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Millennial students' preferred learning style : evaluation of collaborative learning versus traditional lecture methods

Michelle Roa
Nova Southeastern University

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MILLENNIAL STUDENTS' PREFERRED LEARNING STYLE: EVALUATION OF
COLLABORATIVE LEARNING VERSUS TRADITIONAL LECTURE METHODS

Presented in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Philosophy in Nursing

Nova Southeastern University

Michelle L. Roa
2013

**NOVA SOUTHEASTERN UNIVERSITY
HEALTH PROFESSIONS DIVISION
COLLEGE OF NURSING
FORT LAUDERDALE, FL 33328**

This dissertation, written by Michelle Roa under direction of her Dissertation Committee, and approved by all of its members, has been presented and accepted in partial fulfillment of requirements for the degree of

DOCTOR OF PHILOSOPHY

DISSERTATION COMMITTEE

Lynne Bryant EdD, RN, CNE

7/24/13

Lynne Bryant EdD, RN, CNE

Date

Chairperson of Dissertation Committee

Patricia W. Dittman PhD RN, CDE 7/24/13

Patricia W. Dittman PhD, RN, CDE

Date

Dissertation Committee Member

Joy Dienger PhD, RN

8-9-2013

Joy Dienger PhD, RN

Date

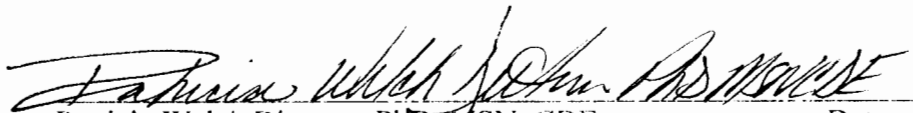
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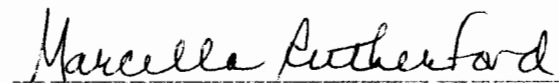
**NOVA SOUTHEASTERN UNIVERSITY
HEALTH PROFESSIONS DIVISION
COLLEGE OF NURSING
FORT LAUDERDALE, FL 33328**

Certification

We hereby certify that this dissertation, submitted by Michelle Roa, conforms to acceptable standards and is fully adequate in scope and quality to fulfill the dissertation requirement for the Doctor of Philosophy degree.

Approved:

 9/18/13
Patricia Welch Dittman, PhD, MSN, CDE Date
Ph.D. in Nursing Education Program Director,
College of Nursing

 9/18/13
Marcella Rutherford, PhD, MBA, MSN Date
Dean, College of Nursing

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Abstract

Background. Nurse educators are challenged with a new generation of students referred to as the Millennial generation. These millennial students, who have different learning style preferences, are testing the traditional pedagogical methods of nurse educators such as lecture. The social nature of millennial students coincides with the social constructivism theory that students learn in groups.

Purpose. The purpose of this quasi-experimental study was to examine if there was an improved retention of knowledge in millennial students who were taught by collaborative learning strategies rather than the traditional lecture method in an associate degree nursing program. Additionally, the study examined if learning by the students' preferred learning style resulted in a higher level of achievement on a comprehensive standardized examination versus learning by a nonpreferred style.

Theoretical Framework. The theoretical framework for this study was founded on the social constructivism theory suggesting students build knowledge through social group interactions.

Methods. The quasi-experimental study was conducted at an associate degree program in the Midwest. The nonprobability purposive sampling was utilized to examine the means of a comprehensive standardized examination and a learning styles preference assessment.

Results. The statistical analysis utilizing the analysis of covariance did not produce statistically significant findings in the differences in the comprehensive standardized examination score means between the students taught by the lecture method and students taught by the collaborative method when controlled for the cumulative grade point average. Additionally, the study did not find statistically significant differences in mean comprehensive standardized examination scores when taught by the students' preferred learning style versus being taught by their nonpreferred style.

Conclusions. Although not significant, the study did find students who were taught by the collaborative method had higher scores than those who were taught by the lecture method. In addition, learning styles preferences were not significant in determining academic success. The implications of the study are significant to nursing education by highlighting the importance of using collaborative activities and multiple teaching modalities.

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I would also like to dedicate my dissertation to my family including my wonderful husband Dennis, beautiful children Jacob and Jenna, encouraging mother Phyllis, loving grandparents Jack and Nancy, and especially my best friend Dawn. I would also like to acknowledge some special colleagues. Each person has lived through this journey providing endless encouragement. I am humbled by the tremendous support given by all to assist me in reaching my goal and dream. Thank you so much for all your time and patience.

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Chapter One

The Problem and Domain of Inquiry

The academic landscape of nursing education has changed dramatically in the past decade resulting in a transformation of how nurse educators teach. This transformation is a result of a new generation of students, with different learning styles, who are emerging in nursing classrooms across the country. The arrival of millennial students on the college campus occurred at the turn of the 21st century and these students will be enrolled in higher education through the year 2020 and beyond (Ricketts, 2009). Millennial students, also designated as Generation Y, were born between 1982 and 2002 making them the largest generational cohort in history (Howe & Strauss, 2000; Johnson & Romanello, 2005). This generation of students has challenged educators' traditional lecture method approach to teaching and learning. Due to alterations in the academic environment by millennial students, evidence for the most effective teaching practices accommodating millennial students has created a need for educators to examine teaching and learning methods in the classroom (Kantor, 2010).

Active Learning Strategies

Millennial students have prompted a remarkable change in the classroom perspective because their learning style preferences differ from the traditional teacher-centered approach to instruction (Walker et al., 2006). In contrast to previous generations of students, millennial students are said to prefer a student-centered approach to learning. The student-centered approach consists of interactive, engaging, learning activities

incorporating teamwork and group assignments versus individual work (McCurry & Martins, 2010; Skiba, 2005).

The student-centered or active learning method refers to techniques promoting student engagement in the learning process and not merely passively listening to the educator (Oermann, 2007). With active learning, students are interacting with course content and reflecting on the process of learning, which stimulates higher cognitive development (Oermann, 2007; Schell, 2006). The reflective process allows students to take an active role in achieving their desired educational goals by engaging them in their beliefs during the learning process (Oermann, 2007). Students who engage in the learning process develop a deeper and more complete understanding of course outcomes (Scheckel, 2009). As deeper understanding of course content occurs, critical thinking abilities will improve cognitive processes, thus enhancing long-term retention of knowledge (Vandeveer, 2009).

Collaborative Learning

A pedagogical shift away from conventional teaching, such as lecture, to an active learning approach of sharing stories and interpretations has gained attention by nurse educators (Dahlberg, Ekebergh, & Ironside, 2003). One active learning technique utilized inside and outside the classroom is referred to as collaborative learning. Collaborative learning is a method of assigning students in small groups, typically two to six members, to work on a given task (McKinney, 2011; Rowles & Russo, 2009; Thompson, 2009). In collaborative learning, social interaction is considered essential in order for learning to occur (Simina & Hamel, 2005). In a collaborative learning environment, students have the opportunity to interact with others by sharing experiences

and exploring different viewpoints creating a meaning-making process (Ray, 2004; Young & Maxwell, 2007). The meaning-making process occurs when students have the ability to utilize several senses. Students tend to retain more knowledge when they incorporate reading, hearing, seeing, and tactile senses (Hayden, 2009). In addition, students retain more knowledge when a variety of instructional approaches are utilized by educators to effectively engage students in the learning environment (McCurry & Martins, 2010; O'Sullivan & Copper, 2003). Therefore, nurse educators who incorporate different learning principles including a collaborative environment and senses are able to successfully engage millennial students in the learning process.

Learning Style Preferences

Historically, educators have debated the definition of learning styles due to the plethora of literature (Fleming, McKee, & Huntley-Moore, 2011; Paterson & Pratt, 2007; Riding & Cheema, 1991). In general, learning styles can be described as how an individual processes or learns information to master the goals and objectives of an educational program (Guild & Ganger, 1998; Rassool & Rawaf, 2007). For example, Rassool and Rawaf (2008) found age-mature students were able to adapt their teaching and learning experiences to meet the demands of the course requirements. Studies have shown that increased learning may occur when teaching styles match learning styles of students (Felder & Brent, 2005). The evidence suggests nurse educators need to discover the students' learning styles in efforts to make decisions on how to construct learning activities (Ard, 2009).

Justification for Selection

Even though some millennial students may prefer active learning, there are some who favor the traditional lecture approach. These students prefer the lecture method because of the structured classroom environment (Jeffries & Norton, 2005). The structured environment consists of the educator being responsible for organizing and presenting the content; creating student passivity (Thompson, 2009). Many educators also prefer the teacher-centered approach because of the economic ability of conveying the most pertinent information in a shorter length of time (DeYoung, 2009). As a result of the varying preferences between students and educators, the emergence of the collaborative approach to teaching and learning needs to be investigated. This study provides beneficial evidence regarding teaching practices that best meet the needs and preferences of the largest generational cohort in history on our college campuses, millennial students.

Prevalence in Nursing and Nursing Education

Nursing. A primary goal of nursing education is to prepare competent nursing professionals who are able to keep up with the increasing demands of the changing work environment with higher competency standards, technology, and interdisciplinary focus on care. Nurses are expected to work collaboratively with other healthcare team members to meet demands of consumer-driven health care (Johnson & Romanello, 2005; Thompson, 2009). Collaboration in the healthcare environment has become increasingly important in promoting positive patient outcomes (Benner, Sutphen, Leonard, & Day, 2010). However, graduate nurses are often inexperienced with working collaboratively in today's multi-generational workforce (Barcelona & Rockey, 2010; Notarianni, Curry-

Lourenco, Barham, & Palmer, 2009). The lack of experience is a result of decreasing clinical sites for nursing education therefore reducing student exposure to teamwork (Cherry & Jacob, 2011). Without the experience of teamwork, students are unprepared to meet the demands of a collaborative healthcare environment. As a result, patients and students may suffer.

Nursing education. Collaborative learning strategies utilized in nursing education such as group assignments provide students with opportunities to learn and practice collaboration which will prepare them for the workforce (Sandahl, 2009). Nurse educators have a responsibility to prepare students for the complex workforce by engaging them in the learning process. Engagement in the learning process allows students to assess their own learning while fostering critical thinking and problem solving abilities supporting academic achievement and competence (Davis & Davis, 2010; Ioannou & Artino, 2010; Oermann, 2007). L. H. Neuman et al. (2009) found an academic atmosphere utilizing group assignments was more relaxed and flexible, promoting a positive learning process. Even though the aforementioned study found positive results, Thompson (2009) found minimal research on the effect of group assignments. The research that has been conducted across various disciplines in higher education has been limited and yields inconsistent results. Therefore, educators need to challenge the day to day assumptions of teaching practices and conduct research to validate the success of engaging millennial students in the academic environment (Patterson, 2009).

Related Policy and Leadership Issues

Policy. The current practice environment is creating an unprecedented challenge for nurse educators to teach conflict management. Conflict management is critical to policy and politics. The nursing profession is focused on establishing effective working relationships and collaborative efforts to accomplish its health-oriented mission (American Nurses Association, 2010). An effective method to manage discord in the healthcare environment is through collaboration. The focus of collaboration is on problem solving while valuing diversity in thoughts and ideas to reach a mutual goal and an acceptable solution (Dixon, 2007). Additionally, collaboration means true partnership, valuing expertise, and respect. As a result of effective collaboration, conflict will be managed through open lines of communication producing creative solutions to manage a future likely to be plagued with limited resources and chaos (Grossman & Valiga, 2009; Whitehead, Weiss, & Tappen, 2010). Through collaborative relationships with members of the healthcare team and the public, influential decisions may be made on healthcare related issues at the political level (American Nurses Association, 2010).

Leadership. Nurse educators need to be leaders in preparing graduates to face the challenges in healthcare for an aging population, staffing shortages, increasing technology, and financial constraints (Benner et al., 2010). In efforts to prepare students, nurse educators need to assist them in facilitating teamwork bringing out the best in each group. Benefits of working in groups include the development of communication skills, learning how to promote their ideas in a group, learning how to work with others with different backgrounds, and realizing the importance of accountability (Baumberger-Henry, 2003). Students who participate in groups will begin to learn effective

collaboration and the communication skills of actively listening to other viewpoints to acquire new knowledge and problem-solving abilities (Nayan, Shafie, Mansor, Maesin, & Osman, 2010). The movement toward collaborative learning will foster the necessary skills students will need and utilize after graduation into the work environment as staff nurses (Ward-Smith, Peterson, & Schmer, 2010).

Current Research

Current research on collaborative learning connects to interdisciplinary education. In order to transform nursing education, interdisciplinary learning experiences need to be included early in the educational process. Interdisciplinary learning experiences incorporate collaborative learning principles by students working together with other healthcare disciplines, thus fostering interprofessional relationships (Stokes & Kost, 2009). In 2001, the Institute of Medicine (IOM) suggested a method to create a stronger healthcare system through collaboration with one another ensuring appropriate sharing of information and coordination of care. However, working in interdisciplinary teams is a difficult competency to accomplish when education continues to be separated by disciplines, socializing in isolation (Salmon, 2007).

Nursing education should include the concept of working in interdisciplinary teams within the curriculum. Every student needs both knowledge and experience with collaboration. However, many students do not get to experience teamwork during the educational process (Finkelman & Kenner, 2009). The IOM continues to posit that nursing education needs to partner with other disciplines to meet the needs of the diverse, aging population (IOM, 2010). Partnerships in education will assist in improving healthcare through quality and competent professionals (Garrett, 2012).

In recent years, the complex healthcare environment has placed good working relationships under scrutiny to improve the quality of care (Henderson, O'Keefe, & Alexander, 2010). Several studies have been conducted to provide evidence that inter-professional and collaborative education is beneficial (Casimiro, MacDonald, Thompson, & Stodel, 2009; Pollard & Miers, 2008; Soubhi et al., 2009). For example, Kanisin-Overton, McCalister, Kelly, and MacVicar (2009) conducted an educational study utilizing group learning with general practitioners and advanced practice nurses. The findings indicated students had a positive experience with respect shown for different roles and perspectives enabling participants to be open about gaps in knowledge and to ask questions indicating their learning needs were met.

Another interdisciplinary learning initiative with nursing students, medical students, and a chronically ill patient also resulted in positive working relationships between groups for the betterment of the patient (Snow, 2010). These studies provide evidence that group assignments are beneficial in promoting collaboration learning. Additionally, some literature suggests millennial students have a preference for collaborative learning strategies such as group assignments (Walker et al., 2006; Ward-Smith et al., 2010).

Despite millennial students' preference, the traditional lecture method continues to be the teaching method most utilized by nurse educators. Continued usage may be due to the paucity of nursing education research that has not extensively and systematically tested the teaching methods of collaborative learning and the traditional lecture method (McCurry & Martins, 2010). Although few nursing studies have been conducted, there are inconsistencies in the findings that do exist. Studies conducted by Walker et al.

(2006) and J. P. Johnson and Mighten (2005) found millennial students reported a preference for the lecture method compared to group assignments. In addition, the students reported they did not like group assignments unless the content was difficult. Contrary to the aforementioned studies, other studies have reported students' preference for innovative and interactive teaching methods (McCurry & Martins, 2010; Neuman et al., 2009). Due to the inconsistencies in the literature on preferred teaching and learning strategies for millennial students, further research is warranted.

Problem Statement

Nurse educators need to incorporate evidence-based teaching strategies in preparing future nurses with the ability to adapt to the rapidly changing healthcare environment. Existing studies do not provide clear evidence that collaborative learning teaching strategies improve learning outcomes in nursing students compared to the traditional lecture method. As a result, nurse educators choose not to implement collaborative learning techniques in their classrooms for a generation of students who prefer group learning methods (Nayan et al., 2010; Sandahl, 2009; Thompson, 2009; Tomey, 2003).

Purpose of the Study

The purpose of this study is to examine if there is an improved retention of knowledge in millennial students who are taught by collaborative learning strategies compared to millennial students taught by the traditional lecture method in an associate degree nursing program. In addition, the study will examine if learning by the students' preferred style will result in a higher level of achievement on a comprehensive standardized test than learning by a nonpreferred style.

Research Questions and Hypotheses

As a result of discrepancies in the literature, a nondirectional alternative hypothesis is stated (Creswell, 2009). Two research hypotheses will guide the purpose of this study to test the teaching methods on a comprehensive standardized examination (CSE) and learning style preferences.

Research Hypothesis One

There is a statistically significant difference in mean CSE scores between millennial students taught by the collaborative learning strategies and the millennial students taught by the lecture method in their senior year of an associate degree nursing program.

Research Hypothesis Two

There is a statistically significant difference in mean CSE scores between the millennial students taught by their preferred learning style and the millennial students taught by their nonpreferred learning style as indicated on the learning style preference assessment.

Significance of the Study

Millennial students have prompted nurse educators to explore, examine, and evaluate current teaching practices to accommodate a different style of learning. Nurse educators need to make decisions about teaching strategies based on research-generated evidence about what promotes the best student learning outcomes (Oermann, 2007). Evidence-based teaching is considered the conscientious, explicit, and judicious use of current best evidence in making decisions about the education of professional nurses (Patterson, 2009). Due to the paucity of evidence-based teaching practices, educators

struggle with designing effective instructional strategies. The impact and significance of this study will provide evidence for the most effective pedagogy necessary for teaching practice promoting positive learning outcomes for millennial students (Ironside & Valiga, 2007; Simonson, Fairbanks, Briesch, Myers, & Sugai, 2008). A better understanding of generational differences can assist faculty in utilizing various teaching strategies to enhance the learning needs of students (Johnson & Romanello, 2005). The proper selection of teaching strategies is a fundamental component of instructional design promoting engagement in the learning environment and positive learning outcomes (Johnson & Mighten, 2005).

Nursing Education

The nurse educator's responsibility is facilitating and engaging students in classroom instruction and in the learning process (Ortelli, 2006). A core competency of the nurse educator is creating an environment facilitating student learning through a variety of strategies while allowing the achievement of desired outcomes (Kalb, 2008; National League for Nursing [NLN], 2005). Nurse educators engaging students in classroom instruction will create a vehicle for academic achievement (Simonson et al., 2008). These learning activities should be designed to contribute to the achievement of the course outcomes (Jeffries & Norton, 2005).

Nurse educators who follow educational policy are guided to identify and implement scientifically validated or evidence-based teaching practices (Simonson et al., 2008). Evidence-based teaching is necessary to assist educators in utilizing the most effective teaching strategies for nursing students (Johnson & Mighten, 2005; Kim, Brown, Fields, & Stichler, 2009). Even though there is some research indicating

millennial students prefer active learning strategies, there has not been enough research to validate whether active learning strategies are more effective with these students (Patterson, 2009). Now is the time when nurse educators need to increase their pedagogical literacy and expand their teaching skills to respond to the challenges of contemporary teaching (Diekelmann, Ironside, & Harlow, 2003). The significance of evaluating the teaching methods and learning styles of the millennial students is imperative for most effective evidence-based teaching practice in nursing education (Ironside & Valiga, 2007).

Nursing Practice

As new millennial students graduate, there will be a continuation of the learning process in the work environment. Nurse educators have a responsibility to equip graduate nurses with skills and abilities to be successful in the nursing profession. Those skills and abilities reflect on the utilization of collaborative learning principles. This study is significant because it will provide evidence to nurse educators that successful collaboration is required for graduate nurses to respond to the diverse workforce by recognizing, assessing, and adapting the nature of working relationships with individuals, populations, and other healthcare professionals (American Nurses Association [ANA], 2010). The ability of a graduate nurse to work collaboratively in a diverse workforce is essential.

Today's nursing workforce contains members of multiple generations with varying values and beliefs which may present a challenge to establishing cohesive work environments (Notarianni et al., 2009). In 2012, the average age of nurses is projected to be 44.5 years old (Buerhaus, Staiger, & Auerbach, 2009). These results suggest a

millennial graduate may be mentored by a member of a different generation who has a very different learning style which may test the orientation process. Understanding how millennial students learn may aid in the orientation process for teamwork by providing education in their preferred style. This information will also be beneficial for staff nurse education departments in developing self-learning modules for continuing education and competencies (McPherson & Willis, 2010).

Over the last decade, increasing emphasis has been placed on collaboration in the healthcare settings (Barcelona & Rockey, 2010; Pollard & Miers, 2008). The newest focus is the concentration of collaborative learning towards a shared common goal such as patient outcomes. Nurses need to make every attempt to increase opportunities to collaborate within the profession and other disciplines. Nurse educators need to assist in this process by increasing interdisciplinary learning experiences for the betterment of patient outcomes (Finkelman & Kenner, 2009). By increasing interdisciplinary learning experiences, collaboration will improve communication between disciplines.

Collaboration allows professional members to bring specialized knowledge and skills to the interaction process where health care plans are determined. Interdisciplinary teamwork will improve quality of care, increase patient and nurse satisfaction, and decrease costs (Cherry & Jacob, 2011).

Nursing Research

Even though nursing education is involved in research, further exploration is essential to determine how education affects student performance (Finkelman & Kenner, 2009). Ongoing nursing research is necessary to promote awareness and understanding of millennial students' expectations which may reform nursing pedagogy accommodating

this generation of learners (Earle & Myrick, 2009). Diekelmann and Ironside (2002) posited that nurse educators must continue their efforts in developing the science of nursing education so the effectiveness and meaningfulness of pedagogical reform are well substantiated.

Public Policy

Nurse educators need to be aware of the latest legislative bills that are proposed, amended, and signed into law. Knowledge of the latest policy efforts may influence educators to promote life-long learning in students. For example, bill H.R. 6036 is the Lifelong Learning Accounts Act of 2008 is designed to provide an incentive to save for education by encouraging adults to put monies aside for continuing their education or pursuing advanced degrees (Ritt, 2008). Therefore, a nurse educator who promotes a collaborative learning environment through instructional academic advisement may influence a student's decisions to pursue an advanced degree (Pardue & Morgan, 2008). Obtaining an advanced degree may lead professional nurses into the nurse educator profession rather than into a corporate, research, or legal consulting roles (Finkelman & Kenner, 2009). The critical importance of increased collaboration may influence the shortage of nursing faculty and leaders that will advance care management for our aging population who need care (Aduddell & Dorman, 2010).

Philosophical Underpinnings

Contemporary constructivism in education originated by the Enlightenment philosopher Immanuel Kant (1724-1804) who believed all meaningful experiences were the result of interaction between the world and certain innate structures of the mind (Kant, 1929; Young & Paterson, 2007). Kant's revolution in epistemology perception is

an active process dependent upon interpretive categories of human meaning and understanding (Kant, 1929). The meaning and understanding result from the structure of the experience as concepts perceived by the individual (McErlean, 2000). Additionally, these concepts are not chosen by the individual but are considered universally held concepts that are given *a priori* to all human minds (Mariyani-Squire, 1999). Kant further elaborated the *a priori* knowledge precedes all reasoning (Simina & Hamel, 2005). These *a priori* experiences are beneficial to constructing new knowledge.

The constructivism epistemology acknowledges multiple, socially constructed truths, perspectives, and realities which assumes that meaning and values differ between individuals of differing interpretations (Hunter & Krantz, 2010). As a result, constructivism was influenced into the theoretical positions by holding two views that knowledge is cognitively and socially constructed (Simina & Hamel, 2005). The early formalization of constructivism, emerging from the field of education, was founded on the premise of the psychology of learning theory by Jean Piaget (Hunter & Krantz, 2010). In 1935, Piaget claimed intelligence is an on-going process of construction (Bertrand, 2003; Keating, 2006; Piaget, 1970, 1973). The construction of learning evolved into a process by which learning occurs through social and cultural transactions influencing the individual's mechanisms of learning (Bertrand, 2003). Piaget (1977) contends students will acquire new understandings and create mental frameworks based on previous knowledge, beliefs, and experiences through the process of assimilation and accommodation.

Assimilation occurs when students nourish themselves without radical transformation (Bertrand, 2003). Students build on previous internalized representations

of knowledge gained by personal interpretations, while striving to make sense of experiences (Keating, 2006). Ausubel, Novak, and Hanesian (1968) developed the term assimilation to describe meaningful learning which can be obtained by a process of receiving and incorporating new information into stored information.

Accommodation is the process used when students lose control of a situation and must change their cognitive structures to accommodate a new reality (Bertrand, 2003). This supports the view that knowledge constructs are amendable to change as new learning contributes knowledge to the existing foundation and connections (Keating, 2006). For example, educators can prepare students to assimilate and accommodate for subsequent learning through a concept mapping approach (Young & Paterson, 2007).

Theoretical Framework

As a result of Piaget's influence on constructivism, the emergence of the social constructivism theory surfaced. Lev Vygotsky, a Russian psychologist, influenced the social constructivism theory by suggesting learning depended on individual, social, and cultural interactions (Bertrand, 2003; Vygotsky, 1978). The social relations and environment in which the individual lives may significantly influence the construction of concepts (Mariyani-Squire, 1999). Vygotsky proposed the individual is inseparable from social interactions. These social interactions influence the cognitive development as frameworks through which individuals experience, communicate, and understand reality (Vygotsky, 1978).

Lev Vygotsky believed learning depends on the social and cultural interactions that take place in the students' zone of proximal development (Vygotsky, 1978; Young & Paterson, 2007). Vygotsky defined the zone of proximal development as "the distance

between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers” (Vygotsky, 1978, p. 86). The zone of proximal development is located in the classroom and fosters collaboration between the nurse educators and peers (DeCosta, Clifton, & Roen, 2010). Vygotsky believed educators should accept classrooms as communities of inquiry where knowledge is built through meaningful dialog and collaborative work (Kendrick, 2010; Vygotsky, 1978). In addition, Vygotsky observed that humans are social beings and social experiences define the individual in a collaborative process (DeCosta et al., 2010). Consequently, learning is fostered with the assistance of somebody else (Simina & Hamel, 2005).

The essential attributes of social constructivism theory are collaboration and interaction which develops the student’s psychological abilities to learn (Cole, John-Steiner, Scribner, & Souberman, 1978; Powell & Kalina, 2009). Vygotsky distinguished between intermental and intramental psychological abilities. Intermental refers to functions that one is able to perform in a social setting and intramental refers to functions that one is able to perform independently. He uses the idea that once competency has been achieved intermentally, the student can perform the skill independently or intramentally (Young & Paterson, 2007). The extended focus on individual learning incorporates environmental factors including one’s experience, cultural, inquiry, social, and collaboration. The role of peers in the learning process has a significant contribution to the application of the social constructivism theory (Bertrand, 2003). Therefore,

classroom activities under Vygotsky's theory should be organized for students to build new knowledge through collaborative learning experiences.

Theory Application

The constructivism conceptual framework integrates many instructional approaches which directly influence the underlying structure including collaborative learning experiences (Mann et al., 2009). The collaborative nature of social constructivism provides nurse educators the foundation to guide students into formulating new knowledge (Brandon & All, 2010). The new knowledge is a result of the collaborative learning environment which utilizes the talents of each learner to solve problems and synthesize information while learning from one another (DeYoung, 2009; Tomey, 2003).

Learning from peers through social interactions and experiences promotes teamwork, which is a characteristic of collaborative learning (Rowles & Russo, 2009). Because millennial students have a preference for working in teams and have difficulty with individualized thinking, collaborative teaching should be highly effective for student learning (Howe & Strauss, 2000; Johnson & Romanello, 2005; Powell & Kalina, 2009; Skiba, 2005). Educators who design meaningful assignments and build opportunities for students to collaborate will produce positive learning outcomes (DeCosta et al., 2010).

Successful collaborative teaching and learning requires a group of students to interact by participating in dialogue while listening to different ideas (DeCosta et al., 2010; Kendrick, 2010). This interactive process assists students to understand the causes of the problem while working towards an understanding or resolution of a problem (Dillard & Siktberg, 2009). The greater the degree of student interaction, the more

sharing will occur resulting in construction of new meanings, knowledge, skills, and problem solving abilities (Huang, 2002; Karagiorgi & Symeou, 2005).

Schematic

Vygotsky identified the goal of social constructivism as the cognitive development of complex skills referred to as higher psychological or cognitive function (Vygotsky, 1930). Higher cognitive functions are accomplished through mastery of subject matter concepts as part of a system of logical categories and learning to think with concepts (Vygotsky, 1928). Additionally, through collaborative, social experiences the learner will become actively engaged to develop new knowledge and problem solving abilities (DeCosta et al., 2010). Collaborative learning experiences may prove to be invaluable to higher cognitive levels because of peer assistance offering different perspectives and experiences enhancing critical reasoning skills (Cockrell, Caplow, & Donaldson, 2000).

Social constructivism theory may be depicted with the student as the focal point. The cyclical process describes the influences on the student in constructing new knowledge where learning occurs. The student's experiences, cultural, and inquiry interactions will influence learning. However, the focal points of this study are on the social and collaboration influences in the construction of new knowledge and learning. The arrow towards the new knowledge suggests new knowledge is obtained based on cyclic interactions. The new knowledge synthesized will produce long-term learning. The preliminary framework depicted by the principle investigator is based on the theoretical framework and study hypothesis (Figure 1).

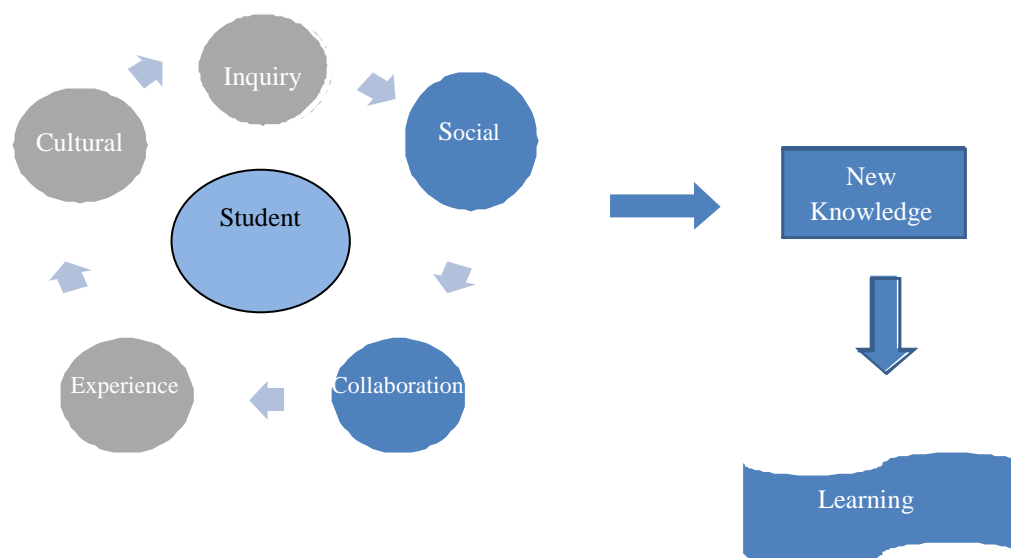


Figure 1. Schema of the theoretical framework of social constructivism.

Theoretical Assumptions

The social constructivist epistemology assumes learners construct their own knowledge through collaborative interactions with their social and physical environment (Simini & Hamel, 2005; Vygotsky, 1978). The social constructivism theory functions under three assumptions including learning, reality, and knowledge.

Learning

Based on the assumption that learning can be considered a process of information gathering and processing, learners connect new with prior information by combining declarative with procedural knowledge (Simina & Hamel, 2005). Students know the world through their existing mental framework and new information is transformed and interpreted based on previous learning. Assimilation and accommodation processes lead to new constructions. Learning is an organic process of invention, and meaning and values can differ for different individuals (Hunter, & Krantz, 2010). Meaningful learning may occur through reflection and by linking new knowledge to an existing framework of

knowledge (Brandon & All, 2010). Assuming learners are in the active process of exploration of old and new ideas, reflection, and collaborative dialogue may assist in creating new meanings (Hunter & Krantz, 2010; Scheckel, 2009). The premise of collaborative learning is based on the ability to learn from peers in an interactive group process consisting of consensus building through cooperation by group members (Bertrand, 2003; Lindauer & Petrie, 1997). The social interaction among group members influences the cognitive learning process (Dillenbourg, Baker, Blaye, & O'Malley, 1996).

Reality

The assumption about reality comes from the cultural and societal background that influences the type of life experiences of individuals (Lee & Greene, 1999). Cultural development occurs from experiences that will assist in mastering methods of psychological development (Vygotsky, 1929). The concept of what is viable or unviable knowledge is constrained by the knowledge within the culture and values that exist for any given society (Peters, 2000). The dialogue from each student's experiences offers a different perspective to consider (Powell & Kalina, 2009). The differing perspectives allow students the ability to recognize the nature of reality that is ever changing (Cottone, 2007). In efforts to bring together concepts with different experiences, an educator may utilize techniques such as group work developing concept maps or thematic organization to connect new material with prior understanding in efforts to build conceptual frameworks (Brandon & All, 2010; Young & Paterson, 2007). Students will come to the learning situations with knowledge acquired from previous experiences which will modify knowledge by challenging their comprehension as a result of the new learning experience (Cobern, 1993; Peters, 2000).

Knowledge

Collaborative learning, the core belief underpinning this pedagogy, acknowledges that the process of individual learning occurs through preferred learning styles, active engagement, and motivation in one's learning environment (Jillings, 2007). Peer interaction is a critical element in learning, assuming there are not any interpersonal conflicts within the group (Yazici, 2005). According to H. Lee (2010), achievement motivation is the experience of making personal contributions at work and advantages gained by comparing with others to achieve targets or completion of tasks. Motivation is an internal state arousing learners to stay engaged and often determines to what extent a student wants to learn (Lei, 2010; Tai, 2006). Typically, nursing students are motivated to learn (Kuncel, Hezlett, & Ones, 2004; Lei, 2010). Chang and Chiou (2005) found high levels of achievement motivation influence a person's ability to maintain psychological contracts or commitments. Based on higher levels of motivation, students are able to achieve goals and build self-esteem managing their own learning while assisting others (Anderson, Griego, & Stevens, 2010). A study by Chiou (2008) found students preferred the social learning style that interacted with course content because it promotes academic achievement. However, there may be many personal and situational factors influencing outcomes whether or not the student is motivated (Kuncel et al., 2004). These personal and situational factors may be influenced by the students' learning style. For example, millennial students will be more motivated to learn if their preferred interactive method of learning is utilized (McCurry & Martins, 2010).

There is documented evidence that millennial students have a desire to work in groups because they grew up playing on teams (Johnson & Romanello, 2005). The

students need to have ability to interact with others for collaborative learning to occur. However, collaborative learning requires cooperation among individuals (Cockrell et al., 2000). Cooperation implies each student has to assume responsibility for participating in the group equally (Rowles & Russo, 2009). Students who do not prefer group learning may experience distress when asked to be an active learner rather than a passive one (Young & Maxwell, 2007).

Definitions of Terms

Social constructivism offers an alternative approach to traditional pedagogy in nursing education (Peters, 2000). This theory has evolved over time to a learner-centered educational paradigm in which content is created by learners in a social, collaborative learning environment (Keating, 2006). A central construct of learner-centered education is that teachers and students are both learners, working together to explore cultural differences and develop students' learning abilities in a collaborative environment (Candela, Dalley, & Benzel-Lindley, 2006; Legg, Adelman, Mueller, & Levitt, 2009). With the diverse millennial students entering the educational environment, the impetus to provide a collaborative learning environment that supports their preferred learning styles is significant (Legg et al., 2009; Yazici, 2005; Zane, 2009).

Collaboration

Collaborative teaching practices consist of teamwork incorporating small groups of two to six students working together to learn (Sandahl, 2009; Vygotsky, 1978). Small groups provide the social environment for dialogue to occur in understanding the cause of the problem, evaluating the situation, and determining a solution collaboratively (DeCosta et al., 2010). This strategy may be utilized in the classroom where the educator

assists learners to construct new knowledge based on existing knowledge. By providing collaborative experiences, the student is able to actively search for new knowledge, find resources to build upon the new knowledge, and solve problems (Huang, 2002). This process known as scaffolding is located in the zone of proximal development allowing students to get to the next level of understanding with the assistance of peers and educators (Powell & Kalina, 2009; Vygotsky, 1962). Because the nature of collaborative learning relies on social interactions and experiences with others, educators must provide opportunities for group interaction (DeCosta et al., 2010). The advantage of collaborative learning is the promotion of teamwork, reflection, and, ultimately, learning.

In an attempt to measure higher cognitive functioning of long-term retention of knowledge and effectiveness of collaborative learning for this study, a comprehensive standardized test was administered. The comprehensive test provided an assessment of the student's basic comprehension and mastery of basic nursing principles learned throughout the nursing program.

Learning Style

Learning is influenced by the student's preferred learning style. Learning style refers to a broader concept including the learners' cognitive functioning and indicates general preferences for methods (Arthurs, 2007). In addition, the learner's pattern of behavior in approaching a learning experience and environment is significant to the learning style preference (Yazici, 2005). Although Kolb (1984) described many of the learning styles, each student develops a learning style based on biological, sociological, and cultural influences (Ard, 2009). The most common learning styles include visual, auditory, and tactile. However, Kolb suggests individual learners have particular

strengths which may form the basis of their preferred learning style (Kolb, 1984; Sadler-Smith, 2001). Students who are aware of their learning style and how learning occurs will be equipped to modify and increase their accountability towards the learning process (Peters, 2000). For this study, a self-assessment learning style inventory was utilized to identify the student's preferred learning style and its influence on the CSE.

Operational Definition of Terms

The definition of terms ensures clarity in the interpretation of the study's related concepts.

Academic Achievement

The term academic achievement refers to the student attempting to achieve the highest grade possible (Young & Paterson, 2007). Grades provide students information about their level of achievement such as how well they understand the course content (Scanlan & Care, 2004). Standardized test scores and grade point averages often serve as measures of students' overall cognitive abilities (Wellman, 2009). In this study, students' cumulative grade point average (GPA) and CSE scores will be utilized as a measurement of academic achievement. In addition, the cumulative GPA will be utilized as the confounding variable and the CSE examination scores will serve as the dependent variable.

Collaborative Learning

Collaborative learning is considered an active learning strategy. This teaching method incorporates assigning students into small groups of two to six members to work on a task such as a classroom activity (McKinney, 2011; Rowles & Russo, 2009). The students work together by sharing and exploring different viewpoints to formulate new

ideas (Young & Maxwell, 2007). Collaborative learning promotes active engagement and reflective learning (Alfonseca, Carro, Martin, Ortigosa, & Paredes, 2006; Rowles & Russo, 2009). The significance of collaborative learning strategies for this study is the belief that these strategies may increase academic achievement and long term retention of knowledge. The revised curriculum emphasizes the utilization of collaborative learning activities in all classes. The group of students in the new curriculum served as the comparison group and independent variable.

Learning Styles

Learning styles refer to the unique way in which an individual perceives, interacts, and learns information to master the goals and outcomes of an educational program (Guild & Ganger, 1998; Wellman, 2009). Nurse educators need to understand students' learning styles in efforts to match teaching methods to preferred learning styles which may produce positive learning outcomes. For this study, students' learning style was evaluated by a self-assessment inventory which is the independent variable in the study.

Long-Term Retention of Knowledge

Knowledge is broadly interpreted as extending beyond information, facts, and knowing to synthesizing and applying information (Young & Paterson, 2007). Application of information as opposed to memorization of facts will enable students to retain knowledge. To identify retention of knowledge in this study, concepts from previous courses were incorporated into the CSE.

Millennial Students

Generation Y, often referred to as Millennials, designates those born between 1982 and 2002 (Howe & Strauss, 2000). In the fall of 2000, these students entered college as the largest generational cohort. These students are considered more numerous, affluent, educated, and diverse with a focus on teamwork and following the rules (Howe & Strauss, 2007).

Pedagogy

Pedagogy is the art and science of teaching utilizing instructional methods and strategies (Young & Paterson, 2007). The different pedagogical methods utilized by nurse educators in this study were collaborative learning and lecture methods.

Student-Centered Learning

Student-centered learning is the teaching and learning process that actively engages students in the development of knowledge (Young & Paterson, 2007). Students are expected to participate in class activities, reflect on their thinking, and explore ideas with peers fostering critical thinking (Oermann, 2007). Exploring ideas with peers is an attribute of social constructivism and collaborative learning.

Teacher-Centered Instruction

Teacher-centered instruction is commonly known as didactic teaching where the educator is center stage in front of the class (Policastro, 2008). Educators often utilize traditional lecture, verbal presentation, as a form of conveying large amounts of information; creating passivity in the student. Passive learning requires little cognitive effort and no consistent use of higher cognitive skills from students (Scheckel, 2009). The cognitive skill of memorization and recall of information is characteristic of this type

of instruction. In this study, students who experienced primarily the lecture method were utilized as the control group and independent variable.

Traditional Student

The traditional student is 18-24 years old and maintains full-time enrollment status (Pompper, 2006).

Chapter Summary

Millennial students have posed a challenge for nurse educators. Results of previous research indicate millennial students prefer teaching modalities that are active and collaborative in nature. Furthermore, their style of learning opposes the traditional and most commonly utilized teacher-centered approach consisting of a lecture with a PowerPoint presentation. Although millennial students may welcome structure in the classroom environment, some may be opposed to the lecture method as they may not feel comfortable learning through traditional passive methods (Giddens, 2007; McCurry & Martins, 2010). The social constructivism theoretical approach to learning coincides with the millennial students' approach to learning. The premise of constructing knowledge in a social environment is significant to successful student learning outcomes.

Theory-driven nursing education research that has systematically tested the generational differences in preferred learning styles and their impact on achievement is lacking. Due to the lack of sufficient evidence, nurse educators are reluctant to alter their teaching practices (McCurry & Martins, 2010). Although a few studies have been conducted, there are inconsistent findings. The results of this study will be significant to nursing programs by providing more evidence that nurse educators can use to effectively design courses and teach millennial students (Simonson et al., 2008). Through evidence-

based teaching practices, positive student outcomes should include an increase in academic achievement and the ability to work collaboratively upon graduation as a new nurse.

Chapter Two

Literature Review

Nurse educators are often overwhelmed with educating millennial students who have different learning styles from those of previous generations of students. Educators often employ a variety of pedagogical approaches to encompass the diverse ways students learn in efforts to promote student engagement and academic achievement (Cleary & Walter, 2010). In efforts to promote student engagement, Hung (2002) suggests students have to be socially active to construct knowledge in the educational environment. Social constructivism theory, which was the foundation for this study, is applicable to nursing education and millennial students. The social nature of collaborative learning occurs when students have the opportunity to utilize other students' interdependent thoughts, dialogue, deliberation, and differing perspectives to reach socially constructed knowledge (Ioannou & Artino, 2010; Kabes, Lamb, & Engstrom, 2010; Liu & Chen, 2010; Luce, 2001; Sandahl, 2009). However, there remains a lack of nursing research utilizing this theoretical framework (Legg et al., 2009).

The literature review for this study examined millennial students' preferred learning style with respect to collaborative and lecture teaching methods. Additionally, the literature review examined the influence of nurse educators' teaching methods and millennial students' learning styles on academic achievement. To support the research questions, a systematic literature search was conducted in the electronic general and multidisciplinary database ProQuest Central for studies from books, scholarly journal

articles, and dissertations. The following search terms were utilized in the title, abstract, or keywords: academic achievement, collaborative learning, learning style preferences, lecture, millennial students, and nursing education. Few studies were found to contain the essential search terms of nursing education, millennials, collaborative learning, lecture, and academic achievement respectively, although a vast amount of studies were found in other disciplines for learning styles and collaborative learning.

Millennial Students

Millennials are children born of Baby Boomers (1945-1960) who had children in their later years or Generation X couples (1961-1981) who had children early (Earle & Myrick, 2009; Howe & Strauss, 2007). The millennial generation has been defined by life events including the Columbine shooting tragedy, globalization, rapid digital technological advancement, and increasing demographic diversity (Considine, Horton, & Moorman, 2009; Howe & Strauss, 2000; Ng, Schweitzer, & Lyons, 2010; Rickes, 2009). These parents nurtured their children as being special; exposed them to different, diverse environments; and provided them with the latest technology to reach their full achievement potential (Ng et al., 2010; Venne & Coleman, 2010). Experiences with team sports and active lifestyles resulted in millennials developing strong teamwork and multitasking skills early in life (Howe & Strauss, 2000; Notarianni et al., 2009; Pardue & Morgan, 2008; Roberts, Newman, & Schwartzstein, 2012; Skiba, 2005).

As the largest generation, representing 100 million people, millennials are expected to pack college classrooms for the next decade (Howe & Strauss, 2007; Rickes, 2009; Walker et al., 2006). To understand the millennial college student, the significance of identifying their common characteristics is essential to the literature review. The

common characteristics of millennial students include being digital natives (Considine et al., 2009; Howe & Strauss, 2000; Notarianni et al., 2009; Oblinger, 2003; Skiba, 2005), better educated and high achieving (Howe & Strauss, 2000; Oblinger, 2003; Opatz & Prestwich, 2007), and team oriented and collaborative (Howe & Strauss, 2000; Oblinger, 2003; Rickes, 2009; Weston, 2006). These characteristics have shaped millennial students' learning styles and expectations within the academia environment, creating challenges for educators.

Digital Natives

The millennials were raised during the rapid advancement of technology creating technology competence (Howe & Strauss, 2007; Pardue & Morgan, 2008). These children grew up with computers and cellular phones as a way of life with unlimited information and immediate feedback at their fingertips (Johnson & Romanello, 2005; Pardue & Morgan, 2008). As a result, millennial nursing students would prefer to get a nursing journal article off the Web rather than a textbook from the library (Johnson & Romanello, 2005). Being digital natives, millennials often become frustrated when educators struggle with technology in the classroom creating delays (Johnson & Romanello, 2005; Oblinger, 2003). In response to keeping in touch with millennials' need for technology, Bonaduce and Quigley (2011) suggest when a student has a question in class the educator may respond by having the student look up the answer to questions on their personal data assistant (PDA). Allowing the students to look up the answer is a feasible request because Lynch-Sauer et al. (2011) found 40% of the students owned a PDA. This percentage is most likely higher due to the current advancement of cellular "smart" phone technology with Internet capability (Papp & Matulich, 2011).

Better Educated and High Achieving

Millennial students are very eager to learn anything and everything (Levett, 2010). These students have high expectations and expect immediate feedback from educators to assist them in reaching their educational goals (Earle & Myrick, 2009; Hannay & Fretwell, 2011; Johnson & Romanello, 2005; Notarianni et al., 2009). Moreover, millennials spend more time doing homework than any other generation (Oblinger, 2003). Their efforts on time spent on studying were validated. In 1968, 18% of students earned the grade of an A compared to 46% in 2002 (Opatz & Prestwich, 2007). Howe and Strauss (2000) found the millennials had the highest Scholastic Aptitude Test (SAT) scores since 1974.

Academic readiness. Although millennials seem to be better educated, there is a lack of academic readiness for college with different expectations than high school (Considine et al., 2009; Opatz & Prestwich, 2007; Pardue & Morgan, 2008). In 2012, Noel-Levitz, Inc. (2012) found nearly one half of 94,202 first-year college students described a deficient or inadequate knowledge in basic science and math concepts. Further, 87.3% of students would accept tutoring to achieve their academic goals, particularly in math and reading (Noel-Levitz, Inc., 2012). These results may be due to millennials reading less and having difficulty critically analyzing the vast amount of information obtained from the Internet (Howe & Strauss, 2000; Johnson & Romanello, 2005; Notarianni et al., 2009).

Not only are millennial students reading less, they are studying less. Pardue and Morgan (2008) indicated students had weak study habits. These study habits have not improved over time. In 2012, Noel-Levitz, Inc. conducted a study finding 32.3% of

freshman students indicate irregular and unproductive study habits. Additionally, 27.4% freshman students get bored and quit studying (Noel-Levitz, Inc., 2012). The lack of studying may be contributed to playing video games. Lynch-Sauer et al. (2011) found 57% of undergraduate and graduate students indicated playing video games enabled them to avoid studying.

The lack of preparedness has created additional stress on the millennial college student who is struggling to maintain an A average which had not previously been a problem (Opatz & Prestwich, 2007). Recall, retention, understanding, and analysis all fail when a student is faced with multiple competing streams of information and stimulation (Roberts et al., 2012). Keeping focused on a task or lecture is challenging for millennial students due to their high-level abilities of multitasking such as texting during class time and their short attention span (Howe & Strauss, 2000; Moore, Fowler, & Watson, 2007; Venne & Coleman, 2010). Millennial students did not struggle during high school because they had helicopter parents. These helicopter parents hovered over many aspects of their children's lives rendering them ill-equipped to handle the pressures of college (Papp & Matulich, 2011). Pardue and Morgan (2008) found nursing students struggling to complete assignments on time because in high school the helicopter parents kept the students focused and assumed the major responsibility for time management.

Entitlement. The helicopter parents created a sense of entitlement in the millennial student because they have always been present to guide and praise their children's efforts, inflating their self-esteem (Howe & Strauss, 2000; Lippmann, Bulanda, & Wagenaar, 2009; Opatz & Prestwich, 2007). The inflated self-esteem has changed the culture in education with a prominent increase in grade inflation (Lippmann et al., 2009;

Scanlan & Care, 2004). A study conducted by Greenberger, Lessard, Chen, and Farruggia (2008) found students had a sense of entitlement to good grades which was not necessarily related to their academic abilities. As a result, these students are very concerned with grades and usually want to know exactly what they need to make the highest grade (Johnson & Romanello, 2005).

Students believe that most classes should require little effort, regardless of assessment results, to receive high grades (Opatz & Prestwich, 2007). Hill (2002) found disconnects between what millennials expect to achieve and what they are capable of achieving. A survey by Walker et al. (2006) found that the grade students receive is all that really matters to them. If the grade is less than desirable, millennial students will question the educator (Greenberger et al., 2008; Hannay & Fretwell, 2011; Johnson & Romanello, 2005; Walker et al., 2006). For example, a student e-mailed a professor about a grade of 87% when the student believed a grade of an A was deserved (Lippmann et al., 2009).

The grade-driven millennial student often feels pressure to perform well in the rigorous collegiate setting (Howe & Strauss, 2000; Shih & Allen, 2007). Nurse educators need to employ strategies that will assist in millennials' success in the collegiate environment with respect to their learning style. Walker et al. (2006) found 56% of nursing students desire structure and guidance in the classroom setting which will assist with millennials' success. Along with structure, S. A. Johnson and Romanello (2005) suggest group activities will assist those millennial students who have difficulty with individualized thinking making them more successful in a collaborative environment.

Teamwork and Collaboration

Millennials are known to be team oriented in nature because they have been raised doing things in teams (Howe & Strauss, 2000; Johnson & Romanello, 2005). Inherently, millennials are more social and gravitate toward engaging activities that promote group discussions such as group projects, collaborative work, simulations, and experiential activities (Johnson & Romanello, 2005; Levett, 2010; Oblinger, 2003; Pardue & Morgan, 2008; Shaw & Fairhurst, 2008; Shih & Allen, 2007; Skiba, 2005).

Collaborative group projects and presentations need to be relevant and exciting which can assist in addressing the millennial students' preferred learning style (Shaw & Fairhurst, 2008; Shih & Allen, 2007). For example, Bonaduce (2009) had millennial students act out a skit in front of a classroom of peers, answer questions, and critique the skit. Millennial students like collaborating closely together, hoping to form friendships while learning from each other (Ng et al., 2010). Case studies are another method to employ in a collaborative environment. Millennial students indicated a stronger preference for case study activities when the content is difficult to understand (Walker et al., 2006).

Millennials also enjoy learning difficult content through social networking and computer-based animations (Roberts et al., 2012). Millennials like to be entertained while they learn and would prefer a hands-on approach to learning rather than listening (Johnson & Romanello, 2005; Shih & Allen, 2007). This type of experiential learning by trial and error is often correlated with simulation or virtual practice (Notarianni et al., 2009). Simulation experiences capture the best approach to learning by using a highly advanced technological device that provides relevant hands-on experiences while

students work together in a collaborative environment sharing insights and problem solving (Reese & Dunn, 2007).

Traditional Lecture Method

Historically, the traditional teacher-centered approach to instruction, such as the lecture method, was considered the most preferred, efficient, and essential means of teaching (Armstrong & Hyslop-Margison, 2006; DeYoung, 2009; Johnson & Mighten, 2005; Oblinger, 2003). Lecture implies the educator is primarily responsible for the content and presentation of material to the student (Berry, 2008). The one-size-fits-all lecture method is one of the oldest and continues to be the most preferred instructional tactic of the educator (Oblinger, 2003). Brown, Kirkpatrick, Greer, Matthias, and Swanson (2009) found 78% of nurse educators surveyed continued to use the lecture method. The reason for the longevity of the lecture method of instruction is primarily related to the generational differences in teaching and learning style preferences. The majority of nursing educators who are teaching are from the Baby Boomer generation (Skiba, 2005).

Baby Boomer Educators

Generally, there is a wide age gap between nursing faculty and their nursing students (Mangold, 2007). The nurse educators of today are predominately from the Baby Boomer generation born 1943 through 1960 (Earle & Myrick, 2009; Howe & Strauss, 2000; Johnson & Romanello, 2005; Skiba, 2005). Boomers are born of a nuclear family and raised during the Civil Rights Act, Kennedy assassination, and Vietnam War which shaped their values, beliefs, and attitudes (Howe & Strauss, 2000). These boomers are optimistic and have a strong work ethic with a desire to change the status quo (Earle

& Myrick, 2009; Howe & Strauss, 2000; Weston, 2006). They have limited technology experience with e-mail, news, and product research but also find technology challenging (Mangold, 2007; Russell et al., 2008).

Baby boomers were educated in a time when learners were dependent on educators providing the necessary information (Mangold, 2007). These baby boomers learned best through lecture which is how boomer educators tend to teach—predominately lecture (Bonaduce, 2009; Eschelman, 2008; Johnson & Romanello, 2005; Popkess & McDaniel, 2011). The average age of educators is around 50 years of age which is in sharp contrast to the millennial students who are arriving on college campuses across the country with different learning styles and teaching preference (Ricketts, 2009). These educators may feel uncomfortable with nontraditional presentation styles such as web-based technology that is preferred by the millennial students (Eschelman, 2008; Howe & Strauss, 2000). Shell (2001) found nurse educators scored students' attitudes, beliefs, and abilities as the greatest barrier to implementing active teaching methods. These items included the lack of student motivation and resistance to active learning, expectation of lecture format, and students' concern for getting a good grade as opposed to learning. Attitudes of nurse educators did not change over time because Schell (2006) found similar results with the highest score on lack of knowledge on innovative teaching methods. These beliefs are congruent with other disciplines as well. In 2010, Nayan et al. found 30% of engineering educators were reluctant to utilize collaborative activities for fear of losing control in the classroom and the lack of time to implement strategies.

The literature review found a few studies on academic achievement and the traditional lecture method that were appropriate for this study. Fewer studies were found

including millennial and nursing students (Mangold, 2007). However, advantages and disadvantages of the traditional lecture method are identified.

Advantages of the Traditional Lecture Method

Teaching for the acquisition of knowledge requires some form of lecture (Shell, 2001). A good lecture can be inspiring and have a positive, transformative impact on student outcomes (Feldon, 2010). Nurse educators often feel personal responsibility to cover all content to ensure students will learn everything they need to practice (Giddens & Brady, 2007). Nursing faculty readily add new content to the curriculum without deleting any nonessential content (Candela et al., 2006). Due to content saturation, time constraints, and diversity of students, traditional lectures allow for an efficient method of conveying facts and ideas for covering a large amount of complex information, especially if a standardized lecture has been created (Benner et al., 2010; Berry, 2008; Johnson & Mighten, 2005). The formal lecture style presentation consists of the educator deciding the content and how it will be delivered (Oermann, 2007).

A good lecture begins with establishing the relevance of the material through explicit connections (Di Leonardi, 2007; Eschelman, 2008; Feldon, 2010). Millennials may challenge nurse educators because they prefer to find relevance in what they are learning (Howe & Strauss, 2000). Roberts et al. (2012) found millennial students preferred to understand why they are learning the information.

Lecture presented in a clear and straightforward manner is essential (Feldon, 2010). Typically, nurse educators may disseminate didactic information by combining lecture with PowerPoint presentations. Susskind (2005) found PowerPoint presentations were viewed positively by students because the slides emphasized key points for those

who have difficulty processing information and made class more interesting. However, there was not a statistically significant difference in mean test scores between students who had lecture only and students who had lectures with PowerPoint slides (Susskind, 2005). Millennial learners have high standards and expectations on how content is delivered requiring the educator to update PowerPoint slides with graphic images to enhance the presentation rather than using slides with just text (Roberts et al., 2012).

A skillfully prepared lecture can be just as effective in facilitating student learning when coupled with interactive teaching techniques (Di Leonardi, 2007; Oermann, 2007). The use of lecture along with PowerPoint slides can also create an active learning approach. For example, PowerPoint slides left blank can be presented during the lectures for student to complete (Moore et al., 2007). Ruhl, Hughes, and Schloss (1987) found pausing for two minutes during a lecture to allow students to write notes will increase their learning. Broussard (2012) found PowerPoint lectures can also be enhanced by incorporating computer technology such as audience response systems, commonly known as *clickers*, to increase student engagement and improve learning and understanding of the material. The clicker technology allows the import of questions into the PowerPoint presentation for students to answer by using a hand-held device to select one of the four answers. The computer will tabulate the results and display them on the screen prompting class discussion (Broussard, 2012). A study conducted by Revell and McCurry (2010) confirmed students' preference of incorporating clicker technology into lecture stating "the technology connected the course material to critical thinking and evaluates my level of knowledge" (p. 274).

Some educators describe the lecture method as the expert teacher providing information to students, creating a learning process of passive absorption as opposed to active student inquiry (Benner et al., 2010; Miller, 2003; Pardue & Morgan, 2008). Although passivity is a concern, many students prefer this teaching strategy because they may have difficulty processing large volumes of information (Arthurs, 2007). For example, Lai, Kwan, Kadir, Abdullah, and Yap (2010) found finance and business students strongly preferred the face-to-face lecture format over other pedagogical methods when learning difficult content. Covill (2011) also found students who preferred the lecture method believed they worked hard to get a good grade and retention of the material will be long lasting. In nursing, Walker et al. (2006) found the majority of students surveyed had a strong preference for the lecture method.

Studies conducted on the lecture method with the outcome of examination scores have been inconsistent. Miller (2003) did not find statistical significance between the lecture method teaching strategy and problem-based learning activities in nursing students' pharmacology examination scores. However, an inference can be made the lecture method is more effective because the mean final examination scores were higher in the lecture method compared to mean final examination scores for classes taught using the problem-based learning method (Miller, 2003). Horton, Wiederman, and Saint (2012) found similar results with students who attend lecture performed statistically significantly higher on assessment scores. These researchers found significance, but the correlation was consistently weak (Horton et al., 2012).

Disadvantages of Traditional Lecture Method

In recent years, the lecture method has been deemed ineffective as a result of the broad array of other interactive teaching strategies, such as technology, available for utilization in the classroom (Dede, 2005; Johnson & Mighten, 2005; Oblinger, 2003). Despite the other strategies and due to the shortage of qualified nurse educators, lecture continues to be prevalent. Clinicians at the bedside are transitioning into a part-time nurse educator role with minimal to no teaching experience (Cherry & Jacob, 2011; MacIntyre, Murray, Teel, & Karshmer, 2009). Boyd and Lawley (2009) interviewed new educators and found they had considerable stress when developing course content because they were “in the dark” with teaching content and strategies that were effective. The reliance on lecture led to students questioning the credibility of these educators and the relevance of the content being taught (Boyd & Lawley, 2009).

Content saturation begins to occur because nurse educators struggle with what constitutes essential relevant information necessary to meet the needs of students (Feldon, 2010; Giddens & Brady, 2007). Howe and Strauss (2007) describe millennials as wanting to know “what is in it for me” when preparing relevant, meaningful information. Because millennials are not able to decipher the information to determine relevance, they regard lectures as a means to deliver pertinent information. As a result, Walker et al. (2006) found 87% of students indicated they frequently or always trust the faculty will tell them what they need to know. These attitudes of students have not wavered. Covill (2011) found students tend to become dependent on educators telling them what they need to know to practice or to pass the test.

Students' dependency on educators providing relevant information has promoted the lack of student participation and engagement during lecture which contributes to passivity of learning. Educators need to re-examine the lecture pedagogical practice to capture attention of students in the classroom, especially the millennials who are distracted easily. Papp and Matulich (2011) found students did not like lecture because they were bored. When students become bored, learning is stifled. Ebert-May, Brewer, and Allred (1997) found science students exposed to lecture classes had decreased attendance and a low desire to participate in discussions. O'Sullivan and Copper (2003) found students were also falling asleep during a 50-minute lecture thus demonstrating a lack of engagement. Susskind (2005) also found lecture style classes with or without PowerPoint did not change students' attitudes about missing class. Other students will begin to net-surf and/or text during class for stimulation (Moore et al., 2007).

The major disadvantage of the lecture method is the lack of emphasis on problem solving, decision making, or transfer of learning (DeYoung, 2009). Lecture, with or without PowerPoint, is considered an individual activity rather than a group activity therefore limiting the ability for students to learn from their peers (McCurry & Martins, 2010). Ebert-May et al. (1997) found students tend to ask knowledge-related content questions in a lecture format as opposed to application and analysis questions when content was presented in a social, collaborative environment. Miller (2003) did not find a statistically significant difference in mean nursing pharmacology exam scores between courses taught with a weekly discussion of content with peers and courses taught by the lecture method. Conversely, J. P. Johnson and Mighten (2005) found nursing students who received lecture only had lower mean examination scores and higher course failure

rates than those students who had lecture with group discussion with peers. Even though these findings were not statistically significant, the evidence does support that lecture alone is not the most effective teaching method for transfer of learning and retention of content.

Passive learning through lecture does not result in students retaining knowledge (Moore et al., 2007). The lecture method or passive learning consists of rote memorization which does not produce knowledge retention (Moore et al., 2007). Consideration should be given to students' ability to memorize content and regurgitate information on a forced-choice test which does not suggest retention of knowledge has occurred (Covill, 2011; Giddens, Brady, Brown, Wright, Smith, & Harris, 2008; Ironside, 2005). Susskind (2005) found even though students perceive lectures with PowerPoint as easier to understand the content, there was not a significant effect on students' performance on exams. Kapp et al. (2011) had insufficient evidence to detect differences in essay-style exam question scores in students who were in a lecture course compared to students in a reformed collaborative course. Beers and Bowden (2005) confirmed there is not a statistically significant difference in overall standardized exit examination scores between nursing students taught by the lecture method and students taught by problem-based learning activities. These results are critical when considering the best methods of teaching for student retention of knowledge.

Millennial Students and Traditional Lecture Method

Typically, lecture halls in college classrooms are large with a lot of students, creating challenges in participation and collaboration (Ebert-May et al., 1997). Given that millennial students are social beings and like to collaborate in groups, the learning

environment should be one where interaction can occur. For example, multi-purpose or small rooms that accommodate a group of students would be an ideal milieu (Rickes, 2009). In addition, classroom environments need to be equipped with the ability to provide images to appeal to visual learning style of millennial students as opposed to text-intensive overhead projections that may appeal to students who prefer to read (Howe & Strauss, 2007; Papp & Mutulich, 2011; Shih & Allen, 2007).

Even though there are discrepancies in the literature regarding the traditional lecture methods' effectiveness, the lecture method can be just as effective in promoting learning in millennials (Covill, 2011). In 2007, Flanagan and McCausland found students believed introductory lectures on content are essential for learning. A study conducted by Covill (2011) found students believe they work hard in lecture style classes. The students believed they were able to retain information provided by the instructor who facilitates independent thinking and involvement in the learning process. However, study findings imply students' perceptions are inconsistent with objective reality because actual course grades did not match the students' perceived course grade (Covill, 2011). This teacher-centered approach questions lecture's ability to produce positive learning outcomes. The collaborative learning approach claims to promote engagement in problem-solving abilities which will assist millennial students in the retention of knowledge and deeper learning.

Collaborative Learning

Nurse educators responded to the NLN's call for curricular reform by designing and delivering new pedagogies that actively involve students in the learning process (Ironsides, 2005; NLN, 2003; Neuman et al., 2009). The student-centered or active

learning approach to teaching engages students to reflect on their thoughts and explore their ideas with peers and nurse educators, thus fostering critical thinking (Oermann, 2007; Rowles & Russo, 2009; Young & Maxwell, 2007).

Active Learning

Active learning is an umbrella term used to group instructional activities. Active learning strategies share four common characteristics including encouragement of critical thinking, student ownership of learning, engagement in activities, and organization of learning by the educator (Kane, 2004). The active learning techniques emerging in the classroom and clinical setting favor a group oriented approach such as games, case studies, and simulations (Earle & Myrick, 2009; Jaffe, 2007; Johnson & Mighten, 2005; Ray, 2004; Rowles & Russo, 2009; Walker et al., 2006).

Collaborative Learning

A paradigm shift from teacher-centered to learner-centered is calling educators to reform their way of thinking in efforts to improve student learning (Candela et al., 2006). Collaborative learning is a teaching methodology that is an active, group-oriented approach utilizing students' interdependent thoughts, dialogue, deliberation, and differing perspectives between educators and students to reach socially constructed knowledge—social constructivism theory (Ioannou & Artino, 2010; Kabes et al., 2010; Liu & Chen, 2010; Luce, 2001; Sandahl, 2009). A study by Ward-Smith et al. (2010) found 37% of students enjoyed learning about others' point of view and interpretations of ideas in a social environment.

Collaborative learning is not new to education as it has been in the educational environment in some form since the 1970s (Cole et al., 1978). The reason for the

longevity is a result of people recognizing they could learn successfully in groups utilizing the talents of each student to solve problems (DeYoung, 2009). The goal of collaborative learning may be the completion of an assigned task, researching content, or the actual group process interaction itself (Sandahl, 2009). The actual group process of collaborative learning promotes cooperation to assume the responsibility for group learning outcomes (DeYoung, 2009; Rowles & Brigham, 2005; Sandahl, 2009; Wolff, 2007).

Collaborative Learning Outcomes

Some educators claim collaborative learning will produce positive student learning outcomes. These learning outcomes include a better understanding of complex concepts, the ability to critically think, and greater retention of knowledge yielding higher academic achievement (Bhatia & Makela, 2010; DeYoung, 2009; Flanagan & McCausland, 2007; McCurry & Martins, 2010). Numerous studies in other disciplines have been conducted on collaborative learning and results indicate that when students have the opportunity to work collaboratively, they were able to perform more competently (Lockie & Van Lanen, 2008; Ocker & Yaverbaum, 2001). A study conducted by Tomey (2003) found students were more efficient, effective, and self-directed when problem-based collaborative learning activities are initiated. Recently, Kendrick (2010) anecdotally found that when students were placed in small groups with open-ended questions they were able to discover meaning and construct new knowledge through dialogue with peers. Kapp et al. (2011) found general education students believed collaborative discussions assisted students in improving their grades by learning information from others.

Other studies have shown that deeper learning occurs in a collaborative environment when students are able to critically evaluate information through peer discussion. For example, O'Sullivan and Copper (2003) found students who worked collaboratively had higher chemistry grades than those who had lecture only. Similarly, Yoder and Hochevar (2005) found psychology students' retention of knowledge was greater on repeated exam item scores over time when content was taught by active learning methods than were exam scores of those students taught with lecture or autonomous reading. The active learning methods used in this study were extended discussions, small group exercises, and/or videos. Although not significant, Stelzer and Coll-Reilly (2010) found when working with education students, team quiz scores were higher than individual quiz scores in 87% of the instances. These higher team scores may be attributed to the social, collaborative nature of the learning environment.

The majority of nursing research has focused on students' perceptions of collaborative learning as opposed to academic achievement (Earle & Myrick, 2009). For example, Ward-Smith et al. (2010) found 85% of nursing students viewed group work positively. These students indicated group assignments were "like having instant friends with a common bond" and taught them "patience, flexibility, and brainstorming" (Ward-Smith et al., 2010). Even though some students enjoyed the active learning strategies, L. H. Neuman et al. (2009) found some nursing students were disappointed at the lack of help with exams when active learning strategies are utilized in the classroom. The belief by the students coincides with nurse educators regarding learning outcomes.

Some nurse educators have been skeptical about embracing collaborative learning techniques in their classrooms because it is unclear whether successful cognitive

development actually occurs in the student (Feldon, 2010; Nayan et al., 2010; Thompson, 2009). The outcomes of collaborative learning have not been researched extensively to determine a measurable effect in nursing (Thompson, 2009). Hoke and Robbins (2005) did find higher clinical grades utilizing a collaborative approach to nursing education, but they did not find a significant difference in course grades when utilizing the collaborative learning approach. The researchers did not find a significant difference in course grades when utilizing the collaborative learning approach. McCurry and Martins (2010) did find statistical significance on nursing students' innovative assignment scores as opposed to scores on traditional assignments. Beers and Bowden (2005) found statistically significant higher posttest scores one year after instruction between nursing students taught using problem-based learning activities and students taught by the lecture method. This evidence suggests long-term knowledge retention was affected utilizing the problem-based active learning approach.

Collaborative testing has gained interest in nursing education. This type of testing consists of students taking a test together by discussing questions and deciding on an answer. Subsequently, the student would take the test individually (Sandahl, 2009). Mitchell and Melton (2003) found positive student perceptions of the method regarding validating knowledge with peers while increasing their exam score. Bhatia and Makela (2010) found students who attended collaborative review sessions prior to a test had significantly higher mean test scores than did students who did not attend. Although many research study results using collaborative testing are positive, there are inconsistent findings regarding long-term retention. Durrant, Pierson, and Allen (1985) were among the first who studied collaborative testing by examining short-term retention with a

midterm exam and long-term retention with a final exam. The researchers found the differences between the exam scores significant, but there was not a control group in the study for comparison (Sandahl, 2009). Lusk and Conklin (2003) did not find a statistical difference between final examination scores between a collaborative testing group and those students who were tested individually. These results led to assuming overall comprehension of material was equivalent between the two groups (Lusk & Conklin, 2003).

Millennial Students and Collaborative Learning

Collaborative learning practices are most effective when educators provide significant structure and guidance (Covill, 2011). Despite millennial students' preference for group work and learning through trial and error, they believe it is more important to manipulate information to generate knowledge than attainment of knowledge (Mangold, 2007). Therefore, collaborative learning activities must be appropriately suited for millennial learners to meet their respective learning style and preferences.

The literature review found a few studies conducted on millennial students that yielded inconsistent results (Neuman et al., 2009; Thompson, 2009). The discrepancy may be related to the assumption that all millennial students prefer active learning strategies. Studies have shown millennial students have voiced complaints about the utilization of active learning techniques (Eschelman, 2008; Howe & Strauss, 2007; Ironside, 2005). These complaints were noted by Revell and McCurry (2010) who found nursing students' resistance for active learning strategies due to their frequent use and unequal student participation. Shultz, Wilson, and Hess (2010) found business students did not like group work because the "freeloader" issue was connected to grade inaccuracy

and not receiving “true credit” for work performed. Ward-Smith et al. (2010) found nursing students complained about the additional responsibilities of doing extra work because one or two members of the group would not actively participate in the project, thereby creating unwarranted stress and anxiety. Smith-Stoner and Molle (2010) found similar complaints that students believed they were doing all the work and felt their less responsible group-mates did not assume responsibility in preparing for class. This belief was also confirmed by L. H. Neuman et al. (2009) who found nursing students perceived difficulty trying to “teach” other students what they need to know. Those students also believed they missed out on other topics by learning only pieces, not the whole picture (Neuman et al., 2009).

Some studies found millennial students have a preference for the traditional lecture pedagogy because they like the structured environment (Jeffries & Norton, 2005; Johnson & Mighten, 2005; Neuman et al., 2009; Walker et al., 2006). Some students felt threatened by the active learning environment due to shyness, different levels of cognitive abilities, and difficulty relating content concepts (Rowles & Russo, 2009). A study conducted by Smith-Stoner and Molle (2010) found instructors had to spend enormous time encouraging nursing students to participate in discussions because students preferred having instructors present materials using PowerPoint slides. Part of the discrepancies in the millennial students’ responses may be a reflection of their preferred learning style.

Learning Styles

The foundation of facilitating learning is to understand the learner (Earle & Myrick, 2009; Felder & Brent, 2005; Oblinger, 2003). Learners are defined by their life

experiences, beliefs, and values shaping how one learns (Ard, 2009; Billings & Kowalski, 2004; Wellman, 2009). The significance of student learning styles and educator teaching methods is that one instructional approach does not fit all types of student learning styles (Felder & Brent, 2005; Noble, Miller, & Heckman, 2008; Pashler, McDaniel, Rohrer, & Bjork, 2009; Riener & Willingham, 2010). For example, millennial students' educational expectations have been affected by technological and societal influences significantly different than those of previous generations creating an impact on learning styles and preferred teaching methods (Roberts et al., 2012; Shaw & Fairhurst, 2008; Shih & Allen, 2007).

Learning Style Definition

The term learning style describes the way an individual begins to concentrate on, process, internalize, and retain new and difficult information (Dunn & Dunn, 1978; Guild & Ganger, 1998). The individual's learning style may also be influenced by experiences with sensory, cognitive, cultural, and environmental factors suggesting different students learn in different ways (Ard, 2009; Farooq & Regnier, 2011; Felder & Brent, 2005; Feldon, 2010; Kinshuk, Liu, & Graf, 2009; Pashler et al., 2009; Paterson & Pratt, 2007; Zimmerman, 2009). These experiences must be transformed into new ways of thinking while utilizing different styles of learning (Lisko & O'Dell, 2010). Most learners discover one or more learning styles preferences that work well for them (Arthurs, 2007; Eschelman, 2008; Gunderman, Williamson, Frank, Heitkamp, & Kipfer, 2003; Horton et al., 2012; Riener & Willingham, 2010). Koch, Salamonson, Rolley, and Davidson (2011) found 62% of students reported more than one learning style preference. Understanding how students learn is essential in developing a wide variety of teaching and learning

activities that promote academic achievement and knowledge retention for all students (Arthurs, 2007; Koch et al., 2011).

A plethora of debates, conceptualizations, and studies have been conducted on learning styles. Research has shown effective learning occurs in adults when the pedagogical method is consistent with their learning styles (Curry, 1990; Dunn, 1990; Federwisch, 2010; Hart & Dunn, 2008; Horton et al., 2012; Johnson & Romanello, 2005; Terregrossa, Englander, & Englander, 2009). Research has also shown conflicting evidence that no significant relationship between learning styles and levels of achievement exists (Strayer & Beitz, 2010). To provide students and educators information on preferred learning styles, a learning style inventory must be administered to students during college orientation (Wellman, 2009).

A literature search conducted on learning styles produced over 4,000 peer reviewed articles. With the additional search term academic achievement, the results were a meager 229; adding the term nursing resulted in only six articles. Although several learning style theories and instruments exist, examination of those instructional and environmental preferences pertaining to this study will be reviewed.

Instructional and Environmental Learning Style Preferences

The context of the instructional and environmental preferences suggests the influence of students' preferences for social interaction and the effect of the environment in which learning occurs (Paterson & Pratt, 2007; Terregrossa et al., 2009; Wellman, 2009). Students who grew up in a supportive environment and/or had positive learning experiences are more likely to be eager to learn and are more analytical in processing information (Paterson & Pratt, 2007). This thought is true for the millennials as they

grew up in a supportive, nurturing environment. Their growth and development had a significant influence on their educational outlook which gave them the characteristic of being better educated and achieving (Earle & Myrick, 2009; Howe & Strauss, 2007). Many of the millennials' characteristics tend to favor the contexts of the instructional and environmental preferences of social learning.

The Dunn and Dunn Learning Style Model

The Dunn and Dunn Learning Style model identifies how students begin to concentrate on, process, internalize, and remember new and difficult academic information (Dunn & Dunn, 1993). This model assumes that most students can learn. Additionally, instructional environments, resources, and approaches affect the different learning style strengths (Dunn, Ingham, & Deckinger, 1995). The Productivity Environmental Preferences survey developed by Dunn, Dunn, and Price (1991) was based on the Dunn and Dunn Learning Style model. This 100-item self report questionnaire utilizes a five-point Likert scale to indicate preference from strongly disagree to strongly agree to measure the learning style preferences of adults (Hart & Dunn, 2008). The survey determines the social and environmental effects on adult learning styles consisting of five major elements: environmental, emotional, sociological, physiological, and psychological which are further divided into characteristics of the element (Dunn et al., 1991). Lovelace (2005) and Kavale and LeFever (2007) confirmed that the students' learning style, determined by the Productivity Environmental Preference Survey results, when matched with compatible instruction would increase achievement of and improve the attitudes toward learning. Because this study's instrument is an adapted model of the Productivity Environmental Preference Survey to

determine students' learning styles, emphasis will be placed on those physiological and sociological elements.

Environmental. The environmental variable includes noise, light, temperature, and design (Dunn & Griggs, 2000; Lovelace, 2005; Reese & Dunn, 2007). Burke and Burke-Samide (2004) found uncomfortable seating, irritating noises, being too hot or cold in the classroom, and varying light are the reasons students become distracted or lose concentration. Amerson (2006) found some students who listen to music including classical or baroque have demonstrated an increase in spatial awareness and concentration. V. L. Reese and Dunn (2007) found male students had higher means for learning when there was music in the background, structure, and teacher present whereas female students had higher means with bright lights, warm temperatures, and instructional variety in a formal setting. The design of the room should be considered. Billings and Kowalski (2004) suggest classroom settings for millennials need to be arranged where students can face each other and work in small groups because they are social beings. Smith-Stoner and Molle (2010) found that nursing students perceived assigned seating to minimize socializing as childish and that students tended to ignore educators when told to be quiet. These studies suggest educators who are responsive to students' environmental needs will create higher-achieving students.

Emotional. The emotional variable includes motivation, persistence, conforming, and structure (Terregrossa et al., 2009). In general, students are motivated to learn (Paterson & Pratt, 2007). Learning occurs whether it is intentional such as in formal structured classrooms or incidental which occurs in everyday life even during targeted educational endeavors (Strayer & Beitz, 2010). V. L. Reese and Dunn (2007) found

students with higher GPAs had higher motivation scores than those students with lower GPAs. However, George, Dixon, Stansal, Gelb, and Pheri (2008) found a relatively low influence of emotional stability and self-esteem on academic achievement with liberal arts students. As learners mature, they tend to become motivated by their needs and interests rather than expectations (Gunderman et al., 2003).

Sociological. Sociological preferences indicate how each student prefers to learn and the preferred method such as working alone, peer, team, or with an educator (Lovelace, 2005). Highly successful students are motivated and prefer to learn alone (Reese & Dunn, 2007). Researchers have found many students like to work individually as opposed to working in groups (Smith-Stoner & Molle, 2010; Ward-Smith et al., 2010). Weldy and Turnipseed (2010) found better business students prefer to work independently when grades are given for a group project. Schultz, Wilson, and Hess (2010) also found 33% of business students prefer to work alone indicating grade reciprocity. The students do not like to rely on peers for their grade because they have had bad experiences with groups previously (Schultz et al., 2010).

Working alone may also indicate a preference for the lecture method which is an individual activity. Walker et al. (2006) found the majority of Generation X and millennial students (83%) preferred the lecture method to group work. Additionally, researchers found those students would prefer to read materials then have an expert lecture on the content (Walker et al., 2006). Robert, Pomarico, and Nolan (2011) found survey results of nursing students that too many group projects were required in the curriculum, which did not match their learning style. Although this information was not

statistically significant, the evidence remains incongruous to the belief that millennials prefer to learn in a group environment.

In opposition, some millennial students do have a preference for working in teams as suggested by the Howe and Strauss (2007) who have studied that generation. Brown et al. (2009) found 11% of nursing students preferred the collaborative learning approach to more traditional approaches to teaching and learning. The preference for teamwork was evident in business students. A study by Schultz et al. (2010) found 40% of students prefer to work in teams because of the increased ideas, improved learning experience, and reduced workload. These students enjoy the socializing aspect and perceive they learn more working in groups (Schultz et al., 2010). Fountain and Alfred (2009) found 77% of nursing students preferred a social learning environment. An example of a collaborative, social learning environment is simulation. Simulation brings together many aspects of experiential and teamwork through technology. Those students indicated they were satisfied with simulation because it enhanced their learning style (Fountain & Alfred, 2009). C. E. Reese, Jeffries, and Engum (2010) found positive student responses on the collaboration scale when utilizing simulation.

The evidence of working with an educator is also prevalent in millennial students. The volumes of information may be a contributing factor for students who desire to work with educators. Those students who have difficulty processing information and lower GPAs may need assistance to synthesize information. For example, V. L. Reese and Dunn (2007) found students with lower GPAs prefer an authority figure to assist with learning. This information may suggest students prefer structure in the classroom. Walker et al. (2006) found 90% of nursing students preferred face-to-face teaching

methods and not web-based instruction. The information suggests the need for structure in the classroom and the desire to have educators tell students what they need to know including relevance of the topic. Smith-Stoner and Molle (2010) surveyed nursing students and found some students do not purchase any course-related books because of the expectation that educators will synthesize important content during class.

Physiological. The physiological or perceptual factors include visual, auditory, tactile, or kinesthetic (Terregrossa et al., 2009). Hoke and Robbins (2005) found nursing students have a preference for those physiological variables. Millennials are considered more fluent in visual literacy and kinesthetic learning styles than any other generation due to their vast exposure to multi-media (Papp & Mutulich, 2011; Shih & Allen, 2007). Zhou (2011) suggests accommodating all styles by making liberal use of visuals such as photographs, drawings, or video clips, decreasing lecture time, and placing students in pairs for group exercises throughout the class. Amerson (2006) and V. L. Reese and Dunn (2007) found visual learners prefer graphics, PowerPoint presentations, movies, and video clips to supplement traditional lectures (auditory) while learning new and difficult information. Robert et al. (2011) found nursing students indicated their learning needs as wanting visuals and handouts before class. Adding visuals to a presentation will almost double a student's recall (Arthurs, 2007). Koch et al. (2011) found 62% of nursing students preferred reading and writing as their learning preference but was not a significant predictor of academic performance. L. H. Neuman et al. (2009) found some nursing students would like to be shown more via demonstration to learn skills indicating a visual preference to learning. This is contradictory to the preferred hands-on approach with millennial students.

The auditory learning style preference refers to the hearing aspect of learning. In 1995, Dunn et al. found that adults with auditory preference who were taught with lecture and visuals obtained significantly higher test scores than those taught with tactile and kinesthetic and visuals approach. Rico, Beal, and Davies (2010) found nursing students still prefer the lecture with PowerPoint presentation as their preferred method of learning. Walker et al. (2006) found 72% of nursing students indicated they learned from hearing stories about actual clinical events from nurse educators. However, Hart and Dunn (2008) found students could not remember what was said in a lecture because they were low auditory but high kinesthetic learners. This finding correlates with the study by Dunn et al. (1995) suggesting mismatched learning style preferences and methods produced statistically lower test scores.

Millennial students are also considered tactile or kinesthetic learners with a hands-on approach. Rico et al. (2010) found nursing students commented on learning psychomotor skills with a hands-on approach. One student stated “there is something more to a skill than watching and talking about it, I do better with hands on learning” (Neuman et al., 2009, p. 161). Simulated scenarios may assist with the kinesthetic learning style to enhance learning by simulating a patient that engages the learner in an interactive activity reflecting real-life conditions without the risk of an actual situation (Murray, Grant, Howarth, & Leigh, 2008).

Another kinesthetic approach to learning is the utilization of games. Millennials are used to having fun, and game-like, interactive activities appeal to them because they grew up playing video games (Roberts et al., 2012). Lynch-Sauer et al. (2011) found 88% of students believed nursing education should make better use of video games and

new media technology to enhance learning. The use of games provides the ability to engage students, give immediate feedback, and enhance their problem solving and decision making abilities (Davis, 2011; Earle & Myrick, 2009; Oblinger, 2003). Cohen and Tesh (2002) found evidence to support that knowledge retention can be improved by gaming. In their study, nursing students who experienced gaming and lecture had higher posttest scores than did nursing students who received only lecture. Additionally, Royse and Newton (2007) found the use of games enhanced knowledge retention and promoted problem solving skills. Millennial students seek instant gratification and feedback on their performance, which they receive through gaming (Shih & Allen, 2007). Revell and McCurry (2010) conducted a study on personal response system technology with nursing students and found this technique effective in engaging students. Students demonstrated increased participation and enjoyed the immediate feedback in a safe, nonthreatening environment. This interactive game is conducive to learning for those shy students who prefer a passive approach to learning because of the fear of discomfort (Revell & McCurry, 2010).

Psychological. The psychological variable identifies how students absorb and process new information consisting of global (deductive) versus analytical (inductive) approaches (Dunn & Griggs, 2000). Global learners prefer a relaxed environment, noise, and soft light. They are able to multitask well (Terregrossa et al., 2009). Terregrossa et al. (2009) found global learners had better exam performance when matched with their preferred global learning style. Millennial students are considered to prefer a “free” approach to learning which correlates well with the global learner variable (Howe & Strauss, 2000; Levett, 2010). The free approach to learning is considered the “any time,

any place” belief allowing students to access lectures and or assignments any time during the day (Papp & Matulich, 2011). Phillippi and Schorn (2011) found students’ preference for placing lectures online to view at their convenience, most often during the evening hours. In addition, researchers found the lectures were viewed by students prior to tests and final exams, which may have contributed to higher course grades (Phillippi & Schorn, 2011).

On the contrary, analytic learners tend to prefer quiet backgrounds, brightly lit, structure, and formal learning environments with a preference of working alone (Terregrossa et al., 2009). V. L. Reese and Dunn (2007) found students who prefer a structured learning environment need educators to provide specific guidelines for completing assignments and graded assignments should be returned in a timely manner. With regard to structure and learning outcomes, Angel, Duffey, and Belyea (2000) did not find a statistically significant difference in student’s knowledge or critical thinking scores between a structured and nonstructured health pattern assessment course.

Learning Styles and Nursing

After the creation of numerous instruments to measure types of learning styles and decades of research, the consensus is that students learn differently (DeYoung, 2009). For example, students who prefer a social environment for learning will respond favorably to learning in a social environment. L. H. Neuman et al. (2009) found nursing students responded positively in a social environment for learning because the diversity of peer discussion and interaction influenced learning. Kabes et al. (2010) found 98% of nursing students ranked collaborative problem solving and dialogue with other students as essential to learning.

Educators need to be responsive to the varied and changing learning styles of the students in the classroom. The popular learning style theory developed by David Kolb, experiential learning theory, suggests learning is flexible and cyclic to allow growth and development of the learner (Kolb, 1984). Kolb also believed learning styles were not set personality traits but rather patterns of behaviors based on the individuals' background and experiences (Kolb, 1984). Zoghi et al. (2010) found this theory assisted in explaining that students' preference for learning can change and adapt to the teaching methods provided by the educator. Additionally, Fleming et al. (2011) found students' learning style preference changed from the time they entered nursing school to the final year. Additionally, researchers found by the final year 53% of the students did not have a dominant learning style (Fleming et al., 2011). Rassool and Rawaf (2008) found 33% of nursing students had dual learning styles indicating there was not one preferred learning style but two. The changes in learning styles did not equate to any statistical significance to academic achievement but greater flexibility for learning (Fleming et al., 2011; Rassool & Rawaf, 2008). Kinshuk et al. (2009) did find statistical significance on final exam scores of those students who did not have a strong learning style preference as opposed to those students who do have a preference. Therefore, incorporating many different active and engaging activities will assist in accommodating the many different learning styles in the classroom and is necessary for student success.

Chapter Summary

Nurse educators need to avoid assuming that millennial students will have the same learning styles as previous generations and eliminate frequent comparisons on "how I was taught" (Eschelmann, 2008; Notarianni et al., 2009; Roberts et al., 2012; Walker et

al., 2006). They need to incorporate evidence-based teaching strategies in preparing future nurses with the ability to adapt to a rapidly changing healthcare environment. Nurse educators have chosen to rely on traditional methods of teaching rather than implementing collaborative learning techniques in their classrooms. However, nurse educators have been encouraged to implement new instructional strategies with a limited research base and little to no achievement results (Lovelace, 2005). Based on the literature review, research on millennial students' preferred teaching methods and academic achievement is essential because existing studies do not provide clear evidence that collaborative learning strategies improve learning outcomes compared to learning outcomes in courses taught by the traditional lecture method (Nayan et al., 2010; Sandahl, 2009; Thompson, 2009; Tomey, 2003). Overall, students are affected by the different combinations of learning style preferences (Riener & Willingham, 2010). These preferences will increase the ease to which learning can occur for academic achievement (Lovelace, 2005).

Nurse educators must be committed to identifying ways to make innovative changes to pedagogical approaches to meet the needs of millennial learners based on learning styles. The results show the multiple learning style preference characteristics in which millennial students can move fluidly from one style to another. Students tend to prefer one learning style over another. Some researchers believe learning occurs regardless of learning style because there is not sufficient evidence on mismatched student learning style preferences to the teaching methods (Mayer, 2009; Pashler et al., 2009). However, some researchers believe knowing the students' preferred learning style can assist educators in making decisions on how to construct learning activities to

promote higher academic achievement (Ard, 2009; Dunn, 1990; Riener & Willingham, 2010).

Even though some studies reviewed had statistical significance, consideration should be made to the generalizability. Many of the sample sizes in the study were very small and were limited to a targeted population. In addition, studies on the different techniques of collaborative learning provided an overview of a certain strategy with regard to students' perceptions. There are few studies that have been replicated and even fewer studies that examine the impact on academic achievement. This study seeks to provide evidence whether millennial students have a greater retention of knowledge on a standardized test when the traditional lecture method or collaborative learning activities are provided. In addition, this study will seek to determine if there is difference in academic achievement when the millennial students' preferred learning style is utilized.

Chapter Three

Methods

The purpose of this study was to examine if there was an improved retention of knowledge in millennial students who were taught by collaborative learning strategies rather than the traditional lecture method in an associate degree nursing program. In addition, the study examined if learning by the students' preferred style resulted in a higher level of achievement on a CSE versus learning by a nonpreferred style.

Research Design

According to Creswell (2009), selection of a research design is based on the nature of the research problem or issue being addressed, researcher's experiences, and audiences for the study. Generally, experimental designs are considered best for research hypotheses with a narrow scope (Neuman, 2012). In this study, the scope was a specific targeted population with a focus on academic achievement, learning styles, and teaching methods. To examine the purpose of the study, a quasi-experimental research design was most appropriate. In a quasi-experimental design, an intervention is conducted with the absence of randomization (Polit & Beck, 2008). Even though the quasi-experimental design was acceptable, strengths and weakness were considered (Neuman, 2012).

Strengths of the Quasi-Experimental Design

The strength of the quasi-experimental design was the ability to follow similar properties of an experimental design such as control and experimental groups (Creswell,

2009). In this study, the researcher identified the manipulation or intervention as the collaborative learning technique utilized by nurse educators as opposed to the traditional lecture method. The control group was considered the traditional lecture method of pedagogy utilized in previous years. In addition, the practicality of this study design was considered a strength (Polit & Beck, 2008). The availability of senior nursing students enrolled during the years 2011 and 2012 allowed for control and experimental groups respectively utilizing the available population. The available population may provide a potential for greater generalizability, which was a potential strength because the results may apply to a broader group of people (Trochim, 2005).

Weakness of the Quasi-Experimental Design

A limitation of the quasi-experimental design was rival hypotheses competing with the experimental manipulation as explanations for the results (Polit & Beck, 2008). Even though there was a control group, varying differences in students' experiences, culture, inquiry, social, and collaboration factors may influence the plausibility of rival hypotheses (Neuman, 2012).

Another weakness was the lack of randomization which allows for statistical significance based on the necessary effect size (Neuman, 2012). Randomization suggests there was a valid comparison because their likeness was due to chance (Trochim, 2005). Due to the pre-determined groups, randomization of the population was not feasible. Because there was not true random assignment, threats to validity were considered. However, statistical methods assisted in limiting weaknesses in the study.

Research Assumptions

Social constructivists have assumptions that individuals seek understanding of the world in which they live and work by developing subjective meanings to their experiences (Creswell, 2009). Crotty (1998) identified the basic generation of meaning is always social, arising in and out of interactions with people. The aforementioned may suggest the study results may be influenced by the differences in students' experiences, culture, social, and collaborative environment regardless of which group they were placed in: control or experimental.

Even though social constructivists had assumptions regarding how individuals learn, there were also research assumptions to consider for the study when utilizing psychological tests such as the CSE and self-assessment inventory. The significant assumptions were whether the CSE measured what it was intended to measure (i.e., test validity) and whether the scores remained stable over time (i.e., test reliability) (McIntire & Miller, 2007). In order for a test to be considered standardized, validity and reliability procedures were utilized to collect evidence on the test's ability to measure intent (Oermann & Gaberson, 2009).

Additionally, assumptions were made that individuals would report accurately and honestly about themselves regarding thoughts, feelings, likes, and dislikes, and that their true ability was reflected in the scores (McIntire & Miller, 2007). These assumptions were significant to the study because the information may have had an impact on the self-assessment inventory regarding the learning style preferences. Accuracy in students' responses was an essential element of the study because of the impact on the study findings (Neuman, 2012).

Setting

The setting for the research study was a private, not-for-profit college located in the Midwest offering an associate degree in nursing (ADN). The college was accredited by the NLN Accrediting Commission and The Higher Learning Commission. The college had a diverse student body of 350 students, primarily millennial students.

The setting for this research study was chosen based on the study purpose of examining the impact of different nurse educators' pedagogical methods on millennial students' learning. Historically, nurse educators taught nursing students utilizing the traditional lecture method. Recently, a pedagogical shift in teaching by nurse educators had migrated to the collaborative learning method. Even though there was a pedagogical shift, the curriculum continued to follow the associate degree curriculum requirements with regard to content and structure.

Sampling Plan

Sampling is the process of selecting a portion of the population to represent the entire population so inferences about the population can be made (Polit & Beck, 2008). The sampling plan consisted of a sampling strategy, eligibility criteria, determination of sample size, and protection of human subjects.

Sampling Strategy

The sample was a subset of the population (Polit & Beck, 2008). The nonprobability purposive or judgmental sampling strategy was utilized because there was an identified population targeted for the study, millennial students. This strategy was chosen based on the research hypotheses to evaluate the researcher's belief that

millennial students prefer group work and learning style had an impact on academic achievement.

Purposive sampling presents with strengths including accessibility, practicality, and financial. The enrolled students in the college were primarily traditional or millennial students. The convenience of male and female millennial students enrolled in the associate degree nursing program, specifically the senior course, allowed for easy accessibility. Approximately 184 senior students enrolled in the nursing course during the spring and fall semesters of 2011 and 2012 were utilized for the study. In 2011, students experienced the lecture pedagogy and in 2012 students experienced the collaborative learning pedagogy.

An additional strength of this study was considered financial in nature. The financial strength consisted of not having any additional costs incurred by the study or the students. The students' tuition and fees included the utilization of the study's required instruments.

The nonprobability sampling posed a potential weakness due to the lack of randomization creating potential threats to external validity (Trochim, 2005). The lack of randomization may have caused under-representation because of using only millennial students lending caution to the inferences and conclusions about the data. To control for the lack of randomization and causal inferences, a covariate was utilized to minimize the threat. In addition, eligibility criteria for the control and comparison groups were the same.

Eligibility Criteria

The criterion defining the population characteristics for the study was referred to as the eligibility criteria consisting of inclusion and exclusion criteria (Polit & Beck, 2008).

Inclusion criteria. The inclusion criteria consisted of all currently enrolled senior nursing students making normal progression in the ADN program. Normal progression suggested the student was making normal progress in the curriculum taking the senior nursing course for the first time. Students who graduated in 2011 and spring semester 2012 were included. In addition, all students were in the millennial generation born 1982-2002 (Howe & Strauss, 2000). Due to the age range of the millennials, only students who were 18 through 30 years of age were included.

Exclusion criteria. There were two criteria considered for exclusion consisting of progression through the program and age. Any student who had not followed normal progression through the program and/or repeated the senior nursing course was excluded. Those students who repeated the course had been exposed to the course content and teaching methods which might have influenced the results on the CSE. Additionally, any student born before 1982 or after 1994 was excluded.

Determination of Sample Size: Power Analysis

Study findings from the quasi-experimental research method and techniques were generated from statistical analysis of numerical data to test hypotheses to arrive at significant conclusions (Neuman, 2012). The decision to utilize the nonprobability sampling was made upon consideration of the required sample size. The study's sample size was determined on the amount of power necessary to detect statistical significance

and reduce the risk of Type II errors (Polit & Beck, 2008). The estimated sample size utilizing the statistical method, Analysis of CoVariance (ANCOVA), for the research hypotheses determined by the G* Power 3.1.3 program (Faul, Erdfelder, Lang, & Buchner, 2007). The covariate, GPA, assisted in reducing the error variance and increased the relative effect size.

The effect size was an estimate of how wrong the null hypothesis was and how strong the relationship between the independent variable and dependent variable was in the population (Polit & Beck, 2008). A large effect size (0.40) was used in the computation. To prevent committing a Type I error or a false positive, alpha (α) was set at 0.05 level of significance. The power was the probability of rejecting a false null hypothesis or committing a Type II error is beta (β) (Neuman, 2012; Polit & Beck, 2008). The power analysis established was $1 - \beta$ at 0.95. The a priori G*Power computation estimated the total sample size of 162 participants suggesting 81 in each group (see Appendix B).

Protection of Human Subjects

The researcher had a responsibility to design a study protecting the rights of the participants without a risk of harm. The study was approved by the Institutional Review Board (IRB) at Nova Southeastern University (NSU) and the study institution determining risk to study participants (Gabard & Martin, 2003; Polit & Beck, 2008). The study was considered a minimal risk study because there was not any risk of discomfort to participants (Creswell, 2009).

Informed consent. A fundamental ethical principle of research was ensuring the participants made an informed decision regarding their rights (Neuman, 2012). The

informed consent contained information on justice, right to fair treatment, and privacy (Gabard & Martin, 2003). Only the senior students entering the fall semester of 2012 were solicited for informed consent. The students who had graduated during the year 2011 and spring 2012 were not contacted for their informed consent because of impracticality—they were considered an inaccessible population. All data collection was retrospective in nature.

To ensure privacy, participants were de-identified utilizing identification numbers that were stored separately. All information regarding the study will remain confidential in a password-protected, encrypted computer in the researcher's secured office for six years.

Risks and benefits of participation. The risks of participating in the study were minimal including the loss of confidentiality and comprehensive examination scores. The instruments utilized in this study were required by the curriculum plan. The students completing the senior nursing course were required to complete the CSE. Student grades were not altered in any way as a result of participating in the study.

There were a couple potential benefits to participating in the study. The research results can be a potential benefit to students as they are preparing to take the Registered Nurse (RN) licensing examination. The results may assist the students in recognizing the best pedagogical method to prepare for the licensing examination to achieve success such as the online review or the in-class session. In addition, this information can assist the student for continued success in lifelong learning endeavors.

Data storage. All research information was secured through password protected electronic files on the researcher's encrypted computer and securely retained for six years

upon completion of the study. At the end of six years, all computer files and documentation will be erased and shredded respectively.

Procedures

The data collection procedure refers to the formal procedures researchers develop to guide the collection of data in a standardized fashion (Polit & Beck, 2008). Prior to implementing the study, permission to conduct the study was secured from the President of the study college, Academic Dean of the study college, the study institution's IRB, and Nova Southeastern University's IRB (see Appendices A, C, and D). The researcher sent an electronic mail (e-mail) to the nurse educators in the senior course requesting a convenient time during class to meet with the students. Once obtained, notification through the college e-mail system was sent to notify senior students of the information sessions being held after class regarding the study (see Appendix E). The e-mail incorporated the dates and times of the informational sessions and students were asked to sign the informed consent at the end of the session. The information sessions included the study purpose, methodology, data collection, and data analysis procedures. After allowing time for participants to ask questions, voluntary informed consent was obtained. For those students who do not attend the initial informational session, an additional e-mail was sent notifying them of other available information sessions to follow up on their interest in the study (see Appendix E).

The approach to the data collection was through a structured method indicating what information is to be gathered and how it will be gathered (Trochim, 2005). A database was created to collect the students' age, first attempt scores on the CSE, self-assessment inventory results, and cumulative GPA.

There were two processes for data collection with the graduated students and currently enrolled students. For the graduated students who met eligibility criteria, the CSE scores, self-assessment inventory scores, and cumulative GPA were retrieved from the testing company's password-protected electronic database and program databases respectively. For the currently enrolled students, the CSE was administered by the senior course nurse educator in a proctored environment during week thirteen of the fall 2012 semester. The test was administered in the morning to prevent fatigue effects on the score results (Creswell, 2009). All students had three hours to complete the examination and breaks were allowed if necessary. The self-assessment inventory was administered to determine the students' preferred learning style during the first year of the nursing program. Upon graduation, CSE scores, self-assessment inventory scores, cumulative GPA, and age were collected for those eligible students who provided informed consent. Any student who did not meet the study's eligibility criteria were excluded from this segment of the data collection. Those excluded students were considered in the attrition rate.

All study data collected were secured in an electronic password-protected and encrypted computer database by the researcher. The researcher created a database of all student demographic data, CSE scores, self-assessment inventory on learning styles scores, and cumulative GPA during the timeframe of 2011 and 2012. Once the data file was created and scores matched, students' names were removed and assigned a code number to keep the data confidential. All results were reported as aggregate data.

Instrumentation

In this study, two instruments developed by Assessment Technologies Institute®, LLC (ATI) were utilized for data collection. After obtaining permission from ATI, the instruments utilized were the CSE or the Registered Nurse (RN) Comprehensive Predictor 2010 and the Self-Assessment Inventory which incorporates the learning style preferences (Appendix F).

Instrument 1: ATI RN Comprehensive Predictor 2010

The ATI RN Comprehensive Predictor 2010 was a multiple-choice 180-item standardized examination that provided an assessment of student learning in the respective content areas in preparation for the National Council of State Boards of Nursing Licensing examination (ATI, 2012). The examination assessed the students' basic comprehension and mastery of content area principles which included fundamentals of nursing, pharmacology, adult medical-surgical nursing, maternal newborn care, nursing care of children, mental health nursing, nursing, nutrition leadership, and community health nursing. A percentage of the questions were from all of the major content areas of the licensing examination including management of care, safety and infection control, health promotion and maintenance, psychosocial integrity, basic care and comfort, pharmacological and parenteral therapies, reduction of risk potential, and physiological adaptation (ATI, 2012).

Validity. In order for nurse educators to make decisions about student achievement, examinations need to be proven as valid, the degree to which an instrument measures what it is supposed to measure (Downing, 2003; McDonald, 2007). Validity of the examination was evident through the reliability procedures and inferences of face,

content, criterion-related, and construct validity measures. The researcher determined face validity by the subjective appearance of the topic descriptors coinciding with curriculum content in the nursing program taught by different pedagogical methods. ATI established face and content validity with the utilization of expert judges who took the test and reviewed the items to ensure the content is accurately represented the content domain (ATI, 2012). In addition, expert judges performed a thorough item analysis review based on over 3,000 students who took one of the two examinations and rated each item for difficulty utilizing the Mantel-Haenszel Chi-Square procedure (ATI, 2012). The difficulty ratings and the actual score distributions were essential in developing the cut scores for criterion-referenced construct validity (Waltz, Strickland, & Lenz, 2010).

Reliability. Reliability in a criterion-referenced measurement is concerned with the consistency with which a measuring device classifies the variability in categories (Waltz et al., 2010). Several procedures were conducted by ATI to ensure reliability of the instrument which included alpha internal reliability coefficients and item difficulty analysis for the total test score for the two versions of the test (ATI, 2012).

To ensure stability of the instrument, a hypothesized parallel forms procedure was conducted by administering two versions of the ATI RN Comprehensive Predictor 2010 examination in the spring of 2010 to over 3,000 students during the final item analysis after the initial item edits were completed (ATI, 2012). However, ATI utilized a “hypothesized” parallel forms procedure which indicates the students took only one version of the examination. Both versions of the examination were administered during the same time, but to different students which may question the stability.

Following the completion of the norming process, additional analysis of the test data was conducted by two ATI nurse educators and a psychometrician (ATI, 2012). The sample's first attempt scores were compared from the initial and reset normative data which ensured sound relative comparisons were made for internal consistency (ATI, 2012).

The mean scores, standard deviations, and reliability coefficients were reviewed for the total test scores and the content areas by the ATI experts. In addition, experts reviewed the distribution of item difficulty and discrimination statistics for both forms. The experts confirmed both versions of the examination had high performing test items that were valid from a content perspective which added to the overall reliability of the test score (ATI, 2012).

Scores. The scores reported on the standardized comprehensive examination being utilized are the individual scores of the participants. The scores are from the overall performance and from the categorical subscales. These scores represent the adjusted individual score or the percent correct. The level of measurement for the score is ratio with a range from zero to 100 percent. A higher student's score suggests an enhanced student performance and knowledge acquisition.

Instrument 2: ATI Self-Assessment Inventory

The Self-Assessment Inventory was developed in 1999-2000 to help a student assess his or her own personal attributes and attitudes as they relate to qualities of successful nursing students (ATI, 2000). The assessment was a 195-item, five-option, Likert-type assessment designed to allow students to indicate level of agreement (ATI, 2000). The Self-Assessment Inventory had subscales designed to measure the student in

critical thinking, learning styles, professional characteristics, and work values (ATI, 2000). Only the subscale of learning styles was utilized for this study. The learning styles assessment has 45 Likert-type items consisting of visual, auditory, tactile, individual, and group preferences.

Validity. The validity of an instrument refers to the quality of measurement in which an instrument measures what it is intended to measure (Neuman, 2012; Polit & Beck, 2008). To assure the highest degree of validity, ATI utilized several procedures for the scores on the Self-Assessment Inventory to obtain content validity. In the initial stages of the instrument development, deans, program admission committee members, and faculty were surveyed or interviewed regarding characteristics of successful nursing program students (ATI, 2000). A variety of programs, state and privately funded, with geographic diversity were included in the sample (ATI, 2000).

A content analysis was performed to organize and integrate the analysis of the survey results into emerging themes and constructs (ATI, 2000). Content experts developed the test specifications for the identified constructs. Additional content experts from diverse geographic regions and program types experienced in item writing were utilized to avoid insensitive items, inappropriate assumptions about behaviors, linguistic demands, and bias relating to culture, gender, racial, and/or religious inferences (ATI, 2000). The content experts reviewed the test items several times for content representativeness and made modifications to the items until consensus was reached (ATI, 2000).

The test was administered to 8,204 students at 187 different programs of which 3,575 students were from associate degree programs (ATI, 2000). The learning styles

assessment, adapted from the valid and reliable Productivity Environmental Preference Survey, incorporated 45 items reflecting visual, auditory, tactile, individual, and group learning style preferences (ATI, 2012; Dunn et al., 1991). The test was a five-option Likert scale design which students indicate level of agreement for each test item. The score was the mean of all item responses, scored in the same direction and transformed to a 10-point scale (ATI, 2000). After the initial testing, content experts reviewed the student data and conducted a literature review to evaluate for criterion validity. As a result of the evaluation, further revisions and modifications were made to maximize the alignment of the items to the knowledge and skills being measured (ATI, 2000).

Reliability. Reliability refers to the degree of consistency or dependability of an instrument including stability, internal consistency, and equivalence (Neuman, 2012). The stability of the instrument refers to the extent which similar results are obtained on two separate occasions or a test-retest procedure (Polit & Beck, 2008). Even though the exact test-retest procedure was not performed, ATI administered the assessment 8,204 times to evaluate the results with a reliability coefficient (ATI, 2000).

The reliability coefficient, usually ranging in value from 0.00 to 1.00, provides an estimate of how reliable an instrument is (Polit & Beck, 2008). According to ATI (2000), the entire 195-item assessment produced a reliability coefficient alpha at 0.9144 which suggested a good reliability. The coefficient alpha is usually used as an index of internal consistency to estimate the extent to which different subparts of an instrument are reliably measuring the critical attribute (Polit & Beck, 2008). In the learning styles assessment, there were 45 test items. The reliability coefficient alpha for each learning style respectively consisted of visual 0.4747, auditory 0.3084, tactile 0.4479, individual

0.5426, and group 0.5846. Even though the coefficient alpha was not as high as expected, there was consideration given that many traits do change over time and a lower coefficient may be acceptable (Polit & Beck, 2008).

Due to the subscales representing a unique construct, reliability was calculated utilizing the Spearman-Brown prophecy formula. The Spearman-Brown formula assisted with measuring efficiency of the instrument or how reliable the scale would be with fewer items (Polit & Beck, 2008). The Spearman-Brown formula produced high reliability for the learning styles subscales. The results are visual 0.8356, auditory 0.7414, tactile 0.8022, individual 0.8291, and group 0.8636 (ATI, 2000).

Equivalence is concerned with the degree to which two or more independent observers agree about the scoring (Polit & Beck, 2008). The consistency was validated through the regular use of content experts to evaluate the scores. Additionally, ATI ensured test development and construction conformed to the methods and procedures identified in the Standards for Educational and Psychological Testing (ATI, 2000).

Scoring. There were a total of 45 items with each learning style which had a subscale breakdown of eight visual items, seven auditory items, nine tactile items, 11 individual items, and 10 group items (ATI, 2000). The scoring of the Self-Assessment Inventory consisted of a five-option Likert scale design which students indicated level of agreement for each test item. The score was the mean of all item responses, scored in the same direction and transformed to a 10-point scale (ATI, 2000). The higher mean of the item indicated the students' preferred learning style. The Likert scale has a fundamental measurement of interval with scores on the assessment ranging from the lowest measurement of one to the highest of 10.

Data Analysis Plan

A data analysis plan was the systematic organization and synthesis of research data and the testing of hypotheses (Polit & Beck, 2008). The systematic organization of the data was accomplished through coding. The process of coding was transforming information into numerical data prior to data analysis (Polit & Beck, 2008). The coding consisted of entering the empirical data into a Statistical Package for Social Sciences (SPSS) data file. A codebook was maintained describing the data and how the data can be accessed (Trochim, 2005). The codebook included the unique participant's identification, group, variable names, descriptions, format, and instruments (Polit & Beck, 2008).

Data Cleaning

Accuracy in data entry was essential in preventing threats to the validity of the study (Neuman, 2012). In order to ensure the accuracy of data entry, the researcher performed data cleaning procedures by inspecting and editing the data for coding problems or errors prior to analysis (Polit & Beck, 2008). The researcher first performed a visual inspection of the data file printout verifying the accuracy. Once verified, outliers were identified by inspecting frequency distributions and histograms (Polit & Beck, 2008). Although outliers may be present, those scores were included in the study. In order to lessen the impact of outliers, cumulative GPA was utilized as a covariate in the analysis. Once the data were compiled and cleaned, descriptive and inferential statistical procedures were utilized to answer the research hypotheses. The analysis was performed utilizing the SPSS 20.0 version.

Descriptive Analysis

A descriptive analysis of the data was included for the study to provide summaries about the sample and measures (Trochim, 2005). The analysis of the independent and dependent variables included the distribution, central tendency, and variability (McIntire & Miller, 2007).

The distribution provided a summary of the range of values for a variable often described with a frequency distribution (Trochim, 2005). A frequency distribution arranged values from lowest to highest with a count of the number of times each value was obtained (Polit & Beck, 2008). A histogram provided a visual graph of the values and symmetry of the distribution (McIntire & Miller, 2007).

The central tendency of a distribution was an estimate of the center of a distribution of values which included mean, median, and mode (McIntire & Miller, 2007). The mean was the arithmetic average of the scores, median is middle score, and mode is the most common score in the distribution (Polit & Beck, 2008). The measures of central tendency also assist in identifying the outliers creating a skewed distribution (McIntire & Miller, 2007).

The measures of variability described the set of scores in numerical form including the range, variance, and standard deviation (Polit & Beck, 2008). The importance of variability provided the researcher information on the spread of scores whether the scores are similar or substantially different (McIntire & Miller, 2007).

Reliability Testing

Reliability testing refers to the ability of a test to consistently yield the same measurements for the same phenomena (McIntire & Miller, 2007). The most widely

used method for evaluating internal consistency is the coefficient alpha (Polit & Beck, 2008). The instruments utilized for the study have demonstrated sufficient coefficient alpha for internal consistency (ATI, 2012). However, because the instruments were published by the testing company and the student item responses were not available, a coefficient alpha was not utilized to examine the internal consistency for this set of data.

Hypothesis Testing

Statistical hypothesis testing provided objective criteria for deciding whether the stated hypotheses support the data and study results reflect sample differences in a population (Polit & Beck, 2008). Two research hypotheses were utilized for this study.

Research hypothesis one. There is a statistically significant difference in mean CSE scores between millennial students taught by the collaborative learning strategies and the millennial students taught by the lecture method in their senior year of an associate degree nursing program.

Research hypothesis two. There is a statistically significant difference in mean CSE scores between the millennial students taught by their preferred learning style and the millennial students taught by their nonpreferred learning style as indicated on the learning style preference assessment.

The statistical method for the research hypotheses was the analysis of covariance (ANCOVA). The covariance was a variable that removed variability or noise in the study (Trochim, 2005). The requirements for the ANCOVA consist of one or more categorical independent variables, continuous dependent variable, and covariate (Polit & Beck, 2008). The independent variables consisted of pedagogical methods; collaborative or lecture; and learning style preference scores for the visual, auditory, tactile, individual,

and group. The dependent variable was the student's overall CSE score. The continuous covariate consisted of the student's cumulative GPA reducing the effect of the CSE scores. The consideration of each student's academic achievement may create an effect on the CSE scores. This may suggest students with higher GPAs will score higher on the CSE and vice versa. In order to decrease the risk of a Type I error, a post hoc analysis may be applied using the Bonferroni correction procedure.

Limitations

As with any study, there were possible factors that may challenge the validity of inferences. These factors could limit the validity of a study unless strategies are utilized to maintain the rigor of the research design (Polit & Bech, 2008). For this study, strategies were used to minimize threats to internal and external validity.

Threats to Internal Validity

Internal validity refers to the degree of which it can be inferred that the experimental treatment rather than uncontrolled, extraneous factors caused the observed effects (Polit & Beck, 2008). For this study, multiple group threats are of concern because there is a comparison between two groups. Threats to internal validity include selection-history and selection-maturation.

Selection-history threat. Selection threat occurs when there is more than one group of participants in the study and there is not random assignment (Neuman, 2012). The selection threat was present because the groups might differ in some way (Polit & Beck, 2008). An assumption was made that the two groups differed only by the primary type of pedagogy received: lecture or collaborative. The history threat was the way the students differ in reactions to events that transpired during the time of the study

(Trochim, 2005). For example, each group may experience both pedagogies, collaborative and lecture, during the program having a diffusion effect. However, experiences were relatively different with the remarkable change in pedagogy shifting away from lecture method in the revised curriculum. The revised curriculum course syllabi indicated a change in pedagogy with the theoretical component being student-centered with an engaging, interactive, learning-centered environment.

To control the selection-history threat, homogeneity and statistical control procedures were utilized in the study. Homogeneity consisted of sampling millennial senior students into their respective groups based on primary pedagogical methods. An additional control was to exclude students who were repeating the course. Students who repeated the course would have been exposed to the comprehensive examination resulting in potential elevation of the examination score.

Another potential selection-history threat was the researcher's knowledge of prospective participants in the senior nursing course. This possible threat was minimized because the course was team taught by six other nurse educators; therefore limiting the students' exposure to the researcher. In addition, student grades were not impacted by the study. Final course grades were received prior to the administration of the CSE.

Selection-maturation threat. Selection-maturation threat results from differential rates of normal growth between the groups or normal ongoing developmental processes (Trochim, 2005). The selection-maturation was a concern because there are varying degrees of students' academic ability working towards higher levels of achievement producing higher examination scores (Anderson et al., 2010; Lee, 2010).

To control the selection-maturation threat, statistical control was utilized in the data analysis procedures. The cumulative GPA was the covariate in the statistical analysis to minimize the effects of students with higher achievement levels than those with lower achievement levels. In addition, only the students' first attempt on the standardized comprehensive examination was utilized in determining scores.

Threats to External Validity

Potential threats to external validity may surface when researchers draw incorrect inferences from the sample data to other people, settings, and past or future situations (Creswell, 2009). The potential threat in this study included interactions between relationships and people (Polit & Beck, 2008). The interaction between relationships and people refers to the effect observed with certain types of students that might not be observed with other types of students (Polit & Beck, 2008). The specificity of using only millennial nursing students in a small associate degree nursing program may create an issue with generalizability. The ability of the study results to reflect a larger population will have to be explored (McIntire & Miller, 2007). Due to the minimal amount of nursing research on examining millennial students and learning styles, more research is necessary to examine the outcomes of the utilization of different pedagogies.

Chapter Summary

The quasi-experimental research study examined millennial students' preferred learning styles and their impact on academic achievement in an associate degree nursing program. Approval from the respective IRBs was obtained prior to implementation. The study incorporated students who have graduated and those currently enrolled in the senior course. An information session was provided to distribute study information and obtain

consent from those students who wished to participate. After permission was granted from ATI, the instruments utilized were the standardized comprehensive examination and the self-assessment inventory. The instruments were considered valid and reliable. The quantitative and descriptive statistical analysis was performed utilizing SPSS version 20.0. Even though there were limitations to the study, the results provide evidence on the impact on millennial students' academic achievement outcomes. As a result, study findings confirm the need for evidence-based teaching practices benefiting millennial students.

Chapter Four

Results

The rapid changes in the healthcare setting and the arrival of millennial students have accelerated the need for educational research. The requirements of interprofessional collaboration in the healthcare setting have created a heightened awareness by nurse educators for the need of evidence-based teaching practices (Gierman-Riblon & Salloway, 2013). Traditional teaching practices have caused limited exposure to teamwork and collaboration decreasing the students' ability to effectively communicate and work in groups (Benner et al., 2010). However, millennial students are known to have a different learning style than other generations (Howe & Strauss, 2007). If nurse educators provide evidence-based interprofessional educational strategies, these students' overall nursing knowledge and collaborative behaviors can flourish. The purpose of this quasi-experimental study was to examine if there was an improved retention of knowledge in millennial students who were taught by collaborative learning strategies compared to retention of knowledge in millennial students who were taught by the traditional lecture method in an associate degree nursing program. Additionally, the study examined if learning by the students' preferred style resulted in a higher level of achievement on a CSE than learning by a nonpreferred style.

The study began with the IRB from Nova Southeastern University and TriHealth granting permission to conduct the quantitative research study. The study's population was comprised of senior students in an associate degree nursing program enrolled during the years 2011 and 2012. The population was determined based on a nonprobability purposive sampling strategy. There were 184 potential participants for the study. The inclusion criteria consisted of enrollment in the senior course, age, and normal progression. The age eligibility requirement was significant to capture the millennial student which excluded 30% of the sample. The eligible participants ($N = 128$) were placed into groups based on the primary pedagogy methods utilized by the course faculty members during those years. Lecture pedagogy was emphasized in 2011 and collaborative pedagogy in 2012.

Those eligible students who graduated in 2011 and spring 2012 were not contacted for informed consent due to practicality. The fall 2012 students ($n = 40$) were invited to attend the informational session regarding participation in the study through the college e-mail system. Ninety-eight percent ($n = 39$) provided informed consent. The only student who declined consent knew the eligibility criteria would not have been met based on normal progression.

Data Cleaning

The data analysis plan was a systematic organization and synthesis of research data. The data process collection process began after all eligible participants graduated from the college. Retrospective data collection began in the password protected, encrypted college database. Data including the age, CSE scores, GPA, and learning style preference were entered, coded, and de-identified. Given that data entry was prone to

error, data for the age, GPA, and CSE scores were verified and checked for mistakes through visual inspection of frequency distributions and histograms.

The histogram for age is displayed in Figure 2. Because the study consisted of millennial students between 18 and 32 years of age, no outliers were identified in the sample.

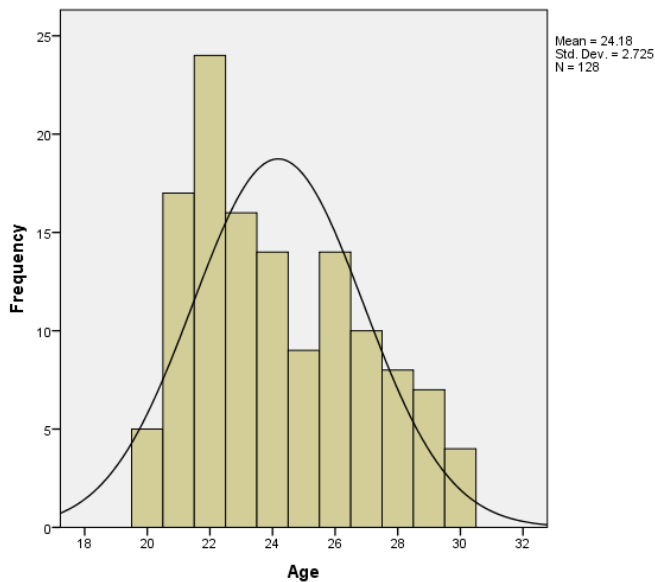


Figure 2. Age of the sample.

The CSE or comprehensive predictor (CP) scores were visually inspected for outliers as displayed in Figure 3. There was an appearance of outliers on the low and high ends of the distribution. Those values were verified for accuracy as legitimate scores.

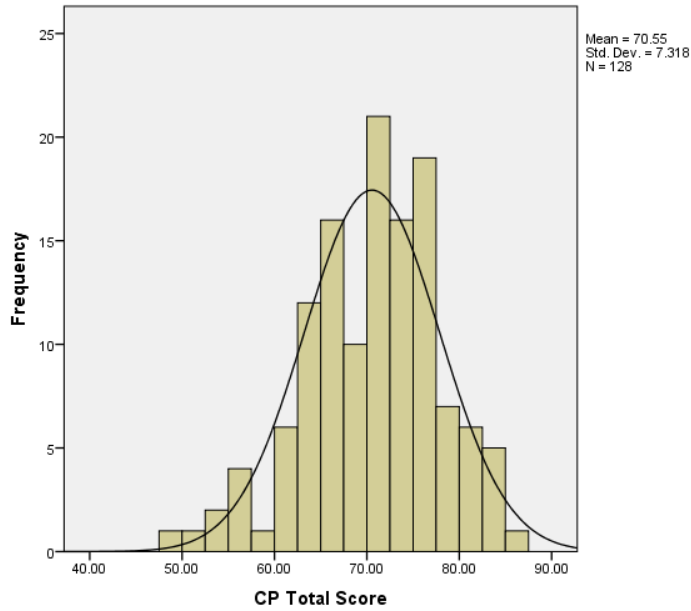


Figure 3. CSE scores of the sample.

In addition, cumulative GPA was utilized to lessen the impact of outliers for the hypothesis testing. The cumulative GPA was also visually inspected through the utilization of a histogram in Figure 4. There was the appearance of an outlier with a student's GPA at 4.0. This outlier was checked and verified for accuracy.

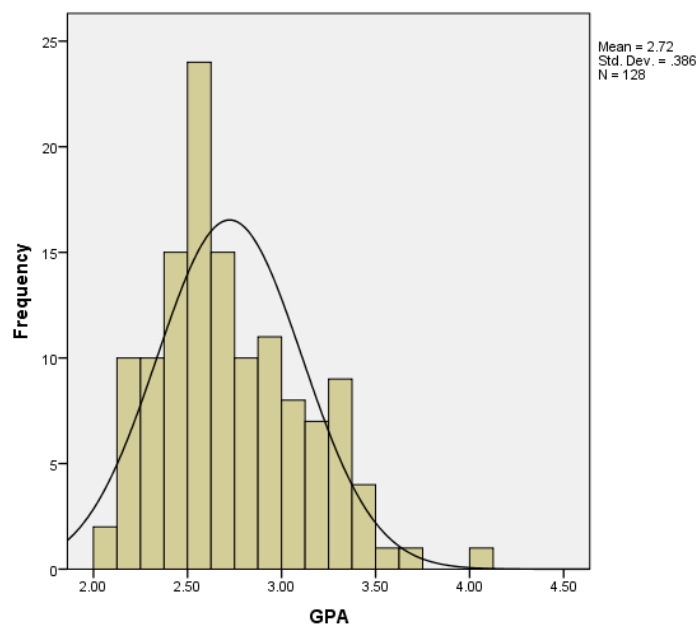


Figure 4. Grade point average of the sample.

Based on the data cleaning methods, all values were checked and verified for accuracy. The data cleaning procedures confirmed the data entry process was precise to conduct the statistical methods.

Descriptives

The overall characteristic of the sample ($N = 128$) was primarily Caucasian female. There were 95% female ($n = 121$) and 5% male ($n = 7$). The sample had some diversity with 91% Caucasian ($n = 117$), 8% African American ($n = 10$), and 1% Asian ($n = 1$). The characteristics of the sample are described by pedagogy type for each group and subgroup based on the semester. The description of the sample and the responses to the measurements are included in the findings.

Description of the Lecture Pedagogy Group

Students enrolled in the spring and fall semester of 2011 ($n = 98$) received the lecture pedagogy method. Those students meeting the eligibility requirements, 74.4% (n

= 73), were asked to participate in the study. Of those participants, 95% were female ($n = 69$) and 5% ($n = 4$) were male. The lecture group was diverse with 92% Caucasian ($n = 67$) and 8% ($n = 6$) African American. Because the lecture group was comprised of two semesters, sample characteristics will be presented to reflect those semesters.

Spring. There were 54 potential participants in the spring semester. Seventy-two percent ($n = 39$) were eligible to participate in the study. The remaining 28% of the students ($n = 15$) were excluded due to age. The characteristics of this 100% female group are displayed in Table 1. Although lacking gender diversity, 92% were Caucasian ($n = 36$) and 8% were African American ($n = 3$). The participants' age had a median of 24 years and mode of 21 years of age. Only 13% ($n = 5$) of the participants' GPAs were 3.0 or above. The CSE scores for this group had the lowest mean and largest standard deviation.

Table 1

Demographic Characteristics of Spring 2011 Participants ($n = 39$)

	<i>M</i>	<i>SD</i>	Range
Age	23.62	2.66	20-28
GPA	2.62	0.34	2.14-3.44
CSE Scores	64.73	6.47	52.70-77.30

Fall. There were 44 potential participants in the fall semester. Seventy-seven percent ($n = 34$) of the fall semester's class were eligible to participate in the study. Twenty-three percent ($n = 10$) of the students were excluded due to age. Of those excluded, one student was excluded for both age and not making normal progression. This class was comprised of 88% female ($n = 30$) and 12% male ($n = 4$). The ethnicity of

this group was 91% Caucasian ($n = 31$) with 9% African American ($n = 3$). The characteristics for this group are depicted in Table 2. The participants' age had a median of 25 years and mode of 23 years of age which is slightly older than the spring group. The participants' GPAs were widely distributed with 24% ($n = 11$) of participants' GPAs 3.0 and above. This group had the highest mean CSE scores.

Table 2

Demographic Characteristics of Fall 2011 Participants ($n = 34$)

	<i>M</i>	<i>SD</i>	Range
Age	24.79	2.29	21-29
GPA	2.77	0.46	2.09-4.00
CSE Scores	75.08	6.01	62.70-86.70

Description of the Collaborative Pedagogy Group

There were 86 potential participants who received the collaborative pedagogy in the spring and fall semesters of 2012. Sixty-four percent ($n = 55$) were eligible for the collaborative pedagogy group and 36% ($n = 31$) were excluded due to age. This group consisted of 95% female ($n = 52$) and 5% ($n = 3$) male. The collaborative group was also diverse with 91% Caucasian ($n = 50$), 7% African American ($n = 4$), and 2% Asian ($n = 1$).

Spring. This semester had 46 potential participants. Sixty-five percent ($n = 30$) of the students in the spring semester were eligible to participate in the study. Thirty-five percent ($n = 16$) of the students were excluded due to age. One of those students was excluded for both age and not making normal progression. The gender of this class was 97% ($n = 29$) female and 3% ($n = 1$) male. The ethnicity was 97% Caucasian ($n = 29$)

and 3% Asian ($n = 1$). The characteristics for this group are identified in Table 3. The median age of the participants was 25 years and mode of 21 years of age. Thirty percent ($n = 9$) of the participants' GPAs were 3.0 and above. This group had the widest range of all CSE scores.

Table 3

Demographic Characteristics of Spring 2012 Participants ($n = 30$)

	<i>M</i>	<i>SD</i>	Range
Age	23.60	2.84	20-30
GPA	2.80	0.37	2.13-3.35
CSE Scores	70.25	6.44	48.00-78.00

Fall. Informed consent was required for this class because the students were enrolled in the course when IRB approval was granted. Forty students were enrolled in the course when the informational session was being held. Informed consent was obtained from the 39 students who attended the informational session. Only one student did not provide consent for the study because the student knew eligibility criteria would not have been met for normal progression.

Sixty-three percent ($n = 25$) of the students were eligible to participate; the remaining 37% ($n = 15$) students were excluded due to age requirements. This group comprised 92% ($n = 23$) female and 8% ($n = 2$) male participants. The participants' ethnicity was 84% Caucasian ($n = 21$) and 16% African-American ($n = 4$). The characteristics of this group are identified in Table 4. The participants' age had a median age of 25.5 and mode of 22 years of age which is slightly older than the other groups.

Forty percent ($n = 6$) of the participants had a GPA at 3.0 and above. This group had the second highest CSE scores with the smallest standard deviation and range.

Table 4

Demographic Characteristics of Fall 2012 Participants (n = 25)

	<i>M</i>	<i>SD</i>	Range
Age	24.92	3.00	21-30
GPA	2.75	0.35	2.21-3.69
CSE Scores	73.81	4.67	64.70-83.30

Responses to the Measurements

The variable characteristics of the study include a review of the dependent variable CSE scores and independent variable learning style preferences for each group. Both of these variables have subscales which provided valuable information on the group characteristics for the millennial learners. An independent t test was conducted to identify significant differences between group means (lecture and collaborative groups).

The CSE was utilized to evaluate the participants' overall academic achievement and retention of knowledge. The instrument utilized was the ATI CP assessment. This standardized assessment has multiple subscales with corresponding scores of percent correct for each pedagogy group as described in Table 5. The table represents scores for comparison on academic achievement and retention of knowledge for both groups. Overall, the collaborative group had higher mean scores on every subscale in the assessment indicating academic achievement levels. The basic care subscale, which is fundamentals, had the lowest mean scores of all subscales by both groups representing the retention of knowledge.

Table 5

Descriptives of the CSE Subscales by Pedagogy

Pedagogy Method		<i>n</i>	<i>M</i>	<i>SD</i>	<i>p</i>
CSE-Total Score	Lecture	73	69.55	8.11	0.07
	Collaborative	55	71.87	5.93	
CSE-Management	Lecture	73	74.55	11.41	0.12
	Collaborative	55	77.32	8.40	
CSE-Safety	Lecture	73	67.32	10.90	0.09
	Collaborative	55	70.82	11.66	
CSE-Health Promo.	Lecture	73	68.78	15.23	0.85
	Collaborative	55	69.21	11.17	
CSE-Psych.	Lecture	73	66.68	12.36	0.14
	Collaborative	55	69.91	11.77	
CSE-Basic Care	Lecture	73	66.47	15.66	0.93
	Collaborative	55	66.70	14.12	
CSE-Pharm.	Lecture	73	69.18	11.02	0.08
	Collaborative	55	72.50	9.81	
CSE-Risk Mgt.	Lecture	73	66.64	13.02	0.10
	Collaborative	55	70.36	12.17	
CSE-Physiology	Lecture	73	71.96	12.69	0.87
	Collaborative	55	72.30	10.93	

Responses to the Learning Style Preferences

The participants' learning styles preferences were indicated by the Self-Assessment Inventory administered to the students upon entering the college. Only 72% ($n = 92$) of the eligible participants ($N = 128$) completed the Self-Assessment Inventory. The assessment was completed by participants in both groups; lecture group, 47% ($n = 43$) and collaborative group, 53% ($n = 49$).

The Self-Assessment Inventory provided subscale information on other types of learning styles including visual, auditory, tactile, group, and individual. The subscale information provided beneficial information regarding characteristics of the millennial learners in the study. Overall, both pedagogy groups identified the visual learning style as their preferred learning style method as indicated by higher mean scores in Table 6. The participants' second highest learning style preference is the tactile or hands-on approach to learning. The individual style of learning or lecture method had higher mean scores than the group method which seems contradictory to the auditory method having the lowest mean scores from both groups. An independent *t* test was conducted to identify any significant means on the learning style subscales. No significance was detected as presented in Table 6.

Table 6

Descriptives of Participants' Learning Style Subscales of Each Pedagogy Method

Learning Style	Pedagogy	<i>n</i>	<i>M</i>	<i>SD</i>	<i>p</i>
Visual	Lecture	43	7.13	.95	0.73
	Collaborative	49	7.07	.87	
Auditory	Lecture	43	5.97	1.16	0.28
	Collaborative	49	5.71	1.10	
Tactile	Lecture	43	6.44	1.02	0.37
	Collaborative	49	6.63	1.06	
Group	Lecture	43	5.90	1.14	0.72
	Collaborative	49	5.99	1.16	
Individual	Lecture	43	6.68	1.11	0.30
	Collaborative	49	6.44	1.11	

These participants identified which pedagogy style they preferred based on their Likert-scale answers. Table 7 represents the mean CSE scores of the 92 participants based on their preferred learning style regardless of which pedagogy type they received. Overwhelmingly, 66% of the participants ($n = 61$) preferred the lecture method. Thirty-four percent ($n = 31$) of the participants preferred collaborative or group learning techniques.

Table 7

Descriptives of Participants' Learning Style Preference With GPA and CSE Scores

Preferred Pedagogy Method	n	GPA	M CSE Score
Lecture	61	2.85	72.73
Group	31	2.61	69.68

These 92 students were categorized based on consistency between pedagogy method received and their expressed preferred pedagogy style. Table 8 represents whether the pedagogy method received was consistent or inconsistent with their preferred learning style. As noted in Table 8, only 50% ($n = 46$) of the students received pedagogy consistent with their preferred learning style.

Table 8

Descriptives of Participants' Learning Style With Pedagogy Method Received

Consistency With Learning Style	Pedagogy Method Received		Total
	Lecture	Group	
Consistent	29	17	46
Inconsistent	14	32	46
Total	43	49	92

The descriptives of the CSE scores based on consistency between pedagogy method received and preferred pedagogy style are displayed in Table 9. Interestingly, the CSE mean was slightly higher in the group who received their nonpreferred pedagogy method.

Table 9

Descriptives of CSE Scores Based on Learning Style Preference With Pedagogy Received

Pedagogy Consistent with Learning Style	<i>n</i>	<i>M</i>	<i>SD</i>
Consistent	46	71.28	8.09
Inconsistent	46	72.13	5.72
Total	92	71.70	6.98

Reliability Testing

The reliability of the instruments examined how dependable and consistent the results were for this study. The instruments utilized in this study were copyrighted by the testing company. Specific student responses to the items for the instruments were not readily accessible. However, comparison was made based on the CSE instrument's national and program mean scores as illustrated in Table 10. The national mean scores were based on all entry-level nursing programs and the program mean scores are for only associate degree nursing programs. These mean scores were considered a reliability measure as the CSE scores remained consistent over the semesters.

Table 10

CSE Scores for Each Semester Compared to National and Program CSE Scores

	CSE	National	Program
2011 Spring: Lecture	64.73%	69.7%	70.2%
2011 Fall: Lecture	75.08%	69.7%	70.2%
2012 Spring: Group	70.25%	69.7%	70.2%
2012 Fall: Group	73.81%	69.7%	70.2%

Hypothesis Testing

In order to ensure accurate data analysis, ANCOVA assumptions must be met. The data for the entire sample ($N = 128$) were examined for meeting the assumptions of normality, linearity, homogeneity, and existence of interaction effect due to sample size of the individual groups. Additionally, between-group analysis was performed as opposed to within-group analysis because the study was not examining interactions within groups. The two hypotheses were analyzed for main effect interactions.

Assumption of Normality

The ANCOVA assumes the dependent variable and the covariate are both normally distributed based on the criteria of skewness and kurtosis. Skewness and kurtosis values falling within the range of -1.0 to 1.0 meet the assumption of normality (Morgan, Leech, Gloeckner, & Barrett, 2013). The entire sample's skewness value (-.472) and kurtosis value (0.277) suggested the CSE scores were normally distributed and the assumption was met.

Assumption of Linearity

The covariate and the dependent variable must show a linear relationship to avoid violating an ANCOVA assumption (Munro, 2005). The linear relationship was determined by the Pearson Correlation between the GPA (covariate) and the CSE scores (dependent variable). The correlation coefficient ($r = 0.50, p = .00$) suggested a significant perfect positive relationship between the GPA and CSE scores. Statistical significance for the linear relationship met the assumption for the ANCOVA which will assist in strengthening the power of the statistical analysis.

Assumption of Homogeneity of Variance

The ANCOVA assumes the variance of the dependent variable is homogeneous as determined by the Levene's test for equality of variance. A nonsignificant Levene's test suggests variances are equal and the assumption has been met (Pallant, 2001). In this study, Levene's test produced a nonsignificant value suggesting equal variances are assumed $F(1, 126) = 2.67, p = .105$. The assumption of homogeneity was met.

Assumption of Homogeneity of Regression Slopes

The final assumption of homogeneity of regression slopes must be met prior to conducting an ANCOVA. This assumption is that there is no interaction between the covariate (GPA) and the independent variable (Munro, 2005). There were two independent variables in this study: pedagogy method received and preferred learning styles consistent or inconsistent with pedagogy method received.

In testing for the interaction, a one-way analysis of covariance was utilized to test the interaction of the independent variables. The result of the independent variable analysis produced nonsignificant results between the interaction of the main effect

(pedagogy method) and covariate (GPA). Assumption of homogeneity of regression slopes was met $F(1, 127) = 1.77, p = .19$.

The one-way analysis of covariance result of the independent variable also produced nonsignificant results between the interaction of the main effect (learning style consistent or inconsistent with pedagogy received) and covariate (GPA). Thus, assumption of homogeneity of regression slopes was met $F(1, 91) = 2.62, p = .11$.

Existence of an Interaction Effect

The interaction effect is how much of the variance in the dependent variable is explained by the independent variable (Munro, 2005). However, the effect size is small with only 1.3% of the CSE scores explained by the pedagogy method.

The ANCOVA was an appropriate statistical method to test the two hypotheses for this study. The main effect results of the ANCOVA will be presented for each hypothesis.

Hypothesis One

The ANCOVA was conducted to examine if a statistically significant difference existed in the mean CSE examination scores between millennial students taught by collaborative learning strategies and millennial students taught by the lecture method. The independent variable was the type of pedagogy method, the dependent variable was the CSE scores, and covariate was GPA as displayed in Table 11. This table indicated the adjusted CSE means based on the covariate $GPA = 2.72$.

Table 11

Adjusted Mean CSE Scores With Controlled GPA and Pedagogy Method

Pedagogy Method	<i>n</i>	<i>M</i>	Std. Error	95% Confidence Interval	
				Lower	Upper
Lecture	73	69.91	.74	68.44	71.39
Collaborative	55	71.39	.86	69.70	73.09
Total	128	70.65	.57	69.53	71.77

The analysis of covariance is displayed in Table 12 indicated the GPA was a statistically significant covariate ($p = .000$). After controlling for GPA, there was not a statistically significant difference in mean CSE scores between the collaborative and lecture pedagogy groups $F(1, 125) = 1.68, p = .197, \eta^2 = .01$. There was a small relationship between the GPA and the CSE scores as indicated by an eta squared value of .244. Because the main effect was not statistically significant and there was only one independent variable, a post hoc analysis was not indicated. Therefore, the data from the study failed to reject the null hypothesis.

Table 12

Analysis of Covariance of CSE Scores Between Lecture and Collaborative Pedagogy With GPA as Covariate

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
Covariate GPA	1	1618.59	1618.59	40.35	.000	.24
Pedagogy	1	67.55	67.55	1.68	.197	.01
Error	125	5014.59	40.12			
Total	128	643881.79				
Corrected Total	127	6801.18				

Hypothesis Two

The ANCOVA was conducted to determine if there was a statistically significant difference in mean comprehensive examination scores between millennial students taught by their preferred learning style and millennial students taught by their nonpreferred learning style as indicated on their learning style preference assessment. The Self-Assessment Inventory determined the participants' preference based on their Likert-scale answers. The participants were identified as group or individual learners based on the higher score preference. The students who scored higher on the group learning items were placed into the collaborative group and those who scored higher on the individual learning items were placed into the lecture group. The distribution of the sample ($n = 92$) was equally matched between participants who received instruction in their preferred style and participants who received instruction in their nonpreferred style—46 students in each of the two groups, as displayed in Table 13. This table also represented the adjusted CSE mean scores with $GPA = 2.77$.

Table 13

Adjusted CSE Mean Scores With Controlled GPA and Learning Style Preference

Pedagogy with Learning Style	<i>n</i>	<i>M</i>	Std. Error	95% Confidence Interval	
				Lower	Upper
Consistent	46	71.60	.89	69.83	73.37
Inconsistent	46	71.81	.89	70.04	73.58
Total	92	71.70	.63	70.46	72.95

The analysis of covariance was conducted as displayed in Table 14. After adjusting for the significant covariate GPA, there was no significant difference in mean CSE scores between those participants taught by their preferred pedagogy method and those participants taught by their nonpreferred pedagogy method, $F(1, 89) = .03, p = .87$,

eta squared = .00. Therefore, data from the study failed to reject the null hypothesis.

There was a small relationship between the GPA and the CSE scores as indicated by an eta square value of .27.

Table 14

Analysis of Covariance of CSE Scores With Learning Styles Consistent and Inconsistent With Pedagogy Method, With GPA as Covariate

Source	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>p</i>	η^2
GPA	1	1188.10	1188.10	32.71	.00	.27
Consistent Learning Style	1	.97	.97	.03	.87	.00
Error	89	3232.29	36.32			
Total	92	477456.34				
Corrected Total	91	4437.10				

Chapter Summary

This research study focused on millennial learners who were enrolled during the 2011 and 2012 years. The emphasis on pedagogy methods and academic achievement were evaluated utilizing the statistical method ANCOVA. The ANCOVA was deemed to be the correct statistical method based on testing of the assumptions which were met. The participants' characteristics of the sample identified several differences between the groups such as age, GPA, and CSE scores. The participants' CSE total scores and subscale values differed between the groups with the collaborative group having higher mean scores in all areas. The most interesting was the participants' learning style preferences. Both groups had higher mean scores in the visual learning style subscale.

The hypothesis testing found nonsignificant results for both hypotheses.

However, the GPA proved to be a significant covariate controlling for the variation in

CSE scores. The participants' learning styles were also found to be insignificant factors in CSE scores for academic achievement. Even though the research hypotheses were not significant, results for this study have significant findings for discussion on educating millennial learners in the future. The importance of creating an academic environment promoting interprofessional education with varied teaching strategies is essential for advancing the nursing profession. Collaborative learning encourages students to learn from each other while discovering new ideas which form cooperative attitudes and behaviors for successful interprofessional teamwork (Gierman-Riblon & Salloway, 2013).

Another important finding for the future of nursing education is the consideration of utilizing varied teaching strategies. Millennial students require intensive educational interventions by nurse educators. These students are able to learn at a rapid pace and expect learning to be entertaining, which is pleasing to their learning style (Herrman, 2008). This creative pedagogy often challenges nurse educators who are of a different generation. However, the ultimate goal of educating millennial students is to increase knowledge acquisition through evidence-based teaching practices that are appealing to this generation.

Chapter Five

Discussion and Summary

As the academic landscape continues to change, nurse educators need to adapt to the different learning styles of the millennial students. To ensure student success, nursing educational research needs to identify individual differences that influence learning, retention, and content mastery (Noble et al., 2008). The purpose of this quasi-experimental study was to examine if there was an improved retention of knowledge in millennial students who are taught by collaborative learning strategies compared to retention of knowledge in millennial students who are taught by the traditional lecture method in an associate degree program. Additionally, this study examined if learning by the students' preferred style resulted in a higher level of achievement on a CSE than learning by students' nonpreferred style.

This study was built upon the theoretical framework of Vygotsky's social constructivism theory. Vygotsky proposed the individual is inseparable from social interactions which influence cognitive development (Vygotsky, 1978). Collaboration and interaction develops the student's psychological abilities for learning (Cole et al., 1978; Powell & Kalina, 2009). The collaborative learning pedagogy being examined in this study is considered an essential attribute of the social constructivism theory. Although the data analysis did not statistically support the social constructivism theory, the study findings are discussed in the summary, integration, implications, and limitations.

Summary of the Findings

The analyses of the study's results do provide information regarding millennial students' characteristics, academic achievement, and learning styles. These results can assist nurse educators in effective pedagogical delivery for the success of millennial students. Even though the study results were inconclusive, differences in characteristics were found between millennial students in this associate degree nursing program.

The study found the majority of millennial students preferred lecture over collaborative or group-work pedagogy methods. Although there was a strong preference for the lecture (individual) method, millennial students who were in the collaborative group had higher academic achievement as evidenced by higher GPAs. These findings are noteworthy of the social constructivism theory suggesting collaboration and interaction develops students' psychological abilities for learning (Cole et al., 1978; Powell & Kalina, 2009). These millennial students in the collaborative group overall performed better on the CSE with higher scores in every subscale. These results may also indicate that collaborative learning promotes retention of knowledge because the CSE is a predictor of success on the RN licensing examination. However, caution should be given to these results because the fundamentals subscale, representing the first semester of nursing school, had the lowest subscale score for each pedagogical group.

Another important finding about millennial students' learning styles from the study suggests that being taught by one's preferred learning style is not imperative for academic achievement. These students adapted to the pedagogy method used regardless of their preferred style. Although the majority of students had a strong preference for the visual method, students indicated they also preferred the tactile method. These preferences suggest that students would most likely prefer to learn with a visually graphic

lecture with hands-on practice. Overwhelmingly, these students indicated they did not prefer group learning methods. The study findings may be integrated into the literature through convergence and divergence exploration.

Integration of the Findings With Previous Literature

The study results produced similarities and differences as evidenced from the literature review regarding millennial students, pedagogical methods, and learning styles. The integration of these study findings within the literature will be explored for further discussion.

Millennial Students

According to Howe and Strauss (2007), common characteristics of millennial students include being digital natives, high achievers, and team-oriented. However, the study found discrepancies between these common characteristics of the millennial students. These discrepancies may provide some insight into this generation on how they learn, which will assist them in being more successful in their academic endeavors.

These millennial characteristics seem to have a symbiotic relationship to academic success. In this study, only 24% of the study population had a GPA of 3.0 and above, which was contradictory to Howe and Strauss's (2007) findings that this generation was high achieving. These study findings may be a result of their academic readiness for college. According to Pardue and Morgan (2008), these students were considered to have weak study habits. These weak study habits may be due to the millennial students' tendency to multitask. Several studies have shown that a possible reason for lower achievement ability may be related to millennial students' multitasking and distractions from the digital media present in their lives, especially during class time.

In 2006, Wolpert found millennial participants who multitask while trying to learn had a reduced capacity to recall memories than those millennial participants who were not distracted while learning. More recently, Wood et al. (2012) found students who attended lectures and did not engage in digital technologies out-performed those students who utilized digital technologies for off-task activities. Although technology and multitasking are integral parts of millennial students, caution should be given when students multitask while trying to learn. Multitasking while learning increases the student's risk of learning at a slower pace and decreases long-term memory and retention of knowledge (McAlister, 2009).

Traditional Lecture Pedagogy

The impact on learning by pedagogical methods is also evident by the study results. The traditional lecture method continues to be the most utilized method by educators as a means to convey information. Although there are few studies to support or negate the lecture method's effect on significant academic achievement, these study findings have mixed results. Students who were in the lecture group had lower CSE scores than those students who were in the collaborative group. Interestingly, more students preferred the lecture method, and those students had higher mean CSE scores. The plausible factor in the study results could be that lectures were presented in a clear manner by experienced nurse educators who were able to establish relevance. Lectures that are clear, concise, and relevant were essential and expected by millennial students (Eschelmann, 2008; Feldon, 2010; Henry & Gibson-Howell, 2011; Walker et al., 2006). Most of the nurse educators in the college utilize PowerPoint presentations to enhance the key points as recommended by Susskind (2005). In addition, student response systems or

clicker technology may have been utilized by the nurse educators to supplement the lecture with positive student feedback (Fifer, 2012). Student response systems consist of an infrared or radio frequency signal connected to a computer in the classroom. The educator poses a question through the computer and the students submit a response by clicking the answer. The anonymous answers from the class are tabulated and displayed for discussion (Welch, 2012). The utilization of this strategy is congruent with Broussard (2012) and Revell and McCurry's (2010) findings to increase student engagement and level of knowledge. Through the congruencies of lectures with or without PowerPoint and clicker technology as individual activities, the missing element was the limitation of learning from peers (McCurry & Martins, 2010).

Collaborative Pedagogy

The students' level of knowledge attained is most important when considering the findings of this study in regard to collaborative learning pedagogy. The students' retention of knowledge and overall scores are higher in all CSE subscales. These findings support the social constructivism theory that peer discussion and active participation in a group setting assists with constructing knowledge (Vygotsky, 1978). Wittman-Price and Godshall (2009) also found active learning strategies promoted deep learning and produced higher standardized examination scores. Studies by Bhatia and Makela (2010) and Flanagan and McCausland (2007) found similar results with higher test scores when collaborative learning methods were utilized by educators. Although inferences can be made about the effectiveness of collaborative learning, caution should be applied. Like this study, other studies comparing the pedagogical methods have not produced significant differences in examination scores (Beers & Bowden, 2005; Johnson

& Mighten, 2005; Kapp et al., 2011; Stelzer & Coll-Reilly, 2010; Susskind, 2005). These studies do indicate that lecture alone is not the most effective teaching method for retaining knowledge. In addition, collaborative learning supports positive student outcomes through a better understanding of content and greater retention of knowledge, yielding higher academic achievement (Bhatia & Makela, 2010; DeYoung, 2009; McCurry & Martins, 2010). The question to consider is the impact of the students' learning style preferences on academic achievement.

Learning Styles

Learners are defined by their life experiences, beliefs, and values which shape how one learns and retains information referred to as learning style (Ard, 2009; Billings & Kowalski, 2004; Dunn & Dunn, 1978; Wellman, 2009). Millennial students' learning styles have been impacted by their experiences with technology and societal influences (Roberts et al., 2012). The study results are mixed with clear disparities between the millennial students' preferred learning style and the pedagogy received from the nurse educators. Surprisingly, these millennial students prefer the lecture method which was similarly evidenced by Lai et al. (2010) and Walker et al. (2006). A possible reason why some millennial students prefer lecture method is their preference to be told exactly what they need to know to obtain a high grade (Covill, 2011; Walker et al., 2006). This possible reason, which is consistent with the findings, is validated by S. A. Johnson and Romanello (2005) and also coincides with Howe and Strauss's (2000) sense-of-entitlement millennial characteristic. The sense of entitlement to a good grade does not equate to academic ability (Greenberger et al., 2008), which is evident by the lower CSE scores among those in this study who received lecture pedagogy.

Consistent with the findings in the literature, millennial students are found to have a commonality with learning style preferences. These students are found to prefer visual and tactile learning methods. This corresponds with the study by S. A. Johnson and Romanello (2005) that found students prefer a hands-on approach to learning.

As previously mentioned, millennial students are known to be team-oriented because they grew up playing in team-oriented sports (Howe & Strauss, 2007). The findings for this study did not indicate a learning style preference for group work as evidenced by that subscale item receiving one of the lowest scores on the self-assessment inventory. This finding is congruent with other studies' findings that students voiced complaints about utilization of active learning techniques (Eschelman, 2008; Ironside, 2005; Revell & McCurry, 2010; Rowles & Russo, 2009; Shultz, Wilson, & Hess, 2010; Smith-Stoner & Molle, 2010; Ward-Smith et al., 2010).

There are two noteworthy findings from this study regarding learning styles. The first finding is that though students may not have preferred collaborative learning, students who received collaborative learning instruction scored higher on their CSEs, suggesting learning does occur in a group environment. This finding also correlates with S. A. Johnson and Romanello's (2005) study that those millennial students who have difficulty with individualized thinking are more successful in a collaborative environment when group activities are utilized by nurse educators.

Historically, research has found students are able to adapt to the type of pedagogical method used by the nurse educator (Fleming et al., 2011; Rassool & Rawaf, 2008; Zoghi et al., 2010). The study findings suggest students have the ability to adapt to different pedagogical approaches regardless of learning style preference. This finding

coincides with Strayer and Beitz's (2010) study findings that no significant relationship exists between learning styles and levels of achievement. Additionally, the findings support Kolb's experiential learning theory that suggests learning is flexible and cyclic to allow growth of the learner (Kolb, 1984). Choi, Lee, and Kang (2009) also found evidence of students' adaptability to different learning environments regardless of learning style. These study findings do have implications for the future of nursing.

Implications of the Findings

The lack of empirical evidence found in this study is consistent with previous research. The significance of these findings offers implications for future pedagogical endeavors for nurse educators to ensure greater student academic achievement. The study results have implications relevant to nursing education, practice, research, and public policy. These results may propel nursing education towards the future in preparing successful graduate nurses who are competent to keep up with the rapidly changing healthcare environment.

Implications for Nursing Education

Previous research in nursing education has primarily focused on student learning preferences and teaching methods. Even fewer studies have been conducted on learning outcomes. This study has several implications for successful teaching and learning of millennial students combining pedagogical methods and learning styles. Although not conclusive, nurse educators need to maintain students' involvement in the learning process to promote successful academic achievement. Assessing students' learning styles prior to them entering the nursing program supports creating a learner-centered environment (Marek, 2013). A nurse educator needs to employ more than one style of teaching method within the classroom to ensure students are engaged in the learning

process. When students are not engaged and bored, they tend to become distracted, interfering with successful learning (Jenkins, 2010; Papp & Matulich, 2011).

This study suggests nurse educators need to keep lectures to a minimum and increase the utilization of collaborative learning activities to keep students engaged. A teaching method that will incorporate many student learning style preferences of tactile learning and capture their digital native characteristic in a collaborative environment is simulation. Other examples to consider are case studies, group activities, and problem-based learning scenarios. The utilization of different teaching techniques reflective of student learning styles will expand the students' ability to reach academic success (Marek, 2013). Regardless of class content and size, multiple learning style preferences should be accommodated to connect with millennial students arriving on the college campus (Carson, 2009; Wright, 2003).

Implications for Nursing Practice

The study produced findings that apply to nursing practice beginning with nursing education. The study supports the shift in pedagogical methods to intensify group learning activities in nursing education preparing students for working in a multi-generational workforce (Barcelona & Rockey, 2010; Utley-Smith, 2004). These experiences will facilitate the graduate student's transition into the diverse healthcare environment (ANA, 2010). Benner et al. (2010) suggest students who can work collaboratively will promote positive patient outcomes. The graduate student's ability to learn and work in teams is significant to interprofessional and interdisciplinary collaboration to meet patients' healthcare goals (Garrett, 2012; Watson, 2011).

The IOM (2013) and Healthy People 2020 (United States Department of Health and Human Services, 2013) identify health communication by nurses as an essential attribute for providing effective nursing care. Interprofessional education can assist in meeting patients' goals by improving communication techniques and group processes. This technique can aid students in overcoming communication barriers that they may encounter in nursing practice. Nurses who can bridge communication gaps and problem solve can improve patients' access to quality and safety healthcare (Blais & Hayes, 2011; Cronenwett et al., 2007; IOM, 2013).

Implications for Nursing Research

Because this study did not produce significant results, the need for further research is imperative. The findings of this study supply the nurse educator with information to formulate changes in pedagogical practices to promote positive student outcomes. Research on millennial students is just coming to fruition. Understanding how millennial students learn based on their preferences can assist nurse educators with the integration of student-centered and engaging learning strategies into pedagogical design (Carson, 2009).

The scholarship underlying nursing education requires exploration to identify the most effective, evidenced-based teaching practices (Emerson & Records, 2008). The NLN is leading the reform of nursing education through research. To advance the science of nursing education, research designs must include replication of studies on assessment of student learning at multiple sites (NLN, 2011). To build a greater foundation of evidence, research needs to link nursing education with the practice environment (Hofler, 2008). One example might be research on evaluating the

effectiveness of interprofessional education and practice (NLN, 2011). This initiative of research is becoming more prevalent as changes in society and healthcare delivery continue to redefine the role of the nurse (Blais & Hayes, 2011).

Implications for Public Policy

Although the ability to effectively communicate has been at the forefront for many years, heightened awareness in public policy at the national level remains steadfast due to the trends in healthcare. Hofler (2008) identifies national entities that have worked over the past decade to examine issues pertaining to the nursing profession, which includes nursing education. The need for nursing educational reform is being influenced by the need to develop future nurses who are able to provide safe and effective care through collaborative practices (Allen, 2010; Cronenwett et al., 2007; IOM, 2013).

The ANA (2010) is focused on establishing good working relationships in the nursing profession and healthcare settings. The implication of nurse educators supporting collaborative learning methods is momentous with cultivating future nurses' ability to effectively communicate. Students who are exposed to collaborative learning activities will establish effective collaboration and communication skills with enhanced ability to listen attentively to varying viewpoints (Nayan et al., 2010). These future nurses with collaboration skills will be instrumental in providing healthcare literacy to society. As the Affordable Care Act (ACA) is enacted, consumers will be seeking information from professionals to make informed decisions regarding healthcare coverage (Oberlander, 2010). These nurses, as teachers, will be able to communicate effectively to all types of learners with exposure during their educational process.

Limitations

Prior to conducting this study, internal and external threats were identified and controlled. Despite the efforts to conduct rigorous research, several limitations exist. The actual threats to internal and external validity will be examined to substantiate the study findings.

Threats to Internal Validity

The internal validity threats that occurred in this study consisted of selection-history and selection-maturation. These threats were controlled by the researcher to minimize the limitations and prevent jeopardizing the results of the study.

Selection-history threat. There were a few selection-history threats of consideration. Even though there was a shift in pedagogical style for the collaborative group, the threat that students were exposed to both pedagogical methods during the program was of concern. This selection-history threat may have influenced the students' CSE scores depending on the pedagogical methods of the nurse educators. The college syllabus provided evidence indicating a change in pedagogy, with less emphasis on lecture, for the collaborative group. However, this threat could not be controlled by the researcher. A recommendation for the future is to interview nurse educators regarding pedagogical methods utilized in the classroom for millennial students.

Another potential factor was the exposure of both pedagogical methods on the learning styles preference assessment. This was controlled because students completed the learning style preference assessment within the first eight weeks of entering the college. Because the placement of the learning style assessment was early, there was not an influence on students' preferred pedagogical methods. Previous research has found

students' learning styles change over time, and they adapt to differences in pedagogical methods (Zoghi et al., 2010). A recommendation to examine the change in students' learning style preferences is to include the completion of the self-assessment inventory at the end of the program.

The final selection-history threat was the lack of randomization. The researcher utilized the nonprobability purposive sampling, which prevented the ability to detect differences between the observed sample and the total population (Polit & Beck, 2008). Even though the sample size was 128 participants, the two groups were homogenous because of the specific population being studied, millennial students. The lack of randomization was controlled through the inclusion and exclusion criteria eliminating any students who were repeating the course preventing an elevation in the CSE scores.

Selection-maturation threat. The selection-maturation threat was a result of students with varying degrees of academic ability. This threat was statistically controlled with the students' GPA. The GPA was found to be a significant factor in the CSE scores between the pedagogical groups.

Threats to External Validity

The immense threat to this study was on external validity. The limitation of generalizability was threatened primarily due to features of the sample including size and representativeness. The power analysis calculated a sample size necessary for this study as 81 per group. However, smaller class sizes and eligibility criteria resulted in a reduced number of participants and unequal group sizes. This ultimately affected the study's power which could not have been rectified. There was hesitancy to incorporate classes

prior to 2011 and post 2012 due to alterations in the course format and changes in the CSE blueprint.

The other concern related to generalizability was the representativeness of the sample. This study was exclusive to millennial students at one associate degree nursing college. Therefore, the study results may not be representative of other students and other nursing programs. In view of the fact that the study results do not reflect a large population, research utilizing larger sample sizes with millennial students is necessary to examine the effects of pedagogical methods on academic achievement.

Recommendations for Future Research

A recommendation for the future is to continue the exploration of millennial students' learning style characteristics and academic achievement. Adding a qualitative component to this study could provide more information to support or negate findings regarding collaborative learning and learning styles. As with any Likert-type survey, the responders are not able to reveal their reasons why they chose a certain answer to the statement. Providing open ended questions could facilitate more depth to their thoughts and perceptions regarding pedagogical methods. This further exploration may provide some information on how the students' learning styles have changed through the educational process and what influenced the change in learning style preference along with the impact on academic achievement. Could a possible reason for changes in the students' learning style preference be influenced by the preferred methods of the nurse educators?

An additional recommendation is to incorporate nurse educators into the study. Nurse educators should be interviewed or surveyed to determine their own preferences of

teaching methods and what influences their educational philosophies. Information from the nurse educators could be compared and contrasted with the millennial students' learning style characteristics.

Other research on millennials is necessary to assist in building the body of science in nursing education for evidence-based teaching practices. Further exploration on how interprofessional education has impacted nursing practice would be beneficial for the healthcare industry. With the increased emphasis on collaboration and teamwork in all facets of nursing education, evidence to support these efforts need to be substantiated through research. For example, graduate nurse and employer surveys could assist in documenting whether interprofessional education prepared the nurse for the work environment. In addition, employers could identify a change in patient care outcomes with regard to quality and safety, which may have global significance as trends in healthcare continue (Blais & Hayes, 2011).

Chapter Summary

Millennial students are known to be collaborative in nature supporting the social constructivism theory for learning. The social nature of collaborative learning occurs when students have the opportunity to dialogue and deliberate differing perspectives to reach a socially constructed knowledge (Ioannou & Artino, 2010; Kabes et al., 2010; Sandal, 2009). In efforts to validate this theoretical framework, a quasi-experimental research study was conducted. The study did not produce significant evidence that pedagogical methods and learning styles were essential to students' academic success. However, the study findings did produce worthy discussion of millennial students' characteristics, pedagogical methods, and learning styles in regard to academic

achievement. The findings substantiate collaborative learning methods are effective with increasing students' retention of knowledge and academic achievement. The findings also suggest that learning is achieved regardless of students' preferred learning style and pedagogical method received. However, some students may be challenged with the varied techniques of presenting content by nurse educators (Marek, 2013). Limitations in the study did reveal the need for further research with larger sample sizes to determine how millennial students learn best. When nurse educators are aware of best pedagogical practices for millennial students, positive educational outcomes will be achieved.

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Appendix A

NOVA SOUTHEASTERN UNIVERSITY
Office of Grants and Contracts
Institutional Review Board



MEMORANDUM

To: Michelle Roa, MSN, PhD(c)

From: Robin Chard, PhD, RN, Center Representative Robin Chard, PhD, RN
Institutional Review Board Signature

Date: October 18, 2012

Re: *Millennial Students Preferred Learning Style: Evaluation of Collaborative Learning versus Traditional Lecture Methods*

I have reviewed the above-referenced research protocol at the center level. Based on the information provided, I have determined that this study is exempt from further IRB review. You may proceed with your study as described to the IRB. As principal investigator, you must adhere to the following requirements:

- 1) **CONSENT:** If recruitment procedures include consent forms these must be obtained in such a manner that they are clearly understood by the subjects and the process affords subjects the opportunity to ask questions, obtain detailed answers from those directly involved in the research, and have sufficient time to consider their participation after they have been provided this information. The subjects must be given a copy of the signed consent document, and a copy must be placed in a secure file separate from de-identified participant information. Record of informed consent must be retained for a minimum of three years from the conclusion of the study.
- 2) **ADVERSE EVENTS/REACTIONS:** The principal investigator is required to notify the IRB chair and me (954-262-5369 and 954-262-1992 respectively) of any adverse reactions or unanticipated events that may develop as a result of this study. Reactions or events may include, but are not limited to, injury, depression as a result of participation in the study, life-threatening situation, death, or loss of confidentiality/anonymity of subject. Approval may be withdrawn if the problem is serious.
- 3) **AMENDMENTS:** Any changes in the study (e.g., procedures, number or types of subjects, consent forms, investigators, etc.) must be approved by the IRB prior to implementation. Please be advised that changes in a study may require further review depending on the nature of the change. Please contact me with any questions regarding amendments or changes to your study.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: Protocol File
Office of Grants and Contracts (if study is funded)



October 31, 2012

Michelle L. Roa, MSN, PhDc, RN
375 Dixmyth Avenue
Cincinnati, OH 45220

IRB Study#: 12140-12-075

Study Title: Millennial Students Preferred Learning Style: Evaluation of Collaborative Learning versus Traditional Lecture Methods

Study Approved: 10/31/2012

Study Approval Expires: 10/30/2013

Dear Dr. Roa:

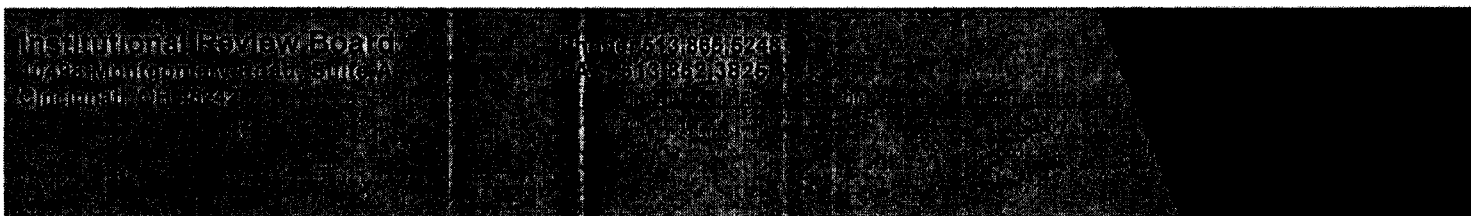
Today I reviewed your new study listed above under expedited review using Category #7: Research on individual or group characteristics or behavior.

This is to confirm that your IRB application is now fully approved. The protocol is approved through Version # 1 dated October 22, 2012. Please note that your total patient accrual may be no more than 181 as noted in your application.

You are granted permission to conduct your study only as described in your application effective today at Good Samaritan College of Nursing and Health Science. Should your project extend beyond the expiration date of 10/30/2013, you should submit your continuing review reports 30 days before your approval will expire. IT IS YOUR RESPONSIBILITY to keep track of your project's expiration date and to submit your continuing review reports in a timely manner either to continue or to close your study. If we do not receive your reports in time to be reviewed your study must stop all activity after 10/30/2013. Please be sure to reference the Principal Investigator's name and complete IRB assigned study number in the subject line of all correspondence with the IRB.

The following items were submitted with your application and reviewed:

1. Executed Administrative Review Application – 10/30/12
2. Appendix A
3. Appendix C – 10/21/12
4. Protocol – V1, 10/22/12
5. TriHealth consent document – V1, 10/22/12



October 31, 2012
Michelle L. Roa, MSN, PhDc, RN
IRB Study #: 12140-12-075
Page 2 of 2

You are reminded to review the guidelines you signed in the initial application titled "Researcher Responsibilities List" and the guidelines included with the approval packet, especially the guidelines for reporting adverse events. Failure to report or meet the requirements may result in immediate suspension of all study activities and/or entry of any further patients into this study until such time as a written explanation has been received and approved by the Institutional Review Board.

Please note that you are responsible for registering this study on ClinicalTrials.gov if this study qualifies as a clinical trial (as defined in section 50.3 of title 21, Code of Federal Regulations) and the principal investigator is designated as the responsible party (as defined in Title VIII of the Food and Drug Administration Amendments Act of 2007 (FDAAA)(PL110-85).

Any changes to the study as approved must be promptly reported and approved before implementing except those necessary to eliminate immediate hazards. Contact the IRB office (513 865-5248) if you have any questions or require further information.

Sincerely,



Roger Karam, MD
IRB Chair - TriHealth Institutional Review Board
FWA 00003114 - IRB00002744

Appendix B

Research Hypotheses Power Analysis

F tests—ANCOVA: Fixed effects, main effects and interactions

Analysis: A priori: Compute required sample size

Input:	Effect size f	= 0.40
	α err prob	= 0.05
	Power (1- β err prob)	= 0.95
	Numerator df	= 10
	Number of groups	= 2
	Number of covariates	= 1
Output:	Noncentrality parameter λ	= 25.9200000
	Critical F	= 1.8906841
	Denominator df	= 159
	Total sample size	= 162
	Actual power	= 0.9509566

Appendix C

Letter of Approval From President



GOOD SAMARITAN COLLEGE
OF NURSING AND HEALTH SCIENCE

May 18, 2012

To Whom It May Concern:

It is with great pleasure that I confirm the approval of Michelle Roa's research study "Millennial Students Preferred Learning Style: Evaluation of Collaborative Learning versus Traditional Lecture Method" at Good Samaritan College of Nursing and Health Science. We very much are looking forward to the findings and their potential application to our concept-based nursing curriculum.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Cohen', written over a white background.

Morris Cohen
President

Appendix D

Letter of Support From Academic Dean

May 25, 2012

Michelle Roa

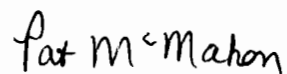
Dear Reviewers,

As an institution of Higher Learning, research in pedagogy is highly valued. Use of collaborative learning strategies is not new to education, but there is limited research regarding its effectiveness in nursing education. It is critical to investigate the effectiveness of various teaching strategies specific to the millennial student in this current climate of knowledge explosion and content-laden nursing curriculums.

I strongly support Michelle Roa's research study entitled "Millennial Students' Preferred Learning Style: Evaluation of Collaborative Learning versus Traditional Lecture Methods". This study will contribute to the body of knowledge related to pedagogic approaches to meaningful learning in nursing education. The Good Samaritan College of Nursing and Health Science has recently adopted a concept based curriculum and the faculty are engaged in collaborative learning strategies to promote student learning. The results of this research study will add to our evaluation of the revised curriculum and the effectiveness of this pedagogic approach.

I am excited to support research that will improve the education of our students at Good Samaritan College of Nursing and Health Science and support our commitment to assessment of student learning.

Sincerely,

A handwritten signature in black ink that reads "Pat McMahon". The signature is written in a cursive, slightly slanted style.

Pat McMahon, RN, MSN, CNP

Dean of Academic Affairs

Appendix E

Student Letter of Participation

October 29, 2012

Dear Nursing Student,

I am currently employed as an Associate Professor at the Good Samaritan College of Nursing and Health Science (GSC). As such, I will be conducting a research study entitled, *Millennial Students Preferred Learning Style: Evaluating Collaborative Learning and Traditional Lecture Methods*. I would like to invite you to participate in this research project which is aimed at curriculum instruction at GSC. I am also a doctoral candidate at Nova Southeastern University, Fort Lauderdale, Florida and will use this research as part of the program requirements for my degree.

I will be holding an informational session regarding my study on November 1, 2012 at 1:15 p.m. in the Auditorium (799) and November 8, 2012 at 1:15 p.m. in Auditorium (799) to explain and answer questions regarding the study. If you choose to participate, your Assessment Technologies Institute (ATI) data including the Self-Assessment Inventory and Comprehensive Predictor Assessment, age, and cumulative grade point average will be collected. All information collected will remain confidential.

Please consider volunteering to be a part of this research process. If you choose to participate, you will be asked to sign the informed consent statement at the end of the informational session.

If you have questions at any time regarding the research study, please feel free to call me at 513 862-7765 or send an e-mail at michelle_roa@trihealth.com.

Sincerely,

Michelle Roa, MSN, PhDc, RN
Associate Professor
Principal Investigator

Student Letter of Participation

November 2, 2012

Dear Nursing Student,

I am currently employed as an Associate Professor at the Good Samaritan College of Nursing and Health Science (GSC). As such, I will be conducting a research study entitled, *Millennial Students Preferred Learning Style: Evaluating Collaborative Learning and Traditional Lecture Methods*. I would like to invite you to participate in this research project which is aimed at curriculum instruction at GSC. I am also a doctoral candidate at Nova Southeastern University, Fort Lauderdale, Florida and will use this research as part of the program requirements for my degree.

If you are interested in participating in my study but were unable to attend the first informational session, additional informational sessions will be held on November 8, 2012 at 1:15 p.m. and 3:30 p.m. in the Auditorium (799) to explain and answer questions regarding the study. If you choose to participate, your Assessment Technologies Institute (ATI) data including the Self-Assessment Inventory and Comprehensive Predictor Assessment, age, and cumulative grade point average will be collected. All information collected will remain confidential.

Please consider volunteering to be a part of this research process. If you choose to participate, you will be asked to sign the informed consent statement at the end of the informational session.

If you have questions at any time regarding the research study, please feel free to call me at 513 862-7765 or send an e-mail at michelle_roa@trihealth.com.

Sincerely,

Michelle Roa, MSN, PhDc, RN
Associate Professor
Principal Investigator

Appendix F

ATI Instrument Approval Letter

Prof. Michelle Roa,

I am writing to inform you that ATI has granted you permission to utilize the Self-Assessment Inventory and the RN Comprehensive Predictor® 2010 in your research study as stated above. ATI partners with many nurse educators in various research studies and would be very interested in your findings once completed.

Sincerely,

Andrew Kay

Regional Vice President