Impact of an Active Learning Strategy on Learner Engagement in a Transition to Practice Program

by

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DNP Project submitted to
American Sentinel University

9/30/2019
AMERICAN SENTINEL UNIVERSITY

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Date of Final Defense:
9/30/2019
Abstract

Research is abundant in the use of active learning rather than lecture. The effect on engagement on knowledge retention is also abundant. Most of the studies focus on secondary and higher education. Less research has been found on the link between active learning and engagement especially in transition to practice programs (TTP). Guidelines on content delivery in TTP is minimal. In this prospective, cross-sectional, quasi experimental project, the impact of an active learning strategy on learner engagement was studied. The sample was 14 new nurse graduates of mostly female gender of Millennial generation in a local transition to practice program. The methods included an active learning strategy for the intervention and use of the ASPECT survey by Wiggins et al., (2017) in a pre/post-test format for evaluation. The results concluded that the active learning strategy did increase learner engagement ($z = -2.20, p < .001$, with a medium effect size, $r = .42$). This study is important as it is one of the first to look at the need to change the format of remedial education in transition to practice programs to better meet the needs of the incoming workforce and improved bedside care. The study also aids the organization with new graduate engagement during the remediation of core concepts. By investigating new active learning strategies that increase engagement, the organization hopes to improve the learning of the new graduates thereby increasing knowledge.

*Keywords: new graduates, transition to practice programs, active learning, engagement*
Acknowledgments

There are so many people and places that helped me with this project it is hard to know where to start. First, I would like to thank God who continues his quest in teaching me patience, perseverance, and my own strength. My prayers were at times curses, but He was always there for me.

Second, is my family, without whom I could not complete this project. My poor husband who put up with every emotion a body can have. Thank you for not committing me to an asylum. For my daughter. This sacrifice was so I could be a better parent to the most important girl in my life. I hope I’ve set a good example on what a person can accomplish and still be there for others. Thank you for the paper chain that was at times, the only thing that kept me going. Daddy, I hope I made you proud. Thank you for always believing in me. Mom, for your words of wisdom and your unconditional love. Your voice of confidence kept me going so many times when I wanted to quit. To the best mother-in-law who continually told me she was proud. To my extended family, your positive thoughts and prayers were felt. I cannot forget my dog, who sat next to me for hours watching me on the “purple thing.”

At American Sentinel University, I would like to thank many people. Dr. Sandra Cleveland, who reminds me of a dance teacher who says “one more time,” but doesn’t actually mean it. Your patience with me was commendable to say the least. Your knowledge is the reason why I am where I am academically. Thank you, K. Burrell, who convinced me to choose American Sentinel University for my MSN and DNP degrees. C. Bilger who thought I was funny and smart enough to apply for the DNP program. American Sentinel University leadership for accepting me into this program. Dr. Whitham who believed in me, supported me, and addressed every concern I had. A. Schipps, A. Blades, and A. Meyers who responded to
countless emails regarding the program and never gave up on me. All my professors who supported me and answered emails “for clarification.” My fellow cohort, we made it! Thanks for all your support.

I would also like to thank my committee. Dr. Lacey Miller, who stepped in as my preceptor and committee member in my hour of need. She is the best editor in the world. Dr. Tim Bock who is flexible and willing to help at any time.

The following people made this project happen. The amazing actors for the interventional videos: Dr. P. Marmion, B. Vital, RN, C. Passmore, RN, and K. Nathan, RN. T. Cassera, the videographer and editor who spent a great deal of hours teaching me the world of video editing. The educator who was told: you get to facilitate this, you have no say in how, and you get to do it alone, E. Wood, RN. All of you rock and I am forever in your debt.

It takes a professional village to raise a DNP graduate. Dr. K. Espinoza, who told me “B equals DNP” and talked me off the ledge many times. Dr. B. O’Malley-Floyd, who has been my friend and role-model for over a decade. V. Downing, RN who saw my vision for this project and helped me with the groundwork. C. Bianchini, RN who allowed me to perform this project in the nurse residency program which she directs. Dr. S. Demeriel, who is a statistic whiz and always willing to educate me. Mr. B. Helgerson, who cheered me on from a distance and during interviews. For everyone I interviewed in the hospital, colleges, and universities, the knowledge you bestowed upon me was greater than any textbook. Most of all, I want to thank the participants for without, there would be no data.

For my friends. Michelle, thank you for all your prayers and friendship. I am lucky to know you. Dawn for your words of wisdom when I was complaining about needing to do another revision, “You’re just that much closer to your degree.” To Cristi, who shared my pain
at times during her own academic journey. To my friends and neighbors who were not allowed
in my house for over four years because it was a mess from a lack of tending as every waking
moment spent was to get to here. Thank you for not deserting me.

To the local coffee shop where I spent countless hours reading and typing. They never
threw me out. Thanks to the makers of the wine I drank that kept me sane during my MSN and
DNP ventures.

Words cannot thank everyone enough!
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SECTION I: INTRODUCTION

*Tell me and I forget. Teach me and I remember. Involve me and I learn ~Benjamin Franklin*

There are work-based programs that help bridge the theory to practice gap for new graduate nurses (NG). These programs are called new residency programs (NRP) or transition to practice (TTP) programs. The National Council of State Boards of Nursing (NCSBN, 2010) has devised a curriculum for these programs, but does not include much information in the execution of the programs other than preceptorship. This project was being conducted to find better practices for improving engagement in TTPs.

The most common way of teaching in professional development remains lecture style; however, lecture is passive learning that does not involve the learner in anyway. Passive learning is teacher focused and does not engage the learner. If the learner is not engaged, then the knowledge absorption is severely decreased (Halm, 2015). Also affecting the lecture format is Millennials. Millennials are the largest population entering the workforce (Halsey, 2016). They have been brought up in a flipped classroom concept where the focus is on active student learning with teachers acting as facilitators. The aim of this study was to implement an active learning strategy into a TTP and measure the engagement of the learners.

This proposed study investigated the effect of an active learning environment on learner engagement in a TTP. Currently, the didactic is mostly lecture which is more pedagogical in nature. The overall shift in education is from pedagogical or teacher centered to andragogical. Knowles’ theoretical framework on adult learning supports the desire to incorporate andragogy into the curriculum. Adult learners do not need to be spoon fed, but rather given problem-based scenarios that complement the self-learning that has already taken place on a need to know basis (Muneja, 2015). While there is quite a bit of literature on passive and active learning on student
engagement, little research has been acquired on the relationship of the two styles in new graduate programs in a hospital, lending this prospective project as pioneering in this research.

The aim of this study was to implement an active learning strategy into a TTP and measure the engagement of the learners. The steps of the study will be described in this paper which is divided into three sections. Section I focuses on the background, significance, and purpose of the project. This section contains a literature review as well as information on the pertinent theoretical framework. Section II focuses on the actual study and includes the design, sample, reliability/validity, and data collection methods. In addition, items related to the internal review board and research ethics are included. The results and discussion will be found in Section III.

Background of the Problem

The need for a TTP is recognized by the NCSBN. This is in response to high turnover rate, higher acuity patients, and increased stress levels (NCSBN, 2018). In addition, TTPs have also been shown to improve patient safety and quality (Spector, Ulrich, & Barnsteiner, 2017). There were two studies conducted on the NCSBN TTP. They focused on hospital and non-hospital settings and whether the programs were cost-effective and met the goals (NCSBN, 2014). There is no mention of delivery of content. A recommendation by Spector et al., (2017) is programs should be flexible such as hybrid or blended classrooms, and have a variety of learning strategies. Barnett, Minick, and Norman (2014) believed there should be a standardization of TTPs.

Lecture is not an adequate means of teaching content to learners. It does not promote engagement. Therefore, an active learning strategy needs to be incorporated into the TTP. The incorporation of this type of strategy increases engagement which is important for knowledge
acquisition. Given the lack of guidance from the NCBSN, the individual programs need to implement and measure these techniques on engagement.

**External Influences**

“Currently more than 25% of NGs leave their first hospital position within the first year” (Africa, 2017, pp. 178). This is an increase from 2014, where 18% left their first year and 35% their second year (Robert Wood Johnson Foundation, 2014). In addition, new nursing graduates are unable to meet the skill related demands of a hospital unit. Individual training of a new graduate is costly and time consuming for the hospital. A TTP provides a cost-effective option for orienting new nursing graduates to the hospital and improving retention (Africa, 2017). A cost-analysis on TTPs by Trepanier, Early, Ulrich, and Cherry (2012) demonstrated a $10-50 a day per patient reduction in cost.

Transition to practice programs previously called NRP began in 2002 by chief nursing officers, program deans, and nurse educators as a way to increase new nursing graduate support and retention in a hospital setting. The program was implemented in six hospitals in response to the Institute of Medicine (IOM) and Carnegie Foundation recommendations. Standardization has been implemented through American Association of Colleges of Nursing’s (AACN) Essentials of Baccalaureate Education for Professional Nursing Practice and later revised through Nurse Residency Accreditation Standard (Goode, Lynn, McElroy, Bednash, & Murray, 2013). The focus is on accreditation of these programs much like academic credentialing (AACN, 2017). The Commission on Collegiate Nursing Education (CCNE, 2015) posted standards for nurse residency programs. There is only one goal regarding delivery of content which simply states that programs are to strive for academic excellence including teaching and assessing. This is a vague objective as it does not define what academic excellence is in teaching
and assessing. There is the assumption that those directing these programs are educators which is not the case in the local environment.

One key element of the curriculum states that the needs of the program and new graduates are met through the learning environment (CCNE, 2015). Again, this is not specific. The curriculum speaks to what the program should address, but does not include the need for lesson plans. The recommendation is learning activities. This phrasing indicates that the new graduates are not sitting in a classroom, but actively participating in their learning. However, there is no specific instruction as to what learning activities are acceptable or encouraged.

Another external influence is the incoming employee population of Millennials. Millennials do not tolerate lecture as an education medium and educators need to change to a learner centered format (Roehl, Reddy, & Shannon, 2013). Also, this generation desires hands-on and team-based projects (Benfer & Shanahan, 2013). This is of great importance as Millennials will comprise 50% of the workforce by 2020 (Halsey, 2016). TTPs must begin to structure content delivery in a way that meets the needs of Millennials.

Learning how to teach Millennials is necessary for those in higher education and professional development. Well-known nursing education specialist Patricia Benner and co-authors Benner, Sutphen, Leonard, and Day (2010) interviewed experienced nurse educators for their book Educating nurses: A call for radical transformation. One teacher stated “You have to be able to keep students engaged, and particularly this [Millennial] generation” (p.73). “I truly believe that if they’re not engaged and interactive and interested then they’re not going to be understanding the material” (p.73).

A study by Freeman et al. (2014) reinforces this second statement. Freeman et al. (2014) conducted research on lecture versus active learning failure rates in a science, technology,
engineering, and mathematics (STEM) environment. The results demonstrated that students given the traditional lecture format were at a 1.5 times higher risk of failure than those in the active learning environment.

**Internal Influences**

In a local medical organization, NGs are hired into a TTP traditionally known as an NRP. The focus of this program was to remediate and educate the new nurses on nursing procedures, policies, and hospital standards. The objective is to assure that the new nurses are capable of performing their job. The issue the director and the NG are experiencing is a lack of engagement in an 80% lecture didactic, classroom environment.

At the beginning of the program, the NGs sit through hours of remediation learning the hospital wide standards, procedures, and protocols. This takes place eight hours a day, five days a week, for three weeks. Then the NGs move onto their specialty areas and the floor. The director reports that the students are on their phones, not paying attention, and have given feedback of boredom. The director is open to changing the didactic, but is unsure how to do so. In a meeting with the director and a facilitator, multiple methods were discussed, and it was decided to trial an interactive video for the PCA/neuraxial analgesia module of the program.

The TTP is the last opportunity for a new graduate nurse to obtain knowledge and skill before directly caring for patients. With lack of engagement, a decrease in knowledge retention is noted in student populations (Chen & Teherani, 2015). In addition, active learning is more effective than the traditional pedagogy (LoPresto & Slater, 2016). Student engagement benefits the facilitators by limiting disruptions, thereby increasing expedition of the material. The bottom line is that the NGs need to be engaged in order to obtain full benefit of the education being provided.
From observations, the director and facilitators report disaffection characteristics of
distraction, inattention, boredom, and disinterest. These factors hinder the ability of the learners
to be engaged (Skinner, Furrer, Marchand, & Kindermann, 2008). Furthermore, interest and
satisfaction are two traits of emotional engagement (Skinner et al., 2008). These traits are not
currently shared by the NGs within the organization’s program (C. Bianchini, personal
communication, 2017). The facilitators of the program are competing against personal,
technological devices such as phones, tablets, and computers. There needs to be a way to pull
the students away from these distractions and towards learning.

Students have been learning in active learning and flipped classroom environments in
secondary education and college; therefore, they are bored with the lecture format. The
accrediting and regulating agencies are not focused on how the delivery of content is conducted
in TTP so information in this area is lacking.

**Active Learning**

There is little research on the subject of active learning and professional development.
Dewing (2010) discussed how active learning needs to be incorporated into professional
development. The learning is still within classrooms and the assumption is that this will be taken
into practice by the learner. Dewing (2010) builds upon Dewey’s premise that learning is
holistic by stating all the senses need to be stimulated during content delivery. This necessary
stimulation or motivation leads to engagement (Dewing, 2010).

In 1915, Dewey stated that learning is holistic. The more opportunities that involve the
entire body, the greater the enhancement of learning. Chickering and Gamson (1987) published
their seven principles of learning for undergraduate education stating that learners need more
than a passive lecture in which to regurgitate the information given. Noted examples of active
learning are team-based activities, guided trainings, and challenging discussions.

Furthering the support for active learning, Bonwell and Eison (1991) stated that active
learning was a means to higher order thinking. Using Bloom’s taxonomy, higher order could be
analyzing and evaluating. Analyzing verbs can include organizing and attributing while
evaluating verbs includes critiquing (Armstrong, 2016). Using video vignettes will lead to
evaluating and analyzing. While these studies focus on undergraduate or K-12 education, active
learning is transferrable into any classroom setting.

Engagement

To date the emphasis of TTPs is on turnover, preceptorship, and the competencies of the
Quality and Safety Education for Nurses (QSEN), not delivery of content or engagement
(Spector, 2015). But the delivery of content is the most important part of the curriculum. If the
new graduate is not engaged or actively learning, then content is rendered useless. In addition,
“traditional teaching methods for integrating evidence-based practice do not lead to sustained,
integrated change” (Marshall & Broome, 2016, p.157).

Engagement is when the learner is motivated and involved in the learning process. This
does not happen on accident. The facilitator must plan learner focused activities to foster
engagement (June, Yaacob, & Kheng, 2014). There are three types of engagement: behavioral,
emotional, and cognitive. Behavioral engagement focuses on participation which is the overall
goal of the director of the TTP. Behavioral displays include action, effort, and involvement. This
type of engagement is responsible for academic success. Emotional engagement is how the
learner responds to others in the class. The commitment to learn and improve knowledge is
cognitive engagement (Fredricks & McColskey, 2012). The focus for this study will incorporate all three.

To increase engagement, one of the methods chosen involves a team-based approach. This type of collaborative activity leads to higher learning and inter-personal skills (Lightner, Bober, & Willi, 2007). In a pilot study by Lightner et al. (2007), 66% of students enjoyed the team-based activities. By having enjoyment, the students demonstrate emotional engagement. Another study conducted by Kniewel (2012) focused on the relationship between team-based learning activity and engagement and knowledge. Kniewel (2012) found that students had greater accountability (engagement) with TBL ($M = 32.76$, with 27 a high indicator). The overall result demonstrated no significance in scores between the TBL and lecture groups in knowledge ($M = 100$ for both groups). This is consistent with pedagogical and andragogical learning.

**Flipped Classrooms**

Many colleges are moving to the flipped classroom where students are in charge of their learning. In this setting, much content is delivered before class allowing for opportunities of active learning during actual class time. This method leads to higher learning per Blooms Taxonomy (Anderson & Krathwohl, 2001). This switch is because active learning leads to engagement and better outcomes for student learning (Braxton, Milem, & Sullivan, 2000). In the flipped classroom, class time is utilized in a way that allows learners to incorporate previous and newly acquired knowledge and experiences into real-life situations in safe settings.

A strong push for a flipped classroom is in progress in medical education (Jesurasa, Mackenzi, Jordan, & Goyder, 2017). However, in professional nursing settings, the flipped classroom has not yet been adopted (McPherson & Talbot, 2018). This is a necessary change as
the traditional lecture in any setting is not as effective as active learning. In addition, traditional methods are not keeping up with the rapid changes in healthcare including information technology (Huda, Saeed Ali, Nanji, & Cassum, 2016). McPherson and Talbot (2018) performed a study on the incorporation of a flipped classroom for annual review. The staff reported increased competence in their job, enjoyed the flexibility of being able to view the content at their convenience beforehand, and the first-year cost was $11,899 less. This study is significant to this project as the flipped classroom model is the one that will be incorporated for the active learning strategy.

**Summary of Background of the Problem**

In a local medical organization, new graduate nurses are hired into a TTP traditionally known as an NRP. The focus of this program is to remediate and educate the new nurses on nursing procedures, policies, and hospital standards. The objective is to assure that the new nurses are capable of performing their job. The overall issue the director and the NGs are experiencing is a lack of engagement in an 80% lecture didactic, classroom environment.

**Review and Summary of Relevant Literature**

There is little research on student engagement and its relation to content delivery in a NRP or TTP. Lecture has been the preferred didactic for delivering knowledge content needed to equip new graduates to perform the needed tasks (McPherson & Talbot, 2018). This may be attributed to the fact that older generations are educating the younger ones (Gillispie, 2016).

While academia has been shifting to a flipped classroom approach, NRPs or TTPs are focusing more on simulation, reflection, and clinical experience for student (learner) engagement. Knowledge content delivered through PowerPoint lectures is still the preferred method (Nowak, Speakman, & Sayers, 2016). However, this passive learning style does not
foster critical thinking or collaboration as active learning (Clark, Nguyen, Bray, & Levine, 2008). Lecture has also been demonstrated not to engage students in content delivery, while active learner activities have been proven in academia and other disciplines (Blagg, 2012). Adult learners are able to exercise time management and achieve higher learning through a variety of learning strategies (Jesurasa et al., 2017).

TTPs do not have a standardized curriculum. Each program can refer to the guidelines set forth by the NCSBN and ACEN, but these guidelines do not address actual delivery of content. Crimlisk et al. (2017) designed a curriculum for their program that was 34% lecture, 7% simulation, and 34% technical skills. The rest of the curriculum included specialty classes and lunch conferences. Active learning strategies included discussions, vignettes, and presentations by the NGs. NG feedback was that case presentations improved their learning through the process of thinking. 97% of the NGs reported that the curriculum helped them learn and understand hospital policies and procedures (Crimlisk et al., 2017). However, knowledge assessment skills and critical retention remained low. It was discussed that more practice in decision making may be beneficial.

This literature review will focus on the PICOT question: In the transition to practice program how does a learner-focused activity affect student engagement? The population was one cohort of a local transition to practice program comprised mostly of Millennials, those born between 1981-2000 (Kilmer, Barley, & Ohmer, 2014. The intervention was an active learning strategy and the outcome was the effect on engagement. The aim of this quasi-experimental study was to lead to incorporation of active learner teaching strategies to potentially reduce the lecture didactic resulting in greater engagement. For the purpose of this project, the terms new graduates, learners, and students will be used interchangeably.
The search strategy utilized many data bases and search engines including Google, Google Scholar, CINAHL with full text, One Search!, ProQuest Central, ProQuest Dissertations and Theses, Ovid, eLibrary, ERIC, and ProQuest E-Book Central. Search terms utilized were numerous as the topic is not well-researched. Successful search phrases included: a) interactive learning in nursing, b) lecture and engagement, c) increasing engagement in nursing students, d) learner engagement survey, e) active learning theory, and f) active learning. Many of these retrieved the same articles. In addition, in-article citations and reference pages were utilized for more articles relevant to the search. These references were searched on the above databases. When articles were found, but not accessible, the librarian was utilized to retrieve the articles.

**Inclusion/Exclusion Criteria**

Inclusion criteria was originally student engagement in TTPs then expanded to NRPs. Since there is limited data on this topic, inclusion encompassed academia and other disciplines. Studies included are those of secondary and undergraduate programs in addition to professional development. All scholarly articles are peer reviewed. Grey periodicals such as nursing organizations and healthcare organization sponsored journals were also utilized to fill in gaps and obtain statistics. Exclusion criteria included duplicates, evaluation tools not addressing student engagement, non-landmark studies greater than 10 years, and articles without dates or references.

**Importance of Learning**

Learning is superficial or deep. Superficial or surface learning is achieved by memorization or cramming (Bevan, Chan, & Tanner, 2018). Deeper learning is longer lasting and is fostered by engagement (LaDage, Tornello, Vallejera & Baker, 2017). Therefore, engagement a critical piece of learning (Bevan, Chan, & Tanner, 2014). This is evident by
increased understanding of the material (LaDage et al., 2018). In their study comprised of 118 college students in a biology class, the effect of engagement on learning was demonstrated. The students who used manipulation for engagement scored 90% on the quiz while those who attended lecture with no engagement scored 50% on the same quiz. This is significant with $p = .023$.

Another study by Bevan, Chan, and Tanner (2018) demonstrated the difference engagement had on surface and deeper learning. The authors performed testing at the beginning and end of the semester in the new engagement-focused course and the traditional course. The surface learning scores were not significantly different between the two classes. Using unpaired t-tests, deeper learning was significantly higher in the engagement centered class than the traditional classroom as evidenced by $p < .001$. Deeper learning is only attainable from active learning and engaged students. It allows for higher understanding (Bevan et al., 2018).

**Lecture**

A brief discussion of those who support lecture is warranted. Articles supporting lecture were also noted (Nowak, Speakman, & Sayers, 2016). These authors performed a qualitative study on PowerPoint lectures in nursing curriculum where they evaluated the quality of the presentations against nine criteria. The retrospective study concluded that the issue may not be in lecture itself, but in the formatting of a PowerPoint lecture. Components such as too much information, reading each line verbatim, and not having enough breaks built into the presentation to allow for group discussion were shown as barriers to PowerPoint lecture (Nowak et al., 2016). Blagg (2012) supported Nowak’s et al. (2016) stance that interactive breaks are a key component to lectures. The salient point deduced from these articles is group discussion. This style of lecture could be a form of active and collaborative learning (Bonwell & Eison, 1991). If one
must change lecture to be more interactive, perhaps an active learning strategy is more appropriate.

**Engagement**

Engagement has many definitions (deNoyelles, & Reyes-Foster (2015). One is “The degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education” (The Glossary of Education Reform, 2016). Another is “A dynamic reiterative process marked by positive, behavioral, cognitive, and affective elements exhibited in pursuit of deep learning” (Bernard, 2015, p.57). Both have a common thread which is engagement increases learning. The benefits of engagement are many.

Engagement is essential if students are to comprehend the material being delivered. It motivates the students to learn (Jerusasa et al., 2017). “Engagement equates to interaction that equates to involvement. If students’ feel involved through communication and through course content, they will be satisfied” (Olliges, 2017, p.129).

Shernof et al. (2017) performed a study with 407 students over two cohorts in a financial program. Utilizing the Experience Sampling Method, they were able to measure multiple parts of the learning experience including engagement. Engagement increased self-motivation, academic scores, and self-esteem ($ICC = 0.57-.89$) (Shernof et al., 2017). Overall, engagement makes learning enjoyable (Shernof et al., 2017).

A meta-analysis by Lei, Cui, and Zhou (2018) was conducted for measuring the effect engagement has on academic achievement. Out of 273 articles, only 69 were included in the study. The findings indicated that there was a significant correlation between engagement and academic success with a weighted Pearson’s $r = .269$ ($z = 46.1, p < .001$).
Engagement is also an indicator of student learning potential (Popkess & McDaniel, 2011). Popkess and McDaniel (2011) found that freshman scored lower in the active collaborative learning than seniors ($t = 16.558$, $p = .000$). This translated into lower scores for freshman than seniors in the academic challenge ($t = 11.49$, $p < .001$). With engagement, the findings were similar with the freshman scoring lower ($M = 43.3$) compared to seniors ($M = 47.4$).

Wilkinson (2013) also stated that engagement needs to be active. Increased interaction through active learning in the classroom promotes engagement, critical thinking, and collaboration. New graduates need to be able to demonstrate team collaboration. Learner engagement increased with a project-based activity in a qualitative, retrospective Utah pilot study which also improved staff development through implementing a new curriculum that focused on engagement of the new nurse residents (Poynton, Madden, Bowers, & Keefe, 2007).

Engagement has been shown to foster critical thinking (deNoyelles, & Reyes-Foster, 2015). Critical thinking is necessary for nursing students to determine interventions needed for their patients. deNoyelles and Reyes-Foster (2015) developed a quasi-experimental study using student self-reports and t-test on engagement and critical thinking. While this study was based in an online setting, the results clearly demonstrated the connection between engagement and critical thinking ($r = .63$, $p < .05$).

Studies on engagement are promising although limited in nursing education. Most engagement studies pertain to K-12 or undergraduate; however, some studies were found in the healthcare realm. Popkess (2010) performed a dissertation study on the link between active learning and engagement in a baccalaureate nursing program. Sample size was 347 from five different schools. Total engagement scores of those in a passive learning environment were lower ($M = 3.68$) than those students in an active classroom ($M = 4.54$), $p < .001$. for the mean
scores. This study is pertinent as the active learning strategies varied and were not necessarily based on models such as TBL, PBL, or flipped classrooms.

But the method to measure the engagement is controversial. There are self-reporting methods in the forms of surveys which are the most common (Fredricks & McColskey, 2012). Then there are observations such as the Student Record of Engagement (STROBE) method (Currey, Oldland, Considine, Glanville, & Story, 2015). Currey et al. (2015) conducted a study of post-graduate critical care nurse residents --the first of its kind. Methods used included the STROBE instrument and the Student Self-Report of Engagement Measure to determine engagement in a TBL. The self-report results of TBL had a higher score \(M = 4.21\) than lecture group had \(M = 3.20\) \(p = 0.05\). The STROBE observations revealed more than half of time was spent on interactive activities compared to the lecture.

Ozgonul and Alimoglu (2017) also conducted a study on engagement of TBL versus lecture in a medical ethics class. This study utilized the in-class engagement measure which is based on the STROBE. There were also observations and lecture /TBL feedback forms. Using the t-test, these researchers found a lower engagement score for lecture \(M = 2.60\) and a higher score for TBL \(M = 3.50\) \(p < .001\).

Another study with 48 nursing students, over six learning sessions, and totaling 305 minutes, was conducted by Feingold et al. (2008) focusing on engagement during TBL. The team learning handbook was followed including the individual and group readiness assurance tools. In addition, STROBE and student interviews were conducted. The study revealed that students were self-engaged during the readiness testing. Overall, during the task, students were interactive 84% of the time with most of the interaction being student-to-student. The study demonstrates that TBL fosters engagement in nursing education.
Active Learning

The overarching theme of the literature is that active learning is the best way to instill critical thinking and collaboration individual readiness testing at least 70% of the time and 60% interactive during the group in learners and is holistic in nature (Connolly & Lampe, 2016; Dewing, 2010). Active learning means the student is doing something to attain a higher thinking (Brame, 2016). In addition, active learning ensures optimal education since it builds upon previously learned material (Middleton, 2013). Previous knowledge helps students learn new concepts and process information (Gillispie, 2016). Nursing graduates have already learned much of the basic information needed to be a nurse. They need to take this information and apply it to the workplace.

Active learning can bridge the age gap. Traditionally, Baby Boomers were brought up in lecture halls and prefer this method. Generation X grew up in the age of blooming video and the cusp of computers in the school and prefer this method to learning. Gen Ys (known as Millennials) prefer collaboration, teamwork, and technology for education (Gillispie, 2016). Active learning incorporates a variety of strategies that can be utilized for these different generations. Beebe, Gurenlian, and Rogo (2014) found that most of the faculty in higher education are Baby Boomers followed by Generation X. While studying the effects of technology in dental hygiene programs, they found that the faculty thought that hybrid programs or those with active learning, especially with technological components, were very beneficial in education (82%). In the same study, 54% if the students agreed.

While not directly related to this project, Boctor (2013) performed a survey study on the use of a game in learning to fill a gap in the literature on the subject. Thirty-nine nursing students anonymously filled out a Likert style survey on whether the game helped their learning.
The Likert scale was 1-5 with five as strongly agree and 1 strongly disagree. The means for the questions were 4.6 - 4.7 demonstrating a strong connection between the use of technology and learning.

In addition, active learning has not been shown to be less effective than lectures. Using a pre-posttest format with 50 students in two groups of team-based and lecture Clark et al., (2008) found no significance using a paired t-test. However, a greater participation in the team-based learning (TBL) group than the lecture group ($M = -2.23, t = 1.23, p < .03$) was demonstrated. Gillispie (2016) performed a study over a year with 70 students. The students were divided into a traditional group and an active learning group in the form of a flipped classroom over two rotations. Student test results for multiple choice and clinical skills were compared between the two groups in both rotations. The multiple-choice scores demonstrated a 58% for the traditional group and 68% ($p < .0017$) for the active learning group. In the skills, the scores were as low as 67% for the traditional group to 84% for the active learning group ($p < .01$) (Gillispie, 2016).

Another study of 173 nursing students in various programs on self-perceptions of active learning was conducted by Huda et al. (2016). Results were obtained from an 18-point Likert scales survey. Huda et al. (2016) found that 56% of the students felt active learning promoted critical thinking, nearly one half (86) students were more motivated, and 56 students felt more engaged in the perceived benefits category. On the Likert scale, a mean score of $16.6/18$ demonstrated active learning increased engagement.

A literature review of 22 articles involving 3,837 nursing students from practical to graduate programs confirms that active learning does not interfere with knowledge comprehension (Waltz, Jenkins, & Han, 2014). The research is so compelling that Dewing
(2010) wrote on how to incorporate active learning into professional development. The general literature is consistent on active learning, but the models to implement remain controversial.

**Active Learning Models**

There are many active learning models that have evidence of effectiveness. Problem-based learning (PBL) is one model for learner-centered activities. In these scenarios, students work together to come to a solution. The goal is to foster critical thinking. (Klunklin, Subpaiboongid, Keitlertnapha, Viseskula, & Turalej, 2011).

Klunklin et al. (2011) performed a qualitative study of 25 undergraduates to determine if PBL increased critical thinking. An overall theme was that the students self-reported more retention with PBL. In addition, they reported a more concrete thinking process to solve problems.

In a 22-article literature review by Waltz, Jenkins, and Han, (2014), PBL was shown to be equally effective as traditional learning techniques such as lecture for knowledge retention. This style of learning encourages application of previously learned material and is self-directed by the learners (Farid, & Ali, 2012). Alcaron and Prezotto (2015) performed a comparison study of PBL to lecture with 16 students divided equally into two groups: control and experimental. There was no significant difference in grades between the methods with the cognitive assessment; however, in the cognitive assessment exercise, the PBL scored significantly higher in the experimental group ($M = 8.60$) than the control group ($M = 7.00$).

Disruptive technology is another strategy to increase engagement in professional nursing environments. Examples include lap tops replacing typewriters, email rather than snail mail, and online education versus brick and mortar. This strategy incorporates technology into teaching such as an interactive learning environment (McPherson & Talbot, 2018). Traditional classroom
settings of teacher focused lectures do not allow for increase in technology available for delivery of content (Huda et al., 2016).

For this project, the use of video and computers will be used. Videos are pertinent teaching strategies (Smith & McDonald, 2013). June et al. (2014) performed a qualitative, action research study in the use of videos. The population was comprised of 50 multinational students in Malaysia. It was concluded that students enjoyed the videos and found them interesting, increasing collaboration which lead to higher engagement. In addition, the students reported a higher ability to transfer the critical thinking skills utilized in class to the workplace.

Finally, the flipped classroom model is another active learning option to increase engagement in learners. It has the benefit of closing the gap between theory and practice by front-loading content prior to the learners attending the class (Hawks, 2014). The flipped classroom has been shown to be as effective if not more than traditional teaching methods. A well-cited study by Hake (1998) with 6,542 students. The gain of the traditional group remained below 30% while the gain for the experimental group (flipped classroom) was up to 60%. In addition, Hawks (2014) stated that graduate nursing students appreciate the ability to come to class to learn more. The flipped classroom increases critical thinking, encourages full engagement, and increases learning to a deeper level (Gillispie, 2016).

Critz and Knight (2013) conducted a survey of graduate nurses on a new flipped classroom environment. 85% of students felt the in-class activities worthwhile and faculty observed more student engagement than in traditional settings. Benefits from repeating this study revealed more engagement and self-directed learning (Critz & Knight, 2013).

The literature review by Hawks (2014) revealed that other disciplines and professions are using the flipped classroom. A family nurse practitioner program found that engagement was
linked to increased accountability and critical thinking. These results by Critz and Knight (2013) are reported later in this review. In medicine, the flipped classroom (FC) enhanced learner centered education and has been recommended in Educating Physicians: A Call for Reform of Medical School and Residency (Cooke, Irby, & O’Brien, 2010). In this landmark publication sponsored by the Carnegie Foundation as a follow up to the Flexnor report, Cooke et al. (2010) recommended to “Engage learners in challenging problems, and allow them to participate authentically” (p.25). In addition, it is recommended to “Engage learners in challenging problems, and allow them to participate authentically” (p. 26).

FC is being incorporated in pharmacy school as well. Pierce and Fox (2012) implemented a study using the flipped classroom. A three-point Likert scale was used to measure 52 student perceptions of the value of the flipped classroom (FC). The survey revealed that 62% of the students would like to see more flipped classrooms and 80% felt they could do well on the final after being in an FC.

A two-year study was conducted in a pharmacy education program in which the program that was 85% lecture was restructured (Ferreri & O’Connor, 2013). A flipped classroom was implemented so students used the classroom to problem solve. Promotion of student engagement through use of multiple exercises such as case studies and role-play was the focus of the class time. The satisfaction score went from 85% prior to the redesign to 98% after two years. These students had better team skills, communication skills, and ability to resolve unfamiliar cases (Ferreri & O’Connor, 2013). Student feedback indicated that they were happy with the ability to be engaged in class.

A chiropractic program measured exam scores before and after implementing active learning strategies in the classroom (Guagliardo & Hoiriis, 2013). Cohort A was the traditional
classroom and cohort B was the active learning strategy. Cohort B had significantly higher exam scores after the implementation of unfolding case studies in the classroom with 2-tailed independent t-test, $t = 3.71, p < .001, 95\% \text{ CI}$. Cohort A also had a 7\% grade of failure where cohort B had 0. The importance of this study to the proposed study is that there is little concern for lack of knowledge retention or performance related to an active learning environment.

**Population**

The comprising population of TTPs, or NRPs, was new graduate nurses. Locally, about 85\% of the new graduate populations are Millennials (C. Bianchini, personal communication, 2017). Millennials were born between 1981-2000 (Kilmer, Barley, & Ohmer, 2014). This is in line with the national trend of 50\% of the workforce being comprised of Millennials by 2020; 75\% by 2030 due to the aging workforce of Baby Boomers and Gen Xers (Halsey, 2016; Kilmer, Barley, & Ohmer, 2014). This poses an issue with the lecture format as Millennials in general do not tolerate lecture (Gardner, 2014).

Most new nurses recently graduated from a flipped classroom concept in academia where the focus is on self-directed learning with collaborative activities during class time (Roehl, Reddy, & Shannon, 2013). Medical students desire student-centered activities over lecture (Ozgonul & Alimoglu, 2017). Students in a study in Utah asked that their material be relevant, applicable, and not traditionally presented (Poynton, Madden, Bowers, &, Keefe, 2007). The students in this qualitative study found lecture to be repetitive. A study by Alcaron and Prezotto (2015) compared lecture to PBL. The results are previously reported, however, a salient point to be made is that the control (lecture) group had an older age range of 19-35 versus the PBL group of 19-21 demonstrating that Millennials prefer more interactive learning environments.
In addition to active learning, Millennials are very technologically focused and desire this in their learning (Roehl, Reddy, & Shannon, 2013). According to Beebe et al. (2014) 78% of the faculty found that technology increased student engagement in the Millennial population. Millennials have grown with technology at their disposal and they relate well to phones, computers, tablets, notebooks, texting, social media, etc. (Gillispie, 2016). However, they are not impressed with low technology such as PowerPoint (Gardner, 2014). In the qualitative study by Gardner (2014), which interviewed seven experienced instructors, one theme uncovered was that the students did not appreciate traditional teaching methods which meant the Instructors needed to change their teaching strategy.

Even for the non-Millennial population, technology is a useful medium for students to learn from and with (Schrader, 2008). Generation X prefers computers and videos (Gillispie, 2014). A study by Beebe et al. (2014) found that videos were the most preferred technology used in class with 75% of faculty and 85% of students using this form. Beebe et al. (2014) also found that 81% of faculty and 89% of students use computers in school. Media can be used for instructional purposes and include CD-ROM, DVDs, videos, computers, and virtual reality (Schrader, 2008). Computer and video will be utilized in this project.

Gaps in the Literature

The largest gaps observed were the lack of studies on student engagement and active learning outside of traditional settings (Waltz, Jenkins, & Han, 2014). Anderson, Hair, and Todero (2012) only found 35 possible articles for their review on effective NRPs narrowing it down to 20 usable studies. There are multiple studies designed to measure engagement in primary and secondary settings, although secondary setting studies focus on engagement in and outside the classroom.
Nursing studies on the subject are few and far between (Popkess & McDaniel, 2011). Waltz et al. (2014) also state that research in nursing education is lacking and suggest more methodical and theoretically based studies need to be conducted as most of the studies in their 22-article review were qualitative. Furthermore, there are no studies as to how the research method for engagement correlates to academic success (Lei et al., 2018). Anderson, Hair, and Todero (2012) found NRPs have multiple ways that content is delivered in NRP/TTPs, a lack of education theories to drive content, and further quasi-experimental studies are needed.

Another gap is the fact that there is no set way to measure student engagement (Fredricks & McColskey, 2012; Sinatra, Heddy, & Lombardi, 2015). The definition of student engagement is not the same for every researcher and is multi-dimensional (Lei et al., 2018). In addition to multiple definitions, Sinatra et al. (2010) discussed the many types of engagement including behavioral, emotional, cognitive, and agentic. Not having a solid definition can hinder evaluation of such (Fredricks, Filsecker, & Lawson, 2016).

There are self-reports, observations, surveys, experience samplings, teacher perceptions and interviews with the most common being self-reports (Fredricks et al., 2016; Fredricks & McColskey, 2012). Perhaps this is due to the fact that the definition of student engagement remains to be standardized (Glossary of Education Reform, 2016). This project will use the most common method of self-reporting survey and the definition of student engagement per the Glossary of Education Reform.

**Themes of Literature Review**

Overall themes of this literature review include: a) NRPs or TTPs are valuable for new nurses, b) active learning is equally effective as lecture or passive learning related to cognitive comprehension and retention, c) lecture is no longer the preferred method of content
delivery in general education, but is slow to nursing education, d) there is little research on active learning and engagement especially in professional nursing development, and e) the proposed prospective study was needed. The methods of research for engagement rely heavily on self-report and observations making for subjective data rather than objective; however, the data obtained is quantitative, valid, and reliable.

**Statement of the Problem**

Learners are not engaged in the current lecture focused residency program modules. The consensus is that students are bored with lecture. This is an issue as engaged students learn more (Kuh, 2003). Engagement also encourages students to create their own learning (Halm, 2015). Therefore, having learners, especially Millennials, go to lectures is redundant. Most NGs have received some education on the modules in residency such as patient controlled/neuraxial analgesia while in college, so it would be more beneficial to review and then have the students participate in an active learning project where engagement is heightened by requiring participation of the learners.

To rectify this issue the proposed project will answer the question of how an active learning activity affects engagement in a TTP. The intervention will include an interactive video vignette. By doing so, the project incorporates an active learning strategy to increase engagement through a collaborative setting. Increasing the engagement will inversely decrease the dissatisfaction and boredom of the current lecture didactic.

**Purpose of the Project**

The purpose of this prospective, cross-sectional, quasi-experimental project was to answer the question, in the transition to practice program how does a learner-focused activity affect student engagement during the implementation of one cohort? As an intervention will be
implemented, this negates the ability for this study to be descriptive (Tappen, 2016). At a local five hospital organization, the director of the NRP or TTP has determined that students are not engaged in the required core classes of the curriculum which includes a near 100% lecture didactic. As lecture is passive learning, the director would like to incorporate more active learning to increase engagement, but is at a loss as to specific activities that can be incorporated.

Interactive learning increases engagement (Hake, 1998). Engagement increases academic success. Even though this was not an academic setting, it is imperative that the learners are engaged for knowledge absorption (Handelsman, Briggs, Sullivan, & Towler, 2005). The learners are NGs who are in a TTP which reviews pertinent basic nursing functions for all patient care units of the organization. Students have had much of this information in their schooling, but each school offers different experiences which may impede a new nurse’s competency. Therefore, the organization offers remediation to remedy this issue. In order for the remediation to be effective, students must be engaged to properly receive and retain the information. The current issue is that students are not engaged.

The sample was non-probability, specifically of convenience as the program only runs bi-annually. As an intervention was implemented, this negates the ability for this study to be descriptive (Tappen, 2016). The cohort received the Assessing Student Perceptions of Engagement in Class Tool (ASPECT) pre and post the intervention of the active learning strategy. The survey, ASPECT, has undergone a psychometric analysis to prove reliability and validity.

The independent variable was an active learning strategy as it will not be measured or manipulated. For the purpose of this project, the definition of an active learning strategy is defined by Bonwell and Eison (1991) as “students doing things and thinking about the things
they are doing” (p.19). The active learning strategy was an interactive group video and will be implemented to measure the effect on the dependent variable of engagement. The goal was to specifically determine how the independent variable of active learning affects the dependent variable of student engagement. To avoid any confusion, the definition of student engagement per the Glossary of Education Reform will be utilized. The hypothesis was that student engagement will be increased with the implementation of a video based active learning strategy.

This project will hopefully close some of the gaps previously identified. The first, being the lack of research in nursing. This study will lend reliable and valid information for more studies in post-collegiate nursing education. In relation to the second gap of lack of standardized student engagement measurement, this project may help determine that self-reporting surveys are the most appropriate and accessible tools to measure learner engagement in a post-collegiate remediation setting.

While specific research to active learning in a TTP is limited it is valuable to know how NGs prefer to learn so the most effective methods can be utilized to increase engagement lending to greater knowledge retention and safer patient care (Smith, 2014). Incorporating active learning into NRP to increase engagement can benefit the learners, educators, patients, and community. The educator will not be working to minimize distractions and the new nurses will be proficient in their care. Having proficient nurses will allow for safe and prudent care. In turn, unsafe nurses can cost the hospital its reputation in the community and possibly reimbursement for nurse related errors.

**Significance of the Project**

The more practice and problem-solving opportunities given to students, the more proficient they will be (Kuh, 2003). This is essential to nursing students who must take
knowledge from the classroom to the bedside. The purpose of the NRP is to provide new nursing graduates a TTP. In the local NRP, NGs take remediation classes in core items such as blood transfusions, cardiac issues, and patient controlled/neuraxial analgesia. Upon completion of these core classes, the learners are sent to their units of specialty for on-the-job-training and further classroom instruction. The students are engaged in the specialty areas, but not in the core concepts (C. Bianchini, personal communication, 2017). This is an issue because NGs are not prepared for direct care of complex patients (Spector & Echternacht, 2010). The remediation is necessary to ensure competency of skills and basic knowledge to care for patients.

By performing this study, the hope is that other TTPs will evaluate how they remediate their NGs and begin to incorporate those strategies that increase engagement. Increasing engagement by allowing the learners to use what they know to make life/death decisions will benefit the entire healthcare team, especially the patients as patients receive care from competent and confident nurses (Africa, 2017). The organization benefits by having nurses utilize safe patient care practices. Finally, the community has trust in the organization’s ability to provide safe and prudent care as reputation is key to an organization’s success.

The issue arises when the students are not engaged in class and knowledge retention is lessened. If knowledge is not retained, then the care provided to patients will be subpar and have detrimental effects. Direct patient harm including death can be a result of a new nurse not knowing the correct procedure for over-sedation which is a side effect of patient-controlled analgesia. Over-sedation is preventable if the nurse is able to recognize early signs and symptoms. Increasing engagement will lead to knowledge retention thereby decreasing the risk of NG errors. NG errors reflect poorly on the hospital with the community becoming hesitant to
go to said hospital for care. In addition, any accreditations and incentives can be lost resulting in financial loss to the hospital.

The immediate effects of lack of engagement are the students are preoccupied which can lead to distractions for the entire class. The facilitator is then managing those distractions rather than educating. Other students are not able to learn effectively due to the actions of the unfocused learners. This contributes to the lack of knowledge learned and retained leading to the effects listed above.

**Nature, Scope and Limitations of the Project**

The project was a prospective, cross-sectional, quasi-experimental study that assesses student engagement in active learning. Its focus was on quality improvement of a TTP in a local organization. This type of design was chosen as it has a pre/post format with a non-probability sample construct. During the winter 2019 class on patient controlled/neuraxial analgesia, the learners will be given a pre/post survey on engagement in the program before and after the implementation of the activity. The activity will include two video vignettes for groups of students to view. The videos will be intermittently paused for the learner to assess the situation and form a plan of care.

The evaluation tool chosen is ASPECT. This tool was brought to attention by K. Casey of Casey Fink Surveys. This is a 16 item Likert survey that assesses student perceptions of engagement within an active learning environment. It has undergone a three-phase method of testing including construction, item development, validity and reliability, then external validity (Wiggins et al., 2017).

In addition to the ASPECT survey, a demographic survey will also be conducted to determine any themes related to engagement. One example is what connection age has to
preferred style of learning and engagement? The hypothesis is that non-Millennials will not appreciate active learning as much as a Millennial. Other demographic data to be obtained include age, previous degrees held, and sexual identification.

**Data Analysis**

Excel and IBM SPSS will be utilized for this study. Descriptive statistics will be rendered for demographic data. Pearson’s r or Spearman’s rho will be used for correlation. Total scores from the surveys will be calculated and compared pre/post intervention. Since this is a pre/post study design, a paired t-test will be utilized if normal distribution is garnered (Pallant, 2016). Otherwise, a non-parametric test such as Wilcoxon Signed Rank Test will be employed. In addition, there are two built-in factors of interest that will also be compared using a paired t-test or Wilcoxon Signed Rank Test. If it is necessary, a linear regression will be used for each individual question (A. Crowe, personal communication, 2018).

**Data Management**

To safeguard the data, the surveys will be placed in coded and sealed envelopes. The envelopes and their contents will be locked in a file cabinet. The key will be kept in an undisclosed location known only to the researcher. There will not be any identifiable information as the codes will be utilized and untraceable. The researcher will input the data into a secured computer that is password protected. Back-up data will be on a thumb drive also locked in the cabinet. During the analysis, the work will be done in a private room. The analyzed data will then be included in the dissertation. The data will be secured for three years from the completion of the program, publication, or report submission and then shredded. (Health and Human Services, 2018). The thumb drive will be destroyed as well.
Scope

The scope of this project was learner engagement in a group setting involving an active learning strategy. Learners who are more engaged demonstrate more knowledge, self-satisfaction, and self-efficacy (Bernard, 2015; Halm, 2015). This is important as NGs need to feel confident as well as be competent (Africa, 2017). Currently, NGs in a local NRP are not engaged in core remediation classes; therefore, there is concern about how much knowledge the students are taking to the bedside. This study will not focus on the knowledge content or the effectiveness of the active learning method, but strictly learner engagement as engagement must occur first.

The non-probability, convenience sample population will consist of one cohort of projected 40-50 NGs enrolled in the TTP during the proposed implementation date of February 2019. The target population was 90-100. The sample population will be referred to as students, learners, cohort, and NGs interchangeably. The sample group was composed of nursing graduate residents generally from the local college area whom have obtained state licensure and graduated from a BSN program within the past year. Other characteristics include a mostly female demographic with the Millennial and Gen X generations represented at 85% and 15% respectively. The location of the project will be in the central education building of the five-hospital organization in a classroom setting. A self-learning module (SLM) was assigned to the entire cohort by the residency director. The researcher does not have access to the SLMs so confidentiality of the students will be maintained.

The rationales for this non-probability, convenience sample include the infrequency of the event, set number of learners in the cohort, and the availability of the population (Tappen, 2016). Since this was a convenience sample, all learners of the winter 2019 cohort were asked to
participate in the survey. The cohort must complete the active learning strategy as the content was required. The participation to fill out the demographic and pre and post self-reporting surveys on engagement will be voluntary. This is in accordance with IRB.

Inclusion criteria includes all the learners enrolled in the program, current lecture PowerPoint, an active learning activity, the ASPECT survey for student self-reporting, and a demographic survey. Only one active learning activity will be used so as not to introduce more variables. Exclusions include any knowledge content related variables, non-related subjects outside of the PCA/neuraxial module, facilitator, director, or content expert feedback, current nurses, and those who decline to participate in the surveys.

Limitations

There are some logistical limitations that are realized. The facilitator that runs the PCA/neuraxial class was not currently aware of the project. This could mean reluctance in the implementation of the project or inexperience in implementing an active learning activity which could skew the engagement results. Another limitation was the post-survey was slated to be given two weeks. This could have led to a failure of responses. In addition, there are multiple modules and some modules may have an active learning component, students may become confused between the multiple classes. Limitations to the actual implementation include the possible need for the audio/visual department and volunteer actors for a video-based activity. If these resources are not secured, then the project will need to be re-evaluated for another activity which could affect the date of implementation.

In addition to the logistical limitations, there are some internal and external threats to the study. Internal validity threats include history, short-term maturation, and instrumentation.
External threats included selection bias, construct, and possibly mortality if the post-survey was given a week post intervention. These are discussed in detail later in Section II.

**Delimitations**

One delimitation is the organization. While the results could be indicative of other programs, this study was focused only within this particular organization which has one training center for all NGs. In addition, the open-ended questions at the end of the survey could lead to how knowledge was enhanced by engagement, but that is not the implication of this project. This project was not designed to determine if lecture or video is a better method of education. The demographic survey may reveal themes in relation to engagement, but these themes will not be included in the project except for data analysis.

**Feasibility**

This project is very feasible. The program is already in place, so IRB approval will most likely be exempt. There are minimal ethical considerations. The director has already approved the project. There may be costs webbed into the need to have employed actors come during their shift and the facilitator will need to be present for the video recording and as a consult for the project. In addition, the information services department may need to be used for the videos. The survey can be done on paper which is already a budgeted cost. Once the videos are scripted and recorded, the time of implementation will not be in excess of the allotted class time. Data collection will strictly be on the researcher with a maximum of 100 surveys to be reviewed.

**Theoretical Framework**

The overarching theoretical framework for this project is Knowles’ theory of adult learning based on the premise of andragogy. The learners in this project were adults and need to have opportunities to participate in their learning. Adult learners need to know the relevance in
learning the specified material and disengage when relevance is not perceived (Knowles, 1973). Furthermore, adults are life-long learners (Lindemen, 1926).

**History**

Andragogy is based on adult learning. Andragogy in Greek terms means an adult who guides himself (Zmeyov, 1998). In 1833 the term Andragogik was coined by Knapp, a German educator, who stated the need for adult learning (Reischmann, 2004). In 1926, Lindemen introduced the concept of andragogy to the United States in his book, The Meaning of Adult Education. In this book, Lindemen (1926) discusses the many facets of an adult learner such as intelligence, the needs for freedom and expression as well as the benefits of appreciation and creation. Lindemen (1926) concludes that absorbing knowledge is not the goal of andragogy, but rather a creation of a meaningful experience.

Knowles further defined andragogy and adult learning in the latter part of the 20th century. In his first book, Knowles explored child and adult learning theories. He surmised that educators merely adapted child learning to adults. But, in his investigation, Knowles discovered a maturation that occurs as children grow into adults leading to the need to change adult learning (Knowles, 1970). Due to this discovery, Knowles had originally distinguished between pedagogy and andragogy as pedagogy being child related, but he changed his mind realizing that the concept of andragogy being learner rather than age focused could be included in primary education (Knowles, 1970).

The assumption of adult learning that all men are created equal is not true. Some adults prefer the traditional pedagogical teaching styles that create more passive learning environments. These adults need structure and do not perform well in the more free-style method of andragogy.
(Mirriam, 2001). On the opposite stance, some children have greater experience than adults and can be quite mature for their age containing an internal motivation for learning (Knowles, 1973).

After the passing of Knowles, Zmeyov (1998) further described adult education as a service. The premise was that adult education needs to be flexible and open to adult learner schedules as well as have diversified methods for teaching and learning. In addition to Knowles’ principles, Zmeyov (1998) added three more assumptions to adult learning. The first assumption is that the life surroundings of the learner contribute to the ability to learn. This fits within the premise that education needs to flexible. The second principle is that the learner is the leader. Gone are the pre-conceived notions that the teacher knows all and the learner nothing. Now, the teacher should facilitate the learning of the students. This premise leads to the last assumption that the teacher and learner are partners. There is no hierarchy.

Other Considered Theories

Constructivism has its roots from many theorists. Piaget is credited as the first contributor to this theory for his work in cognitive development (Lourenco, 2012). His focus was on the pedagogical transformations of how children learned by building upon previous experiences and physical development. Then Vygotsky was recognized for his theory on children needing social interaction (Lourenco, 2012). Vygotsky (1978) believed that children learn then develop cognition. In addition, Vygotsky thought that children should have an active role in their learning such as play. Children learn through play and interacting with each other, thus the theory of social learning.

Another contributor to constructivism is John Dewey. As previously mentioned, Dewey (1915) believed that learning was a holistic event. This is in congruence with Vygotsky’s premise that children need to have play or interaction to learn. Later, Dewey (1938) deduced
that learning was a progression and that past experiences influenced current learning. As demonstrated, constructivism mainly focuses on social interaction during the learning process. Although the NGs will be in groups, this is not the focus of the project.

The cognitive learning theory (CLT) was also considered for this project. CLT is a culmination of multiple learning theories that focus on multiple higher learning skills such as decision-making, problem solving, synthesizing and evaluating. The main premise is the content delivery needs to be organized in a way to help with the memory process (Keating, 2015).

People learn by having the whole broken down into organized parts. Learning each part in a specific order helps the learner process the information (Aliakbari, Parvin, Heidari, & Haghani, 2015). While this theory supports this project, it is only one part of the whole equation.

Alignment

One of the constituents of adult education is the focus on situational concepts (Lindemen, 1926). This focus is different from the pedagogical method of presenter to the learner. Pedagogical learning traditionally is passive learning whereas andragogical learning is active, student centered learning. Lindemen (1926) stated that “adult education is a process through which learners become aware of the significance of experience” (p. 169). Learners are “not repositories in which knowledge is dumped with the hope that it can be reclaimed in the hour of need which is what pedagogy is based upon” (Lindemen, 1926, p.176). Therefore, students need less structure and more autonomy in their learning.

There are a variety of methods to teach the adult learner. Lindemen (1926) laid out six steps to adult learning success: (a) recognizing a problem or issue; (b) analysis of the problem; (c) a discussion including information and experience; (d) putting the information together; (e) attaining a conclusion; and (f) implementing the solution. In the patient controlled/neuraxial
The analgesia module the students are currently given a lecture. Lecture does not include any of the steps laid out by Lindemen (1926). Lecture also does not demonstrate relevance or provide a meaningful experience (Lindemen, 1926; Knowles 1970).

The proposed study is to provide an active learning experience. This experience will encourage the students to identify and analyze the situation concerning the “patient.” Next, students will be given an opportunity to discuss and collaborate on information obtained. Finally, the correct diagnosis will be ascertained and interventions implemented. The active learning will be adult learner focused and encourage engagement by the students.

In addition to Lindemen’s (1926) six steps to learning success, the project will align with Knowles’ principles of andragogy: learner involvement, previous experiences, relevance, and problem-solving. (Figure 1) (Knowles, 1970). This project touches on all of these principles except for the first one which states the learner should have input into the instruction process. At this time, the researcher and facilitators of the program will determine the teaching strategies.

By allowing the students time for discussion, the adults will be able to share experiences already acquired. These are NGs but one may have had an abundance of experience on a surgical floor which is beneficial to the others in the group. This is also supported by the theory of constructivism which states students use previous experiences to learn. By solving a life-like problem, the students will see the relevance to their future care of patients which should also increase engagement.

While the concept of adult learning is well accepted, it is still under scrutiny (Mirriam, 2001). New and old ideas such as self-directed learning and transformational learning are currently being studied, but as demonstrated, this project aligns well within the adult learning theory and andragogy of Knowles. In addition, this project utilizes constructionism by building
upon previous experiences and incorporating social interaction. By combining both theories, the
active learning portion of the project will be holistic in its approach.

**Definition of Terms**

*Student:* “one who studies or an attentive and systematic observer” (Miriam-Webster, 2017). Will be used interchangeably with learner, new graduate, nurse resident.

*Learner:* “one who gains knowledge or understanding of or skill in by study, instruction, or experience” (Miriam-Webster, 2017). See “student.”

*Graduate nurse:* a person who has completed the regular course of study and practical hospital training in nursing school (Miriam-Webster, 2017)

*Transition to practice program:* A model for training NGs to increase retention and patient safety. The program usually incorporates classroom and on-the-job-training including preceptors (Spector & Echternacht, 2010).

*New resident program:* An older term for transition to practice programs.

*Active learning:* Students engage in a learning environment where activities are planned by the facilitator to allow creative thinking by the students. The students are responsible for their learning (Oregon State University, 2017).

*Passive learning:* A learning environment where student involvement is minimal. Little feedback is given to the students. Lecture is an example of passive learning (Herr, 2007).

*Student engagement:* “The degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education” (The Glossary of Education Reform, 2016, n.p.). “A dynamic reiterative process marked by positive behavioral, cognitive, and affective elements exhibited in pursuit of deep learning”
(Bernard, 2015, p.57).

**Patient controlled analgesia:** “Patient-controlled analgesia (PCA) is a delivery system with which patients self-administer predetermined doses of analgesic medication to relieve their pain” (Momeni, Crucitti, and Kock, 2006, p.2321)

**Neuraxial analgesia:** Also known as an epidural. “Injection of anesthetic medication in the fatty tissue that surround the nerve roots as they exit the spine” (Princeton Anesthesia, 2017, n.p.) This numbs the nerves which decreases sensation in the legs, buttocks and part of the stomach. Patients often feel numb (Princeton Anesthesia, 2017).

**Team-based learning:** “Small group-based instructional strategy that uses theoretically based and empirically grounded strategies for ensuring the effectiveness of small groups working independently in classes with high student-to-faculty ratios” (Clark, Nguyen, Bray, & Levine, 2008).

**Knowledge retention:** “the fact of keeping learned information a preservation of the aftereffects of experience and learning that makes recall or recognition possible” (Miriam-Webster, 2017).

**Summary**

Learner engagement is important for knowledge retention. If a graduate nurse is not retaining knowledge, then the ability to care for patients diminishes. Passive learning, especially in the form of lectures, does not promote engagement. Adult learners require an experience, not a one-way instructional method. Knowles’ theory of adult learning based on the premise of andragogy is the chosen framework for this project. By incorporating active learning, the expectation was that learner engagement will be impacted. Andgrogogy has been well adopted by the primary and secondary education systems, but not in TTPs.
The goal of this prospective, pioneering, project was to demonstrate the impact of student engagement with the incorporation of an active learning strategy in a TTP. A video based active learning strategy will be implemented. The overall goal is that other TTPs will benefit from the results of this study leading to a standardization of an andragogy-based curriculum.

This project will include the implementation of an interactive, team-based learning strategy to one half of a cohort in a TTP. The strategy of choice includes a front loading of the current PowerPoint lecture to be viewed prior to class and two video scenarios in which students will critique in groups of about five. The facilitator will be available to answer questions and give guidance, but will not instruct the learners. This assures learner engagement in the project. Upon completion of the intervention, students will complete a survey based on engagement. In section II the complete method for the project will be discussed.
SECTION II: METHODS

Introduction

This study was to determine the effect of an active learning strategy in a classroom setting on learner engagement in a transition to practice program (TTP). It was a prospective, cross-sectional, quasi-experimental non-probability sample design. The sample was NGs in the PCA/Neuraxial Analgesia module of the Feb. 2019 cohort of the residency program. The Assessing Student Perspective of Engagement in Class Tool (ASPECT) survey will be used to assess engagement prior to and after the implementation of the strategy. Results from this project are projected to help the program restructure modules to improve learning.

In this section, the specifics of the project design will be described. Highlights will include information about the sample, evaluation tool, analysis, collection, and management of the data, and internal and external validity. It will also cover ethics and Internal Review Board (IRB).

Project Design

This prospective, cross-sectional, quasi-experimental design was chosen. The study was being conducted during one cohort in a TTP as cohorts are bi-annually. In addition, the study will only focus on one module as there are three weeks of material to cover in the entire program. Since the sample was one of convenience, the quasi-experimental design has been chosen. There was an independent variable (active learning) and an intervention (active learning) lending to a quantitative design.

As far as the literature search has revealed there has not been a study that measures engagement after an active learning strategy implementation in a professional nursing program. The literature on active learning and engagement has focused on K-12 and higher education.
This was the exploratory component of the project (Labarree, 2009). One aim of this study was to provide enough evidence to further more exploration in other nursing TTPs so that a definitive practice change and standardization can commence.

The sample size was of convenience which automatically makes this project quasi-experimental (Tappen, 2016). There was no random selection of the participants. However, the study was experimental as the study implemented an intervention to the sample participants (Tappen, 2016). The independent variable was active learning strategy and the dependent variable, engagement of the learners. The survey was given pre/post the interventions and results of the pre/post survey were analyzed and data obtained. In addition, the study took a snap-shot of one cohort at one time in the program. This justified the cross-sectional design (Creswell, 2015).

Sample and Setting

The target population of the study was NGs enrolled in the TTP within a local, six-hospital organization. The accessible population was approximately 50 NGs of the February 2019 cohort making this sample one of non-probability, specifically convenience. Current data for this year was 41 NGs in Feb 2018 and 54 NGs August 2018 (T. Bock, personal communication, 2018). This would make the target population 95 with the current cohort the largest to date. With a power analysis using G-power of two tailed t test, the required sample size is 39 with a power of .81, critical $t = 2.72$ (effect size = .50, $alpha = .01$, $1-\beta = .80$). The $1-\beta$ was reduced to .80 to compensate for the sample size. At .91 power, critical $t = 2.68$ (effect size = .50, $alpha = .01$, $1-\beta = .90$) the sample size required is 49 which runs the risk that this target may not be reached.
The core group was composed of NGs generally from the local college area who have obtained state licensure and graduated from a BSN program within the past year. Other characteristics include a mostly female demographic with the Millennial and Gen X generations represented at 85% and 15% respectively. It was assumed that some NGs may already have previous degrees given the accelerated nursing programs in the area. This data will be collected through a demographic survey included within the study.

The setting for this study will commence at the learning center at the organization’s main campus. Consent has been granted (see Appendix A). The NGs will be in the classroom with the tables arranged to accommodate groups with 4-5 NGs each. The videos will be loaded onto the facilitator’s sign-in and accessible on the classroom computer. The videos will be shown via projector onto the screen at the front of the classroom.

The rationales for this non-probability, convenience sample include the infrequency of the event, set number of learners in the cohort, and the availability of the population (Tappen, 2016). While convenience sampling is not considered the most rigorous method, it is very common and can help answer the questions such as what this project is asking (Creswell, 2015; Trochim, 2006). One major drawback of convenience sampling is the inability to prove conclusive representation of the larger population; therefore, statistical extrapolations cannot be determined for the sample size (Banerjee & Chaudhury, 2014). However, the study conducted at this facility can be replicated within the city and/or state demonstrating a trend to determine if a nationwide practice change should be implemented at the content execution level of a TTP.

Since this was a convenience sample, all learners of the winter 2019 cohort will be asked to participate in the survey. The cohort must complete the active learning strategy as the content was required, but participation to fill out the demographic and pre and post self-reporting surveys
on engagement will be voluntary. The only exclusions include those nurses not enrolled in the TTP, those that remove themselves from the survey, and those who do not fill out both pre/post surveys.

The benefits to this sample plan to recruitment are: (a) the surveys will be completed during class time, (b) no costs to the participants, (c) learners get to participate in a non-lecture format, and (d) there is no way to trace answers to the participant. Furthermore, since this study did not take place in a medical or formal education environment, HIPAA or FERPA consents were not needed. Motivation for the study was a consideration. It was hoped that the learners would want to participate based on curiosity of how effective the intervention will be or altruism in helping future learners not have to sit through hours of lecture (Tappen, 2016).

One barrier to the study could be that the study is of no interest to the learners. They may choose not to fill out the survey. Another potential barrier is fear of others finding out their answers or the facilitator finding out who did not like the new way of teaching. Assurance would be given that confidentiality of answers will be secure.

**Instrumentation**

The evaluation tool chosen was Assessing Student Perspective of Engagement in Class Tool (ASPECT). This tool was brought to attention by K. Casey of Casey Fink Surveys. Approval from the authors has been granted (see Appendix B). This tool has gone through extensive testing. This is a 16 item Likert survey that has undergone a three-phase method including construction, item development, validity and reliability, then external validity (Wiggins et al., 2017). The construct phase included interview of students and question development. In the validity and reliability phase two tests were used: Spearman’s rank correlation coefficient and exploratory factor analysis (EFA). According to Tappen (2016)
Spearman’s rank correlation coefficient should be used with ordinal data such as a Likert scale. The EFA measured the consistency of the identified factors (Wiggins et al., 2017). Tappen (2016) stated that the sample size is 5-10 per factor identified and Wiggins et al. (2017) had three factors with two sample sizes of over 400 students. Wiggins et al. (2017) further used Cronbach’s alpha for internal validity.

The ASPECT survey reviewers calculated Cronbach’s alpha for three factors. The first factor was the value of the activity. There are nine statements for this factor with a Cronbach alpha of .91 (Wiggins et al., 2017). The second factor was personal effort represented by three statements with a Cronbach’s alpha value of 0.84. The final measured factor was instructor contribution measured in four statements with a Cronbach’s alpha of .78. These values indicate internal reliability for this tool for this proposed project as the factors personal effort and value are indicators of engagement. While the instructor contribution factor was below 0.80, this factor was not expected to be contributory to the proposed study. The last phase measured the effects of activity length and demographics. Wiggins et al. (2017) found a ceiling effect. This is due to the fact that the Likert scale is ordinal and some of the sample populations would have scored higher on the survey if the option was available.

The survey was a 6-point Likert scale of 16 positively, worded statements. The scale was as follows: (a) Strongly Disagree, (b) Disagree, (c) Slightly Disagree, (d) Slightly Agree, (e) Agree, and (f) Strongly Agree. There are originally three control statements, but these will be removed due to irrelevance without affecting the results of the survey (Crowe, A., personal communication, 2018). The total score can be used as well as measuring for the factors. There are nine statements for the value of the activity (VA), three statements for personal effort (PE), and four statements for instructor contribution (IC) (Wiggins et al., 2017). Sample statement for
PE include: “I had fun in today’s [topic] activity” and “The [topic] activity stimulated my interest in the course material.” For the PE factor a sample statement was “I was focused during today’s [topic] activity.” Finally, the IC factor had a statement of “The instructor put a good deal of effort into my learning for today’s class” (see Appendix C).

**Data Collection**

**Preliminary Set-up**

The project has three components to it: PowerPoint, two videos, and a survey to be given before and after the intervention. The survey has already been discussed, so this portion of the paper will refer to the intervention. The PowerPoint presentation was already designed and usually given in class. In order to have time in class for the videos, the PowerPoint will be placed into the electronic self-learning module accessible on the E+ website. This was because the idea was to implement an active learning classroom where lecture is minimal or absent to allow the learners the ability to build upon what has been learned (Towle & Breda, 2014). This PowerPoint was not included in any of the analysis. It was simply the information the learners need in order to be prepared for class. This method follows a flipped classroom format, but the flipped classroom was not the focus of this project. The researcher does not have access to the SLM, so the director needed to load this at the beginning of the cohort.

Video incorporation into the classroom has been well documented in literature and has been supported to be a valid tool in education. June et al. (2014) found that students perceived more interaction and critical thinking skills using YouTube videos. In addition, the authors recommend that teachers create interactive video environments rather than just having the students watch a video to increase active learning.
The videos will be of two different scenarios since the module has two parts. One video will be on Patient Controlled Analgesia (PCA) and the other will be on neuraxial analgesia. See (see Appendix D). Each video will be recorded in the organization’s simulation lab. The facilitator will arrange actors from the education center after proposal defense and IRB approval. The facilitator felt that obtaining actors would not be an issue. Anyone can be the “patient” and the content expert or facilitator can be the “nurse.” The lab has a capability of recording video or the facilitator can do so on her phone for easier editing if necessary. The videos will be 10 minutes in length. The videos will be accessible through the facilitator’s sign-in on the computer. The videos need to be secured on the intranet so that only the facilitator, researcher, and director have access. IT will need to be consulted on the best way to do this.

Within four weeks of the start date of the winter 2019 cohort, the director and content expert/facilitator will be educated on the procedures by the researcher to ensure understanding of the procedures. The procedures to be covered are the need for the existing PowerPoint to be uploaded into the SLM, collection of surveys, and the need to not identify the students to the researcher. In addition, the facilitator may need training on how to implement and facilitate the active learning intervention to the class. This will be addressed within two weeks of the start of the class (see Appendix F for the timeline of the project).

**Recruitment**

With the actual recruitment of participants, it was suggested that someone with a relationship with the projected population broach the subject (Tappen, 2016). This would be the director and facilitator of the TTP who have already agreed to lay the foundation. A week prior to the class, the facilitator and director will explain that a research project will be conducted in
the PCA/Neuraxial module of the program and hand out the flier (see Appendix G). In addition, a flier can be emailed (Office of the Human Research Protection Program, 2012).

At the beginning of the PCA/Neuraxial class, a question/answer session led by the researcher will commence. The consent elements required by the Protection of Human Subjects which are pertinent to this study could be included: (a) statement of purpose for the project, (b) benefits to future learners, (c) the issue of confidentiality, (d) who to contact, and (e) that the survey was voluntary, but the activity was not (Hicks, 2014). This would fulfill the agreement phase of recruitment (Tappen, 2016).

Motivation for the study was a consideration. It was hoped that the learners would want to participate based on curiosity of how effective the intervention will be or altruism in helping future learners not have to sit through hours of lecture (Tappen, 2016). Some barriers could be that the study was of no interest to the learners, so they chose not to fill out the survey or fear of others finding out their answers, or the facilitator finding out who did not like the new way of teaching. Assurance would be given that confidentiality of answers will be secure.

The benefits to this sample plan in regard to recruitment are the surveys will be completed during class time, there are not costs to the participants, learners get to participate in a non-lecture format, and there is no way to trace answers to the participant. Furthermore, since this study was not taking place in a medical or formal education environment, HIPAA or FERPA consents are not needed.

**Implementation of the Survey**

Creswell (2012) discusses standardization in the implementation of the experiment. While this focus is greatly on observers and interviewers, it is important for a straight up quasi-experimental of pre/post survey design of a single sample within a single event. In the study on
student engagement and active learning the ASPECT survey (permission granted) will be presented pre/post the intervention of the active learning strategy to one group concurrently. Students were instructed that the class was not voluntary, but the survey was. Thus, the implementation meets the standardization issue. To maintain standardization with the instructions, researcher must be clear in describing the entire process and how the learners should fill out the pre and post surveys, when to place them into the coded envelopes, the importance of the numbering system, and when to return the surveys and to whom. It is suggested by Creswell (2012) that instructions be given verbally and in writing. The facilitator was also clear on how to get the completed surveys to the researcher in the event that the researcher was not available.

At the beginning of the PCA/Neuraxial class, the researcher conducted the question/answer session. Then the consents were given to all learners in the class. The class was instructed to complete the consent form if they would like to participate in the survey, (see Appendix H). It was reiterated that they are only consenting to the survey. The consent forms were collected and placed into a sealed envelope. The envelopes were placed in a locked filing cabinet. The consents will be kept for five years at which point will be shredded.

After obtaining consent, and prior to implementation, all the students received the pre-survey and envelope. They were instructed to quietly remain at their seats without phones during the 10-minute allotted time for completion of the survey. The survey was implemented via the pen/paper method. Students devised an identification number to use for the study by using the first three letters of their mother’s maiden name and father’s birth year onto the surveys and corresponding envelopes. If the father’s birth year is not known the participants were instructed
to use their own high school graduation year. The participants were reminded that this identification number needs to be remembered for the post-survey.

The surveys were placed into the envelopes and sealed by the participant. The facilitator collected the envelopes at the end of the 10 minutes and gave to the researcher. The researcher gathered the envelopes the same day and mark the letter “A” on the envelopes to denote the pre-test. The envelopes were placed into a manila envelope and sealed. The researcher then secured the data in a locked location as described in data management.

The plan was that two weeks after implementation in May 2019, all the students would receive the post-survey and envelope. They immediately filled out the post-survey. The participants had 10 minutes at the beginning of the first class of the day in which to do this. The participants used the same identification number. All the surveys were placed into envelopes by the students, given to the facilitator, and then to the researcher. This assured that all students had taken the ASPECT twice. Anyone who did not do so was excluded from the study.

**The Intervention**

After consent had been obtained and the pre-surveys collected, the students were placed into groups (if the classroom was not already set-up). A brief introduction to the intervention was be done by the facilitator and the first video started. The video was paused at specified points to allow for group discussion based on the two questions: what is your assessment and what is your next plan of action. At the completion of the video, a quick debrief commenced. A ten-minute break was given and the second video commenced following the same procedure as the first. Upon completion of the debrief, class was dismissed.
Data Analysis Methods

The purpose of this prospective, cross-sectional, quasi-experimental study was to measure the effect of an active learning strategy on learner engagement. The demographic data was at the end of the pre-survey. Demographic data such as age, sexual identification, type of program graduated from, and if a previous degree is held. Age was important because research has shown that Millennials prefer active learning. In addition, it would be beneficial to learn how other age groups respond to active learning. Many students in the area attend hybrid programs designed for those who already have degrees. This could affect the active learning receptiveness as well. In addition to gathering data for this project, the demographics could be helpful to the program director in learning more about the NGs hired. This data will be utilized in the already completed Excel codebook (see Appendix I).

Descriptive testing utilizing a codebook in Excel will be run on these demographics. Frequencies and distribution of normalcy will be conducted on each demographic data. Age is a numeric, continuous variable as the participants will choose which age range closely matches their actual age. The ranges were: 18-24, 25-34, 35-44, 45-54, and >55. Depending on the age groups discovered, further grouping may be needed for the analysis specifically to determine the number of Millennials versus Gen X and Baby Boomers.

The next variable was sex which is a categorical value represented as 0=Male, 1=Female, and 2=Prefer not to answer. A nominal, categorical variable that will be measured was whether a previous degree is held. It will be recoded as 0=None, 1=Associate, 2= Bachelor, 3=Master, and 4= PhD. The last nominal categorical variable was type of program the students graduated from and was represented by 0=Traditional (on site, typically 3-5 years, lecture/simulation), 1=Accelerated (onsite or online, typically less than three years, lecture/simulation) and 2=Hybrid
(online theory and onsite simulation), 3 = None of these. The last two variables are important as they may uncover a theme between college experiences and perceptions in learning. In addition, culture has been shown to have a direct effect on engagement (Lei et al., 2018).

**Options**

As previously mentioned, the evaluation tool was a 6-pt Likert scale which makes the variables categorical and ordinal. The value for the lowest scale of strongly disagree was worth 1 while the highest value, strongly agree was worth 6. The total score was compared pre and post-survey. In addition, the scores for each subscale, PE, VA, and IC, was also be evaluated pre/post test. Distribution testing will be run on the data using IBM SPSS to determine assumptions and which statistical analysis needs to be run: parametric or non-parametric. If distribution is relatively normal, then a Pearson’s correlation and a paired t-test will be conducted on the pre and post responses. If the distribution requires a non-parametric test, then Spearman’s Rho and Wilcoxon Signed Rank Test can be utilized.

A paired t-test is used for one sample with one observation at different times (McDonald, 2015). In order to be accurate, the paired t-test requires a strong correlation coefficient (McDonald, 2015). This is why the Pearson’s r has been chosen. Traditionally, the paired t-test has been used only with nominal variables and it was suggested that a non-parametric test be utilized, but these are less powerful. Recently it has been proven that by changing the answers into a survey scale and then using the total scores, parametric tests such as the paired t-test can be used with Likert scales (Sullivan & Artino, 2013).

The four assumptions of parametric tests must be met. The first assumption of nominal values has already been addressed. The second assumption is that the same group is to be studied (Laerd Statistics, 2018). A third assumption that cannot be addressed until after data is
gathered is that there cannot be significant outliers (Laerd Statistics (a), 2018). An assumption specific to the paired t-test is that the sample size is greater than 30. The projected sample size meets this criterion. If these four assumptions are not met, a Wilcoxon Signed Rank Test can be used.

The Wilcoxon Signed Rank Test has three assumptions. One is that the same group is to be measured on the same dependent variable on two separate occasions (Laerd Statitics (b), 2018. This the same for the paired t-test. The other two assumptions differ from the paired t-test. The first is that ordinal variables can be measured and this is a requirement. The second is that each observation must have a normal distribution (Laerd (b)Statistics, 2018). If one is skewed, this test cannot be utilized. This will be determined after distribution for normalcy is run.

**Data Management Methods**

The following is the plan for data management based on the lifecycle of data management (Surkis & Read, 2015). The data was analyzed for relationship of engagement to active learning. The data was also scrutinized for themes that may be revealed for future implications for the program. Data was gathered in the classroom prior to the intervention and again at two weeks after. This is the first step to the data management cycle (Surkis & Read, 2015).

The consent forms were placed into one manila envelope that is sealed. The surveys were also be placed into a separate, sealed manila envelope. After the pre-test, the researcher picked up the envelopes and transported them to the personal residence. The envelopes and their contents were locked in a file cabinet. The key will be kept in an undisclosed location known
only to the researcher. There will not be any identifiable information as the codes will be utilized and untraceable. The procedure for the post-test were the same.

The researcher input the data into a secured computer that is password protected. The computer is kept in a private room. A back up of the data has been obtained onto a designated jump-drive that is kept in the locked filing cabinet. This is to protect against loss via computer. After the data was placed into the computer, the researcher analyzed the data in a private room and saved on said portable drive. These are the next two steps in data management (Surkis & Read, 2015). The analyzed data was then included in the project as results.

The analyzed data was included in the project as results. At this point non-identifiable results will be shared with the researcher’s chair, committee members, and defense committee of American Sentinel University. If successfully defended, the project results may be shared for publication.

Upon completion of the program, publication, or report submission to the organization (whichever is later) the data is usually retained for the recommended three years (Health and Human Services, 2018). Per American Sentinel University protocol, data will be held until the end of the five-year period at which time the paper surveys and envelopes will be shredded and the files erased on the computer. The computer has been primarily used for school so there will not be an issue with electronically wiping it clean with a third-party program (Lee, 2016). Surkis and Read (2015) suggest that the data be preserved and on a reliable medium besides a jump-drive. However, for this project, the protocol for the university will be followed and the jump drive will be wiped as well and physically rendered unusable (Lee, 2016).
Ethical Considerations

The Nuremberg Code specifies many concerns surrounding research. One concern was societal benefit or lack of frivolity (Tappan, 2016). This project will benefit society by increasing the engagement of nursing students in remediation so they can increase their knowledge, confidence, and competence. This translates to improved patient care which benefits the local community.

Another issue was minimal risk to the subjects (Tappan, 2016). There are no documented ill-effects from attending an active learning environment. Perhaps someone could suffer from social anxiety, but group work is not new to the nursing graduate, so this risk would appear minimal. In addition, the Nuremberg Code states that the experiment should be concluded at any time if needed (Tappan, 2016). Risks are minimal so the hazard of terminating the experiment are minimal. In accordance with the Nuremberg Code, the surveys will be volunteer (Tappan, 2016). However, the class was mandatory per the director and conditions of the TTP.

The Declaration of Helsinki is mostly concerned with medical research which this study is not; however, there is a point made of confidentiality (World Medical Association, 2017). The consent form discusses confidentiality. The surveys will be numbered and the researcher does not have access to the emails or self-learning modules (SLM). The only time the researcher will be aware of learner names will be through the consent forms which will be securely filed in a locked cabinet. The names will never be connected to the surveys.

To be sure that ethics are followed, an IRB approval was obtained from American Sentinel University prior to any work executed for this project (Appendix E). In addition, the organization which does not wish to be named was also contacted. Their understanding is that
IRB approval will not be required as related to Health and Human Services 45 CFR 46.101(b) (2009) which states that:

Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior. (pp. 130).

This project will be conducted in an established educational program and will have minimal if any risks to the participants. The researcher will only know the names of the participants by the consent forms. There will be no connection to ID numbers in which the participants will make up. The organization will review this proposal after IRB approval has been obtained from the university, but does not believe a formal evaluation will be necessary.

**Internal and External Validity**

There are some internal and external validity factors. The first internal threat history. The pre-test and intervention will be on the same day with the post-test within two weeks minimizing the chances of a history effect. Another internal threat includes maturation. The study was completely focused on human perception (Laerd Dissertation, 2012b). Someone could say something that changes the behavior of a subject during the intervention which may alter the participant’s response to the survey. This could be a short-term maturation issue. There were no long-term issues as the study were one day.
Another threat not thought of, but discussed by Tappen (2016), is the actual survey. The same survey was given pre/post intervention and this could have skew the post-test results. One way this could happen is if the subject is very interested in active learning and fills out the survey in a way to exaggerate the results to make the study look better (Laerd Dissertation, 2012b). While the pre/post testing of the subjects may be a threat, the evaluation tool did not change over time because the study was very short. In addition, the instrument has been proven to be statistically valid and reliable (Wiggins et al., 2017). There is no doubt that there is a selection bias as a convenience sample is being used. One last concern could be an issue if the post-survey is not given until one week after the implementation. This is the threat of experimental mortality. While it is unlikely, any of the learners could be dismissed from the program during this time frame and could skew the results.

Statistical regression was not a threat as it does not involve the testing of two groups (Laerd Dissertation, 2012b). Other internal validity issues that were included: casual time order, diffusion of intervention, and compensation (Laerd Dissertation, 2012b; Tappen, 2016). These respectively did not pertain to the study as: (a) although anyone can die at any moment, the probability during one class time is low, (b) the independent variable, active learning, should affect the dependent variable of student engagement, (c) there is no control group, and (d) there is no compensation.

There were external validity concerns. Selection bias was a very real concern as the sample was convenience of a specific population (Laerd Dissertation, 2012a). The sample is from the nurse graduate residency which was selective in itself and may not lend to generalizations of other nursing populations; however, the study was purposely designed for NGs, but still may not be representative of this entire population (Tappen, 2016). Another
external threat was that of construct. According to Laerd Dissertation (2012a), the fact that this study was only using one type of active learning strategy and not all the types, could skew the representation of the population. Using a video may not have been as accepted as say a case study review in a group setting. This could have hindered the study of active learning on student engagement. The one external validity that was not an issue is the experimental effect. This was because the intervention was done in an established program, in the same environment for all the other modules taught, with the same staff. Everything was the same except that lecture was replaced by an active learning strategy. This study was not held in an artificial environment. In addition, there was only one intervention, so the possibility of one intervention affecting the other was non-existent (Tappen, 2016). Lastly, Laerd Dissertation (2012a) mentions the researcher effect. From readings, it appears to be best if the researcher is not directly involved in the intervention, therefore, the content expert or facilitator conducted the class.

**Summary**

Section II has covered the ethical considerations of this study which there were minimal. The design was a prospective, cross-sectional, quasi-experimental design with a non-probability, convenience sample that measured the engagement of the participants before and after an active learning strategy was implemented. The survey was voluntary although the cohort must participate in the class. The data was obtained, secured, and will be held for five years from the final collection date. The sample was from a local TTP February 2019 cohort. The evaluation tool (ASPECT survey) has been proven to psychometrically sound in validity and reliability. The internal and external validity concerns for the project have been addressed.
Section III will focus on the results of the study. An in-depth analysis of the data will be discussed as well as the results. Limitations will be addressed. A discussion will be commenced regarding what this study means for nursing and whether more studies need to be conducted.
SECTION III: RESULTS AND DISCUSSION OF FINDINGS

Introduction

The purpose for this study was to evaluate the impact of an active learning strategy on learner engagement in a TPP. In the local organization, there is a lack of engagement from the NGs. Nationally, there are poor guidelines regarding how the remediation process of the TTPs are conducted. In this section, the researcher will align the results to the study including the significance of the data, implications for the nursing profession, and recommendations for future research. Additional information includes the methods used, the sample characteristics, and a conclusion.

Summary of Methods and Procedures

This prospective, cross-sectional, quasi-experimental project consisted of pre/post survey administered in the PCA/neuraxial analgesia module in a TTP. The survey chosen was the Assessing Student Perspective of Engagement in Class Tool (ASPECT) (Wiggins et al., 2017). The ASPECT was administered before and after the active learning strategy. The active learning strategy was two videos shown in class. The videos were paused intermittently at set times for group discussion of assessment and the next actions for the plan of care. With the pre/post survey execution, a Wilcoxon Signed Rank Test was administered for data analysis. Demographic data was also obtained.

After the pre-survey was obtained, the answers were placed into an Excel codebook and recoded into usable data. Total scores and modes were obtained. Since this is a paired study, it was opted to wait until the post-survey was conducted to run any further analysis.

The post-surveys were collected, including the demographic questions. All the data was placed into an Excel code book and recoded. The modes and total scores were obtained for the
post-survey. Analysis of the total scores was performed and average scores for the pre-survey ($M = 62.7, SD = 8.6$) and post-survey ($M = 74.6, SD = 12.2$) were calculated. Next, frequencies, central tendencies, and variance were conducted including percentage, minimum, maximum, mean, median, and standard deviation on the demographic data.

**Summary of Sample and Setting Characteristics**

The target population was the 2019 nurse residency program of a local organization. The target sample size was 80-100 NGs. The accessible population was the February 2019 cohort which was estimated to be 40-50 NGs, but due to budget cuts within the organization, only 25 positions were created. Only 17 NGs were accessible as the other residents were in mental health specialties and not required to attend the PCA/Neuraxial analgesia module. Of the 17 available NGs, all of them consented. However, one consented with the incorrect month. Since it was not known which survey was connected to this consent, all surveys were used in the data.

The setting was in the organization’s medical auditorium and conference center. As the NGs entered, best efforts were made to group them in the first two rows of chairs. The NGs not in the front row were later grouped after the pre-surveys were filled out prior to the interventional videos. A week prior to this class, the director emailed the research flier to all the NGs attending this module. The morning of the class, the researcher made introductions, reviewed the purpose of the project, and attempted to edify the need for the expertise of the NGs as learners. The specifics of consenting were reviewed. The consents were handed out to everyone and collected.

Next, envelopes were passed out to the NGs. Then verbal instructions were given on how to code the pre-surveys and envelopes. Finally, written instructions reiterating how to code the survey and envelopes were given to all the NGs with the pre-survey. The NGs were
instructed to remain in their seats and not to use their phone for the purpose of anonymity so the researcher would not be aware of who was and was not filling out the survey. The NGs were also instructed to place their survey -- whether filled out or not -- into the envelope. The researcher allowed ten minutes to fill out the survey. The envelopes containing the surveys were collected from all NGs. The researcher thanked the class and left the room. The instructor of the module conducted class using the videos. The envelopes and surveys were marked with “A” to denote pre-survey.

Four weeks later, the post-survey procedure was commenced the same way as the pre-survey with the exception that the researcher had to remind the NGs that only the NGs who filled out the pre-survey and consented to the study could partake in the post-survey. This was due to the fact that all of the NGs were present as it was their last class. The participants were reminded to be sure their ID codes were the same as the pre-survey using the written instructions given. They were also reminded that the project was about the PCA/neuraxial module. After receipt of the envelopes, the letter “B” was written on the envelopes and surveys.

The number of post-survey participants was fifteen. There were two missing from the pre-survey. In addition, there was a survey where the post-survey code did not match a pre-survey code, so the pre-survey was not included. This left 14 participants in the sample (N = 14).

**Demographic Data**

The demographic data did not reveal any surprises. Gender was predominately female (71%) (Figure 2). Given the regional location of the program, an option not to disclose gender was provided, but not utilized. The 25-34 age group was the most common (71%) followed by 18-24 and 35-44 (14% each) (Figure 3). There were no participants older than 44.
One participant had a master’s degree and one with an associate’s degree (Figure 4). All other participants had bachelor’s degrees. Fifty percent of participants graduated from a traditional nursing program. Participants who graduated from an accelerated nursing program with lecture or active learning was 43% (Figure 5). Only one NG had graduated from a hybrid program, online and onsite.

**Major Findings**

The results of this study revealed a positive relationship between an active learning strategy and learner engagement in a TTP. This result rejects the null hypothesis. While the data met the distribution of normalcy for the pretest (Table A) and post-test (Table B), non-parametric testing was utilized due to the sample size which did not meet the four assumptions of a paired t-test. There was a slight right shift on the pretest and one outlier. The outlier was determined not to be affecting the overall analysis and was left in (Figure 6). The post-test had a centered histogram without outliers in the Q-Q plot and box plot tests (Figure 7). The chosen Wilcoxon Signed Rank Test calculated with SPSS, revealed a statistically significant increase in student engagement following participation in the active learning strategy, \( z = -2.20, p <0.001 \), with a medium effect size \( r = 0.42 \) (Figure 8). The median score on the pretest increased from \( Md = 65 \) to the post-test \( Md = 73 \). This finding is important as it demonstrates that there is a relationship between learning activities and learner engagement. These results demonstrate that more research would be beneficial to those directing and teaching in TTPs.

**Theoretical Framework**

The theoretical framework chosen for this project was Knowles’ theory of adult learning which is based on andragogy. Knowles’ (1973) premise is that adult learners need to know the relevance in learning the specified material and disengage when relevance is not perceived.
Another concept is adults are life-long learners (Lindemen, 1926). Zmeyov (1998) furthered the concept by stating that adult education needs to be flexible and have diversified methods for teaching and learning. Active learning is one type of method.

Knowles (1970) defined four principles of andragogy of which three are aligned with this project (Figure 1). By making the traditional lecture PowerPoint into a self-study out of the classroom, the actual class time benefited from the students being able to apply what they learned in the self-study to common scenarios in the hospital. This active learning demonstrated relevance. Adult learners appreciate problem-centered learning which the group discussions during the viewing of the video met when the plan of care needed to be determined.

In addition to Knowles’ (1970 principles, Zmeyov (1998) added three more assumptions to adult learning. The first assumption is that the life surroundings of the learner contribute to the ability to learn. This study used previous experiences of the learners in their groups to devise plans of care. The second principle is that the learner is the leader. In this study, the facilitator was not teaching, but the students were learning through engaged measures by utilizing previous and current knowledge. The last assumption is that the learners and the facilitator were partners in learning. This allowed the learners the ability to be engaged as they were able to take charge of how they reacted to the videos. By basing the structure of the class and project on the principles of andragogy, the goal was for the project to enhance engagement.

The ASPECT Survey

The ASPECT survey used measured the engagement of the learners within the local TTP during the PCA/neuraxial analgesia module. The survey by Wiggins et al. (2017) was psychometrically sound and chosen as it specifically measures student engagement in a
classroom setting. The ASPECT survey demonstrated that the adults in the study were engaged with the group discussion related to the video presentation during class.

**Implications for Nursing Practice**

This study is useful in the nursing profession as it demonstrates that the NGs had more engagement within the remedial portion of a TTP. There are no true guidelines for the remedial portion of TTPs. The Millennial population prefers less traditional methods in learning as mentioned in the literature review. Higher education has been incorporating active learning activities in place of traditional lecture. The culmination of these points determines that there is a need to find ways to teach and remediate patient care information to the NGs.

Higher education has been incorporating active learning to improve engagement which increases student outcomes (Wang & Degol, 2014). The next logical step would be for TTP directors to begin incorporating the techniques used by higher education to enhance the learning of NGs in their last training before patient care. Better learning outcomes would theoretically lead to better patient care through competent nurses.

**Dissemination of Findings**

In regards to the local organization, the organizational strategy is in a current shift towards Lean SixSigma; therefore, the results of this study must include a Lean SixSigma approach in the report of findings. One chosen avenue is Kaizen which means continual improvement (Graban, 2016). Another avenue includes Deming’s 14 points of quality which encompass healthcare and education (The Deming Institute, 2019). Listening and reading is not the best way to train employees (Graban, 2016). Furthermore, if an organization wants quality healthcare, the staff must be appropriately trained and allowed to work within their scope of practice (Institute of Medicine, 2013). The involvement of leadership, employees and end-users,
quick response to needed improvements, and fact-based actions help achieve the indicators of quality education. These indicators include curriculum, achievements, learning and teaching, student support, student satisfaction, resources, and leadership (Vlasic, Vale, & Puhar, 2017).

Studies like this one are valuable to entities in education or professional development. Publishing of this and future studies in education and nursing journals can provide interprofessional support. Trade magazines are another avenue for publication. In an era of interprofessional collaboration, it is important not to re-invent the wheel. Professions such as business, technology, medicine, and education need to educate their students and professionals. If one profession finds a method that works, then it is a waste not to share the information with others to produce quality employees. The more people working together, the better the outcome for student learning (Brown et al., 2013).

**Recommendations**

As far as this researcher is aware, this study is the first of its kind in a TTP. There have been many studies on active learning in secondary education and some in higher education (Labarree, 2009). While there are increasing studies in learner engagement there is no knowledge on how best to educate NGs in a TTP. Wang and Degol (2014) strongly encourage more studies on student engagement. The following are recommendations for future research.

**Future Research**

There are many recommendations for future research. One includes larger sample sizes, perhaps with multiple organizations. The limited accessible population does not allow for inferential statistics. However, in the local area, there are four residency programs available with one to two cohorts annually. Tapping into these programs could provide a more randomized study with a larger population. This population would be more representative of the area.
Another recommendation is to use the same videos in multiple TTPs. This would increase the reliability of the videos as a teaching tool. Using the same videos minimizes the possibility of different strategies affecting the results. In addition, using the same intervention would help increase the success of replicated studies which normally have a minimal success rate of 36% (Patil, Peng, & Leek, 2016). On the other hand, studies on multiple active learning strategies could help determine which activities elicit engagement.

In the local organization, the director has struggled with engaging the NGs in many of the lecture-based modules. This may be due to the sample population being mostly of the Millennial generation. The Millennials are the largest incoming workforce (Halsey, 2016). It is important to change the teaching methods to best meet their needs. The Millennial generation values teamwork and active learning. As a result, they exhibit less of a tolerance for lecture (Roehl et al., 2013). This study reflects that the active learning strategy was well-received in the majority Millennial age group (71%).

The clinical significance is that knowledge from this and other modules needs to be translated into bedside care. If the learner is not engaged, then knowledge is not readily absorbed (Halm, 2015). If the knowledge is not absorbed, it cannot be used at the bedside. A simple mistake such as lowering the head-of-bed on an epiduralized patient with low blood pressure complaining of dizziness could have dire consequences for the patient. The results of this study demonstrate that perceived engagement in the learners through active learning in the classroom promotes critical thinking (Wilkinson, 2013). Further research should be conducted to connect active learning engagement to patient outcomes.

Sharing the results of all these studies could lead to solid guidelines for TTP facilitators. If multiple TTPs around the country performed studies in urban and rural communities,
commonalities could be found. These common points would lead to solid guidelines for TTPs and the accrediting bodies. The learning needs of the Millennial population could be better served. Collaboration teams in instructional design can work with the educators and directors within the TTPs to develop courses that engage the learners (Brown et al., 2013). Consistency would be a result of all NGs in TTPs being engaged in their learning.

**Discussion**

While this study had a small sample, there was statistical significance. Other strengths include a well-developed evaluation tool, organizational support, and a need for the study in the nursing field. Limitations included sample size, timing of the project (only one cohort), and a selective sample. The sample was of convenience which limits the application of the results to the general population (Tappen, 2016).

Trials included creating and editing the video and class schedules. Finding actors proved to be a challenge. Editing two videos was very time consuming. The class was anticipated to be completed March, but was pushed out until April. The post-test was a month after the pre-test due to the program schedule. While this helped with memory bias, it may have affected the post-scores due to the amount of time between the tests.

This study is more of a pilot due to its limited sample and lack of or limited previous research. The population studied was small and selective. Yet, the literature review has demonstrated why this study was needed. NRPs or TTPs are valuable for NGs. Active learning is more effective than lecture or passive learning related to cognitive comprehension and retention. Active learner activities have been proven in academia and other disciplines (Blagg, 2012). Bonwell and Eison (1991) stated that active learning was a means to higher order
thinking. The videos incorporated in this study led to evaluating and analyzing (Armstrong, 2016).

In regards to engagement, this project demonstrated similar results to Lightner et al. (2007), 66% of students enjoyed the team-based activities. By having enjoyment, the students demonstrate emotional engagement. Another study conducted by Kniewel (2012) focused on the relationship between team-based learning (TBL) activity and engagement and knowledge. Kniewel (2012) found that students had greater accountability engagement with an active learning scenario. This project demonstrated a positive correlation between group activity and engagement which is supported by a previous study. In the study by Poynton, Madden, Bowers, and Keefe (2007), learner engagement increased with a project-based activity in a qualitative, retrospective Utah pilot study. The project-based activity also improved staff development through implementing a new curriculum that focused on engagement of the new nurse residents.

In addition, this study helped to fill in gaps in the literature. There are few studies on active learning and engagement in nursing (Popkess & McDaniel, 2011). Furthermore, there is a lack of methodical and theoretically based studies (Waltz, Jenkins, & Han, 2014). Regarding TTPs, Anderson, Hair, and Todero (2012) found that TTPs have multiple ways that content is delivered in NRP/TTPs, a lack of education theories to drive content, and further quasi-experimental studies are needed. This project used an education theory and was quasi-experimental, and methodical.

A limitation to this study is that the definition of student engagement is not the same for every researcher and is multi-dimensional (Lei et al., 2018). There exist many types of engagement including behavioral, emotional, cognitive, and agentic (Sinatra et al., 2010). To help with the definition, this project defined engagement according to the dictionary.
Another limitation is that engagement has been measured in many ways. There are self-reports, observations, surveys, experience samplings, teacher perceptions, and interviews, the most common being self-reports (Fredricks et al., 2016; Fredricks & McColskey, 2012). The methods of research for engagement rely heavily on self-report and observations making for subjective data rather than objective. This study used the ASPECT survey which was psychometrically proven to be valid and reliable for self-reporting.

More studies need to be conducted for validity in TTPs. Furthermore, additional studies on engaging learners would be beneficial to many professions. This project demonstrates that the current NGs were engaged with the active learning strategy. This is important as improved student learning is accomplished by aligning the instructor’s intention with the learners’ needs and expectations (Konings, Seidel, & van Merrienboer, 2013).

**Conclusions and Contributions to the Profession of Nursing**

The purpose of this study was to determine the impact of an active learning strategy on learner engagement in a TTP. The study results demonstrated an increase in post-test scores of participants’ engagement with the implementation of an active learning strategy (video and group discussion). Active learning has positive reactions by learners over traditional methods, such as lectures, and improves engagement (Huda et al., 2016). In addition, the rapid changes in healthcare and technology are not able to be effectively taught with traditional methods (Huda et al., 2016).

Like active learning, engagement has proven to improve academic learning outcomes (Fredericks, Filsecker, & Lawson, 2016). However, there is controversy on how to measure and define engagement (Fredericks et al., 2016). Fredericks et al. (2016) also conclude that engagement is improved when there are different types of tasks and students have some
autonomy. Knowles’ (1970) adult learning theory supports this thought as well as the fact that
learners are responsible for their own learning and want to learn (Taylor & Hamdy, 2013).

There are limited, structured, studies on active learning and engagement (Fredericks et
al., 2016; Huda et al., 2016). Add to this the lack of studies on remediation in TTPs as
demonstrated by the literature review conducted for this study. This project was a start. Other
research is needed to further education and consistency in TTPs. This project is needed and so
are others to further education and consistency within TTPs. By increasing engagement in
remediation portions of TTPs, NGs may be better prepared to perform needed tasks and
recognize significant changes at the bedside.
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Table 1

Pretest Normalcy

### Descriptives

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### Tests of Normality

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a. Lilliefors Significance Correction
Table 2
Post-test Normalcy

### Descriptives

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### Tests of Normality

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* This is a lower bound of the true significance.

a. Lilliefors Significance Correction
Figure 1

Knowles’ 4 Principles Of Andragogy

1. Involved Adult Learners
   - Adults need to be involved in the planning and evaluation of their instruction.

2. Adult Learners’ Experience
   - Experience, including mistakes, provides the basis for learning activities.

3. Relevance & Impact to Learners’ Lives
   - Adults are most interested in learning activities that have immediate and impact to their job or personal life.

4. Problem-Centered
   - Adult learning is problem-centered rather than content-oriented.
Figure 2

Gender

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<th>Female</th>
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<td>1</td>
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%0 50% 100%

Male Female Prefer Not to Answer
Figure 3
Figure 4

Previous Degree Held

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- Doctorate
- Masters
- Bachelor
- Associate
- None
Figure 5

Type of Program Graduated

- None of These
- Traditional
- Accelerated
- Hybrid
Figure 6
Figure 7
Figure 8

Wilcoxon Signed Ranks Test

<table>
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<tr>
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<tr>
<td>Ties</td>
<td>0c</td>
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<tr>
<td>Total</td>
<td>14</td>
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<td></td>
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a. TTL Score Post < TTL Score Pre
b. TTL Score Post > TTL Score Pre
c. TTL Score Post = TTL Score Pre

Test Statisticsa

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<td></td>
<td>-2.198b</td>
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a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.
Appendix A

Facility Approval

Pending IRB approval from American Sentinel University, the residency program of Legacy Health is in full support of student implementing a new learning activity to measure resident engagement during the winter cohort of 2019. This learning activity will be a video vignette in the PCA/neuraxial module of the program.

In the capstone report, the student will refer to the organization and involved employees per the organization's request as: local organization, the director, the facilitators, and personal communications only.

Printed Name: Cindy Bianchini RN  Date: 10/31/18

Signature: [Redacted]

Position within organization: Residency and Academic Relations Program Director
Appendix B

Evaluation Tool Consent

Re: ASPECT survey
Alison J Crowe < >
Reply
Thu 1/25, 7:34 PM
You
ASPECT_PlusSupplemental.pdf
3 MB
Hi Janiece,
You are more than welcome to use the survey for assessing student engagement in an active learning classroom.
I’ve attached the full paper here with the survey included in the supplemental.
Thanks for your interest in our survey,
Cheers,
Alison

Alison Crowe
Sat 12/8/2018, 12:34 AM
Hi Janiece,
Please see my comments below:

Alison Crowe
Principal Lecturer
Department of Biology
University of Washington

On Dec 6, 2018, at 11:51 AM, J. PAULAT < wrote:

Dear Ms. Crowe,

I hope this email finds you ready for the upcoming school break. It has been a few months since I last spoke to you. I am in the process of defending my proposal (Dec. 14) and my chair asked me to ask you for some clarification regarding the ASPECT survey.

My statistician thought it would be interesting to compare scores of the personal effort and value of activity factor scores pre/post survey as they were psychometrically tested separately complete with Cronbach’s alpha for each. My school is asking me to obtain permission to do this. It is fine to compare scores on the factors independently

Also, my school is asking for clarification on the three control questions used for your testing. Mainly that they are not part of the total Likert scale total score. I know you said I could edit them to my situation, but my school will not allow me to do this. May I omit them?
You may omit these but then you cannot control for different factors (e.g. we removed all students from the survey data if they said they were not working in a group). We also controlled for whether survey participants had a friend in their group since this can influence your engagement with the class.

Thank you for your support in my project.
Good luck!
Appendix C

Evaluation Tool

ASPECT Survey (Wiggins et al., 2017)

Instructions for students:

All questions in this survey refer to today’s class in which you completed an activity on PCA/Neuraxial analgesia. Your responses on this survey will be used to evaluate how we teach this topic in future Residency classes. Your instructor will not know whether you completed this survey or how you answered the questions, but your effort will impact the experience of future new graduates in this program.

The following questions ask you about your experience with the interactive video activity that you will complete or have completed during the PCA/Neuraxial analgesia module. Please rate how strongly you agree or disagree with each of the following statements by circling the number that best correlates with your rating.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Explaining the material to my group improved my understanding of it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. The instructor’s enthusiasm made me more interested in the interactive video activity</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. Having the material explained to me by my group members improved my understanding of the material</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. Group discussion during the interactive video activity contributed to my understanding of the course material</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Slightly Disagree</td>
<td>Slightly Agree</td>
<td>Agree</td>
<td>Strongly Agree</td>
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<tr>
<td>5. The instructor put a good deal of effort into my learning for today's class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. I had fun during today's interactive video activity</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. Overall, the other members of my group made valuable contributions during the interactive video activity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. The instructor seemed prepared for the interactive video activity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9. I would prefer to take a class that includes this group activity over one that does not include this interactive video group activity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10. I am confident in my understanding of the material presented during today's [insert topic name] activity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>11. I made a valuable contribution to my group today.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12. The instructor was available to answer questions during the interactive video activity</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13. The interactive video activity increased my understanding of the course material.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>14. I was focused during today's interactive video activity.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Slightly Disagree</td>
<td>Slightly Agree</td>
<td>Agree</td>
<td>Strongly Agree</td>
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<td>15. The interactive video activity stimulated my interest in the course material.</td>
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<td></td>
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<td>5</td>
<td>6</td>
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<tr>
<td>16. I worked hard during today's interactive video activity</td>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Please answer the questions below. Your answers will be kept confidential.

**Demographic questions:**

**Age** (circle one): 18-24 25-34 35-44 45-54 >55

**Sex** (circle): Male Female Prefer Not to Answer

**Do you have a previous degree** (circle one):

None AA/AS BA/BS MA/MS Ph.D

**Which type of nursing school did you graduate from** (circle one)?

**Traditional** (on site, typically 3-5 years, lecture/simulation),

**Accelerated** (onsite or online, typically less than three years, lecture/simulation)

**Hybrid** (online theory and onsite simulation)

**None of these**
Appendix D
Outlines for PCA/Neuraxial Videos

Video 1

- **PCA Scene**
  - Patient room with patient in bed with complaint of pain
  - Nurse enters room.

- **Assessment of pain**
  - Nurse assesses pain

- **Contraindications**
  - Reviews that PCA is appropriate for the adult patient

- **Review of orders**
  - Teaching to patient

- **Programming pump**
  - With another RN

- **Reassessment of pain**
  - Post intervention assessment
  - Still having a lot of pain
    - Pause video
  - Nurse obtains order for more medication
    - Titrates pump
  - Reassessment of pain

- **Signs of toxicity (time lapsed)**
  - Patient reports symptoms such as sleepiness, lack of ability to converse, etc.
• Nurses notes signs such as RR < 10, decrease urine output
• Mistake by nurse
  o Pause video
• Issue resolved
• Video ends

  Video ll

• Neuraxial Scene
  o Patient room with patient in bed with complaint of pain
  o Nurse enters room.
• Assessment of pain
  o Nurse assesses pain
• Contraindications
  o Reviews that PCA is appropriate for the adult patient
• Patient teaching
  o Benefits
  o When to call
• Review of orders
  o Teaching to patient
• Programming pump
  o With another RN (Subject to change based on policy)
• Reassessment of pain
  o Post intervention assessment
  o Still having a lot of pain
• Pause video
  o Nurse obtains order for more medication
  • Titrates pump
    o Reassessment of pain
• Signs of toxicity (time lapsed)
  o Patient reports symptoms such as sleepiness, “seeing things,” not able to breathe, etc.
  o Nurses notes signs such as hypertension, tachy/bradycardia
• Mistake by nurse
  o Pause video
• Issue resolved
• Video ends
Appendix E

IRB Approval Letter

December 20, 2018

Janiece Paulat
DNP Student
American Sentinel University

Re: Impact of an Active Learning Strategy on Learner Engagement in a Transition to Practice Program

Dear Ms. Paulat,

On December 20, the Institutional Review Board (IRB) of American Sentinel University has approved the above-referenced submission. The contingencies have been addressed and the IRB approves the protocol. Work on this project may begin. This approval is for a period of one year from the dates of this letter and will require continuation approval if the research extends beyond one year. If you make changes to the protocol during the period of this approval, you must submit a revised protocol to the American Sentinel University IRB for approval before implementing the changes.

If you have any questions regarding the IRB’s decision, please contact me through irb@americansentinel.edu.

Sincerely,
Elaine Foster PhD, MSN, RN
Chair
American Sentinel University IRB

C. Dr. Cleveland
Appendix F

Timeline for Project

- Five to six months prior to implementation
  - Prepare proposal defense
  - Contact director of program regarding project
  - Design videos
- Four months prior to implementation
  - Defend proposal
  - Obtain IRB approval from ASU and organization
  - Write script for videos
- Three months prior to implementation
  - Record videos
  - Arrange for SLM for PowerPoint distribution
  - Discuss with director when to do module
  - Contact content expert and facilitator about participation
  - Purchase envelopes
- One month prior to implementation
  - Print out consents and surveys
  - Contact content expert for inclusion into project
- Two weeks prior to implementation
  - Make sure video is available
- One week prior to implementation
  - Meet with content expert regarding implementation of project
  - Send PowerPoint to NGs via SLM
- Day of implementation
  - Researcher to explain research project to cohort.
  - Obtain consent from participants.
  - Give surveys to participants.
  - Collect consents and surveys from participants.
  - Implement active learning strategy.
- Two weeks after implementation
  - Re-administer survey to participants.
  - Collect surveys from participants.
- During the three months following implementation
  - Review and clean data.
  - Analyze data.
  - Prepare results.
Appendix G

Flier for Recruitment

Participants Needed

A research study measuring the impact of an active learning strategy on learner engagement is taking place during the Feb. 2019 Nurse Residency Program. I am looking for participants willing to fill out a survey before and after the class is taught.

The survey will be taken during class time and requires only your opinion. There is no cost or risk to you. This project is open to any February 2019 Nurse Residency Program participant.

An informational session will be held on April 25, 2019 at in the Peterson Education Center classroom.

See You There!
Appendix H
Consent Form

Date: 11/2018

Project Title: Impact of Active Learning Strategy on Student Engagement

Principal Investigator: Janiece Paulat
Capstone Advisor: Dr. Sandra Cleveland

Approved Consent is valid for one year from the date of IRB approval.

You are being asked to participate in a DNP student capstone project. This form provides you with information about the project. The project will be described and all of your questions will be answered before you sign this consent. Please read the information below and ask questions about anything you do not understand before deciding whether or not to take part in this project.


Why is this project being done?

The purpose of this project is to determine how an active learning strategy affects student engagement.
You are being asked to take part in this project because you are enrolled in the residency program.

Up to 50 nurse residents will take part in this project.

**What happens if I participate in this project?**

If you agree to take part in this project, you will be asked to complete a survey before and after the PCA/neuraxial module of the program. Everyone is required to attend this module, but the survey is voluntary.

We anticipate that it will take most people about 20 minutes to complete both surveys which will be completed during class time.

**What are the possible discomforts or risks?**

Discomforts you may experience while taking part in this project include the time it will take you to answer all the questions on the surveys.

There are no other foreseeable discomforts or risks.
What are the possible benefits of the project?

This project is designed to learn more about student engagement.

There are no direct benefits to you for participating in this project. However, learning more about student engagement may help aid in the development of a more engaging curriculum for the residency program.

Who is paying for this project?
There is no funding required for this project.

Will I be paid for being in the study? Will I have to pay for anything?

You will not be paid to participate in the project and it will not cost you anything to participate in this project.

Is my participation voluntary?
Taking part in this project is voluntary. You have the right to choose not to take part in this project. If you choose to take part, you have the right to stop at any time. If you refuse or decide to withdraw later, you will not lose any benefits or rights to which you are entitled. If after receiving the surveys, you decide to not take part in this project, do not return the surveys. If I have not received your completed surveys by the end of class, I will assume that you decided not to take part in this project and any information received from you will be destroyed.

Who do I call if I have questions?

The principal investigator (student) carrying out this project is J. Paulat. You may ask any questions by contacting me at [email protected]. If you have questions later, you may contact the principal investigator by sending an email message.
You may have questions about your rights as someone in this study. You can contact the students’ Capstone advisor, Dr. Sandra Cleveland, at [REDACTED] or by sending a message to the advisors’ email address [REDACTED]. You may also contact the American Sentinel University IRB Director or the Associate Dean of Graduate programs with questions about your rights as a research subject at [REDACTED].

Who will see my information?

I will do everything I can to keep your information private (confidential). Any documents that identify you, the consent form signed by you, and any information you provide may be looked at by the following:

- The DNP students’ Capstone chair and committee members
- American Sentinel University Institutional Review Board (IRB)
- Regulatory officials from the institution where the project is being conducted who want to make sure the research is safe

________________________

Subject Initials

The results from this project may be shared at a meeting with the DNP students’ capstone committee, at a professional conference, and may also be in published articles. Your name will be kept private when information about this project is presented in any form.

Agreement to be in this study/project

I have read this paper about the project or it was read to me. I understand the possible risks and benefits of this study. I know that taking part in this project is voluntary. I choose to take part in this study/ and I will get a copy of this consent form.

Subject - Signature: _____________________________ Date: __________

Subject - Print Name: ___________________________
## Appendix I

### Project Codebook

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Type</th>
<th>Level of Measurement</th>
<th>Values</th>
<th>Labels/Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part_ID</td>
<td>String-text</td>
<td>String-text</td>
<td>Varied</td>
<td>First three letters of your mother’s maiden name and father’s birth year or participant’s year of high school graduation.</td>
</tr>
<tr>
<td>Gender</td>
<td>Numeric-Categorical</td>
<td>Nominal</td>
<td>0=Male; 1=Female; 2=Prefer not to answer</td>
<td>Gender</td>
</tr>
<tr>
<td>Age_Yrs</td>
<td>Numeric-Continuous</td>
<td>Nominal</td>
<td>1=18-24; 2=25-34; 3=25-44; 4=45-54; 5=&gt;55</td>
<td>Age in ranges.</td>
</tr>
<tr>
<td>Prev_Deg</td>
<td>Numeric-Categorical</td>
<td>Nominal</td>
<td>0=None; 1=Associate; 2= Bachelor; 3=Master; 4= PhD</td>
<td>Previous degree held, if any.</td>
</tr>
<tr>
<td>Prog_Type</td>
<td>Numeric-Categorical</td>
<td>Nominal</td>
<td>0=Traditional; 1=Accelerated; 2=Hybrid</td>
<td>Type of nursing program attended: traditional or accelerated or hybrid.</td>
</tr>
<tr>
<td>Q1 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>Explaining the material to my group improved my understanding of it.</td>
</tr>
<tr>
<td>Q2 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>The instructor's enthusiasm made me more interested in the activity.</td>
</tr>
<tr>
<td>Q3 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>Having the material explained to me by my group members improved my understanding of the material</td>
</tr>
<tr>
<td>Q4 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>Group discussion during the activity contributed to my understanding of the course material</td>
</tr>
<tr>
<td>Q5 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>The instructor put a good deal of effort into my learning for today's class.</td>
</tr>
<tr>
<td>Variable Pre</td>
<td>Variable Type</td>
<td>Level of Measurement</td>
<td>Values</td>
<td>Labels/Descriptions</td>
</tr>
<tr>
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<tr>
<td>Q6 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>I had fun during today's activity</td>
</tr>
<tr>
<td>Q7 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>Overall, the other members of my group made valuable contributions during the activity.</td>
</tr>
<tr>
<td>Q8 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>The instructor seemed prepared for the activity.</td>
</tr>
<tr>
<td>Q9 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>I would prefer to take a class that includes this group activity over one that does not include this group activity.</td>
</tr>
<tr>
<td>Q10 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>I am confident in my understanding of the material presented during today’s activity.</td>
</tr>
<tr>
<td>Q11 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>I made a valuable contribution to my group today.</td>
</tr>
<tr>
<td>Q12 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>The instructor was available to answer questions during the activity.</td>
</tr>
<tr>
<td>Q13 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>The activity increased my understanding of the course material.</td>
</tr>
<tr>
<td>Q14 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 =Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>I was focused during today's activity.</td>
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<tr>
<td>Q15 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
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<td></td>
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<td>The activity stimulated my interest in the course material</td>
<td></td>
</tr>
<tr>
<td>Q16 Pre</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>I worked hard during today's activity.</td>
<td></td>
</tr>
<tr>
<td>Q1 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td></td>
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<td>Explaining the material to my group improved my understanding of it</td>
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<td>Q2 Post</td>
<td>Numeric-Categorical</td>
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<td></td>
<td>The instructor's enthusiasm made me more interested in the activity.</td>
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<td>Q3 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
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<td></td>
<td>Having the material explained to me by my group members improved my understanding of the material</td>
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<tr>
<td>Q4 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
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<td>Group discussion during the activity contributed to my understanding of the course material</td>
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<td>Q5 Post</td>
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<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
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<td></td>
<td></td>
<td></td>
<td>The instructor put a good deal of effort into my learning for today's class.</td>
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</tr>
<tr>
<td>Q6 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>I had fun during today's activity</td>
<td></td>
</tr>
<tr>
<td>Q7 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
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<td></td>
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<td></td>
<td>Overall, the other members of my group made valuable contributions during the activity.</td>
<td></td>
</tr>
<tr>
<td>Q8 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>The instructor seemed prepared for the activity.</td>
</tr>
<tr>
<td>Q9 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>I would prefer to take a class that includes this group activity over one that does not include this group activity.</td>
</tr>
<tr>
<td>Q10 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>I am confident in my understanding of the material presented during today’s activity.</td>
</tr>
<tr>
<td>Q11 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>I made a valuable contribution to my group today.</td>
</tr>
<tr>
<td>Q12 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>The instructor was available to answer questions during the activity.</td>
</tr>
<tr>
<td>Q13 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>The activity increased my understanding of the course material.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Type</th>
<th>Level of Measurement</th>
<th>Values</th>
<th>Labels/Descriptions</th>
</tr>
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<tbody>
<tr>
<td>Q14 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>I was focused during today's activity.</td>
</tr>
<tr>
<td>Q15 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
<td>The activity stimulated my interest in the course material</td>
</tr>
<tr>
<td>Q16 Post</td>
<td>Numeric-Categorical</td>
<td>Ordinal</td>
<td>I worked hard during today's activity.</td>
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<td></td>
<td>1 = Strongly disagree; 2 = Disagree; 3 = Somewhat disagree; 4 = Somewhat agree; 5 = Agree; 6 = Strongly agree</td>
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</tbody>
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