<td>Researcher Name</td>
<td>Researcher Signature</td>
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APPENDIX E: PARTICIPANT CONSENT FORM FOR RESEARCH SITE

PARTICIPANT CONSENT FORM FOR University of Saint Francis
(RESEARCH SITE)

Insert Date

Dear Participant,

In addition to the consent for participation for Liberty University, this consent has additional requirements as necessary for University of Saint Francis student participants.

Introduction

I am Professor Ronnie Faretta, a doctoral student at Liberty University, and I am conducting a study of possible differences that may exist when students experience various teaching strategies such as lecture and the flipped classroom. I would appreciate your participation in this study, as it will assist me in making recommendations for improving the teaching of future students of nursing.

Summary

The previous consent provided you with full explanations of the procedures of this study including the necessity to collect your final exam scores from your pathophysiology course, and to request you to fill out the surveys (demographics and classroom community). Upon providing both your initial Liberty consent and this University of Saint Francis consent, I will collect your final exam scores and use your surveys to begin data analysis which will provide much needed answers to the research questions.

You have been selected to participate in this study because you fit the criteria and were enrolled and participated in a pathophysiology course at the research site where this study will be conducted. Each of you participated in a pathophysiology course that was taught utilizing one of
two teaching strategies (lecture or flipped classroom). This consent form is presented to you utilizing the SurveyMonkey™ online data collection tool and you will have the option to either accept participation in the study or decline participation. As a participant in this study, you are free to voluntarily withdrawal your participation at any time before September 1, 2015. The choice of participation is entirely yours and will involve several forms of data collection by this researcher. Your participation or your withdrawal from participation will not impact in any way your standing in the nursing program nor will it impact or affect in any way current or future relations with Liberty University. Participating in a nursing research study may help to enhance your understanding of the importance of instructional strategies while reinforcing your understanding of the importance of evidence-based practice in nursing. This form will outline the details of the study including inquiries, procedures, risks, benefits, compensation, and confidentiality.

Researcher
Rhonda S. Faretta, MSN/ED, RN, CCRN, Doctoral Candidate, Liberty University

Inquiries

Once the study is completed, I would be glad to give you the results to you. In the meantime, if you have any questions, please contact us at the following:

All inquiries can be emailed to Rhonda Faretta at [redacted]. In addition, participants may contact the chair for this study, Dr. Jennifer Courduff at [redacted]. Any further inquiries may be submitted to the Liberty University IRB at 1971 University Blvd., Lynchburg, VA 24502.

If you have any complaints about your treatment as a participant in this study, please call or write:
Procedures

In this study, participants will provide their participation by signing a consent form, allowing this researcher to utilize his or her final exam scores, and completing a SurveyMonkey™ with two surveys (demographics and Classroom Community Survey®). The consent and surveys will take less than ten minutes to complete in their entirety and will take place upon the participant entering the SurveyMonkey™ LINK website.

Results regarding who is participating, and from the demographics survey and CCS® will only be known to me. I trust that a student’s consent to participate will verify the assumption that the student will do his or her very best in providing accurate details in the surveys. Once again, participation in this study is voluntary and students may opt out at any time prior to September 1, 2015. The results from this research will be used in a dissertation for a doctorate of education degree and may be used in publications and speaking engagements.

Participant Risks

The only potential risk in this study is the possibility of a student’s scores on the final exams and CCS® being made known to others. To avoid this risk, only the instructor and researcher will see the final exam scores and only the researcher will have access to the CCS®, all of which will then be turned into anonymous number identifiers to avoid scores being made known outside of the research study in reference to specific students. In addition, the name of the school will not be included anywhere in the research report; rather a pseudonym will be used to
avoid identifying specific participants. No other risks are identified within this study that is outside of the student’s normal everyday life.

**Participant Benefits**

By participating in this study, the student may increase his or her understanding of the research process and the importance of evidence-based practice in nursing and nursing education. In addition, the student’s participating in the flipped classroom may receive the highlighted benefits of this type of instruction that is potentially more beneficial to their learning and experience. In addition, students may gain a greater understanding of the importance of peer collaboration and active learning. Finally, it is possible that future students, instructors, and administrators may benefit from the findings of this study should this research be approved, completed, and published upon completion.

**Compensation**

Any student who agrees to participate in this study, regardless of opting out at a later date, will be entered into a drawing for one of five $50.00 VISA gift cards as a thank you from the researcher for your time and consideration of being a participant in this study.

**Confidentiality**

Participants can be assured that every effort will be taken to keep his or her information confidential. Data obtained in this study includes demographic information and test scores, all of which will be seen only by the instructor and researcher and then transferred into anonymous number identification so that participants cannot be identified. In addition, pseudonyms will be used within the research report and the school will not be identified. Furthermore, any surveys or exams that the student takes or the researcher collects will be stored electronically and password
protected. Any documents that require hard-copy storing will be kept in a fire-proof safe with only the researcher having code access.

Disclosure

Your electronic signature on this website signifies you agree to all the terms stated therein. In addition, your electronic signature is a statement that you have read and understand the contents of this document and have had the opportunity to ask any questions and decline participation should you so choose. Furthermore, by signing this consent you agree that you understand you can opt out of participating at any time prior to September 1, 2015 and your participation is purely voluntary. Thank you for your contribution to the science of nursing.

Closing Remark

I have received an explanation of this study and agree to participate. I understand that my participation in this study is strictly voluntary and that I have the freedom to withdraw at any time.

*Refer to SurveyMonkey™ electronic signature process*

_________________________________  ____________________________
Participant Name  Participant Signature

_________________________________  ____________________________
Researcher Name  Researcher Signature

IRB Code Numbers: 1907.070914

IRB Expirations Date:
APPENDIX F: DEMOGRAPHIC SURVEY

Tell the researcher about yourself…

A. For the purpose of identifying cross-data comparisons to final exam scores and community surveys *(all names are seen by the researcher ONLY and kept confidential)*.

Please write your first and last name:

a. ____________________________________________

B. Gender

a. Male

b. Female

C. Age

a. _______ years old

D. Race

a. Hispanic or Latino

b. White

c. Black or African American

d. Native Hawaiian or Other Pacific Islander

e. Asian

f. American Indian or Alaska Native

g. Two or More Races (Other)

E. What is your highest degree of education (do not include your current associate degree)

a. High School graduate or GED

b. Associate

c. Bachelor
d. Master  
e. Doctorate

F. Which program are you currently in?
   a. Pre-Nursing (Working on courses to be in the Nursing Program)  
   b. Nursing  
   c. Other

G. How many months have you been in the nursing program (including pre-requisite, non-nursing courses)?
   a. 1-3 months  
   b. 4-6 months  
   c. 7-9 months  
   d. 10-12 months  
   e. 13 + months  
   f. Not Applicable (I am not in the nursing program)

H. Have you taken this course before and are now repeating the course a second time?
   a. Yes  
   b. No

I. How would you rate your overall GPA in your previous science courses (include High School and College)?
   a. A average (high school and college)  
   b. B average (high school and college)  
   c. C average (high school and college)  
   d. D average (high school and college)
e. I did very poor in high school but earned A’s and B’s in college
f. I did very poor in high school but earned C’s in college
g. I did very poor in high school and earned C’s after two attempts in college

J. How would you rate your experience with pathophysiology?

1 = I know absolutely nothing about this field and feel anxious about learning the new material.
2 = I know very little about the field but feel confident that I can learn the new material.
3 = I have a basic knowledge about the field which will help me do well in the class.
4 = I am very knowledgeable about the field but I feel that there is more that I can learn.
5 = I am an expert in the field and feel extremely confident of my skills.
APPENDIX G: CLASSROOM COMMUNITY SCALE

Please click on the link below to gain access to the Classroom Community Scale:

http://www.alfredrovai.com/classroom-community-scale/
APPENDIX H: PERMISSION TO USE CLASSROOM COMMUNITY SCALE® (CCS®)

Alfred Rovai
alfrrov@regent.edu
Tue 5/6/2014 2:19 AM
To: Faretta, Rhonda;

Good Morning, Rhonda.

Yes, you may use the CCS as you describe your use.

Best wishes,
Fred Rovai

Mon 5/5/2014 8:26 PM
To: alfrrov@regent.edu

Dear Dr. Rovai,

Thank you for your guidance in previous emails related to the various possible scales related to a sense of community. After much consideration, I have determined that the Classroom Community Scale (CCS) (Rovai, 2002) is the most appropriate scale to measure sense of community within my study.

To refresh from our previous conversations, I am a doctoral student at Liberty University and my topic will examine the flipped classroom and lecture among nursing students, and any differences that might exist in academic performance or sense of classroom community.

To complete my proposal process, I am writing you to respectfully request your permission to utilize the CCS within my study. In return, I will provide the appropriate citations and credits, and I will look forward to sharing with you the results of my findings. Thank you in advance for granting your permissions.

Sincerely,

Rhonda Sue Faretta
Doctoral Candidate
Liberty University