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## Flipped Approach on Student Outcomes

Christina Johnson

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FLIPPED APPROACH ON STUDENT OUTCOMES

An Evidence-based Practice Capstone Project

Submitted to the Faculty of the

Graduate Program in Nursing

In Partial Fulfillment

of the Requirements for the Degree

Master of Science in Nursing

Christina Johnson

Messiah College

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Christina Johnson

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Messiah College  
School of Graduate Studies  
Graduate Program in Nursing

We hereby approve the Capstone Project of

Christina Johnson

Candidate for the degree of Master of Science in Nursing

Tara Jankouskas, PhD, RNC  
Capstone Advisor

May 13, 2017

Louann B Zinsmeister, PhD, RN, CNE  
Professor of Nursing  
Director of Graduate Program in Nursing

May 13, 2017

Anne B. (Nancy) Woods, PhD, MPH, RN  
Professor of Nursing  
Chairperson, Department of Nursing

May 13, 2017

Title of Capstone Project: Flipped Approach on Student Outcomes

Author: Christina Johnson

Capstone Advisor: Dr. Tara Jankouskas

Capstone Approvers: Dr. Louann Zinsmeister, PhD, RN, CNE  
Dr. Nancy Woods, PhD, MPH, RN

The flipped classroom approach guided by Constructivist Theory uses active learning strategies to promote student critical thinking. Active learning strategies include activities that promote student engagement and application of knowledge. The purpose of this evidence-synthesis project focused on conducting a review and critical appraisal of literature on the flipped classroom approach and its effects on student satisfaction and learning outcomes. The themes discussed are teaching strategies, student satisfaction, theoretical support, and learning. The author of this paper presented findings of fourteen research studies including reviews which discussed student satisfaction and student outcomes. Swart and Wuensch (2016) suggested the flipped classroom approach can improve student satisfaction. Martin, Kreiger, and Apicerno (2015) reported that in-class activities were significantly more important to meet course objectives. Bhojrub et al. (2010) suggested that the flipped classroom approach engaged students by using heutagogy. However, more research evidence is needed to generalize the findings to determine whether the flipped classroom approach can positively affect student satisfaction and student outcomes in pre-licensure nursing programs.

*Keywords:* flipped classroom, student satisfaction, transactional distance, hybrid/blended course, transactional learning, problem-based learners (PBL), non-problem-based learners (NPBL), and nursing education.

## DEDICATION

To my husband Steve who has been with me every step of the way. Through your encouragement, belief in me, and all of your support, you have helped me through the completion of this project. For the countless hours, pre-dawn mornings, and late nights, you have been patient and helped our children with homework, projects, and attended all types of events when I could not be there. I thank the Lord Jesus Christ for you! I love you with all my heart. Mom, your continuous prayers have given me strength to keep going. Your encouragement in our early morning conversations at 6:00 a.m. lifted my spirits many days. May the fruit of this work fall fresh on us and be a blessing to others.

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## CHAPTER I

### INTRODUCTION

Today's nurse educators are challenged with meeting the learning needs of students due to advancing healthcare technologies. Currently, the nation demands more educated nurses to address the needs of the increasingly complex and sophisticated healthcare. In order to continue to provide high-quality healthcare, it is essential that nursing programs develop or revise curricula to engage learners of all levels and of various learning styles to meet the educational needs of today's students.

Presti (2016) cited the Institute of Medicine's report, *Crossing the Quality Chasm* (2001), that there is a need for future demands of quality evidence-based care, effective multidisciplinary team collaboration, and complex patient-clinician relationship facilitation. Today, educational reform is needed to help students problem-solve, reason, and apply theory into their practice. The traditional pedagogy of didactic teaching limits learning due to lack of engagement, understanding of course material, and translating knowledge into practice. Instead, healthcare programs are turning to student-centered approaches that actively engage learners, support diversity of learning styles, as well as have learners take a more active role in accountability for their learning (Betihavas, Bridgman, Kornhaber, & Cross, 2016).

#### **Statement of Problem**

According to Gilboy, Heinerichs and Pazzaglia (2015), the in-class lecture style of imparting knowledge is no longer an effective strategy in assisting students to acquire knowledge because the attention span declines after the first 10 minutes of class. The authors also noted that students only remember about 20% of material presented during lecture. In nursing programs across the country, the traditional lecture approach of imparting knowledge is no longer

adequate. According to Gilboy et al. (2015), higher learning institutions have undergone intense scrutiny for addressing student learning due to the increased amount of retained knowledge and skills expected post-graduation. Nursing educators are pressured to transform curricula to engage active learning.

### **Background and Need**

According to Schlairet, Green and Benton (2014), there is a need for nursing students to learn in complex, unpredictable environments. The authors suggested that faculty are inspired to explore the flipped classroom approach because it fosters independence, self-direction, critical thinking, and clinical decision-making. According to Presti (2016) the flipped classroom approach originated from a teaching strategy called peer instruction by a Harvard University professor Eric Mazur in 1997. In 2007, Jon Bergmann and Aaron Sams received recognition for introducing the flipped classroom approach to their high school chemistry class (Presti, 2016). Presti (2016) used the following definition of the flipped classroom approach as defined by Bergmann and Sams (2014):

a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter (p. 252).

There is a need to develop or redesign nursing curricula to meet the needs of complex and unpredictable healthcare environments (Schlairet, Green, & Benton, 2014).

According to Ratta (2015), nursing educators are challenged to transform the traditional classroom approach of teaching to active learning methods to emphasize a sense of salience, thinking and action. According to Gilboy et al. (2015), learning institutions are moving away

from the traditional pedagogy of “sage on the stage” of imparting knowledge through lecture alone (p. 109). Instead, the authors suggested that “guide on the side”, or guiding students with assistance and correction to explore content independently or with a group is a better alternative to meet the demands of today’s learners as well as fostering accountability. There are gaps in knowledge in using the flipped classroom approach which include variations among faculty in designing and implementing this approach (Missildine, Fountain, Summers & Gosselin, 2012). The significance of this topic to nursing education is imperative because nurse educators must remain current with educational technologies using creative strategies and innovations to engage learners. According to Harrington, Bosch, Schoofs, Beel-Bates and Anderson (2015), integrating theory with practice involves more than knowledge application and requires effective strategies for integration of nursing knowledge. The authors stated that educators must step out from the podium to engage students in practice-based learning experiences that stimulate critical thinking. By using the Constructivist Theory to create a flipped classroom, experiential activities can guide students in significant and relevant changes in caring for the population (Harrington et al., 2015). According to Harrington et al. (2015), application of the Constructivist Theory to the flipped classroom approach supports knowledge building, reasoning skill development, learning preferences, and prior learning experiences.

### **Purpose Statement**

The purpose of this paper is to provide an integrative review of literature on using the flipped classroom approach compared to traditional approach as it relates to student satisfaction and learning outcomes in an academic setting. The PICO question for this paper is: In undergraduate pre-licensure nursing programs, does the use of a flipped classroom approach as a

teaching methodology improve student satisfaction and learning outcomes in terms of grades and exam scores compared to traditional lecture teaching methodology?

### **Definition of Terms**

- Constructivist theory - knowledge that is constructed or reconstructed by those who are trying to make sense of new information in terms of what they already know (Gilboy et al., 2015).
- Flipped Classroom - a pedagogical approach that involves direct learning of content completed by the individual student prior to class. Active learning strategies are used in the classroom, which involves student interaction, application, and interpretation of acquired knowledge through experiential learning activities. During the classroom activities, educator guides learning with formative feedback.
- Heutagogy - a teaching methodology that supports learning engagement, flexibility, student ownership, self-direction and active learning (Presti, 2016). Heutagogy is related to the Constructivist Theory because it engages the learner in the construction of knowledge through active learning strategies.
- Learning outcomes - include course grades and exam scores.
- Student satisfaction - includes feelings or perceptions that learning occurred, progress toward learning goals occurred, and learning experiences were appropriate for the course (Swart & Wuensch, 2016).

## CHAPTER II

### METHODS

In today's complex and advanced world of healthcare technology, the need for program revision is necessary to keep current with trends by using creative teaching strategies. The Institute of Medicine published a report, *Crossing the Quality Chasm*, in 2001, which emphasized the need for new health professions educational models. These new models are essential for preparing the healthcare workforce to effectively provide and support evidenced-based care, collaboration of multidisciplinary teams, and management of patient-clinician relationships (Presti, 2016). The Constructivist Theory can be applied as a conceptual framework for implementing active learning strategies in a flipped classroom approach. Educators can use the flipped classroom approach to merge construction and reconstruction of knowledge using active learning strategies designed for student achievement of the highest levels of Bloom's taxonomy; thus most effectively preparing students for the healthcare workforce .

The purpose of this paper is to conduct an integrative review and critical appraisal of literature on using the flipped classroom approach compared to traditional approach as it relates to student satisfaction and learning outcomes in an academic setting. The PICO question for this review is: In undergraduate pre-licensure nursing programs, does the use of a flipped classroom approach as a teaching methodology improve student satisfaction and learning outcomes in terms of grades and exam scores compared to traditional lecture teaching methodology?

#### **Data Collection and Evidence**

The timeframe to conduct this review of literature was six months. The literature reviewed for this study came from a search of the following databases: CINAHL, ERIC, Education Source, and Cochrane Library. Boolean operators, AND/OR/NOT, were used with

the following search terms: flipped classroom, traditional, student satisfaction, hybrid course, active learning, teaching strategies, and associate degree nursing. The inclusion criteria were peer reviewed studies, written in English that investigated the flipped classroom approach in academic institutions. Exclusion criteria were textbooks and studies published more than five years prior to (January 2011). The studies that were included in this review were primary research studies and systematic reviews. The timeframe of the studies were those conducted within the last five years.

### **Evidence-based Practice Model**

The Johns Hopkins Toolkit was used to organize and critique the quality of the studies. Based upon the best evidence using the Johns Hopkin's Appraisal tools, a synthesis of the literature was generated. For each of the studies presented in the literature review, the procedure used to conduct the study, including the interventions, participant selection, and setting is discussed. The literature review provides the evidence about the outcomes of the flipped classroom approach and how it relates to student satisfaction and learning outcomes. The literature review synthesis for this project is provided in Appendix A.



### **CHAPTER III**

#### **LITERATURE REVIEW AND ANALYSIS**

According to Gilboy et al. (2015), higher learning institutions have undergone intense scrutiny for addressing student learning due to the increased amount of knowledge and skills the students are expected to retain post-graduation. The authors suggested that learning institutions are moving away from the “sage on the stage” to more of a “guide on the side” approach which was introduced by King over 20 years ago. Gilboy et al. (2015) suggested that “guide on the side” approach guides students with assistance and correction to explore course content independently or collaboratively. The flipped classroom approach combines construction and reconstruction of knowledge to provide learners with the opportunity to achieve higher cognitive levels of Bloom’s taxonomy (Gilboy et al., 2015). Harrington et al. (2015) cited Fosnot and Perry (2005) in stating that the Constructivist Theory can be applied in the flipped classroom approach through teaching strategies that promote application of acquired knowledge and stimulate the development of reasoning skills. According to Gilboy et al. (2015), the active and contextualized process of constructing knowledge can also be achieved through personal experience because of differing interpretations. The purpose of this literature review is to present evidence on implementation strategies for a flipped classroom approach and achieved outcomes from a flipped classroom approach.

Geist et al. (2015) conducted a quasi-experimental quantitative study to gather scientific information on the effects of the flipped classroom approach on knowledge acquisition. A convenience sample consisted of 86 baccalaureate nursing students (BSN) in a Pharmacology II course.

Geist et al. (2015) used a pretest-posttest nonequivalent control group quasi-experimental study to compare knowledge acquisition between traditional and flipped classroom pedagogies. Two cohorts were chosen from a baccalaureate nursing program at the University of Tennessee. There were 40 students in the control group and 46 in the treatment group. The average GPA/HESI exam score was 3.8/965 for the control group enrolled in the course in fall 2012. The average GPA/HESI exam score was 3.7/911 for the treatment group enrolled in the identical course in spring 2013.

According to Geist et al. (2015), How People Learn (HPL) can serve as a guide for best practices to support students as they learn and transfer concepts into a variety of situations. Geist et al. (2015) did not discuss how they implemented HPL into the study. However, they did state that HPL theory can guide the flipped classroom approach in implementing learning experiences which incorporate the four major tenets of HPL theory. The four tenets are learner-centered, knowledge-centered, assessment-centered, and community centered. In a learner-centered approach, the educator implements teaching strategies that builds on student's knowledge and experiences. In a knowledge-centered approach, classroom activities promote knowledge comprehension and application. Formative assessment is performed by the educator in the assessment-centered approach by providing ongoing feedback to students to allow for revision of thinking. In a community-centered approach, students scaffold their learning by making connections between facts and real-patient situations (Geist et al., 2015). Geist et al. (2015) stated that by including the four tenets of 'How People Learn' (HPL) in the instructional design, the flipped classroom approach provided a learning environment that was structured for deeper understanding of nursing concepts.

The study findings showed that the variance in performance of groups was highly associated with the teaching method. On each of the three tests, students demonstrated better performance with the flipped class classroom approach. On the first test, the highly significant result accounted for a 52% variance in performance between the traditional compared to the flipped classroom ( $p = .000$ ). The second test showed a highly significant result of 15% of the variance in performance ( $p = .000$ ). The third test showed a significant result of 34% variance in student performance ( $p = .000$ ).

In critiquing this study, Geist et al. (2015) identified what was known about the flipped classroom approach and stated the purpose of the study clearly. The authors did not discuss how HPL was implemented. There was no discussion of the reliability or validity of the tests used to measure study outcomes. Geist et al. (2015) reported the variance in performance had highly significant results in all three exams. Because the variance in performance of groups was highly associated with the teaching method, applying HPL in a flipped classroom approach may be an effective approach to active learning. In addressing the limitations of this study, it was noted that Geist et al. (2015) used admission standards that were equivalent for both groups. Also, Geist et al. (2015) screened for missing data, miscodes, outliers, and testing violations of assumptions of the analysis and found no screening problems or assumption violations. There is a potential for a historical effect since there was a difference of over a year between the control and treatment group. The generalizability is limited due to implementation of one course at one location; thus more research is needed. The findings had reasonably consistent results for with fairly definitive conclusions based on the study type and is considered a Level II quantitative quasi-experimental study with a quality rating of B.

Martin et al. (2015) conducted a non-experimental quantitative method to evaluate the effectiveness of a flipped course as determined by student satisfaction and perceptions. A convenience sample of 206 students who completed a semester of a Medical Terminology course from Quinnipiac University was used.

Martin et al. (2015) explained that the hybrid course definition can be explained in a myriad of ways. The authors used the hybrid course which provided independent, self-directed, online content and activities prior to class followed by classroom content review. Martin et al. (2015) used Tyler's (1949) four-step curriculum review model in implementing the hybrid course involving: identifying educational purposes, providing useful instruction and effective learning experiences to meet learning objectives, and evaluating instruction and learning experiences (Martin et al., 2015).

According to Martin et al. (2015), demographic questions were used to gather information about past experience with online courses as well as future considerations of enrolling in an online course. The students' perceived effectiveness of the instructional methods in learning medical terminology was measured. A 5-point Likert scale; from (1) strongly disagree to (5) strongly agree, was used to quantify the students' perceived effectiveness of instructional methodology. A 7-point ranking question was used to evaluate factors in the students' ability to meet course objectives. Open-ended questions were also used. Students were contacted via email and voluntarily participated in an online survey. Two weeks later, a reminder email was sent. The equality of groups was tested using a Mann Whitney U test which compared respondent demographics between the two groups, traditional and hybrid classrooms. Data were analyzed using the SPSS 22.0.

According to Martin et al. (2015), there were no statistical differences between the two groups in previous experience with online courses. Response rates from the traditional and hybrid groups were 40.6% and 36.2%, respectively. No significant difference was found between groups in regards to perceived value of in-class instruction. According to Martin et al. (2015), both groups agreed that the medical terminology can be delivered in a hybrid format ( $p=0.008$ ). According to Martin et al. (2015), both groups agreed that the course was effective in developing the students' ability to translate unfamiliar medical terms, construct acceptable new medical terms from their descriptions, pronounce medical terms, and read case studies while defining words in context. According to Martin et al. (2015), both groups agreed that their own commitment to learning the material and information from the textbook were the most important factors; however, the hybrid respondents indicated that class activities were significantly more important to meet course objectives ( $p = 0.019$ ). According to Martin et al. (2015), several conclusions may be drawn from the data, particularly by the students in the hybrid course who perceived that a medical terminology course offered in a hybrid format can potentially be a successful model on instruction ( $p = 0.005$ ). One of the 14 students who answered the open-ended question stated: "I probably would not have taken this course if it was in hybrid format. I like the traditional classroom style" (p. 79). However, the majority of open-ended questions were positive (64%) or neutral (21%), in the hybrid group including several comments that indicated the hybrid model was conducive to learning and integrating course material, and to promoting higher level thinking for application and synthesis of word construction and meaning (Martin et al.,2015). One student stated "I like the hybrid course format because it helped me to integrate what I learned to studying outside of class independently without feeling lost on the material" (Martin et al., 2015, p. 79).

Study findings of the best way to implement hybrid courses have been found to be elusive because of various factors (Martin et al., 2015). The authors noted that transitioning a traditional course to a hybrid model requires more than adding online work, but involves implementing a redesigned course. An interesting point noted by the authors was that both students and instructors may have difficulty grasping the concept of the hybrid course even though they may believe the plan will be successful. In order for this method to succeed, students must be self-directed. Course announcements, reminders, and informational documents are of utmost importance to ensure student accountability for learning.

In critiquing this study, Martin et al. (2015) identified what was known on the topic, clearly stated the study purpose, and compared the effectiveness of traditional and hybrid course designs. There were no reliability and validity data reported on the outcome measures which is a threat to internal validity. However, survey methods were appropriate in collecting information with acceptable response rates. The evidence presented did not clearly demonstrate that the flipped classroom approach was implemented in which higher levels of learning occurred in the classroom. Therefore, this study is considered a Level III comparative descriptive design study with a quality C rating.

Gilboy et al. (2015) conducted a descriptive non-experimental design study. The purpose of this study was to show how to implement the flipped classroom approach and to describe the students' perception within two undergraduate nutrition courses. A total of 142 students (72%) volunteered to participate in the study (Gilboy et al., 2015).

Two nutrition professors participated in redesigning one traditional course of didactic lectures into an active learning course of flipped classes. A template was provided to enable the professors to design before, during and after class activities and assessments based on learning

objectives using all levels of Blooms Taxonomy (Gilboy et al., 2015). To evaluate students' satisfaction regarding their experience with the flipped classroom approach, Gilboy et al. (2015) used a five-item Likert scale (Cronbach's alpha = .71).

Approximately 76% of students preferred watching the video lecture for the topic compared to the traditional method. Sixty-five percent of students would rather participate in the in-class activities for two class periods rather than listen to the professor lecture the same amount of time. Almost 62% of students thought they had learned the material more effectively by viewing the online recorded lecture rather than attending the traditional lecture and about half of the students (56%) believed that they learned how to use the material for each topic more effectively by using the flipped classroom approach. The majority of the students felt connected to the teacher during the virtual online component of the flipped classroom (Gilboy et al., 2015). Through this study, the students' perceptions were captured which adds to the evidence for using the flipped classroom approach.

In critiquing this study, the findings of this study may add some support for the flipped classroom approach to improve student satisfaction compared to the traditional lecture approach. The reliability of the instrument used met the standard of Cronbach's alpha. The authors took appropriate steps to avoid bias for the non-experimental design by making the surveys anonymous. The sample size is realistic for the type of study. According to Gilboy et al. (2015), the limitation of this study was that the results focused only on students' satisfaction regarding their experience with the flipped classroom. This study provided reasonably consistent results, some control and fairly definitive conclusions. This study is considered a Level III descriptive non-experimental study with a quality rating of B.

Swart and Wuensch (2016) conducted a descriptive study to evaluate how transactional distance on the flipped classroom approach compared to traditional methodology. Transactional distance is the presence of obstacles to learning. The sample consisted of a convenience sample of 96 students enrolled in a quantitative business class.

According to Swart and Wuensch (2016), Moore's Theory of Transactional Distance states that high structure and low dialogue produce high transactional distance (TD) while low structure and high dialogue would yield low TD between teacher and student. This means that a highly structured classroom with low teacher-to-student or student-to-student dialogue leads to high transactional distance. A low structured classroom with high teacher-student or student-to-student dialogue leads to low transactional distance.

Zhang developed a five-point, 31-item, TD scale containing the four TD constructs which are: Transactional Distance between Student and Student (TDSS), Transactional Distance between Student and Teacher (TDST), Transactional Distance between Student and Content (TDSC), and Transactional Distance between Student and Interface (TDSI) which refers to instructional technologies used to in the delivery of course content. Zhang's instrument also included three student satisfaction outcomes for the amount of learning, progress toward learning goals, and overall course satisfaction. The students were asked to complete the questionnaire during the fall semesters of 2013 and 2014 enrolled in both sections of the course by the instructor (Swart & Wuensch, 2016). Swart and Wuensch (2016) developed two hypotheses: 1) would students perceive improved level of transactional distance in a flipped classroom compared to the traditional classroom; and 2) would a decrease in transactional distance be a predictor of student satisfaction.



Each student from four course sections across a one-year period completed the scale twice, once for the course using a flipped classroom approach and once for a hypothetical traditional course. Reliability of the instrument constructs was demonstrated (Cronbach's alpha for the questionnaire = .912) and the student satisfaction outcomes were significantly correlated ( $p < .001$ ,  $a = .01$ ). Validity was reported by prior factor analysis (Swart & Wuensch, 2016). No statistical difference between sections was noted.

According to Swart and Wuensch (2016), existing classrooms were modified into Integrative Group Learning (IGL) classrooms to accommodate small group collaboration learning activities. According to Swart and Wuensch (2016), a design framework and nine design principles proposed by Kim, Kim, Khera, and Getman (2014), was used to guide the implementation of the flipped classroom approach. Based on these principles, the instructor redesigned the teaching approach and explained the revised approach to the students. The redesign included identification of learning objectives, recorded lectures for pre-class viewing, development of in-class collaborative learning activities, and summative assessment of learning objective achievement. The students had to study daily lectures and prepare questions before class. For the in-class component, instructor had to make announcements and comments about the day's material, provide daily IGL activity to groups, provide coaching as needed, teach by observing group activities and intervene with student feedback when appropriate. At the end of each class, both the instructor and student had to agree that objectives of the IGL activity had been achieved. The students had to ask questions, collaborate to complete daily IGL activity, and take daily quizzes to demonstrate that each individual achieved the day's learning goals (Swart & Wuensch, 2016).

TD results for each construct and for the student satisfaction outcomes were each significantly improved for the flipped classroom approach as compared to the hypothetical traditional classroom approach ( $p = .001$ ). Based on these results, the authors suggested that students perceived the flipped classroom to be superior to the traditional classroom on every TD construct. The students perceived the greatest change of transactional distance occurred between students and students. Due to these significant correlations, the rest of the analysis focused on the surrogate outcome 'Satisfied' with the understanding that the conclusions would also apply to the outcomes 'Learn' and 'Progress; (Swart & Wuensch, 2016).

In critiquing this study, Swart and Wuensch (2016) presented some evidence to support the flipped classroom approach to improve student satisfaction and perceived learning compared to the traditional lecture approach. The authors identified what was known and described the purpose of the study which was to construct Integrative Group Learning classrooms to promote innovation in learning by both faculty and students. The study instrument used for this quantitative study is reliable and valid. Swart and Wuensch (2016) quantified their findings using multiple regression analysis in measuring student satisfaction. TD results following the flipped classroom intervention were compared to a hypothetical traditional course by the same group of students which could lead to biased results. The convenience sampling used was adequate for this type of study. The positive results were compelling in terms of increasing student satisfaction with the flipped classroom approach.

Swart and Wuensch (2016) addressed the limitations of this study. Swart and Wuensch (2016) stated that although the results were compelling, the findings were based upon students in one course at a single university. Also, caution should be exercised not to confuse perceptions of learning with actual learning as it is measured by grades (Swart & Wuensch, 2016). That is,

measuring student perceptions is a limitation since it does not show that higher levels of learning were achieved. This study is considered a Level III descriptive design study with a quality B rating which had reasonably consistent results, fairly definitive conclusions, and reasonable consistent recommendations. This study was based on fairly comprehensive literature review that included some references to scientific evidence. However, more research is needed before results can be generalized.

Presti (2016) conducted a literature review to examine the flipped classroom approach in nursing education. A literature search of CINAHL, ERIC, and the National Library of Medicine (PubMed and MEDLINE) was used to identify the studies. The keywords for conducting the search included: flipped classroom, inverted classroom, and nursing education. Inclusion criteria included articles published from January 2010 to September 2015 and articles which described the use of flipped classroom approach in undergraduate, graduate, and post-graduate academic nursing education. Articles that were excluded were those related to medical education. The inclusion and exclusion criteria were appropriate and the included studies were sufficiently valid for the type of question presented. Of 94 articles identified, 13 articles met the inclusion and exclusion criteria. Two of the articles discussed the theoretical underpinnings of the flipped classroom approach and 11 articles described the implementation into nursing education (Presti, 2016). Refer to the table in Appendix A which presents the studies reviewed and findings. Reviewed articles are categorized into the following themes: theoretical support, strategies used, and outcomes measured.

The first theme is theoretical support for application of the flipped classroom approach. Presti (2016) presented two articles by Bhoyrub, Hurley, Neilson, Ramsay, and Smith (2010) and Hawks (2014) that discussed theoretical underpinnings pertaining to the flipped classroom

approach in nursing education. Bhojrab, Hurley, Neilson, Ramsay, and Smith (2010) conducted a theoretical concept study comparing the theoretical underpinning of heutagogy with current approaches, challenges and applications. Bhojrab et al. (2010) found that heutagogy is potentially an effective framework to guide implementation of a flipped classroom approach. Heutagogy is self-directed learning that promotes active learning in a dynamic nonlinear format, which is congruent with the self-direction required of students in a flipped classroom approach. Hawks (2014) conducted a literature review to provide an overview of the flipped classroom approach. Hawks (2014) proposed that the flipped classroom approach incorporates both behavioral and constructivist learning theories. According to Hawks (2014), the behavioral learning theory is similar to the traditional approach because it includes teaching approaches such as lectures, tutorials, and teacher-centered instruction. Whereas, the constructivist learning theory is based on the main principle that individuals use personal experience to construct and understand knowledge. Students and teacher can actively engage in the present and then reflection of the activity takes place. Students use reflection to create meaning by collaborating with students and teachers who are actively engaged (Hawks, 2014).

The second theme is the teaching strategy used in the flipped classroom approach. According to Presti (2016), five studies described strategies for implementing the flipped classroom approach in nursing education. Several researchers used a strategy of online learning and various active learning activities prior to class. Pre-class activities included video-recorded lectures, Voiceover PowerPoint, videos, online modules, pre-class readings, worksheets, concept mapping (Swartz, 2014, Simpson & Richards, 2015, Critz & Knight, 2013, Burden et al., 2015, Missildine et al., 2013). Learning objectives paired with a virtual simulation activity was a novel approach used as pre-class preparation which facilitated active involvement and better

preparation for class. This strategy helped students feel better prepared for class (Burden et al., 2015). In-class learning activities included case studies, peer instruction, small group presentations, small group work, role-play, concept creation, games, case studies, and simulation (Schlairet, Green, & Benton, 2014, Bhojrab et al., 2010, Burden et al., 2015, Burden et al., 2015, Missildine et al., 2013). Harrington et al. (2015) provided no detail on the strategy used in flipping the classroom other than student participated in “experiential activities” (p. 5).

The third and final theme is outcomes measured in evaluation of the flipped classroom approach. Outcomes measured in the reviewed studies included student satisfaction and examination scores. Students liked the recorded lectures because they could replay them at their convenience which they believed improved their understanding of the course content. Some authors reported enhanced student satisfaction with the flipped classroom approach (Critz & Knight, 2013, Swartz, 2014, Simpson & Richards, 2015). For example, Critz and Knight (2013) reported that the majority of students noted that the content, assignments, activities, and quizzes were worthwhile and wrote positive comments. However; Ratta (2015) noted that the initial subjective feedback was negative on the flipped classroom approach; but did not discuss the aspects of the course that the students found undesirable. Schlairet et al. (2014) found improved peer-to-peer interaction and enhanced individualized learning. Burden et al. (2015) found there was better preparation for class activities. Simpson and Richards (2012) found there was better preparation for engagement of class activities and flexibility of classroom activities to student learning. Missildine et al. (2013) found that students who received lecture digitally (Voiceover PowerPoints) with the flipped classroom approach were significantly less satisfied than student in the lecture only and lecture plus lecture recording groups ( $p < .001$ ). Presti (2016) stated that the flipped classroom approach may be effective in promoting active learning by increasing

student engagement as well as self-efficacy based on the evidence presented by Schwartz (2014) that students agreed that the flipped classroom approach helped to increase their understanding as well as reported favorable views of the activities and assignments. Ratta (2015) reported that students achieved higher standardized assessment scores following a flipped classroom experience compared to a traditional classroom experience; however there was no statistical analysis. According to Harrington et al. (2015), there was no statistical difference found in exams, quizzes, and course grades. Simpson and Richards (2015) found no statistical difference in course evaluations. Missildine et al. (2013) found significant improvement in exam scores. Based upon the literature review, Presti (2016) suggested that further development of the theoretical underpinnings for the flipped classroom approach is needed in designing classroom strategies for nursing education. Presti (2016) concluded further research is needed to substantiate whether the flipped classroom approach is an effective teaching methodology.

According to Presti (2016), there are limitations of this review of literature. The selection of the articles presented excluded those from medical education which may have expounded this topic. Due to the lack of articles that met inclusion criteria for this review may have hindered appropriate comparison findings (Presti, 2016). Presti (2016) noted that there was a lack of description of detailed in-class activities used during the flipped classroom approach. Presti (2016) suggested that the findings of this study are consistent with the conclusions drawn by Benner et al. (2010) and Ratta (2015) that student satisfaction may not correlate with learning outcomes because of improved examination scores and mediocre feedback. This literature review is Level V research with a quality rating B.

In critiquing this literature review, Presti (2016) identified the purpose of the literature review which was to discover what is known about using the flipped classroom approach in

undergraduate, graduate and post graduate nursing education. The authors described the methodology and search strategy. Inclusion and exclusion criteria were appropriate. It is unlikely studies were missed. Presti (2016) presented two tables summarizing the studies and the results; Table A: Literature Review of Theoretical Underpinning Articles Pertaining to the Flipped Classroom Approach in Nursing Education (p. 258), and Table B: Literature Review of the Flipped Classroom Approach in Nursing Education (p. 259). Course content should be considered prior to flipping a classroom (Presti, 2016). According to Presti (2016), challenges of student satisfaction and objective evaluation measures emerged as main themes of the review of literature. Presti (2016) recommended further research because the findings on student satisfaction and learning outcomes were inconsistent across the studies reviewed.

### **Summary**

Theoretical support and teaching strategies applied to the flipped classroom approach were described in the review of the literature. Additionally, findings from a flipped classroom approach related to student satisfaction and learning outcomes were presented.

Based on the literature review, the theoretical underpinnings of constructivism and heutagogy facilitate active learning as it pertains to the flipped classroom approach (Hawks, 2014, Gilboy, 2015, Presti, 2016). The theoretical underpinning of the Constructivist Theory was found to support the use of the flipped classroom approach to enhance and engage student learning. As discussed, constructivism allows for one's own personal experience to gain knowledge and understanding by using active learning strategies that promote student interaction and through student reflection on classroom activities.

The strategies for implementation of the flipped classroom approach allow students to learn knowledge prior to class then learn in class to operate at higher levels of learning. The

flipped classroom facilitates student engagement, flexibility and self-direction. Several researchers used a strategy of on-line learning and pre-class learning followed by in-class active learning. With heutagogy, learner-centered activities promote self-discovery leading to critical thinking and higher levels of learning. Heutagogy is an approach to learning which promotes self-direction, class preparation, and learning engagement. Students and faculty behaviors were evaluated in response to the interventions. In order for the flipped classroom approach to work, students must be self-directed. The educators need to be responsible in planning classroom activities as well as communicating with students outside the classroom. The flipped classroom approach required students to be self-directed by preparing for class and taking ownership for their learning, allowing for learner flexibility (Martin et al., 2015, Schlairet et al., 2014). Students can schedule their learning sessions around other activities. The HPL Principle employs active learning strategies for students to adapt to the flipped classroom approach (Geist, 2015, Ratta, 2015).

There were positive outcomes associated with the flipped classroom approach by increased student engagement over the traditional method. Several positive behaviors were observed in the studies; such as arriving to class on time, teamwork, friendly competition, and collaboration (Ratta, 2015, Critz & Knight, 2013, Schlairet et al., 2014, Burden et al., 2013, Simpson and Richards, 2015). Anxiety and perceptions is a key aspect to consider when evaluating student satisfaction. Using the flipped classroom approach can help alleviate anxiety because students feel connected to the teacher (Swart & Wuensch, 2016). They are able to progress to their goals more effectively by having the flexibility to learn at their own pace. This perception of feeling better prepared for class can decrease anxiety resulting in increased student satisfaction and grades. When teachers are coaching and guiding students, whether in-class or



online, students perceive they learn more; and have better control of their learning in the flipped classroom than in a traditional setting (Gilboy, 2015, Swart & Wuensch, 2016, Presti, 2016).

Overall, most studies reported positive findings related to student satisfaction with flipped class course and learning strategies (Gilboy, 2015, Swart & Wuensch, 2016, Presti, 2016). Grades improved with flipped class courses (Geist et al., 2015, Ratta, 2015, Missildine et al., 2013). Presti (2016) noted mixed findings on learning outcomes. Harrington (2015) found no difference in learning outcomes.

There were limitations in the literature reviewed. A lack of critical analysis was noted in studies conducted by Bhoyrub et al. (2010), and Hawks (2014), and Critz and Knight (2013). Another limitation noted was that the studies were limited to a single university. Various teaching strategies and teacher skill to implement the flipped classroom approach impacted internal validity and potentially study outcomes. The flipped classroom approach requires more than adding an online component; rather the approach must include teaching strategies that promote critical thinking and higher-level learning. Outcome measures used frequently lacked reliable and valid measurements, analyses in mastery of content, reporting on quantitative data and data analysis.

This evidence-synthesizing project was a suitable project for the study topic. There was good and ample evidence available in the research databases. However, few research studies yielded definitive conclusions that the flipped classroom approach is more effective in improving student satisfaction and learning outcomes compared to the traditional lecture methodology. Although there are studies that have discussed the implementation of a flipped classroom approach, no standardized protocols exist. Therefore, a search for quality evidence was

completed to transfer or generalize research findings into practice by providing a synthesis of the evidence.

## **CHAPTER IV**

### **SYNTHESIS AND RESULTS**

Overall, the results of this review of literature addressed the PICO question: In undergraduate pre-licensure nursing programs, does the use of a flipped classroom approach as a teaching methodology improve student satisfaction and learning outcomes in terms of grades and exam scores compared to traditional lecture teaching methodology? Of the five studies reviewed, this evidence synthesis project included: one level II, two level III, and one level V research studies. The quality ratings of the articles reviewed were mostly B and one C. The C quality study by Martin et al. (2015) will not be applied to the synthesis and recommendations.

Level II evidence is provided by results from Geist et al. (2015). The teaching strategies to implement the flipped classroom approach appear to engage the learners and produce student satisfaction in the majority of findings. Student learning can be supported by using creative ways that builds on the student's knowledge and experiences. Beyond comprehension to application, if students are self-directed and take responsibility for their own learning, the flipped-classroom approach is a methodology to consider. Geist et al. (2015) found students demonstrated better performance with the flipped classroom approach as evidenced by improved performance on learning outcome assessments. The student performance was highly associated with the deliberate application of the HPL framework tenets in its teaching methodology.

Level III evidence is synthesized from Gilboy et al. (2015) and Swart and Wuensch (2016). Student anxiety and perceptions are factors that can influence student satisfaction and must be considered in the flipped classroom approach. Feeling connected to the teacher by timely feedback can improve anxiety and perceptions of knowledge acquisition. By having students view online, recorded lectures, they can have more control of the learning process.

According to Gilboy et al. (2015), students felt they learned how to use the material more effectively by using the flipped classroom approach. In the study presented by Swart and Wuensch (2016), students perceived that the transactional distance among students was improved. Since transactional distance is the existence of barriers in an online environment as defined by Swart and Wuensch (2016), the author hypothesized that a change in transactional distance would influence the perception of satisfaction and it did. After using a multiple regression analysis, the transactional distance was found to be a predictor of student perception of satisfaction between the modes of using the flipped classroom approach and the lecture approach (Swart & Wuensch, 2016).

Level V evidence is provided by results by Presti (2016). Theoretical support, teaching strategies and outcome measures were discussed in the review of literature by Presti (2016). The theoretical concept of Constructivist Theory can be applied in implementing the flipped classroom approach because students can build on their experiences and knowledge in application of what has been learned. Emphasis was placed on the necessity of heutagogy in promoting active learning.

Teaching strategies of implementing the flipped classroom approach goes beyond adding a computer component. The planned learning activities should enhance the learning experience outside of the classroom so students can participate in classroom activities. Various pre-class and in-class learning activities such as Voiceover Power Points, YouTube Videos, concept mapping, games, and group presentations are some teaching strategies discussed by Presti (2016).

Lastly, outcome measures were discussed in the review of literature by Presti (2016). The effects of the flipped classroom approach on learning outcomes were inconsistent.

Although, there was some evidence that reported positive student satisfaction, active student engagement, better class preparation, and positive student feedback were some of the benefits reported. With the flipped classroom approach, some study results indicated that students have the flexibility to develop their own study habits to acquire better comprehension in their knowledge acquisition. Table 1 provides a summary of the levels of research, number of sources, overall quality ratings and synthesis of findings.

Table 1

*Synthesis Table*

Category (Level)	Total # Sources	Overall Quality Rating	Synthesis of Findings Evidence That Answers the EBP Question
<p><b><u>LEVEL II</u></b></p> <ul style="list-style-type: none"> <li>• Quasi-experimental studies</li> <li>• Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis</li> </ul>	1	B	Geist et al. (2015) found variance of performance was significantly improved with the flipped classroom approach on three outcome assessments (p=.000). Assessment 1 explained 52% of the variance, assessment 2 explained 15% of the variance, and assessment 3 explained 34% of the variance of performance.
<p><b><u>LEVEL III</u></b></p> <ul style="list-style-type: none"> <li>• Non-experimental study</li> <li>• Systematic review of a combination of RCTs, quasi-experimental, and non-experimental studies, or non-experimental studies only, with or without meta-analysis</li> <li>• Qualitative study or systematic review of qualitative studies with or without meta-analysis</li> </ul>	2	B	<p>Gilboy et al. (2015) found in the flipped classroom approach: 76% of students preferred pre-class video lecture; 65% preferred in-class, active learning strategies; 62% believed more effective learning was achieved; and 56% believed better application of material was achieved.</p> <p>Swart and Wuensch (2016) found that students' perceived transactional distance was improved (p=.001). The</p>

			transactional distance was found to be a predictor of perceived student satisfaction (p=.001)
<p><b><u>LEVEL V</u></b></p> <ul style="list-style-type: none"> <li>• Evidence obtained from literature reviews, quality improvement, program evaluation, financial evaluation, or case reports</li> <li>• Opinion of nationally recognized expert(s) based on experiential evidence</li> </ul>	<b>1</b>	<b>B</b>	Presti (2016) discussed that for the flipped classroom approach to be effective, a guiding framework is needed such as the Constructivist Theory or heutagogy. Teaching strategies must be planned. Teaching strategies need to include planned pre-class content and in-class active learning strategies. The effects of the flipped classroom approach on learning outcomes and student satisfaction were inconsistent.

## CHAPTER V

### DISCUSSION AND CONCLUSION

In order to continue to provide high-quality healthcare, it is essential that nursing programs develop or revise curricula to engage nursing students in higher levels of learning of Bloom's Taxonomy so they can apply their knowledge in the rapidly changing healthcare environments. The research provided lacked evidence in addressing the PICO question: In undergraduate pre-licensure nursing programs, does the use of a flipped classroom approach as a

teaching methodology improve student satisfaction and learning outcomes in terms of grades and exam scores compared to traditional lecture teaching methodology?

The results of the studies were inconsistent. Level II evidence showed there was improved student performance with the flipped classroom approach. Level III evidence showed there was increased student satisfaction as evidenced by improved perceptions of transactional distance. However, Level V evidence was conflicting. There were inconsistencies in student satisfaction and learning outcomes.

Based on the evidence, there are consistent recommendations for initiating the flipped classroom approach. The theoretical framework must be in place before implementing the flipped classroom approach. Constructivist Theory and heutagogy are two frameworks discussed in the evidence that are important in using the flipped classroom approach. Teaching strategies should be well planned in developing the pre-class and in-class activities. Active engagement by the educator is necessary to promote student accountability. Faculty must design courses that allow students to learn course content prior to class and provide students with reminders, feedback, and timely communications. Students must take responsibility of their own learning and prepare for classes. The faculty must develop in-class activities that promote engagement of application or higher levels of learning. These behaviors are crucial for the flipped classroom approach to be successful.

The limitations of the review of literature include lack of details on the flipped classroom approach; such as learning objectives, teaching strategy details, and formative assessments methods. There is a lack of experimental designs with statistical analysis, lack of study descriptions of teaching strategies used, and lack of statistical analysis and psychometric properties of outcome measures. There was no evidence gained to evaluate the application of

higher levels of learning. Therefore, replication of these studies is not adequate at this time.

Experimental studies with statistical analysis of higher level learning outcomes based on reliable and valid outcome measures are needed.

More research is needed using experimental designs to measure learning outcomes and student satisfaction. Learning outcome assessments at the application or higher level of Blooms Taxonomy are needed to evaluate critical thinking in the flipped classroom approach. The use of outcome measures with acceptable psychometrics for reliability and validity of study instruments are needed.



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## Appendices

### Appendix A

#### *Presti (2016) Literature Review*

Study, Year	Type of Study	Sample	Findings	Limitations	Level of Evidence	Quality Rating
Bhojrub, Hurley, Neilson, Ramsay, and Smith (2010)	Literature Review	1 article reviewed	Heutagogy is potentially an effective framework to incorporate into nursing education.	Lack of detail on the articles reviewed	III	B
Hawks, 2014	Literature Review	1 article reviewed	Students use reflection to create meaning by collaborating with students and teachers through active engagement	Lack of detail on the articles reviewed	III	B
Schlairet, Green & Benton, 2014	Qualitative Phenomenological	Convenience, 40 undergraduate Baccalaureate nursing students, fundamental concept of nursing course	Improved peer-to-peer interaction and enhanced individualized learning in flipped classroom approach.	Evidence of reliability and validity of data collection and data interpretation were absent	III	B
Harrington, Bosch, Schoofs, Beel-Bates, & Anderson, 2015	Quantitative, Experimental	Convenience, 82 nursing students, Public University in the Midwest	No statistical difference in course evaluations.	No detail on the strategy used in flipping the classroom.	I	B
Burden, Carlton, Siktberg, & Pavlechko, 2015	Descriptive	Convenience, 359 nursing students, psychiatric-mental health course	Pre-class activities led to active involvement and better preparation for class reported in reflective journals.	Journal data not anonymous, absence of descriptive statistics	III	B
Critz & Knight, 2013	Descriptive	Convenience, 20 graduate students, two pediatric	Enhanced student satisfaction. Majority of	Analysis of learning outcomes lacking.	III	B

		courses in a family nurse practitioner program	students reported that the content, assignments, activities, and quizzes were worthwhile.	Comparison between flipped and tradition classroom approaches lacking		
Schwartz, 2014	Descriptive	Convenience, 12 post graduate nursing students enrolled in statistics course	Students agreed the flipped classroom approach help improve understanding. Favorable views of activities and assignment were reported.	Analysis of learning outcomes lacking.	III	B
Simpson & Richards, 2015	Descriptive, exploratory	Convenience, 64 junior students and 93 sophomore students, two cohorts in a public health science course and population health course	Improved preparation and flexibility for class activities and learning with the flipped classroom approach. No statistical difference in course evaluations.	The authors did not define the term Web quests. Did not specify whether the survey was anonymous. Lacked analysis whether the flipped approach affected mastery of material.	III	B
Ratta, 2015	Quasi-Experimental	Convenience, 80 undergraduate Baccalaureate nursing students, fundamentals of nursing course	Initial feedback was negative but students achieved higher standardized assessment scores with the flipped classroom approach.	Did not discuss aspects of the course found undesirable. No statistical analysis.	II	B
Missildine, Fountain, Summers & Gosselin, 2013	Quasi-experimental	Convenience, 589 undergraduate nursing students, in two courses, Adult Health I	Students who received Voiceover PowerPoints were significantly less satisfied than those	Description of flipped classroom implementation details lacking.	II	C

		and Adult Health II	who received lecture only and lecture plus Voiceover PowerPoint. Improved exam scores reported.			
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## Appendix B

*Data Summary*

Study, Year	Type of Study	Sample	Findings	Limitations	Level of Evidence	Quality Rating
Geist et al. (2015)	Quasi-experimental	Convenience, 86 BSN students in Pharmacology II course	Variance between traditional and flipped classroom was highly associated with teaching method. Students demonstrated better performance with the flipped classroom approach.	Implementation of HPL was not discussed. Reliability and validity of tests used to measure outcomes were not discussed. Historical effect may have influenced results. Generalizability was not achieved due to implementation of one course at one location.	II	B
Gilboy et al. (2015)	Descriptive, non-experimental	Convenience, 142 undergraduate nutrition course	76% of students preferred watching video lecture compared to traditional method. 65% preferred in-class activities compared to traditional lecture. 56% believe flipped classroom approach was more effective in learning than traditional approach. Majority of students felt connected during virtual online component.	The results focused solely on student satisfaction of experience in the classroom.	III	B
Martin et al. (2015)	Non-experimental quantitative	Convenience, 206 students who completed a Medical Terminology Course	No statistical difference found between traditional and hybrid approaches in	There were no reliability and validity data reported on the outcome measures. The	III	C

Study, Year	Type of Study	Sample	Findings	Limitations	Level of Evidence	Quality Rating
			<p>previous experiences. Hybrid respondents indicated class activities were significantly more important in meeting course objectives. 64% of students of the hybrid course commented they hybrid model was conducive to learning, integrated course material, and promoted higher level thinking.</p>	<p>evidence did not demonstrated that the flipped classroom approach was implemented.</p>		
Presti (2016)	Literature Review	10 articles reviewed.	<p>Three themes were identified: theoretical support, strategies used, and outcome measures. Heutagogy is an effective framework to guide the implementation of flipped classroom. Learning objectives paired with virtual simulation activity as pre-class preparation facilitated active involvement and better class participation. Ratta (2015) reported students</p>	<p>Lack of articles that met the inclusion criteria which may have hindered appropriate comparison findings. Lack of descriptive in-class activities.</p>	V	B

Study, Year	Type of Study	Sample	Findings	Limitations	Level of Evidence	Quality Rating
			<p>achieved higher standardized assessment scores following a flipped classroom experience. Harrington et al. reported no statistical differences in exams, quizzes, and course grades. Missildine found significant improvement in exam scores. Presti (2016) concluded further research is needed to substantiate whether the flipped classroom approach should be implemented.</p>			
Swart and Wuensch (2016)	Descriptive	Convenience, 96 students in a quantitative business class	<p>TD was significantly improved for the flipped classroom approach compared to the hypothetical traditional approach. Students perceived the flipped classroom approach superior to traditional approach on every TD construct.</p>	<p>Findings were based upon students in one course at a single university. Perceptions of learning do not show higher levels of learning were achieved.</p>	III	B