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# NCLEX-RN Predictor Test Scores and NCLEX-RN Success

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Annie Grant

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Walden University

2015

Abstract  
NCLEX-RN Predictor Test Scores and NCLEX-RN Success  
for First Attempt Test Takers  
by  
Annie Ruth Grant

MSN, Medical University of South Carolina, 2002

BSN, Medical University of South Carolina, 1992

ADN, South Eastern Technical College, 1988

Doctoral Study Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Education

Walden University

December 2015

## Abstract

Health care professionals and nurse educators are concerned about increasing percentage of first time test takers failing the NCLEX-RN exam. The purpose of this retrospective study was to examine predictive accuracy of the Assessment Technologies Institute (ATI) RN Comprehensive Predictor for passing or failing the NCLEX-RN exam in a cohort of nursing students ( $N = 195$ ). South Eastern Technical College in South Carolina is in jeopardy of losing accreditation for their nursing program because of the low percentage of first time test takers failing. The college's pass rate on the NCLEX-RN exam has been below the national and state averages for the last 2 years. Guided by Bloom's taxonomy and Knowles' andragogical model of learning as the theoretical mainstay, factors that predict success with the NCLEX-RN exam for first time test takers were examined. Inferential and descriptive statistics were used to determine if a relationship existed between NCLEX-RN scores and the independent variables. A Pearson  $r$  correlation test was conducted to address whether the ATI Comprehensive Predictor accurately predict student success with the NCLEX-RN exam on first attempt. Multiple regression was employed to test for a significant relationship between prenursing GPA, final GPA, age, gender, and ATI predictor scores. Regression analysis results showed ATI Predictor scores to significantly predict student success with the NCLEX-RN exam on first attempt. Based on these Findings, the Structured Learning Assistance Program was proposed to assist in preparing students for NCLEX-RN success. Positive social change occurs within the community, nursing programs, and health care by increased NCLEX-RN pass rates enhancing the number of nurses entering into health care.

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## Dedication

Gods' grace and mercy brought me through this journey along with prayers and encouragement from my family and friends. I would like to dedicate my project study to my late parents, Robert Emanuel and Annie Lee Fore for teaching and showing me that hard work and determination gets results. I see them smiling down from heaven. I would like to thank my husband, Clayton Grant, and my children and grandchildren, Clayton Jarrett, Alicia Nicole, Talayah Zemirah, and America Dava' for their smiles and encouragement. Lastly, I would like to thank my sister, Bernise Belcer and brother-in-law, Derrick Belcer for their time and patience proofing my work.

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## Section 1: The Problem

### **Introduction**

The National Council of the State Board of Nursing (NCSBN) has established three entry levels of practice for registered nurses (RN): associate degree, diploma, and baccalaureate degree. Upon completion of an accredited nursing program, students are required to pass a National Council Licensing Examination (NCLEX), which corroborates competence in performing safe and effective care as a newly licensed nurse. The licensing authorities within each NCSBN govern the NCLEX-RN examination (exam). The NCSBN is responsible for protecting the public by requiring each candidate to pass this exam.

According to Rees (2006), many qualified students accepted into nursing schools do not graduate. Attrition in nursing programs is problematic nationwide (Rees, 2006). Traditional nursing students, licensed practical nurses, and paramedic bridge students have difficulty with the course content during the first semester of nursing school (Bonis, Taft, and Wendler, 2007). Students have to adjust to the rigorous nursing curriculum, which includes preparing for clinical and course studies (Rees, 2006). In addition, students are required to take a drug dosage calculation exam and pass with a 90% in order to progress to the next semester (S. McManus, personal communication, June 10, 2013). Nursing graduates must demonstrate competency, critical thinking, problem solving, delegation, and prioritization skills by passing the NCLEX-RN exam (Bonis et al., 2007; Norton et al., 2006). In addition, graduates must demonstrate the minimum knowledge and abilities needed to provide safe and effective nursing care by employing critical

decision-making skills (Norton et al., 2006). An essential component of any nursing program's success is the pass rate on the NCLEX-RN for first-time test takers. Nursing programs with a history of low passing scores for first-time test takers are at risk for negative impact on their reputations, possibly impacting the school's enrollment, funding, and accreditation (Rees, 2006).

The National League for Nursing Accrediting Commission (NLNAC) and the Commission on Collegiate Nursing Education (CCNE) as well as most state boards of nursing use pass rate data to determine program effectiveness and accreditation (Alameida et al., 2011). Outcome achievement and NCLEX-RN success is a priority for all nurse educators and programs because these benchmarks establish their quality standards and eligibility for accreditation. Nursing programs frequently use NCLEX outcomes to determine content areas that may benefit from curriculum changes and thereby increase student success (Carrick, 2011; Greenspan, Springer, & Ray, 2009). Nursing programs increasingly use such programs as the Assessment Technology Institution (ATI), Health Education Systems (HESI) exit exam, and the Mosby Assessment Test (Mosby). In addition, computerized testing is frequently administered to students during the final semester of the nursing curriculum to provide an assessment of their predicted ability to pass the NCLEX-RN exam on the first attempt. The quality of a nursing education program is defined by the performance of the graduates on the NCLEX-RN examination (Harding, 2010).



### **Definition of the Problem**

The Associate Degree of Nursing (ADN) at South Eastern Technical College (SETC) in the southeastern portion of South Carolina (SC) is in jeopardy of losing its accreditation. Students at this particular college are having difficulty passing the NCLEX-RN exam. Prior to graduating, students are required to take the NCLEX-RN predictor test to determine their readiness for the NCLEX-RN exam. Students who do not achieve a 91% probability of passing the NCLEX exam are required to complete remediation by reviewing the content missed and writing a summary of each area with less than 50%. Results of the predictor test depicting areas of weakness are reviewed with students stressing the need for further practice of NCLEX style questions (S. McManus, personal communication, June 10, 2013).

The nursing program at the school in question is a 5-semester program that has an option for students to sit for the NCLEX practical nursing (PN) exam after completing 3 semesters of study. Sixty-four students enter the ADN program during fall and spring semesters. This SC College is a year-round school; nursing students graduate in May and August each year. In this research, I focused on the students' final semester grades, final GPA after program completion, and their scores on the predictor exam. Additionally, I focused on results from the students' first attempt to pass the NCLEX-RN exam to determine if the NCLEX-RN predictor accurately predicts success for first-time test takers.

NCSBN adopted a policy in 1989 to evaluate the passing standards for the NCLEX-RN examination every 3 years in order to ensure that nurses caring for patients

are knowledgeable and competent (Roa, Shipman, Hooten, & Carter, 2010). First time test-takers at the college in question failed to maintain the required 89% passing standard for 2 consecutive years. The State Board of Nursing for South Carolina (2011) required the college faculty to develop and present to them an action plan for improving students' NCLEX-RN scores by May 2012.

### **Rationale**

#### **Evidence of the Problem at the Local Level**

The ever-changing NCLEX-RN test plan, question format, passing standard, and combinations of demographic, academic, and psychosocial variables make it difficult to identify academic and nonacademic predictors of NCLEX-RN performance (Gilmore, 2008). Researchers have noted that first-time NCLEX-RN pass rates have steadily declined in recent years (Grossbach & Kuncel, 2011; Truman, 2012). Modifications in question format, test plan, and the increase in standards are contributors to escalating concerns of nursing programs, health care institutions, and the community. Researchers are now tasked with exploring strategies that can increase the NCLEX-RN pass rate (DiBartolo & Seldomridge, 2008).

Nursing programs with substandard pass rates have a significant problem. Prospective students use the school's pass rate as criteria for selecting nursing programs. Application and admission rates are affected if the smarter students do not apply. When at risk students are unsuccessful in completing their program of study, loss of program operating revenue may become a problem. Decreased customer satisfaction is also associated with low performance by the graduates; the school's perceived reputation

among parents, and the community. The nursing program is at risk for regulatory intervention with program approval and accreditation at stake (Norton et al., 2006).

Nursing program administrators are well aware of the decrease in the pass rate for first-time test takers. The nursing shortage has increased the need for nursing students' success the first time they attempt the NCLEX-RN exam. According to the NCSBN (2010, 2013) patients' conditions are aggregating in complexity with an increased risk of complications occurring while hospitalized, resulting in the necessity for review of the NCLEX-RN exam every 3 years. With the increased difficulty of the NCLEX-RN exam, nursing programs are being pressured to develop a method of prediction for NCLEX-RN success and to identify students at risk for failing (Norton et al., 2006).

A cascade of costly events occurs when a graduate nurse fails the NCLEX-RN exam. The student is devastated and experiences a decrease in self-esteem and confidence, which declines even further during the wait to retake the exam. Graduates have to wait 45 days before retaking the exam, which costs an additional \$300 to \$400 for the second test. The ethical responsibility of graduating students who meet the qualifications and academic rigor of the nursing program but cannot pass the NCLEX-RN exam needs to be addressed by educators (Roa et al., 2010). Table 1 shows that the percentage of successful first time test takers has decreased.

Table 1

*2010 /2011 NCLEX-RN National Pass Rates for Associate Degree, South Carolina, and School of Study*

NCLEX-RN	2010		2011	
	<i>N</i>	Percentage	<i>N</i>	Percentage
National	140,883	87.90	144,565	86.99
South Carolina	2,197	89.53	2,215	89.66
SETC	101	85.15	97	81.11

*Note.* *N* = the number of students taking the NCLEX-RN for the first time.

In 2010, the percentage of passers at the national level was 87.9%, 89.53% in SC, and 85.15% in SETC. In 2011, the percentage pass rate decreased to 86.99% for the national level, 89.66% in SC, and 81.11% in the SETC.

Leaders and educators nationwide are evaluating and changing curricula to increase the success of first time test takers (Norton et al., 2006). Research has been conducted on factors that may assist in predicting a student's success with the NCLEX-RN exam the first time (Billings & Halstead, 2012; Norton et al., 2006). Such factors include fewer individuals entering nursing programs and more career choices for men and women who compete with the choice of becoming a nurse (Billings & Halstead, 2012).

The purpose of this study is to examine predictors of success on the NCLEX-RN exam and determine if there is a correlation between the NCLEX-RN predictor test scores and NCLEX-RN exam success for first-time test takers. Numerous research studies have been conducted to determine the most appropriate predictors of NCLEX-RN success (Grossbach & Kuncel, 2011; Horton et al., 2012; Truman, 2012). Academic

predictors include prenursing GPA, GPA at graduation, science grades, math grades, and predictor test scores. Nonacademic predictors are age and gender (De Lima et al., 2011 London, and Manieri, 2011; Frith, Sewell, & Clark, 2008; Gilmore, 2008; Grossbach & Kuncel, 2011; Horton et al., 2012; Truman, 2012).

### **Evidence of the Problem From the Professional Literature**

Nurse educators are attempting to improve NCLEX-RN success for first time test takers. Although some students are successful, a number of students continue to fail the NCLEX-RN exam (Gilmore, 2008). Student success or failure can be difficult to identify and is dependent upon associations between variables (Holstein, Zangrilli, & Taboas, 2006). Therefore, nursing programs use standardized testing to assist students prepare for NCLEX-RN. Researchers have attempted to pinpoint what variables influence success or failure in the NCLEX-RN exam (Gilmore, 2008).

Researchers have also identified several predictors of success. The academic predictors include high school rank, scholastic aptitude test scores, ACT scores, entering grade point average (GPA), nursing GPA, GPA upon completion of the nursing program, achievement in specific nursing courses, Mosby Assess paper and pencil Tests (Mobsy), and science course grades (Gilmore, 2008). Along with the GPA in nursing courses, the cumulative GPA of general education courses has been cited as a predictor of the NCLEX-RN success (Gilmore, 2008). In addition, higher grades in sciences and nursing courses are also linked to NCLEX-RN success (Gilmore, 2008). A university conducted research on associate's degree nursing (ADN) students and found that as the scores on the

National Entrance Test (NET), math skills, and reading comprehension improved, the probability of passing the NCLEX-RN increased (Gilmore, 2008).

Holstein et al. (2006) conducted a study at a university in North Carolina to identify variables that had the most impact on predicting NCLEX-RN success. These researchers identified 11 variables influential in predicting success or failure in NCLEX-RN takers. With data analyzed at  $\alpha < .03$  and  $\alpha < .05$  levels of significance, among the predictor variables were test scores in several languages, mathematics, and nursing competency measures. The results of the study suggested that the students' scores on these tests are the most significant measure of success in the NCLEX-RN (Emory, 2013; Holstein et al. 2006).

Remediation is one of the strategies proposed to improve NCLEX-RN exam pass rates. In an effort to increase students' NCLEX-RN success for first time test takers, faculties at a Long Island University School of Nursing in New York examined causes for students' failure to pass the NCLEX-RN exam on their first attempt (Carr, 2011).

Carr (2011) concluded that sources for failure were gaps in curriculum content, student attitudes toward taking the NCLEX-RN exam, delays in taking the NCLEX exam after completing the program, and lack of preparation for standardized testing as well as incongruous and ineffectual exit exams. Faculty implemented strategies to improve student pass rate that included materials designed to close gaps in curriculum content, remediating students with insufficient performance on standardized tests such as the NCLEX-RN predictor exam, and making changes to the exit exam. The NCLEX-RN pass

rate increased from 70% to 93% 2 years after the changes were implemented (Carr, 2011).

### **Definition of Terms**

For clarity, the following terms are defined:

*American College Testing (ACT):* The ACT is an educational and career-planning tool that assesses the mastery of state and college readiness standards (Gilmore, 2008).

*Assessment Technologies Institute (ATI):* The ATI offers programs that are influential in improving faculty, student, and program outcomes. One example is the predictor test (ATI, 2007, 2010, 2013).

*Associate degree nursing:* An associate's degree in nursing usually is awarded for completion of a 2-year nursing program of study (Gilmore, 2008).

*At-risk students:* Students who are in jeopardy of failing the exam based on their earned GPA during the nursing program (Murray, Merriman, & Adamson, 2008).

*Commission on Collegiate Nursing Education (CCNE):* CCNE is a voluntary, self-regulatory program that encourages and supports nursing education programs designed to execute self-assessments that cultivates and advances their academic professional education (Harding, 2010).

*Construct validity:* Refers to how a test determines specific traits or characteristics at an intellectual level (Morrison et al., 2008).

*Content validity:* Refers to how accurate test items are in measuring basic nursing knowledge and skills of the students (Morrison, Adamson, Nibert, & Hsia, 2008).

*Criterion-related validity:* References made from analysis of test scores to predict student outcomes on additional criterion of interest (Morrison et al., 2008).

*Generic student:* Students with no formal nursing training who are entering a nursing program (Norton et al., 2006).

*Grade point average (GPA):* The GPA is determined by dividing the number of test grades a student earns during a course into the total number of credits taken (Gilmore, 2008).

*Health Education Systems, Inc. (HESI):* HESI is a tool that identifies students who are likely to fail the NCLEX-RN exam on the first attempt (Frith et al., 2008).

*Health Resources and Services Administration (HRSA):* A primary federal agency that provides access to health care service areas for individuals who are uninsured or medically vulnerable (Murray et al., 2007).

*Miller Analogies Test (MAT):* The MAT is a high-level mental ability test requiring the solution of problems stated as analogies (Frith et al., 2008).

*Mosby Assessment Test (Mosby):* The MAT assesses basic nursing knowledge (Frith et al., 2008).

*National Council Licensure Examination (NCLEX-RN):* The National Council Licensure Examination is the exam that nursing students are required to take to complete and pass in order to practice as a license registered nurse (NCSBN, 2010, 2013).

*National Council of State Board of Nursing (NCSBN):* The NCSBN develops and administers the NCLEX-RN exam to nursing graduates for licensure (NCSBN, 2010, 2013).



*National League for Nursing Accrediting Commission (NLNAC):* The NLNAC (2010, 2012) is responsible for the accreditation of nursing education programs. The NLNAC has the authority to and is accountable for carrying out the application of standards and criteria, accreditation processes, and the affairs, management, policy making, and general administration of the NLNAC (NLNAC, 2010).

*Paramedic bridge student:* The paramedic bridge student is a certified paramedic who has been working in the medical profession for several years and is seeking advancement in the profession by obtaining a degree in nursing (Norton et al., 2006).

*Sentinel event:* A sentinel event is an unexpected occurrence involving death or serious injury to a patient (Whitehead, Weiss, & Tappen, 2007).

*Shift work:* A schedule that offers 24 hours a day, 7 days a week service in order to keep an establishment operating successfully. Employees usually work 8 hours during a day or could work 12 hour shifts. Shift work scheduling once restricted to the manufacturing sector is now applied in many industries and fields (Schwartz, 2010).

*Unlicensed assistive personnel:* Individuals who are not licensed but are trained to deliver certain necessities of patient care under the supervision of a registered nurse. These individuals include patient care technicians, nurses' aides, and certified nursing assistants (Kelley, 2010).

### **Significance of the Study**

Health care professionals and nurse educators are increasingly concerned about decreasing percentages of pass rates on the NCLEX-RN exam for first time test takers. Several factors are associated with decreasing pass rates and subsequently the nursing

shortage (NCSBN, 2002; Alameida et al., 2011). Enrollment of students in nursing programs is not occurring quickly enough to meet the projected demand for registered nurses. Research conducted by task force members for NCSBN (2002, 2012) scrutinized pass rates of nursing students who did not sit for the exam, trends in NCLEX pass rates, and results of candidates repeating the exam. The task force results showed that pass rates decrease when applicants delayed time between graduation and sitting for the examination. Applicants and first time foreign-educated applicants have a tendency to wait the longest to take or re-take the NCLEX exam and have the lowest pass rates. Between October and December pass rates are lowest due to the high number of students graduating in May but wait longer to take the exam. The candidate's probability of passing decreases with each exam attempt (NCSBN, 2002, 2012).

The NBSCN (2002, 2012) also found the following commonalities in nursing education programs with NCLEX pass rates results 10% or more below the national average. Available sources of data was not used by some nursing programs on a regular basis to evaluate correlation between admission scores, grade point average, NCLEX predictor exam scores, and NCLEX pass rates (NCSBN). Many programs have only recently begun the use of NCLEX predictor exams as a requirement of their program. Data on the efficacy of these predictor exams and appropriate follow-up plans was found to be limited. The task force linked grade inflation and not categorizing minimum academic requirements for admission to low NCLEX pass rates. NCLEX-RN failures is also associated with students who work full time, have family obligations; English as their second language, and a low admission GPA. Problems within the nursing program

in particular, lack of adequate experienced faculty, director of the nursing department resigning, faculty leaving, educators inexperience with writing NCLEX-RN style test questions, and increased use of adjunct faculty has been related to NCLEX failures (NCSBN, 2002, 2012).

Due to the shortage of nurse educators, nursing programs have a restriction on the number of students who can apply to the nursing program (Blegen, Spetz, Vaughn, & Park, 2011). According to the United States Registered Nurse Workforce Report Card and Shortage Forecast (2012), the nursing shortage is expected to continue nationwide through 2030. Consequently, data from this study may help identify methods that can assist students in passing the NCLEX-RN exam on their first attempt.

Today, the nursing profession is beset with challenges along with changing demographics. The change in general population demographics requires that more nurses are needed to care for the aging population. Unfortunately, many factors prompt nurses to leave the profession early, resulting in negative consequences for access to health care. Nurses' early departures are caused mainly by high stress levels associated with the job brought about by insufficient staffing levels and low job satisfaction. This has led to higher levels of nurse turnover and vacancies, creating a nursing shortage (Blegen, Goode, Spetz, Vaughn, & Park, 2011).

Rectifying the nursing shortages has several implications for the general patient population. For example, higher nurse ratios are associated with fewer patient deaths, lower incidence of sentinel events, and shorter length of stay for patients in the hospital (Blegen et al., 2011). Kovner et al. (2007) found, however, that approximately 13% of

new RNs changed jobs after 1 year, and 37% expressed desire to change jobs. If the trend of nursing shortages continues, the quality of care for patients is in jeopardy.

### **Research Questions**

The NCLEX-RN exam is a high stakes exam; therefore, it is essential that the passing level where competent nurses have an opportunity to obtain a license (O'Neill et al., 2005). SETC nursing graduates are not passing the NCLEX-RN exam at a rate compulsory to meet demands for additional nurses. At present, the nursing shortage has SETC faculties working diligently searching for a solution to this problem. If proposed solutions do not succeed, the nursing shortage will be further compromised. For this quantitative study, I addressed the following questions:

1. What significant relationship exists between prenursing GPA, final GPA and NCLEX-RN success?
2. What significant relationship exists between age, gender, and NCLEX-RN success?
3. What significant relationship exists between ATI predictor scores and NCLEX-RN success?

Addressing these questions assisted in determining whether the predictor test is a valuable screening tool to use before students attempt the NCLEX-RN exam the first time.

### **Literature Review**

The purpose of this literature review is to serve as a framework for development of this research study. A review of historical perspectives on the nursing shortage,

American Nurses Association position statements, and the NCLEX-RN examination itself supports the significance of this study and how critical thinking is an essential part of nursing education to help assure students successfully pass the NCLEX-RN examination. A review of the literature on predictors of the success of students in an associate degree nursing education program in passing the NCLEX-RN is also included. In addition, a review of Knowles's books *Andragogy* (1984) and Blooms's *Taxonomy* (1956; Knowles et al., 2005; Merriam et al., 2007) was used to show how these theorists influence adult learners and nursing education.

For this literature review, I accessed the following electronic databases: ProQuest Central, EBSCO, MEDLINE, and ERIC. Each database was searched for scholarly articles and dissertations using keywords *NCLEX-RN success*, *Bloom's taxonomy*, *Knowles andragogy*, *NCLEX-RN and ATI*, and *preparation and NCLEX-RN*. Sixty potential articles, books, and dissertations were collected. In addition to electronic databases, articles were selected using article references. The majority of studies cited in this project study were within the 5 year time frame. Theoretical literature describing the theory of andragogy (Knowles) and Bloom's taxonomy were also included in this review. These theoretical works were helpful in revising the structure of curricula for adult learners.

### **Theoretical Framework**

Knowles's (1984) theory of adult learning is the theoretical foundation for this research study. Knowles's theory is based on the belief that adults are self-directed learners who use past experiences to gain knowledge and that their learning style is

different from that of children. This theory was chosen to assist in understanding adult learners. Adult learners bring with them life experiences they can use to improve their learning. Knowles's theory may also help educators develop strategies to aid in enhancement of student learning (Knowles, 1984; Knowles, Holten, & Swanson, 2005).

The concept of andragogy, the art and science of helping adults to learn, is based on assumptions about adult learners. Knowles's theory is anchored in six assumptions: the need to know, the learners' self-concept, the role of the learners' experiences, readiness to learn, orientation to learning, and motivation (Knowles et al., 2005 p. 67-68). Knowles viewed these assumptions as a foundation for developing programs for adult learners. These assumptions suggest that in order for an adult learner to excel, there must be a learning climate of mutual trust and clarified expectations. This theory distinguishes adult learning from other areas of education (Merriam, Caffarella, & Baumgartner, 2007).

Matching students' learning styles with similar teaching styles can enhance learning. A meta-analysis completed in 2005 by Lovelace (as cited in Billings & Halstead, 2012) concluded that "matched learning styles with instructions usually increased the achievement and motivation of the students. When instructions match students' learning style preferences, students may achieve higher scores than when instruction and learning styles are mismatched" (p. 24). Nursing educators need to use various teaching methods appropriate to course content and determine learners' needs, learning styles, and appropriate learner outcomes. In other words, student-centered learning based on fostering meaningful dialogue with faculty helps identify and overcome obstacles (Billings & Halstead, 2012).

Knowles (1973) delineated the difference between the pedagogical model and the andragogical model used by most traditional educators. The pedagogical model focuses on how to transmit information and skills to students by planning course content and organizing them into logical units through the most efficient instructional methods possible. The plan is then implemented by teaching these units in sequences.

The andragogical model is more concerned with how to provide procedures so that students can become self-directed learners. The educator does not personally transmit information but rather facilitates learning by establishing procedures that engage learners. First, a climate conducive to learning needs to be established. Second, mechanisms need to be created for mutual planning and the needs of learning have to be identified. Program objectives have to be formulated in order to satisfy learning needs of students. A pattern of learning experiences also needs to be crafted and implemented with the use of appropriate materials. Lastly, learning outcomes need to be evaluated and learning itself needs ongoing reevaluation based on results as education proceeds (Knowles, 1973, p. 32).

The andragogical model is a process design based on life experiences that provides procedures and resources for assisting learners in acquiring information and skills (Knowles et al., 2005). In order for adults to excel, there must be a climate of mutual trust. Educators must encourage retention of information by the learners for learning to be successful. Encouraging repetition of materials by students assists in retention and their application of the information in the learning environment. The learners' learning style must also be determined for best dissemination of information

(Knowles et al., 2005). This can be accomplished by focusing on how students meet and overcome obstacles on an ongoing basis while helping them develop strategies and tactics that help them succeed. Faculty needs to structure interactions with students based on dialogue rather than the lecture pedagogy.

For retention of material, learners need to interpret and apply information in the learning environment. Educators must determine the learning styles of their students in order to establish essential methods for disseminating information. Association of new information with what is already known is also of importance for the students to master (Knowles et al., 2005). Learning preferences are identified as visual, auditory, and tactile or kinesthetic. To keep students actively involved in learning, adult educators must use various techniques to encourage every type of learning style. How information is delivered can have a positive or negative influence on the learner's performance and may or may not hinder NCLEX-RN success (Graf, Kinshuk, & Liu, 2009).

On one hand, Knowles's (1973) theory of andragogy is not without its critics who argue that it really is not a theory but a teaching style. The andragogical perspective on adult education does differ from teaching styles espoused by other adult education theorists in terms of its respective philosophy, classification, and underlying values (Cross, 1981). Although London (1973) recognized that there are differences between children and adults, he viewed education as a single basic human process and the learning activities of adults and children as being essentially the same. McKenzie (1979) believed that the truthful theory concerning learning is pedagogy not andragogy. In teaching adults, there may be teaching methods that appeal to adults more, but the theory of



pedagogy lays the foundation for developing critical thinking skills in all humans, regardless of age. Knowles's critics argued that his theory on andragogy only offered teaching strategies and did very little to provide solid theoretical support for adult learning (Cross, 1981; Knowles et al., 2005).

Bloom's taxonomy, on the other hand, can be used for development and assessment of faculty and students. Bloom's taxonomy is thought to be a critical component in developing educational objectives that offer the foundation for structuring curriculum, developing lesson plans, and facilitating classroom activities that assist in expanding students' understanding of the content (Knowles et al., 2005; Merriam et al., 2007).

Bloom and his associates developed a system of educational objectives, which has impacted education on a global scale (Knowles et al., 2005; Merriam et al., 2007). Bloom's taxonomy (Knowles et al., 2005) categorizes thinking according to six cognitive levels: remembering, understanding, applying, analyzing, evaluating, and creating. The taxonomy provides a guideline for developing test questions at levels of increasing difficulty. Bloom's taxonomy can help students with understanding how to move beyond the basics and advance to a higher level of learning. Bloom's (1984) recommendations for improving critical thinking are to ensure students explain in their own words the importance of the lecture, explain clearly and precisely the problem, assist with making assumptions that are reasonably based on the situation, discuss key concepts, assist students in thinking through problems, and have students practice test questions with

varying degrees of difficulty. Implementing these recommendations as a vital part of the curriculum assists the students in their efforts to learn (Pickard, 2007).

Bloom's taxonomy, which has significantly influenced many curriculum developments, may be criticized in several areas. One criticism of Bloom's taxonomy is that it disregards the development of imaginative understanding. An important strength, on the other hand, is that the taxonomy has taken the crucial topic of thinking and structured it for practical use by educators. Bloom's taxonomy is a tool for assessing the level of teaching in classrooms and monitoring changes in curriculum (Hopson, Simms, & Knezek, 2002; Pickard, 2007). Because Bloom's taxonomy is used as a foundation for writing test questions for the NCLEX examination, it is appropriate for use in this study (NCLEX-RN Test Plan, 2010). The majority of items are written to address the application or higher levels of cognitive ability requiring further difficult thought processing. It could be surmised that SETC students who encounter difficulty passing the NCLEX examination may need to master critical thinking and problem solving skills. Implementations of a critical thinking course may be crucial in assisting these students in improving their thinking and problem solving skills. Such a course also increases their probabilities of successfully passing the NCLEX examination (Merriam et al., 2007; NCLEX-RN Test Plan, 2010).

Thus, mastering higher order thinking ensures that students can problem solve in the clinical setting. Consistently preparing lessons around this foundation not only increase test scores, but also advance the probability of students' success when taking the NCLEX-RN exam. Educators must identify the academic level of their students,

encourage them to ask questions, and create lesson plans aimed at the mastery of critical thinking and achievement of well-defined goals (Knowles et al., 2005).

### **Historical Perspective on the Nursing Shortage**

The nursing shortage first became evident in 1998 and peaked by 2002 (Allen, 2008). During the latter part of the 1990s, government and private payer reimbursements declined (Allen, 2008). Hospital administrators began downsizing the number of RN positions and replacing them with unlicensed assistive personnel (UAP) to cut costs; at the same time nursing recruitment initiatives were decreased (Allen, 2008). These changes in health care establishment contributed to the nursing shortage. Numerous articles have been published about the nursing shortage concerning either facts related to the current shortage or predictions of future nursing shortages. Due to the predicted long lasting nursing shortage, nursing educators are introducing ingenious, collaborative approaches to assist students in passing the NCLEX-RN exam and become professional practicing nurses (Allen, 2008).

The current shortage of professional nurses is critical. In December 2013 the Bureau of Labor Statistics' Employment Projections (BLSEP) 2012-2022 was released, indicating that the RN workforce is expected to grow from 2.71 million projected 2012 to 3.24 million by 2022. The task force also projected that 525,000 RNs will be needed for growth and replacement of nurses leaving the profession due to disabilities and retirement (BLSEP, 2013; Juraschek, Zhang, Ranganathan, & Lin 2012).

In 2006, the Health Resources and Services Administration (HRSA) used data from a 2004 survey to support their predication that the nursing shortage will continue to

grow steadily for the next few years. The HRSA projected the shortage would stand at 218,800 in 2005 and reach 1 million unfilled nurse positions by 2020 (Kuehn, 2007). The nursing shortage will have negative repercussions on health care if left unaddressed. Even a single graduate who fails the NCLEX-RN significantly impacts health care organizations and the nursing programs. A major task for nursing instructors is to meet the enormous demand by helping nursing students graduate and become knowledgeable nurses who can safely provide care for individuals (Murray et al., 2007; Jones, Caton, Dewitt, & Stubbs, 2010).

However, the challenges posed by the nursing shortage are multifaceted; there is no single global measure of their extent and nature. There is growing evidence of the impact of relatively low staffing levels on health care delivery and outcomes. The central cause of nursing shortages are inadequate workforce planning and resource allocation, poor recruitment, retention and return policies, poor incentive structures, and inadequate career support (Buchan & Aiken, 2008). Fox and Abrahamson (2009) examined multiple causes influencing the nursing shortage. Increased diversity of career options along with a strict admission process for nursing programs has resulted in an educational system that is contributing to the shortage of available nursing staff (Fox & Abrahamson, 2009). Turnover of hospital nurses is costly, in terms of both economics and care quality, and contributes to the decreased availability of hospital nurses (Fox & Abrahamson, 2009). Moreover, the nursing shortage has, for many years, been exacerbated by the lack of qualified nursing educators (O'Neill et al., 2005).

In terms of retention, for practicing RNs, the strain caused by the strenuous nature of shift work negatively influences how long nurses stay in the profession. Individuals, who work shifts, in particular night shifts, are at risk for developing Shift-Work Disorder (SWD). SWD occurs when the work schedule overlaps with the normal sleep pattern, causing misalignment between the body's day-to-day clock and the time at which the employee is actually able to rest. These individuals are less likely to be able to meet the demands of shift work and, therefore, often return to nonshift work schedules or retire from the workforce (Schwartz, 2010). During 1983 and 1991, registered nurses' salaries rose only about 3% each year (Fox et al., 2009). By 1994, nurses' wages began to decrease, which contributed to the shortage of nurses (Fox et al., 2009). Decreases in salaries were triggered by the scarcer resources, restrictive managed-care systems, hospital restructuring, and the overall economic recession (Fox et al., 2009).

The nursing shortage in conjunction with graduate nurses' inability to pass the NCLEX-RN exam the first time is a major concern for the health care system and nursing programs because the current failure rate increases the shortage of RNs available to work. The prediction of students' success in passing the NCLEX-RN exam as first time test takers is an important issue for nursing programs for the aforementioned reasons of credibility, ability to offer proper care to patients, and cost. Increased difficulty of the NCLEX-RN exam significantly impresses upon faculty the need to determine a method that accurately predicts student success on the NCLEX-RN exam (Davenport, 2008; Fox et al., 2009).

A definitive method will assist educators in identifying students at-risk for failing the exam and mentoring them to help assure their success in passing the NCLEX-RN exam on the first attempt. Remediation programs developed to fit individual needs increases students' likelihood of successfully passing this exam. In addition, efforts to help students pass the NCLEX-RN exam positively impacts on psychological and financial circumstances of the students as well as the health care profession and the community (Davenport, 2008).

The NCLEX-RN is the final test a graduate nurse has to successfully pass the NCLEX-RN before beginning a nursing career. Graduate nurses are required to demonstrate critical-thinking skills and problem-solving skills by passing the standardized NCLEX-RN exam. This standardized test consists of 75 to 265 questions in a variety of formats. The intensity of this exam is determined by a national practice analysis survey on the current practice of an entry-level nurse (NCLEX Test Plan, 2010, 2013). The practice analysis survey consisted of the frequency and importance of 155 nursing-care bedside activities compiled at sites around the country. Changes in the intensity of the questions were made due to increased demand by employers for higher levels of competence among new nurse graduates. The test was last updated in April, 2010 and was reevaluation in April, 2013 (Roa et al., 2010). Many groups are impacted by the higher passing standards of the NCLEX-RN. Graduates experience pressure and stress owing to the higher level of competence required in order to get their license to practice. On the other hand, some employers may consider the standards "too low" because newly licensed nurses are "too green" or without experience (O'Neill et al.,

2005). Still, other employers may perceive standards as too high because there are not enough nurses in the labor market to fill vacant positions (O'Neill et al., 2005).

Educators have implemented specific strategies to help assure student success on the NCLEX-RN exam and maintain the current pass/fail standard. Strategies for success include strict admission requirements, identifying and requiring interventions for at-risk students, developing and enforcing specific progression policies, developing course-related interventions, and endorsing review courses as well as providing individual and academic support (Herrman & Johnson, 2009).

Rogers (2008) examined factors that contribute to student success in associate degree nursing programs and on the NCLEX-RN exam and encompassed a meaningful model. Determining factors that contribute to NCLEX-RN success is difficult to ascertain because of the various research studies directing educators to dissimilar factors that are successful and those that disputed previous studies (Davenport 2008; Rogers, 2008). This research was conducted at a state university in a rural area. The enrolled student body at this particular school predominately consisted of Caucasians, with females outnumbering the males. The group was diverse in terms of demographic characteristics and life experiences, however. Participants in this study strongly agreed that a combination of skills, academic achievement, and demographic characteristics could predict NCLEX-RN success. Data analysis showed a substantial emphasis on academic achievement, but none of the participants stated prenursing academic achievement as an essential factor (Rogers, 2008). Furthermore, the participants thought proper rest and nutrition, stress management

skills, complex circumstances, multiple roles and responsibilities, and personal well-being were important factors influences scores on the test (Rogers, 2008).

In answer to the increased demand for nurses, the NCLEX exams are offered virtually daily with the candidates receiving results within days after testing. Students should be encouraged to sit for the NCLEX-RN as soon as possible. Woo and Wendt (2009) investigated the relationship between passing the NCLEX-RN and the lag time in sitting for the NCLEX-RN exam. Data were obtained from July 2006 to June 2008. During the 2 years, 176,539 RN examinations were administered. The regression model showed lag time had a significant inverse relationship with pass/fail status, RN:  $b = 0.013$ ,  $p < 0.001$  suggesting that pass rates decreased as lag time increased (Woo & Wendt, 2009).

Test measures such as the Computer HESI exit exam have been shown to draw positive correlations with NCLEX-RN test scores. Faculty at a nursing program in the Southeastern region of the United States wanted to determine if the Computer HESI exit exam was equivalent to paper and pencil exit exam, the Mosby Test (Frith et al., 2008). They administered two exit exams to their students, the HESI Exit Exam and the MAT. The HESI exit exam was given first and the Mosby was given 4 months later. The Mosby was completed for graduation and the HESI for evaluation. The HESI scores were  $r = 0.723$ ,  $p < .001$ . The school's passing score for the Mosby test was 60%. Of the 60 students, 12 failed to achieve this score and were required to retake the test before graduation. The chi-square analysis showed four of the students who passed the Mosby Test the second time and six students who passed the MAT on the first attempt failed the



NCLEX-RN. In addition, students who made a score of 84 or higher on the HESI Exit Exam passed the NCLEX-RN the first time. Faculties voted to adopt the HESI exit exam due to the positive results of the study (Frith et al., 2008).

Some universities prepare for the NCLEX-RN by identifying students at risk of failing. The faculty of Wichita State University (WSU) decided to adopt standardized computer testing to evaluate scores along with course grades to identify students who needed interventions (Jacobs & Koehn, 2006). The school has had difficulty getting past the national average for passing the NCLEX-RN exam. Upon inquiry, they realized that the students did not appear overly anxious about taking the exam and usually waited until after graduation to start preparing for it. Due to their not meeting the national average, the faculty agreed that a program using a standardized practice test to increase preparation for NCLEX-RN and giving feedback regarding their performance needed to be established. The faculty instituted a program of standardized computer testing (Jacobs & Koehn, 2006). Test scores along with course grades were used to identify at-risk students who needed additional assistance (Jacobs & Koehn, 2006).

Another predictive program used by WSU to improve NCLEX-RN passing rates is the ATI. In a review by Jacobs and Koehn (2006), educators found the usefulness of a program to identify students needing remediation. Two tests were chosen by the school: the Test of Essential Academic Skills and the Comprehensive Predictor test. Faculty tested the students near the end of the semester with students required to make the 60<sup>th</sup> percentile; remediation was deemed necessary for students scoring lower. Students not completing remediation by the end of the semester received an incomplete grade and

could not move forward to the next course until completed. The first class to graduate following the implementation of the ATI standardized computer testing showed improvement on NCLEX-RN pass rate (Jacobs & Koehn, 2006). The ATI program validated a solid consumer-oriented program that was helpful to WSU nursing school (Jacobs & Koehn, 2006).

Bondmass, Moonie, and Kowalski (2008) conducted a study concerning a change in the NCLEX-RN success rates following the addition of standardized exams throughout the program curriculum. They also compared the exam scores between graduates who passed the NCLEX-RN and those who did not. The 187 students populating four classes were enrolled in the study. Twenty-three students (12.3%) did not graduate from the program. One-hundred sixty-one students completed the program and graduated. The retention rate for the students was 87.7%. Of the 161 students who graduated, data were available for 147 of them. One hundred and twenty-nine (87.8%) students passed the NCLEX-RN exam on the first attempt and 18 (12.2%) graduates did not pass. Results showed a 8.5% change ( $p < 0.000$ ) in the NCLEX-RN pass rate from the previous 5-year mean pass rate and significant differences in standardized test scores for those who passed the NCLEX-RN compared to those who did not pass ( $p < 0.0$ ). Researchers concluded that the selected standardized exam scores significantly identified graduates likely to pass the NCLEX-RN exam (Bondmass et al., 2008).

Preadmission and admission criteria for nursing degree programs have also been shown to influence NCLEX-RN pass rates. Trofino (2013) conducted a quantitative nonexperimental pilot study to determine which of the criteria for an associate degree

nursing program have a strong relationship with the first-time pass rate on the NCLEX-RN. Data were obtained from students enrolled in an associate degree nursing program at a private rural liberal arts college. The dependent variable was the first-time pass rate and independent variables were preadmission criteria, admission criteria, and nursing courses (Trofino, 2013).

According to Trofino (2013) preadmission criteria indicates that adult students had a marginally significant influence ( $p = .08$ ) in terms of the probability of students passing the NCLEX-RN exam on first attempt. The admission criteria results revealed that the math subscores had a statistically significant influence ( $p = .03$ ) on the probability of students passing the NCLEX-RN. Pharmacology ( $p = .001$ ), advanced medical-surgical nursing ( $p = .03$ ), medical-surgical nursing ( $p = .006$ ), psychiatric nursing ( $p = .004$ ), and leadership ( $p = .004$ ) were significantly related to the probability of NCLEX-RN success. Trofino (2013) also determined that the odds of passing the NCLEX-RN for students repeating nursing courses are low. This means that it is possible for nursing schools to identify students who are at-risk of failing the NCLEX-RN as first time takers and can implement necessary interventions to address this issue.

In an attempt to improve NCLEX-RN exam success, facilities have made modifications in their curriculum. Educators at the University of Delaware developed a residency curriculum including a senior-year involvement for nursing students (Herrman & Johnson, 2009). The curricula consisted of two seminars during the final year of school. The first seminar course emphasized topics such as professional clinical development, health care practices, caregiving, career planning, and ethics (Herrman &

Johnson, 2009). The second seminar, scheduled the semester prior to graduation, consisted of reinforcement study skills and preparation for the NCLEX-RN. This course provided consecutive clinical building of NCLEX-RN specific content through the semester (Herrman & Johnson, 2009).

### **National Council of State Boards of Nursing**

Founded in 1978, the NCSBN is a not-for-profit organization created in order to guard the safety of the public. NCSBN protects the public by ensuring that licensed nurses provide safe and competent nursing care. NCSBN establishes regulatory excellence for public health to ensure that nurses entering the workforce have the necessary knowledge and skills to practice. To accomplish their goals, the NCSBN develops a licensure examination that is consistent with current nursing practice. NCLEX-RN test questions are based on Blooms' taxonomy for the cognitive domain (Anderson & Krathwohl, 2001; NCSBN, 2012).

NCSBN is the main regulatory agency for nursing in the United States whose mission includes the development of the NCLEX-RN, NCLEX-PN, NNAAP, and MACE examinations (NCSBN, 2009, 2012). The computerized NCLEX-RN test includes multiple choices, exhibit items, fill-in-the-blank calculations, drag and drop, charts and graphs, and hot spot items. The NCSBN (2009, 2012) developed a position statement in July 2009 regarding the impending nursing shortage. NCSBN posited that standards should be based on the highest degree of available evidence for nursing practice, education, and regulation, and that these standards should be upheld in order to secure safe care and quality education for students.

This statement was developed by the NCSBN based on events that occurred in reaction to previous nursing shortages due to deregulation of educational standards including decreased qualified faculty. The NCSBN reviews the NCLEX-RN exam every 3 years for possible increases in the intensity of questions that reflects the complications in patient care encountered by health care organizations.

### **Assessment Technology Institute (ATI)**

According to Davenport (2008), various strategies are associated with passing the NCLEX-RN exam. One such strategy, the Assessment Technology Institute (ATI), offers programs that are influential in improving faculty, student, and program outcomes such as the predictor test. The ATI RN Comprehensive Predictor test provides students and faculties with a numeric report of the probability of passing the NCLEX-RN at the student present level of preparedness. Secondly, the predictor is a guide for remediation based on incorrect answers given. Students are given a list of topics missed in individual and group score reports. An all-encompassing validation process involves statistical comparisons of student performance on the RN Comprehensive Predictor and the concrete NCLEX-RN first attempt pass/fail status (ATI, 2010, 2013).

The ATI RN Comprehensive Predictor Version 3.0 is the third version of an assessment that is intended to evaluate readiness for the NCLEX-RN (ATI 2010). Version 3.0 contained 155 multiple choice, four-option questions that required a single response within the 180 questions on the examination. The remaining 25 questions were presented as alternate format questions (ATI, 2010). Version 3.0 preceded Forms A and

B, which are fixed at 150 scored items and contain 30 pretest items that are not scored (ATI, 2010).

Students are required to purchase the ATI comprehensive package that gives them access to all required tests throughout the program (Davenport, 2008; ATI, 2010).

Included in the program are computerized critical thinking entrances and exit exams, a learning style inventory, content-specific exams, and a comprehensive predictor test, all of which are based on the NCLEX-RN test blueprint. Students complete nonproctored and proctored exams during each semester (ATI, 2010).

The ATI comprehensive package assists educators in augmenting curriculum, upgrading courses, and faculty development (ATI, 2010; Davenport, 2008). In addition to the predictor test, ATI incorporates a RN Content Mastery Series (CMS) to assist in identifying at-risk students. The ATI RN CMS consists of nine content assessments aligned to the NCLEX-RN blueprint. The series of assessments measures student comprehension in the major nursing content areas as they progress through the nursing program. The CMS is significant in that it is a secure standardized test, based on the RN-NCLEX. Various programs in different environments can also use the CMS (ATI, 2010).

Very few studies presented have addressed whether a correlation exists between ATI scores and first-time pass success on the NCLEX-RN. Furthermost studies (Davenport, 2008; Vandehouten, 2008) conducted thus far indicate that the ATI RN Predictor Test score can accurately determine the chance of success or failure of a nursing graduate in completing the NCLEX-RN examination. Jacobs and Koehn (2006) found that 12% of those who scored below the 20<sup>th</sup> percentile in the ATI failed the

NCLEX-RN on their first attempt. This implies that the ATI can be used to effectively determine at-risk students who need intervention and remediation.

Vandenhouten (2008) examined predictors of NCLEX-RN scores including cumulative GPAs, nursing course grades, and ATI comprehensive predictor test scores. Using logistic regression to analyze data, Vandenhouten (2008) determined that the ATI exit examination was statistically significant ( $p = 0.00$ ) in terms of predicting success for first time test takers of the NCLEX-RN. The results were only significant in predicting students likely to succeed on the first attempt with the NCLEX-RN. Mosser, Williams, and Wood (2006) conducted a study at Rhode Island College and Waynesburg College of nursing program that used the ATI to promote progression testing. Both schools' NCLEX-RN pass rates were less than 80% prior to implementing the ATI standardized progression test. The pass rate improved to over 90% following implementation of the ATI progression test (Mosser et al., 2006). Alameida et al. (2011) conducted a study on the predictive power of ATI on the first-time success of nursing graduates on the NCLEX-RN. Using a quantitative research design, Alameida et al. evaluated demographic variables, academic performance, and ATI scores to determine which of them can accurately predict success or failure in the NCLEX-RN examination. Statistical analysis showed that ATI scores were positively correlated with first-time pass rates. No finding of a significant relationship, however, was established between first-time pass rates and demographic data. Ukpabi (2008) studied the predictor power of 18 independent variables to determine NCLEX-RN success. Discriminant function analysis

revealed that ATI scores had statistically significant predictive power, particularly the ATI Critical Thinking score, ATI reading, and math test percentile scores (Ukpabi, 2008).

### **Health Education Systems Incorporated (HESI)**

HESI is a standardized exam used by schools of nursing in evaluating students' competency in achieving certain curricular outcomes. HESI provides various exams including the HESI Admission Assessment (entrance exam), specialty exams that can assess detailed clinical content, custom exams that assess faculty-specific content, and the HESI Exit Exam, a comprehensive exit assessment that evaluates students' knowledge base and their ability to apply nursing concepts. For this research study, the HESI Exit Exam was reviewed (Morrison et al., 2008; Young & Willson, 2012).

The HESI Exist Exam is a comprehensive 150-item test administered prior to completion of the nursing program for evaluation of students' readiness for the NCLEX-RN. Identification of students' weaknesses, strengths, and the need for remediation prior to taking the exam is determined (Young & Willson, 2012). Test items are based on a critical-thinking model that necessitates applying clinical reasoning to select the correct answers (Adamson & Britt, 2009; Nibert, Young & Adamson, 2008).

The HESI predictability model-, a proprietary mathematical model, calculates scores of this exam. The reliability of the exam is determined by conducting an item analysis on each exam for a composite report of the combined data. Validity is determined by an evaluation of content validity, construct validity, and criterion-related validity (Morrison et al., 2008; Langford, & Young, 2013).



Abbott, Schwartz, Hercinger, Miller, and Foyt (2008) conducted a retrospective, descriptive study at a University in Omaha, Nebraska on variables that predicted NCLEX-RN. The sample size consisted of 127 accelerated nursing curricula (ANC) graduates from 1999 to 2002 who took the NCLEX-RN examination. Variables in this study were previous science or nonscience degree, admission GPA, senior complex grade course grades, and the preRN assessment score. The majority of the students had a B average in their prior degrees. Seven of the 127 students failed the NCLEX-RN initially. The graduates who passed the NCLEX-RN had higher HESI scores for both degrees (Abbott et al., 2008). The mean average for the graduates who passed the NCLEX-RN was 10% higher than the ones who failed (Abbott et al., 2008). The students with science degrees who passed the NCLEX-RN had higher admitting GPA, HESI scores, and SCC grades than any other group. Students with a science, nonscience, and admitting GPA who passed the NCLEX-RN scored higher than students who failed. Students with science degrees who passed the NCLEX-RN had HESI scores 10% higher than all students who failed (Abbott et al., 2008). The findings show that students with science degrees perform better compared to students with nonscience degrees. In addition, these students had a higher course GPA and are most likely to pass the NCLEX-RN exam on their first attempt (Abbott et al., 2008)

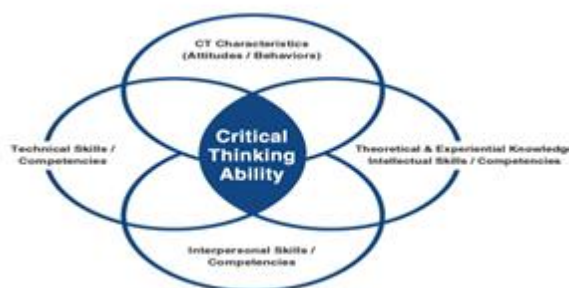
### **Critical Thinking**

Critical thinking (CT) is an integral part of accountability and quality care within the nursing profession. CT continues to be an essential part of nursing and thus must be a central factor of course content. Shirrell (2008) conducted a study to determine if CT is a

predictor of NCLEX success. Results showed that critical thinking alone is not a good predictor of NCLEX-RN success. Including CT in the curriculum is, however, essential for enhancement of the students' higher level of thinking. CT skills are an expectation of all nurses for accurate interpretation of patient issues and appropriate management of their care. Patients' lives depend on nurses making quick decisions and taking appropriate actions (Shirrell, 2008).

Brookfield (2010) described critical thinking as developing an awareness of the assumption that an individual and others think and act. Brookfield wrote, "Critical thinking can be recognized in the contexts of our personal relationships, work activities, and political involvement" (p. 1). CT is what students see and how they take care of problems to ensure that their patients are healthy. It is essential for students to know CT can be, in certain situations, the distinction between keeping patients safe and putting them in harm's way (Brookfield, 2010).

Alfaro-LeFevre (2011) created a four-circle CT model that educators can use in helping students to understand critical thinking (see Figure 1).



*Figure 1.* From "Critical thinking and clinical judgment: A practical approach to outcome-focused thinking" by R. Alfaro-LeFevre, 2009, p. 68. "Reprinted with permission".

The model located on the inside cover constructs a picture of what is involved in critical thinking. Beginning at the top and continuing clockwise, this model helps students understand the need for a commitment to develop CT characteristics, such as persistence and fair-mindedness (Alfaro-LeFevre, 2009). Second, students should be responsible for their learning by seeking out learning experiences that increase their academic and pragmatic knowledge needed for critical thinking (Alfaro-LeFevre). Third, students need to develop interpersonal skills, for example, conflict management, teamwork, and being an advocate for their patients. Fourth, students should practice related technical skills, for example using computers, starting intravenous therapy, and completing sterile procedures (Alfaro-LeFevre). Educators using the nursing process can help their students improve their critical thinking skills, pass the NCLEX-RN exam, and be safe, effective nurses (Alfaro-LeFevre, 2009).

### **NCLEX-RN Test Plan**

The licensing authorities within the state, commonwealth, and territorial boards of nursing regulate entry into the practice of nursing. Development of the NCLEX-RN Test Plan is accomplished by collecting data on the current practices of entry-level nurses by conducting a practice analysis. Licensed RNs were asked about the occurrence and significance of performing 155 activities concerning current nursing practice. An analysis of the activities is completed in relation to the frequency of performance, impact on maintaining client safety, and client care settings where the activities are performed. Results of the analysis serve as a guide for improvement of standards for entry-level nursing practice. The succeeding stage involves development of the NCLEX-RN Test

Plan, which guides the selection of content and performances to be tested (NCLEX-RN Detailed Test Plan 2010, 2013; NCSBN, 2010, 2013).

The NCLEX-RN Test Plan serves as a template for development of the examination. The NCLEX® examination assesses the knowledge, skills and abilities that are essential for the nurse. The organization of the NCLEX-RN examination is based on nursing actions and competencies crucial for meeting the needs of patients. The NCLEX Examination Committee reviews and approves the test plan. Upon approval of the NCLEX-RN exam, the test plan is presented to the Delegate Assembly for review and approval (NCLEX-RN Detailed Test Plan 2010, 2013; NCSBN, 2010, 2013).

In December 2009, the NCSBN Board of Directors made a decision to raise the NCLEX-RN from -0.21 to -0.16 logit. In combination with the 2010 NCLEX-RN Test Plan, the new standards were applied April 1, 2010. The Computerized Adaptive Testing (CAT) is used to administer the examination. CAT is a technique for administering exams that combines computer technology with contemporary measurement concepts to increase the interactive experience of the exam process (NCLEX-RN Detailed Test Plan 2010, 2013; NCSBN, 2010, 2013)'

**Reliability/Validity.** The NCSBN must ensure that the NCLEX-RN exam is valid and can be legally defensible due to the high-stakes nature of the exam. In doing so, all NCLEX questions are analyzed thoroughly to ensure that the exam measures only nursing-related content and potential biases such as gender and ethnicity. Using differential item functioning (DIF) analyses is one way the NCSBN can investigate for biases. In order for DIF to exist, two or more groups of candidates differ after their ability

level is held constant. One group is called the focal group (group of interest) and the other is the reference group, which is compared to the focal group (NCSBN, 2010, 2013; Woo & Dragan, 2012).

The Rasch Separate Calibration  $t$  test is used to increase sensitivity to small sample sizes and to stay consistent with the item calibration method used on the NCLEX exam. The  $t$  test compares the difference between the difficulties of a question for the focal group and the reference group (NCSBN, 2010, 2013; Woo & Dragan, 2012).

The NCLEX questions are reviewed for language sensitivity and readability to help assure test validity. To ensure that the reading level is not a barrier for successfully completing the examinations, all operational question pools undergo readability analyses. The ultimate goal of the NCLEX exam is to categorize test candidates into two groups: individuals who have sufficient knowledge, skills, and ability to practice entry-level nursing safely and effectively and those who cannot (NCSBN, 2010; Woo & Dragan, 2012).

**Test plan structure.** The framework of the test plan is based on client needs and defining nursing actions and competencies that focus on clients in all situations. The structure of the NCLEX-RN Test Plan has four major client needs categories with two of the four categories divided into subcategories. The four categories of the 2010 NCLEX-RN Test Plan and subcategories are as follows (a) Safe and Effective Care Environment, (b) Health Promotion and Maintenance, (c) Psychosocial Integrity, and (d) Physiological Integrity (NCLEX-RN Detailed Test Plan, 2010, 2013).

**Integrated processes.** Also incorporated into the NCLEX-RN exam are the diverse processes fundamental to the practice of nursing. These questions are integrated throughout the Client Needs categories and subcategories (NCSBN, 2010, 2013).

*Nursing Process:* A scientific, clinical reasoning approach to patient care that includes assessment, analysis, planning, implementation, and evaluation.

*Caring:* The Interaction of the nurse and patient in an atmosphere of mutual respect and trust. In this collaborative environment, the nurse provides encouragement, hope, support, and compassion to help achieve desired outcomes.

*Communication and Documentation:* Verbal and nonverbal interactions between nurse and patient, the patient's significant other, and members of the health care team. Events and activities associated with client care are validated in written and/or electronic records that reflect standards of practice and accountability in providing care.

*Teaching/Learning:* Facilitation of the acquisition of knowledge, skills, and attitudes promoting a change in behavior.

**Distribution of content.** Based on the results of the “Report of findings from the 2008 RN Practice Analysis: Linking the NCLEX-RN® Examination to Practice,” the percentage of test questions are allocated to each patients' needs category and subcategory of the NCLEX-RN Test Plan (NCSBN, 2010, 2013). Percentages of Items from each Client Needs Category/Subcategory are found in Table 2 (NCSBN, 2010, 2013).

Table 2

*Percentages of Items From Each Client Needs Category/Subcategory*

Distribution test questions	Percentage
Safe and effective care environment	
Management of care	16% – 22%
Safety and infection control	8% - 14%
Health promotion and maintenance	6% - 12%
Psychosocial integrity	
Basic care and comfort	6% -12%
Pharmacological and parenteral therapies	13% - 19%
Reduction of risk potential	10% -16%
Adaptation	11% -17%

*Note.* Adapted from “NCLEX-RN Examination Test Plan for the National Council Licensure Examination for Registered Nurses” (NCSBN, 2010).

The detailed test plan serves as a guide for students and faculty to assist in preparation for the examination. Additionally, the test plan directs item writers in improving test questions and simplifies the classification of examination items. NCSBN creates two versions of the detailed test plan: (a) Item Writer/Item Reviewer/Nurse Educator version and (b) Applicant version. The Item Writer/Item Reviewer/Nurse Educator version has a more exhaustive and wide-ranging listing of content for each patient’s needs by category and subcategory. Following each category are sample questions that explicitly focus on the client needs category reviewed in that section. The educator version of the test plan has an item-writing guide with sample scenarios for hands-on experience in writing NCLEX style test questions. The student version of the

detailed test plan does not have an item-writing guide (NCLEX-RN Detailed Test Plan, 2010, 2013; NCSBN, 2010, 2013).

### **Predictors of NCLEX-RN Success**

DeLima, London, and Manieri (2011) found that a number of variables are considered influential in predicting NCLEX-RN success for first time takers. It is important to determine academic or nonacademic variables that are helpful in identifying which test-takers among qualified applicants are most likely to pass the NCLEX-RN examination. This is related to the high attrition rate of nurses and the need to enhance the quality of beginning nurses (DeLima et al., 2011). Determination of variables provides the impetus for examining whether a correlation exists between exit examination scores in a standardized test and NCLEX-RN passage or failure. Studies in the literature have found that academic, nonacademic, and demographic variables can predict future outcomes in the NCLEX-RN examination (DeLima et al., 2011).

Daley, Kirkpatrick, Frazier, Chung, and Moser (2003) found that specific nursing program variables such as course grades for medical-surgical nursing and cumulative GPAs were positively associated with NCLEX-RN examination success. Demographic variables did not significantly influence NCLEX-RN outcomes. Daley et al. (2003) also evaluated the predictive power of two standardized examinations for nursing graduates: the HESI Exit Examinations and Moby Test. Nursing program variables evaluated in the study included course grades in nursing (didactic senior medical-surgical nursing course, pathophysiology, and clinical senior medical-surgical nursing course). Demographic variables evaluated were age, race, gender, and prenursing GPA and ACT scores. Using



independent *t* tests and *chi*-square tests, the authors concluded that only two variables had predictive ability in terms of NCLEX-RN examination outcomes: cumulative GPA and a medical-surgical nursing course grade. Performance on the NCLEX-RN exit examinations (HESI and Mosby Test) did not show a positive relationship with pass or fail status on the NCLEX-RN exam (Daley et al., 2003).

Haas, Nugent, and Rule (2004) examined whether it was possible to predict first time success on the NCLEX-RN examination with a selected group of variables. The predictive power of academic and nonacademic variables such as race, age, and gender, nursing GPA, SAT scores, admission scores and campus group membership was evaluated. A descriptive archival design was utilized using a sample of 317 nursing students who graduated between 1991 and 2001. Discriminant function analysis revealed that gender was positively correlated to exam pass or fail outcomes (Haas et al., 2004).

Interestingly, women were more successful than men were at passing the NCLEX-RN for the first time. Aside from gender, no other study variable showed predictive power. Furthermore, the researchers noted methodological limitations such as the conversion from ordinal to interval data in the statistical analysis (Alameida, et al., 2011; Haas et al., 2004) Nonetheless, they concluded that it is possible for institutions to predict future NCLEX-RN performance and identifying those at-risk students who need remediation and intervention (Haas et al., 2004).

DiBartolo and Seldomridge (2004) conducted a descriptive archival study to examine whether success in the computerized NCLEX-RN examination can be predicted using a number of variables. The variables considered for logistical regression analysis

included preadmission variables similar to the finding made by Haas et al. (2004).

DiBartolo and Seldomridge (2004) also recognized that success or failure in the NCLEX-RN examination can be predicted and intervention can be made to improve success rates among first time takers.

Laundry and Lea (2006) used a mixed methods study to examine whether demographic variables, prematriculation variables, and intramatriculation variables can predict NCLEX-RN performance in an associate nursing degree program. Demographic variables analyzed included marital status, age, race/ethnicity and gender.

Prematriculation variables were GPA and NET scores. HESI Exit Examination scores were considered intra-matriculation variables. The sample consisted of 93 nursing students who passed the HESI Exit Examination, graduated in the spring of 2005 and passed the NCLEX-RN exam in the 2005. The sample was divided into two groups; those having prenursing GPA of less than 2.8 were identified as at-risk and those having prenursing GPA of 2.8 or higher made up the not-at-risk group. The quantitative aspect of Laundry and Lea's (2006) study indicated that statistically significant differences in HESI Exit Examination scores between at-risk and not-at-risk students but during the actual NCLEX-RN examination, all 93 students passed on their first try. The qualitative aspect of the study evaluated the perceptions of nursing students and revealed that faculty-led interventions and remediation programs to assist first-time takers of the NCLEX-RN were considered influential in ensuring the 100% passing rate of study participants (Laundry & Lea, 2006). The finding of this study lends support to the

assertion that remediation programs and interventions intended to assist first time takers are effective in improving NCLEX-RN outcomes (Laundry & Lea, 2006).

Baker (2008) studied the predictive power of standardized preadmission examination scores in NCLEX-RN examination scores. Using a quantitative research design, Baker (2008) posited that nursing programs requiring standardized preadmission tests with cut off scores would register higher passing rates on the NCLEX-RN examination than nursing programs that do not administer preadmission testing or with lower cut off scores as admission criteria. Spearman's rho and *chi* square tests revealed that standardized testing and NCLEX-RN passing rate were not positively associated. The findings, however, did not reflect standing policies in admission criteria of nursing programs (Baker, 2008). Ninety percent of the program directors within Arizona State University believed that standardized preadmission testing was the best predictor for NCLEX-RN examination passing or failing (Baker, 2008). Standardized exams were rated as the most significant variable in predicting NCLEX-RN performance among first time takers. The author recognized methodological limitations in the study and recommended further research (Baker, 2008).

Homard (2012) conducted an ex post facto correlation study to evaluate whether exit examination scores in HESI and ATI resulted in a significant difference in NCLEX-RN pass rates among three cohort groups of nursing students. The sample was divided into three cohort groups namely: (a) those that did not participate in the standardized package, (b) those that participated in two semesters of the standardized package, and (c) those that participated in four semesters of the standardized package. Homard (2012)

used the novice to expert theory (Benner) as a theoretical framework. Statistical analysis revealed that participation in a standardized test package to prepare for the NCLEX-RN examination influenced pass rates on the NCLEX-RN (Homard, 2012).

Harris (2006) studied whether a number of variables are significant predictors of success on the NCLEX-RN exam. Evaluated were the following variables: cumulative GPA, admission GPA, age, race, gender, and marital status (demographic variables). It was hypothesized that the aforementioned variables would be significant predictors of NCLEX-RN success. Using a descriptive archival research design, academic records of 167 nursing students were gathered. Harris (2006) found that among the demographic variables analyzed, age and race could be used to predict NCLEX-RN success. Older students (26 years old and above) had a higher likelihood of passing the NCLEX-RN examination for the first time than younger students. Caucasian students were also more likely to pass the NCLEX-RN examination than African American students were. Cumulative GPA was not found to be a statistically significant predictor of NCLEX-RN success (Harris, 2006).

Spurlock et al. (2008) utilized a descriptive, correlational, retrospective research design to determine whether the HESI Exit Exam is a statistically significant predictor of NCLEX-RN examination outcomes. The impetus for this study was the failure of a school's progression policy in improving NCLEX-RN pass rates. The HESI Exit Exam was the sole predictor of NCLEX-RN outcomes used in the progression policy at the institution under study. Using logistic regression analysis, the researchers found that the

HESI Exit Exam did not accurately predict success in the NCLEX-RN examination (Alameida et al., 2011; Spurlock et al., 2008).

Campbell (1976) found that, “The more any quantitative social indicator is used for social decision-making, the more subject it is to corruption pressures and the more apt it is to distort and corrupt the social processes it is intended to monitor” (p. 49).

Spurlock et al. (2008) suggested that institutional interventions addressing low pass rates in the NCLEX-RN should not be limited to a single indicator like the HESI predictive test. They questioned the poor judgment of schools in using the HESI Exit Exam, which cannot predict NCLEX- RN success or failure (Spurlock et al., 2008).

However, there are contradictory findings as to whether or not standardized predictive tests can accurately determine the eventual success or failure in NCLEX-RN examinations. The basic assumption is given that all nursing students undergo the same theoretical and clinical training, they should be able to complete the NCLEX-RN exam successfully (Alameida et al., 2011; Poorman & Martin, 199; Spurlock et al., 2008). Nevertheless, average and even above average nursing students have failed to pass the NCLEX-RN examination (Alameida et al., 2011; Poorman & Martin, 199; Spurlock et al., 2008).

Nursing graduates utilize strategies to ensure their success in the NCLEX-RN by undertaking commercial review courses initiated by nursing schools or use personal methods in preparing for the exam (Poorman & Martin, 1991). Despite these preparations, many graduates are unsuccessful in passing the NCLEX-RN exam, suggesting that nonacademic variables may be influential in students’ performance in the

NCLEX-RN examination. For example, Poorman and Martin (1991) concluded that “...factors other than a deficient knowledge base in nursing content can influence NCLEX-RN results” (p. 25-26). A finding by Poorman and Martin (1991) suggests that test anxiety and cognitive preparation may be influential to NCLEX-RN failure or success.

Higgins (2005) conducted a mixed methods study to determine which variables affect success in NCLEX-RN examinations in an associate nursing degree program. Examined were demographic variables and exit examination scores. Age, gender, and race were not significant predictors in NCLEX-RN success.

Harris (2006) found that repeating science courses among students did not predict NCLEX-RN outcomes. This finding is contradicted in Washington and Perkel’s (2001) finding that students who repeat courses are at-risk students who have lower chances of passing the NCLEX-RN examination the first time. Course grades were also found to be influential in predicting pass or fail status in the NCLEX-RN. Variables such as performance in a medical surgical nursing course (Buttry, 2003), grades in Introduction to Nursing courses (Bonte-Eley, 2002), grades in senior final nursing theory class (Sayles et al., 2003), and performance in all nursing courses (Matos, 2007; Simon et al., 2013) relate significantly with NCLEX-RN success. Another variable that can predict NCLEX-RN success or failure is cumulative GPA Simon et al., 2013. Several studies have established that a high cumulative GPA has a positive relationship with NCLEX-RN success or failure (Matos, 2007; Collins, 2002; Simon et al., 2013).

High nursing theory course GPAs were also found to be positively associated with NCLEX-RN success or failure by Milow (2002) and Hardin (2005). Gilmore's (2008) retrospective study showed that nursing graduates who were successful first-time takers of the NCLEX-RN had higher ACT scores and higher nursing GPA by 0.3. This finding established that nursing GPA is a significant predictor of NCLEX-RN examination success or failure (Gilmore, 2008; Simon et al., 2013). Increasing GPA is therefore a crucial component of the effort to improve NCLEX-RN scores (Gilmore, 2008; Simon et al., 2013). Remediation for many students is a viable option in this regard. A discussion on the advantages of remediation is presented.

### **Remediation**

The nursing shortage has raised the stakes for nursing programs. Educators are seeking many means by which to ensure their students pass the NCLEX-RN exam on the first attempt (Sifford & McDaniel, 2007). Many schools are developing remediation courses to help their students pass the NCLEX-RN exam the first time. Sifford and McDaniel (2007) explored the effects of a 15-week remediation course on students found to be at-risk of failing. These students' exit scores showed a significant positive increase.

Subsequently reviewing their nursing curriculum, Bonis, Taft, and Wendler (2007) made changes which increased their pass rate. The changes included (a) RN assessment test at the end of the semester, (b) an independent study model at the end of the semester, and (c) administration of a simulated NCLEX during the last 6 weeks of their last semester. Following implementation of the strategies, the NCLEX-RN pass rate increased from 89.5% to 94.1% (Bonis et al., 2007; Davis, 2011).

Horton, Polek, and Hardie (2012) conducted a study at a mid-Atlantic associate degree nursing school to examine the impact of three success measures: a computerized, self-directed remediation course, entrance examination scores, and selected course grades. After a drop in the pass rate from 91% to 82%, the school reviewed their curriculum, preadmission testing, exit examination, and remediation. These measures resulted in the implementation of remediation requirements (Horton et al. 2012). Results of the school's remediation program were significantly positive. Reinforcing performance-prescribed remediation with an addition of course grade improved the NCLEX-RN pass rate (Horton, Polek, & Hardie, 2012).

Taking another approach with a narrower demographic, Sifford and McDaniel (2007) compared the performance of senior nursing students on an exit exam before and after remediation. The participants were in a graded two-credit mandatory remediation course. After retesting, the results showed a significant difference,  $t(46) = -5.228, p < .001$  showing the students' performance significantly improved after remediation (Sifford & McDaniel, 2007). Of the 47 students, 18 (38.3%) obtained a passing score following the remediation course (Sifford & McDaniel, 2007).

Specifically with regard to remediation courses, the results from a study conducted by Pennington and Spurlock (2010) suggested several methodological problems in education research literature. First, the research design used to examine the effectiveness of the remediation process does not provide any type of test (Pennington & Spurlock, 2010). Second, because intervention was cross-domain, it is impossible to determine which intervention had the most significant effect on NCLEX-RN outcomes



(Pennington and Spurlock, 2010). The researchers felt that evidence exists for risk assessment methods and interventions influencing first-attempt pass rates. Pass rate for first-time test takers may increase with remediation and policy progression. Remediating educators on their teaching and evaluation techniques could be more beneficial than focusing all efforts on student remediation (Pennington & Spurlock, 2010).

### **Implications**

Results of this study may have implications for nursing programs and show a need for further research. Academic variables might prove useful in the early identification of students at risk for failing the NCLEX exam. Results from this study may also influence nursing programs by assisting nursing faculty in identifying at risk students who may need remediation to increase their chances of being successful in the nursing program. In addition, results from this study could be important since predictor variables could point to factors that possibly will lead to a successful first attempt at the NCLEX-RN exam. The majority of the nursing graduates who take the NCLEX-RN examination are associate's degree graduates, and success on the exam influences the number of nurses entering the field each year (NCSBN, 2009, 2010, 2013). This study may inform interventions and programs that can address the nursing shortage currently experienced in the United States at present.

In terms of the accomplishment of this goal, examination of the literature reveals that multiple studies have concerned independent variables (Romeo, 2013). However, these studies tend to focus on a sample of each cluster of the independent variables, making strategic implementation of their findings problematic. For example, one study

explored age, science courses within the program, and the uses of the NLN II and I. Studies focusing solely on prerequisites and preprogram preparation with respect to NCLEX-RN success do not exist. Due to the rigor of nursing curriculum and the need to admit well-prepared students in order to develop competent nurses who can be successful in their program and pass the NCLEX-RN, this study is appropriate and timely.

The review of the literature mainly found a positive relationship among particular independent variables such as standardized testing and NCLEX-RN success. In terms of academic variables, GPA was shown to be a strong predictor of NCLEX-RN success (Collins, 2002; Hardin, 2005; Simon, 2006; Washington & Perkel, 2001). Nonacademic variables such as grades in nursing classes were also found to be positively associated with NCLEX-RN success (Bonte-Eley, 2002; Hardin, 2005; Matos, 2007; Milow, 2005; Sayles et al., 2003; Simon, 2006). In addition, performance in standardized tests was generally considered statistically significant predictors of first-time success in NCLEX-RN (Buttry, 2003; Campbell, 2006; Matos, 2007). In particular, those who performed well on the ATI Predictor Test were found to be more likely to pass the NCLEX-RN examination on their first attempt (Alameida et al., 2011; Vandenhouten, 2008). It must be established however that there are contradictions in the findings and methodological limitations accepted by authors. Researchers cautioned against generalizing the application of study findings to all contexts and unanimously recommended that further study is warranted (Alameida et al., 2011; Vandenhouten, 2008).

## Summary

The scope of the national nursing shortage goes well beyond the healthcare agencies. Nursing programs are conscientiously working to increase the number of qualified graduate nurses to address the nursing shortage. Increase in graduates is only one consideration to increasing enrollment. Along with increasing enrollment, nursing programs must maintain quality programs. Nursing educators need to improve students' likelihood of passing the NCLEX-RN by making appropriate revisions to nursing programs' curriculum, developing assessment testing, and utilizing program predictors to identify students at risk for failure on NCLEX-RN. The quality of a good nursing program is dependent on their graduates being successful with the NCLEX- RN exam on the first attempt.

Predictors of NCLEX-RN success are both academic and nonacademic in nature. NCLEX-RN pass rates have been steadily declining since the change in the difficulty of the NCLEX-RN test questions (2013 NCLEX-RN Detailed Test Plan). This section encompasses the purpose of the project study, definition of the problem, rationales and significance of the problem, research questions, the literature review, and implication of the study.

Section 2 provides the methodology approach used for this study. This section details the research design, methods, and data gathering procedure that was utilized in determining if there is a correlation between the NCLEX-RN predictor test scores and the NCLEX-RN exam success for first-attempt test takers. Included are the detailed results of

the study using descriptive statistics, three guiding research questions, and the hypothesis generated and tested.

Section 3 provides a description of the policy developed from the results of the study. Section 4 contains personal reflections, conclusions, and recommendations.

Information related to the project is located in the appendix A and B.

## Section 2: Methodology

### **Introduction**

There exists a literature gap in the predictive ability of the ATI RN Comprehensive Predictor to forecast success on the NCLEX-RN on the first attempt. The purpose of this quantitative study was to augment information in the literature with respect to the determination of predictive factors in NCLEX-RN success in support of evidence-based interventions to address the declining NCLEX-RN pass rate in the country. With Bloom's taxonomy and Knowles's andragogical model of learning as the theoretical backbone, the goal was to determine which of the independent variables significantly predict nursing graduates' success or failure in the NCLEX-RN on their first attempt. The independent variables included the ATI comprehensive predictor scores, demographic factors--age and gender, and academic variables, prenursing GPA, and final GPA. The dependent variable was the students' first-time results on the NCLEX-RN. Data were taken from archived records from 195 ADN student records. All students completed a 5-semester ADN nursing program in spring and summer of 2010 and 2011.

Section 2 includes a description of the screening procedures and data collection of the study, a synopsis of the statistical analyses used to address the research questions, and the results of the analysis in the quantitative study. The study involved analyzing all the independent and dependent variables. Analysis results were then aligned with the hypotheses.

The sample consisted of 195 nursing students from an ADN program in the southeastern portion of SC. Success on the NCLEX-RN exam results in more nurses

entering into the health care setting. Understanding what variables influence NCLEX-RN success can inform decision-making in nursing schools on curriculum and admission requirements. The research results provide an analysis of the variables that can predict NCLEX-RN success that can be used to make changes in admission requirements and curriculum. In a period of limited educational funding and fiscal resources, educational leaders need to make informed judgments of allocation of funds by ensuring that students prepared to be successful in the nursing program are admitted.

### **Research Questions**

Accordingly, this section of the manuscript details the results of the study in response to the following research questions:

1. What significant relationship exists between prenursing GPA, final GPA and NCLEX-RN success?
2. What significant relationship exists between age, gender, race, and NCLEX-RN success?
3. What significant relationship exists between ATI predictor scores and NCLEX-RN success?

### **Hypotheses**

Six hypotheses were generated and tested for this study:

$H_{10}$ : NCLEX-RN success at first attempt cannot be predicted by prenursing GPA and final nursing GPA.

$H_{1a}$ : NCLEX-RN success at first attempt can be predicted by prenursing GPA and final nursing GPA.

*H2<sub>0</sub>*: NCLEX-RN success cannot be predicted by age and sex.

*H2<sub>a</sub>*: NCLEX-RN success can be predicted by age and sex.

*H3<sub>0</sub>*: NCLEX-RN success cannot be predicted by ATI scores.

*H3<sub>a</sub>*: NCLEX-RN success can be predicted by ATI scores.

### **Data Collection**

The data were collected from a single 2-year ADN program. Test records reflect official evidence that is used to determine interventional effectiveness (Lodico et al 2010). Data collection was archival and included the NCLEX-RN exam results for first time test takers of the NCLEX-RN exam. Data were collected from records of ADN students who graduated from SETC during spring and summer of 2010 and 2011 who took NCLEX-RN exam the first time. I entered the data into Statistical Package for Social Sciences (SPSS). The independent variables measured in this study were the ATI predictor scores, prenursing GPA, final GPA, gender, and age. The dependent variable was the NCLEX-RN exam pass rate. Data obtained from the college are stored on my personal computer if needed and are password protected.

A numerical scale was assigned to students' course grades, ATI results, age, gender, and NCLEX-RN results. Course grades, prenursing and final, were entered using the grading scale used by the college. Descriptive statistics were calculated to describe the students included in the study and multiple regression was used to identify the presence of significant relationships between variables and passing or failing the NCLEX-RN exam. The Comprehensive Predictor RN examination scores (ATI, 2010, 2013) were measured as continuous data and coded as the actual scores. The criterion

variable of NCLEX-RN scores on the first attempt is a dichotomous, categorical variable and was coded in the data file as 1 = pass and 0 = fail. To protect their identity, students' names were substituted by a numerical code.

### **Design and Data Analysis**

This quantitative, retrospective study involved examining the predictive accuracy of the ATI RN Comprehensive Predictor scores to forecast both passing and failing the NCLEX-RN at one school of nursing in SC. Retrospective studies are nonexperimental, and there is no manipulation involved in relation to the subject (Burns & Grove, 2009; Creswell, 2012). The researcher's role is to link an event to another event occurring before the first (Burns & Grove, 2009). I used archival data retrieved from SETC to link NCLEX-RN results to the ATI predictor test students completed before graduation. A multiple regression analysis was used to determine if a relationship exists between the test scores and the NCLEX-RN outcomes. The software used to perform the analysis was the SPSS 18.

A retrospective, quantitative design was the ideal method to compare standardized test data to the NCLEX-RN. Retrospective studies involve measuring current circumstances that might have a relationship with past circumstances (Polit & Beck, 2008; Creswell, 2012; Lodico, et al., 2010). The current study involved analyzing NCLEX-RN scores with ATI Comprehensive Predictor scores and other variables to determine the extent of their relationship. Qualitative research designs were not appropriate for the study.



### Descriptive Statistics

Table 3 shows the frequency counts for selected variables. The sample included more female students (90.8%) than male students (9.2%). For the entire sample, 84.1% of the students passed the NCLEX on their first attempt (see Table 3).

Table 3

*Frequency Counts (N = 195)*

Variables	<i>n</i>	%
Gender		
Female	177	90.8
Male	18	9.2
NCLEX outcome		
Pass	164	84.1
Fail	31	15.9

*Note.* Frequency count for variables, gender, and NCLEX-RN outcomes.

Table 4 shows the descriptive statistics for selected variables. The statistics included the students' age ( $M = 32.69$ ,  $SD = 10.571$ ), the ATI Predictor score ( $M = 90.77$ ,  $SD = 9.667$ ), the prenursing GPA ( $M = 3.16$ ,  $SD = .512$ ), and the final GPA ( $M = 2.71$ ,  $SD = .145$ ; see Table 4).

Table 4

*Descriptive Statistics for Selected Variables (N = 195)*

Variables	<i>M</i>	<i>SD</i>	<i>Low</i>	<i>High</i>
Age	32.69	10.571	18	54
ATI predictor score	90.77	9.667	25	99
Prenursing GPA	3.16	.512	2	4.0
Final GPA	2.71	.145	2	4.0

*Note.* Statistics variables for age, ATI scores, prenursing GPA, and final nursing GPA.

### Demographic Data

Demographic data collected included age upon admission to the college and sex. The typical graduate was a 33-year-old female. The youngest respondent was 18 years old while the oldest was 54 years old. Frequency count shows that students' ages 25 and 42 predominate at *n* of 16 (8.2%; see Figure 2). On the other hand, the oldest age was represented by only one respondent (0.5%). Almost all nursing graduates who took the NCLEX-RN in the present study were females (*n* = 177, 90.8%). Males only composed 9.2% of the total respondent pool (see Figure 3).

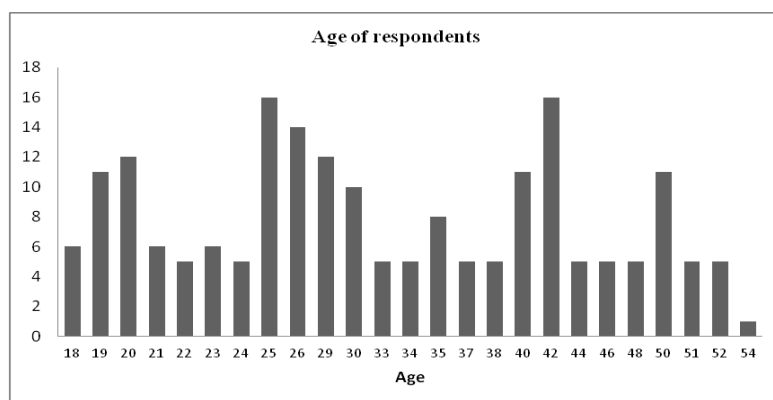


Figure 2. Respondents' age.

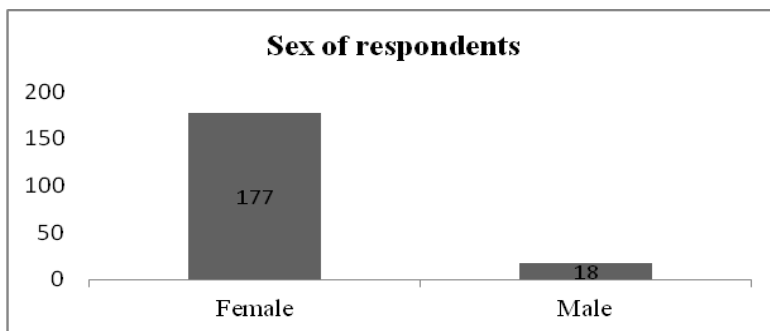


Figure 3. Sex of respondents. Distribution of respondents' gender ( $N = 195$ ).

### Academic Information

#### Admission (Prenursing) GPA

Distribution of admission GPAs varied among the respondents. With respect to the range, the lowest and highest GPAs were 2.00 and 4.00, respectively. Most GPAs were 4.00 ( $n = 34$ , 17.4%). Very few ( $n = 2$ , 1.0%) had a GPA upon admission of 2.90 (see Figure 4). The mean GPA was  $M = 3.16$  with a standard deviation of  $SD = .592$ .

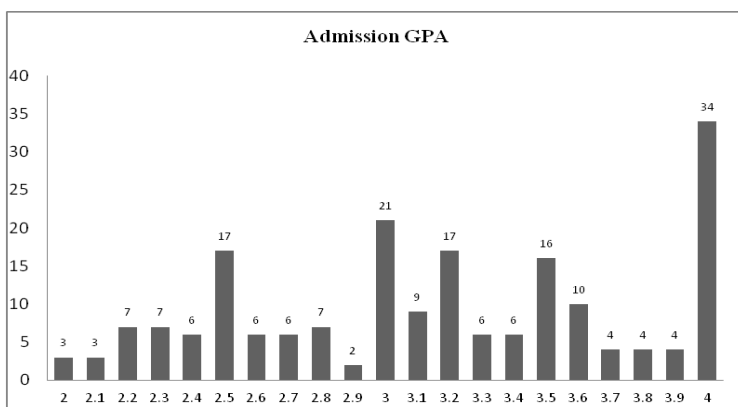


Figure 4. Students' admission GPA.

#### Final GPA

Likewise, majority had a nursing GPA of 2.50 ( $n = 24$ , 12.3%) and one with a 3.10 GPA (0.5%; see Figure 5).

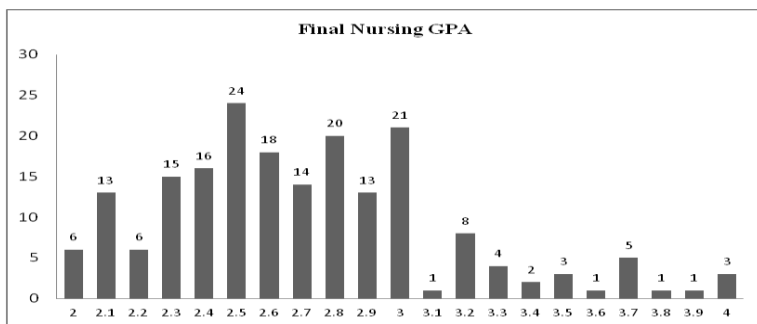


Figure 5. Students' final GPA.

### ATI Predictor Scores

ATI Predictor scores were also determined. Distribution of scores was tabulated as presented below. Most NCLEX-RN takers had ATI scores of at least 91%, which numbered 134 or 68.71%. Sixty-one had scores below 91 (31.28%; see Figure 6). The mean ATI score was  $M = 90.77$  with a standard deviation of  $SD = 9.667$ .

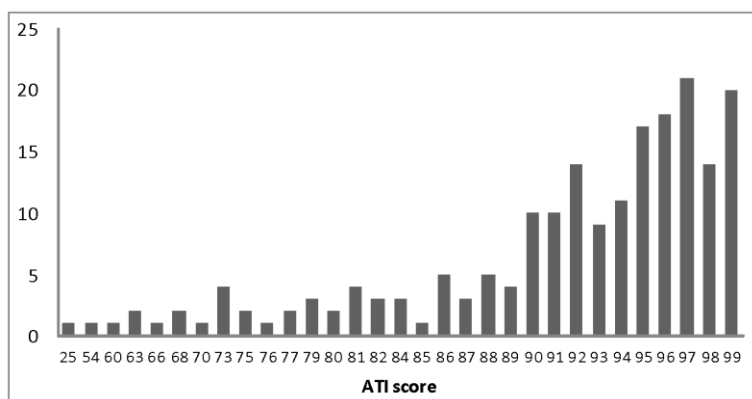


Figure 6. ATI predictor test scores.

### NCLEX-RN Scores

Once the state board of nursing has approved students' NCLEX-RN application, students schedule their exam date. The NCLEX-RN report is sent to the Dean of Nursing quarterly with students' names showing results for pass or fail. I obtained reports from a locked cabinet in the nursing faculty office suite. The data ( $n = 195$ ) were cross-tabulated

to determine the number of students that passed or failed. This application, which is displayed in Figure 7, shows the number of students pass rate for NCLEX-RN ( $n = 164$ , 84.1%) while 31 students failed (15.9%).

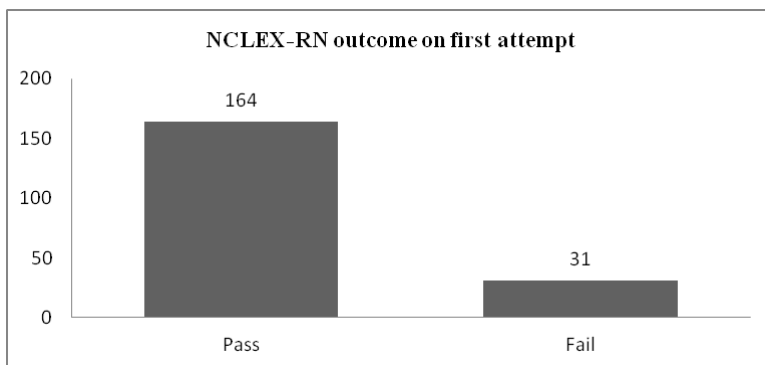


Figure 7. NCLEX-RN first attempt test results.

### Inferential Statistics

Applying a multiple regression, the null hypothesis that none of the independent variables that include ATI score, nursing GPA, academic GPA, gender, and age contribute towards the outcome variable (success or failure on the NCLEX-RN) was tested. The assumptions of multiple regression were conformed, including (a) linear relationship, (b) multivariate normality, (c) no or little multicollinearity, (d) no auto-correlation, and (e) homoscedasticity. These conditions were evaluated and deemed met by analyzing the pattern of the residuals. The same number of points above and below horizontal of 0 suggested no major departures from linearity. Moreover, by analyzing the Q-Q plot, the fairly straight diagonal suggested no major departures from Normality. ATI score, nursing GPA, academic GPA, and age are continuous whereas gender (coded 1 = female, 2 = male) and performance of students in NCLEX-RN (coded 1 = success, 0 = failure) are dichotomous.

## **Multiple Regression Analysis**

Multiple regression (Lodico et al., 2010) is the most popular statistical test used in correlational research. It permits a more accurate depiction of several different variables that encompass multifaceted scholastic occurrences. After the influences of other variables are removed, multiple regression allows investigation of relationships between two variables (Lodico et al., 2010; Creswell, 2012). It also allows investigation of how accurate an amalgamation of several variables can predict a benchmark variable. In addition, multiple regression allows researchers to see how several predictor variables together might improve a prediction, which is the rationale for selecting these strategies (Creswell, 2012).

Multiple regression analysis was performed to determine which predictor variables influence the dependent variable (NCLEX-RN outcome). Multiple regression analysis is a statistical method which allows a researcher to predict a score on a certain variable on the basis of their scores on several other variables (Lodico et al., 2010; Creswell, 2012). Multiple regression analysis was utilized in order to test what variables can statistically predict success or failure of a nursing student on the NCLEX-RN on the first attempt. Multiple regression analysis is also used when investigating linear relationships between criterion and predictor variables (Creswell, 2012).

Data gathering on all variables allowed me to see which and how many of the variables can accurately predict success or failure on the NCLEX-RN. Multiple regression extends the principles of correlation but establishes causality (Creswell, 2012). Utilizing multiple regression analysis allows testing of theories or models in which set of

variables can precisely predict outcomes, which provides further support for using multiple regression (Creswell, 2012). The model summary for this study is provided in Table 5.

Table 5

*Model Summary*

Model summary				
Model	<i>R</i>	<i>R</i> Square	Adjusted <i>R</i> Square	Std. Error of the Estimate
1	0.398 <sup>a</sup>	0.159	0.136	0.34069

*Note.* Model summary of Predictors: prenursing GPA, gender, age, ATI predictor score, and final GPA.

Based on the Model Summary, *R* and *R* Square is highlighted for the regression of outcome in the NCLEX-RN (Y) on five predictor variables (nursing GPA, gender, age, ATI predictor Score, academic GPA). The computed Multiple *R* is 0.398 which indicates that the whole range of predictor variables, prenursing GPA, gender, age, ATI predictor score, and academic GPA, displays a weak relationship with outcome during the NCLEX-RN. According to the *R* Square, 15.9% of the variability in student outcomes in NCLEX-RN exam could be explained by the five predictors.

Next in the Multiple Regression output (see Table 6) is the ANOVA which tests whether the regression model serves as a better predictor of student outcome in NCLEX-RN compared to utilizing the mean as “best guess”. As illustrated, the value of the computed  $F(5, 189)$  is large at 7.125 and  $p$  is highly significant (0.00). Thus the null hypothesis, none of the predictors account for variation in student outcome with the NCLEX-RN exam, is rejected. It could likewise be gleaned that the regression model on

the relationship of independent and dependent variables has a significantly better predictive power than simply taking the mean of the student outcome. The highly significant  $F$  also suggests that there are one or possibly more significant predictors of performance in the NCLEX-RN exam. A more detailed analysis of the hypotheses is provided in the succeeding discussion.

Table 6

*ANOVA Summary*

ANOVA <sup>a</sup>					
Model	Sum of Squares	<i>Df</i>	Mean Square	<i>F</i>	Sig.
1 Regression	4.135	5	0.827	7.125	0.000 <sup>b</sup>
Residual	21.937	189	0.116		
Total	26.072	194			

*Note.* Anova summary for the dependent variable NCLEX-RN exam and predictors.

Variable: NCLEX-RN exam results. Predictors: (Constant), pre nursing GPA, gender, age, ATI predictor score, final GPA.

**Testing of the Hypotheses**

Based on the research questions, the first hypotheses was the NCLEX-RN exam success during the first attempt can be predicted by a student's admission GPA as well as final GPA (see Table 7).

*Hypothesis 1(null): NCLEX-RN exam success at first attempt cannot be predicted by prenursing GPA and final nursing GPA.*

*Hypothesis 1(alternative): NCLEX-RN success at first attempt can be predicted by prenursing GPA and final nursing GPA.*



Table 7

*Coefficient Table: GPA Variables and NCLEX-RN Success*

Model	Coefficients <sup>a</sup>			T	Sig.
	Unstandardized coefficients		Standardized coefficients		
	B	Std. Error	Beta		
(Constant)	-0.410	0.311		-1.319	0.189 <sup>ns</sup>
Pre Nursing GPA (X <sub>4</sub> )	0.059	0.046	0.095	1.272	0.205 <sup>ns</sup>
Final GPA (X <sub>5</sub> )	0.103	0.062	0.122	1.657	0.099 <sup>ns</sup>

*Note.* a. Dependent Variable: outcome in NCLEX-RN. ns - Not significant

\* - significant at 5% level of significance.

\*\* - highly significant at 1% level of significance

Information summarized in the Coefficients table above is rich. To interpret the results, it is advised that the table be read on a column basis starting from left then right, bearing in mind that every row corresponds a predictor variable necessary to draw out the regression equation. Contained in the first and second columns are the raw scores or unstandardized coefficients plus the standard errors. The coefficient labeled Constant represents the y-intercept of the best fit line of the regression model. The raw score coefficients are weights of predictor variables to obtain new outcome (Y) scores in the best fit line. If the purpose of the analysis is to predict scores, then attention should be accorded to these columns since the unstandardized coefficients help in developing the multiple regression model using collected data on age (-2.392X<sub>1</sub>), gender, (0.277X<sub>2</sub>), ATI predictor scores, (4.198X<sub>3</sub>), academic GPA (1.272X<sub>4</sub>), and, nursing GPA (1.657X<sub>5</sub>). The regression model equation is presented as:

$$Y = -2.392X_1 - 0.277X_2 + 4.198X_3 + 1.272X_4 + 1.657X_5.$$

As emphasized in the previous paragraph, model construction uses an equation containing  $b$  coefficients in each of the study predictors. Going back, the first portion of the output provides an estimate of the  $b$  coefficients which are indicators on the relative contribution of each independent variable to the entire model.

These  $b$  coefficients relate age, gender, ATI predictor score, academic GPA, and nursing GPA with student outcomes in NCLEX-RN. Only ATI predictor score, academic and nursing GPAs, recorded positive  $b$  coefficients while the rest are negative. Positive  $b$  coefficients indicate positive relationships while the converse in negative  $b$  coefficients. Simply put, if nursing graduates obtained higher scores in the ATI and earned better GPAs, they are more likely to succeed in their first attempt at taking the NCLEX-RN. Based on the coefficients table (see table 8) I found that both admission GPA and final GPA recorded positive but weak correlation with NCLEX-RN outcomes. Thus, the first null hypothesis is retained and the alternative hypothesis rejected (see table 8).

*Hypothesis 2 (null): NCLEX-RN success cannot be predicted by age and sex.*

*Hypothesis 2 (alternative): NCLEX-RN success can be predicted by age and sex.*

Table 8

*Coefficients Table: Age and Gender*

		Coefficients <sup>a</sup>			T	Sig.
Model		Unstandardized coefficients		Standardized coefficients		
		B	Std. Error	Beta		
	(Constant)	-0.410	0.311		-1.319	0.189 <sup>ns</sup>
1	Age (X <sub>1</sub> )	-0.006	0.002	-0.160	-2.392	0.018*
	Gender (X <sub>2</sub> )	-0.024	0.086	-0.019	-0.277	0.782 <sup>ns</sup>

*Note.* Dependent Variable: outcome in NCLEX-RN. *Ns* - Not significant.

\* - significant at 5% level of significance

Based on the corresponding t-test results on age ( $t=-2.392$ ) and gender ( $t=-0.277$ ), I found that NCLEX-RN outcomes have a significant negative correlation with age. Gender did not record a significant difference. Hence, I concluded the younger the students, the greater the likelihood of pass the NCLEX-RN during the first attempt (see Table 9).

*Hypothesis 3 (null): NCLEX-RN success cannot be predicted by ATI scores.*

*Hypothesis 3 (alternative): NCLEX-RN success can be predicted by ATI scores.*

Table 9

*Coefficients Table: ATI Predictor Score*

		Coefficients <sup>a</sup>			T	Sig.
Model		Unstandardized coefficients		Standardized coefficients		
		B	Std. Error	Beta		
	(Constant)	-0.410	0.311		-1.319	0.189 <sup>ns</sup>
1	ATI predictor score (X <sub>3</sub> )	0.011	0.003	0.289	4.198	0.000**

*Note.* Dependent Variable: NCLEX-RN exam results. *ns* - not significant

\* - significant at 5% level of significance

\*\* - highly significant at 1% level of significance

### **Predictive Ability of Variables**

Corresponding each  $b$  coefficient is a standard error (SE) suggesting the extent  $SE$  would differ across varying samples.  $T$ -test subjects the standard errors to test if they are significantly different from zero. Therefore if  $t$ -test results warrant a rejection of the null hypothesis, then the predictor has a significant contribution to the outcome variable.  $T$  computed for the independent variables age and ATI predictor score were statistically different (Age = -2.392,  $p = 0.018$ ; ATI = 4.198,  $p = 0.000$ ). Based on the magnitude of the  $p$  values, ATI scores have more impact than age of the NCLEX-RN takers. On the other hand, for gender, -0.277 ( $p = 0.782$ ); academic GPA, 1.272 ( $p = 0.205$ ); and nursing GPA, 1.657 ( $p = 0.099$ ). All these computed values are nonsignificant at 5% level of significance.

Beta weights corresponding standardized regression coefficients are likewise in the Coefficients output. Comparing all beta weights in the predictor variables shows that ATI predictor score is highest at 0.289 while age is the lowest at -0.160. For every increase in the ATI predictor score, outcome variable (student's success or failure in NCLEX-RN) also increases by 0.289 standard deviations. As age increases by one unit, there is a corresponding decrease in the outcome by 0.160 standard deviations. Only are the beta weights significant for these variables since the Sig. values are below 0.05.

### **Findings**

Statistical analysis utilizing SPSS 18.0 was conducted retrospectively from students' data after receiving permission from the administration of the College under study as well as the Institutional Review Boards of the institution under study and the

College for which I am employed. Anonymity for of all student data was maintained by substitution of numbers for student.

Data pertaining to hypothesis one did not demonstrate a significant difference between academic predictors and NCLEX-RN outcome. Hence, the hypothesis was not supported for both admission GPA and final GPA. The null hypothesis was retained.

Conversely for hypothesis two, the nonacademic predictors, only age at the time of sitting for NCLEX was predictive of success on the licensure examination. The second hypothesis was retained for age but not for gender. The null hypothesis was retained for gender but not for age.

For hypothesis three, the ATI standardized exit scores of the students were found to significantly predict future success on the NCLEX-RN. Hence, the null hypothesis was not retained. Among the significant predictors found to forecast NCLEX-RN success, ATI scores demonstrated higher predictive power than age.

### **Discussion**

There is interesting insight to be found in the findings of this study. The first unique finding is that students' GPA was found to have a weak correlation with NCLEX-RN success. Usually, data prior to admission to nursing school has great implications in the selection and monitoring of students' progress until their graduation and subsequent taking of the licensure examination. In this study however, both admission GPA and college GPA were not significant variables. This suggests that GPA and college GPA may not be always helpful in identifying so-called "at-risk" students. Still, given the limitations of this study, this cannot be generalized to other populations and the volume

of literature tends to point overwhelmingly to the predictive power of GPA in determining future NCLEX-RN success. This finding does not preclude the use of targeted interventions that can promote and ensure the success of students in the licensure examination.

Results of this study do not provide findings consistent with other nursing programs that established college GPA and admission GPA to be important in predicting NCLEX-RN outcomes. Nonacademic variables were also not shown to forecast NCLEX-RN success significantly in this study. Age at the time of the NCLEX-RN exam was found to be negatively correlated with NCLEX-RN success.

The most significant finding of this study is the predictive power of the ATI Comprehensive Predictor Score in forecasting success of a nursing graduate during the first attempt. This is consistent with the finding from Alameida et al., (2011) study which measured the predictive power of the ATI RN Comprehensive Predictor on NCLEX-RN outcomes. Alameida and colleagues examined the predictive power from two examination versions of the ATI using test results from 589 graduates. This finding firms up the rationale for the implementation and use of curriculum-wide standardized test packages that can significantly improve NCLEX-RN chances of success (Pennington & Spurlock, 2010; Spurlock & Hunt, 2008).

The finding that ATI scores predict NCLEX-RN success during the first attempt is consistent with studies that found exit examination scores such as ATI or HESI with licensure examination success (Adamson & Britt, 2009; Alameida et al., 2011; Young, & Anderson, 2007; Uyehara, Magnussen, Itano, & Zhang, 2007; Vandenhouten, 2008). Use

of comprehensive standardized test packages is found to significantly improve both exit examination scores and actual nursing licensure examination scores (Uyehara et al., 2007; Vandenhouten, 2008; Zweighaft, 2011). Evidence from previously conducted studies has become foundation for the implementation of student progression and remediation policies that include a student's benchmark scores on exit examinations (Uyehara et al., 2007; Vandenhouten, 2008; Zweighaft, 2011). The results of this study lend support to the implementation of such policies to enhance the probabilities of nursing students passing the licensure examination.

The results of this study cannot be generalized to all other nursing programs because the data collected from only one nursing program were used. Nevertheless, nursing programs having similar curriculum can find the information presented by this study very helpful. Given the study's findings, follow up or future studies need to prioritize how effective remediation strategies are in facilitating the improvement of NCLEX-RN outcomes among nursing students.

### **Summary of Key Findings**

#### **Descriptive Statistics**

**Age and gender.** The typical graduate was a 33 year old female. Almost all nursing graduates who took the NCLEX-RN in the present study were females ( $n = 177$ , 90.8%). Males only compose 9.2% of the total respondent pool. The youngest respondent was 18 years old while the oldest was 54 years old. Frequency count distribution shows that those ages 25 and 42 is predominate at  $n$  of 16 (8.2%) - see Figure 2. On the other hand, the oldest age is represented by only one respondent (0.5%).

**GPA.** Distribution of admission GPAs varied among the respondent - nurses.

With respect to the range, the lowest and highest GPAs were 2.00 and 4.00, respectively. Most GPAs were 4.00 ( $n = 34$ , 17.4%). Very few ( $n = 2$ , 1.0%) had a GPA upon admission of 2.90 (see Figure 4). The mean GPA was  $M = 3.16$  with a standard deviation of  $SD = .592$ . Likewise, majority have a nursing GPA of 2.50 ( $n = 24$ , 12.3%) and one with a 3.10 GPA (0.5%) - see Figure 4.

**ATI scores.** Most NCLEX-RN test takers achieved ATI scores of at least 91 which numbered 134 or 68.71%. Sixty-one had scores below 91 (31.28%) - see Figure 5. The mean ATI score was  $M = 90.77$  with a standard deviation of  $SD = 9.667$ .

**NCLEX-RN exam pass or fail.** Of the 195 participants, majority passed the NCLEX-RN in their first attempt ( $n = 164$ , 84.1%) while 31 failed (15.9%) - see Figure 6.

### **Inferential Statistics**

**Nursing GPA and admission GPA.** Data from hypothesis one did not demonstrate a significant difference between academic predictors and NCLEX-RN outcome. Based on the corresponding  $b$  coefficients and  $t$ -test results on admission GPA ( $b = -1,272$ ,  $t = 0.122$ ) and nursing GPA ( $b = 0.095$ ,  $t = 1.657$ ), we find that NCLEX-RN exam outcomes did not register a significant correlation with either variable. College admission GPA was not associated with NCLEX-RN success and the same is true for nursing GPA. Hence, the alternative hypothesis was not retained for both admission GPA and final GPA. The null hypothesis was retained.

**Age and gender.** Demonstrated was significant difference between age and NCLEX-RN outcome but not for gender. Based on the corresponding  $b$  coefficients and



*t*-test results on age ( $b = -0.16$ ,  $t = -2.392$ ) and gender ( $b = -0.019$ ,  $t = -0.277$ ), we find that NCLEX-RN exam outcomes can be predicted by age but not by gender. Conversely for hypothesis two, the nonacademic predictors, only age at the time of sitting for NCLEX was predictive of success on the licensure examination. Hence, the alternative hypothesis for age was retained but not for gender. The null hypothesis was retained for gender but not for age.

**ATI scores.** The ATI standardized exit scores of the students were found to significantly predict future success on the NCLEX-RN exam ( $b = 0.289$ ,  $t = 4.198$ ). Among the significant predictors found to forecast NCLEX-RN exam success, ATI scores demonstrated higher predictive power than age. *T* computed for the independent variables age and ATI predictor score were statistically different (Age =  $-2.392$ ,  $p = 0.018$ ; ATI =  $4.198$ ,  $p = 0.000$ ). Based on the magnitude of the *p* values, ATI scores have more impact than age of the NCLEX-RN exam takers. On the other hand, for gender,  $-0.277$  ( $p = 0.782$ ); academic GPA,  $1.272$  ( $p = 0.205$ ); and nursing GPA,  $1.657$  ( $p = 0.099$ ). All these computed values are nonsignificant at 5% level of significance.

The research findings indicate ATI predictor scores nursing students obtained was correlated with NCLEX-RN exam pass status on their first take of the exam. Therefore the efficacy of administration of a predictor test was shown to be a valid means of improving scores of nursing students on the NCLEX-RN. It is therefore recommended in light of this study's findings that the ATI predictor test be added to the current nursing school program in order to address the program's declining NCLEX-RN pass rate.

Section 3 contains the project that resulted from this study. The section details a description of the project, review of literature on policies, implementation, evaluation, and implications for social change.

## Section 3: The Project

### **Introduction**

#### **Overview of the Problem/Issue**

A significant policy issue requires the immediate attention of the dean of the school of nursing. The ADN program of the SETC is in jeopardy of losing its accreditation because students are having difficulty passing the NCLEX-RN exam. At present, taking the NCLEX-RN predictor exam at the last semester is mandatory for all nursing students. While this has been the practice, the school currently does not have a policy recommendation comparable to other schools that requires all students to take the NCLEX-RN predictor test. These schools that make the predictor test mandatory for every nursing graduate prior to taking the NCLEX-RN require all candidates who do not meet the 91% probability pass rate in the predictor test to undergo a remediation program until they are prepared to take the NCLEX-RN exam. At present, the school does not have an institutionalized policy recommendation for nursing students.

#### **Description and Goals**

Based on the evidence gathered, a policy recommendation is used to strengthen and replace existing school policy in relation to improving NCLEX-RN exam pass rates. The policy recommendation contains a brief overview of the problem, study results, and recommendations specifically made to replace or augment current policy. The policy recommendation written is concise and addressed to the dean.

A policy recommendation is a written policy prepared for an individual given the authority to make decisions, in this case, the dean. Policy recommendations are the result

of ongoing research aimed at creating and implementing policy. A policy recommendation is structured so that it is able to clearly (a) identify the policy issue, (b) present relevant research and literature, (c) present study results, (d) identify alternatives, (e) specify the best option, and (f) prepare policy document for presentation and approval (Doyle, 2010).

The policy recommendation was written in order to provide the dean of the school of nursing with recommendations on how best to improve the school's outcomes on high stakes testing, specifically the NCLEX-RN exam. These recommendations are evidence-based and enlighten what policy interventions that can be beneficial to improve the pass rate on the ATI predictor exam and consequently, the NCLEX-RN exam. The addressee of the policy recommendation is the dean of the SETC who is entrusted with authority to make policy decisions and carry or not carry out these recommendations.

### **Rationale**

The policy recommendation was chosen based on the evidence gathered from the correlation study conducted. This recommendation was the result of the project study and presents options and is to be presented to the dean of the School of Nursing displaying strategies that may enhance student success on the NCLEX-RN exam and improve overall school performance on the licensure examinations.

Faculty and senior nursing students have raised concerns about the pressure both groups undergo as they prepare for the exit exam. The quantitative research conducted and discussed yielded findings that strengthen the viability of the ATI Predictor Exam as basis for high stakes testing policy. In Section 2, it was stated that the school is currently

without a progression or retention policy to respond to NCLEX-RN performance. The policy recommendation can provide clarity on how to craft a strong and evidence-based policy that can improve NCLEX-RN exam performance among nursing students. It proposes the institutionalization of a mandatory SLA program as policy recommendation to address declining pass rates in the NCLEX-RN.

### **Review of the Literature**

The purpose of this review of literature was to identify studies and relevant documents that are related to the development of a policy recommendation, which is the chosen deliverable for this present study. In order to gain insight on policy recommendation and its relationship with nursing education and nursing policy, an online search was conducted using several databases. The online databases used included ERIC, MEDLINE, and CINAHL to which the keywords *policy*, *policy recommendation*, *nursing education*, *NCLEX*, and *retention* were used to narrow down the search. This literature review focuses on a discussion on policy, policy recommendation, progression policy, and effectiveness of retention policies.

### **Policy**

Policy is defined as statements (documents) that reflect the “standing decisions” of an organization about a given problem, issue, or situation. These statements identify a series of actions or programs that articulate a desired set of conditions (Milstead, 2011). Steavey et al. (2014) defined policies in several ways, including statements and principles that govern programs and the distribution of resources toward desired goals.

The importance of research to the crafting of health policy cannot be overemphasized. Broadly stated, policy expresses a belief system on how a particular process should work (Irwin, 2010). In the profession of nursing education, three types of policy are considered important foundations to the competence of nursing students. These are public policy, health policy, and social policy. Policy for the public is made at the legislative, executive, or judicial level of government to direct or influence action, behaviors, or decisions of others (Milstead, 2011).

### **Policy Recommendation**

A policy recommendation (Appendix A) is a document that suggests a specific course of action to address an existing problem or issue. Doyle (2010) defined a policy recommendation as advice for a policy that is written for a specific population, group, or community to someone or some authoritative body who has decision making abilities. The policy process is one of finding balance among the alternatives and slowly building support for the necessary reforms (Morse, 2011). Written policy recommendations must forcefully present the facts, analyze the alternatives, and carefully balance administrative, budget, effectiveness, and acceptability factors (Irwin, 2010). Developing effective and creative solutions requires rigorous analytical thinking (dePlessis et al., 2010). It requires a process of sorting through a confusing array of data, mediating among competing interests, generating creative solutions, evaluating the options, and selecting not just the "best" solution but also the most feasible. Policy recommendations present decision makers with the ideas and information they need to advance an issue or solve a problem.

Doyle (2010) considered a policy recommendation to have three main sections: (a) the issue or problem, (b) an analysis of the policy, and (c) the recommendation. A strong policy recommendation demonstrates a solid understanding of the problem and thorough analysis, and it posits creative, doable solutions (Seavey et al., 2014).

Equally important, a strong policy statement is well written, organized, and must be substantial in content. An effective policy recommendation must demonstrate understanding of the problem, available options, and constraints (Irwin, 2010; Milstead, 2011). In addition, a policy recommendation needs to be well-organized and the problem distinct, with relevant data used to help explain its nature (Irwin, 2010; Milstead, 2011). The recommendations are clear with options clearly defined so that the reader is not left guessing (Irwin, 2010; Milstead, 2011). The recommendation should also be justified with evidence and analysis used to clearly support the recommendation. Furthermore, an effective policy recommendation needs to be concise and well-written. It is measured by its quality not by the number of pages (Irwin, 2010; Milstead, 2011).

Because the NCLEX-RN exam pass rate is an important basis for the accreditation of nursing schools, nursing programs have implemented standardized exit examinations to determine which students are in need of retention before taking the NCLEX-RN exam (Carrick, 2011; Grossbach & Kuncel, 2011). For instance, the University of Arkansas for Medical Sciences nursing program implemented retention programs with success. Students who failed on the HESI exit examination scored more than 99% on the second take of the same exam after undergoing retention (Grossbach & Kuncel, 2011).

Various strategies are used for retention (Dumchin, 2010). In a specific college's retention program, students are given a practice examination where they discuss the more challenging questions encountered. Afterwards, the professor gives a lecture, a case discussion, and a care plan development exercise. Lastly, a lecture of test-taking strategies to help students approach tests in a logical and systematic manner is presented (Dumchin, 2010).

Often, standardized examinations themselves are used as interventions in combination with other strategies such as academic policy, curriculum and teaching approaches, assessment of learning outcomes, and retention and student support strategies. A systematic review of intervention strategies yielded the following summary (Carrick, 2011, p. 82; see Table 1). Carrick (2011) found that the most effective interventions involving a combination of different strategies (see Table 10). For instance, the use of standardized examinations along with the reduction of the number of semesters in a nursing curriculum improved the NCLEX-RN pass rate by 8.5% (Carrick, 2011).



Table 10

*Intervention Strategies*

Academic Policy	Curriculum and Teaching Approaches	Assessment of Learning Outcomes	Retention and Support
High academic standards for admission	Curriculum models the NCLEX-RN test blueprint	Inclusion of NCLEX-RN exam question formats in course testing	Early identification of at-risk student
Academic progression policies – prohibit multiple attempts after failing nursing courses	Revision of course sequencing	Assessment of test products throughout program-proctored and practice tests, study modules, NCLEX-RN exam readiness tests	Test anxiety counseling
Rising minimum passing scores for nursing courses	Use of active learning activities such as case studies, simulation	Assigning assessment test score as part of course grade	Support group
Minimum score on NCLEX-RN exam readiness tests as criteria for graduation	Instruction on test taking skills and study tactics  NCLEX-RN exam review course  Faculty development, test writing, teaching strategies, how to identify at risk students		Weekly mentoring sessions to review study plan, assessment test scores, and student learning needs  Peer mentoring  Structured learning assistance

*Note.* “Student achievement and NCLEX-RN success: Problems that persist,” by J. A. Carrick, 2011, *Nursing Education Perspectives*, 32, p. 78–83.

In order to reverse the declining trend of NCLEX pass rates in nursing schools around the country, nursing faculties have also implemented informal and formal support programs to enhance academic skills and build support systems within the college environment to bolster NCLEX-RN success. Retention programs are usually implemented at the final semester of the program and have prioritized identifying the NCLEX content categories where a student is weakest (Landry et al., 2010; Carrick, 2011).

Despite evidence suggesting that retention can positively influence NCLEX-RN exam success, there are no specific benchmarks yet that identify who these “at-risk” students are (Landry et al., 2010; Carrick, 2011). Nursing facilities have set benchmarks for progression policies based on students’ performance on standardized tests comparative to national norms. These policies serve to identify at-risk students who need retention to hopefully avert failure in the NCLEX-RN exam (Landry et al., 2010; Carrick, 2011).

According to Hedderick (2009), research produced evidence showing that progression policies with definitive benchmarks help in identifying students who needed to be remediated and retested resulting in an improvement on the NCLEX-RN pass rates. The implementation of these interventions increased the pass rate by 17 % from 73% to 90% (Hedderick, 2009).

Hedderick also documented how curriculum changes, the use of standardized testing, and the implementation of a progression policy increased the pass rate from 78% to 93% in just one year. Some nursing schools use review modules such as the ATI

Content Mastery Series for retention and support. For example, the ATI Content Mastery Series is comparable to the actual NCLEX-RN exam but is comprised of case studies, review modules, exercises on critical thinking, CDs, and practice questions that can assist students in reviewing, learning new concepts and self-remediate on specific content (ATI, 2013).

Students can focus on weaknesses in the areas of nursing fundamentals, medical/surgical nursing, maternal/newborn nursing, nursing care of children, mental health nursing, pharmacology, community health nursing, nursing leadership, nutrition, and nursing management (ATI, 2010, 2013). Early NCLEX-RN exam preparation should be something that nurse educators need to inculcate upon their students rather than focus only on preparation at the final semester of the nursing program. Early preparation is a good retention strategy (Heroff, 2012).

The ATI Content Mastery exams are taken by students after presentation of content. Before taking the proctored exam, students need to take two nonproctored exams on which they must score not less than 90% (ATI, 2013; Heroff, 2012). If the students make this benchmark, they can qualify for the proctored exam. The nonproctored exams enable the students and the teacher to evaluate which areas need review and allow students to enhance their test-taking skills (ATI, 2013; Heroff, 2012). By the time they finish the ATI nonproctored and proctored exams, students will have answered more than 1,200 test questions, thus giving them substantial practice and test-taking endurance (ATI, 2013; Heroff, 2012).

Students who do not achieve the designated benchmark on the ATI Content Mastery exam are identified as at-risk and provided with resources for self-retention which they must complete before taking the exam another time (ATI, 2013; Carr, 2011; Heroff, 2012).

Before retention, an Individual Performance Profile is reviewed and a plan is developed by the faculty advisor depending on the resource available to review the content (ATI, 2013; Carr, 2011; Heroff, 2012). The faculty advisor is also tasked to determine when retention has been adequately completed and the student can take the ATI Content Mastery examination again (Baker, 2010).

Overall, studies demonstrate the value of standardized testing used in conjunction with other interventions including progression policies (Simon, McGinniss, & Krauss, 2013; Herman & Johnson, 2009). However, these studies only indicate the success of individual programs in general. These studies do not pinpoint which intervention can be attributed to the improvement of NCLEX-RN pass rates.

### **Retention Interventions**

Literature is profuse with possible options on how to improve NCLEX-RN outcomes and enhance quality of nursing education. Several strategies have been found to help such as a) developing competencies, skills, and processes among individual students so that they succeed in the nursing program; and b) reforming policies, curriculum or modifying learning processes (Hermann & Johnson, 2009; Haleem et al., 2010; Lauer, et al., 2011). Some schools have reported developing programs which teach students test-

taking strategies and conduct study sessions in order to enhance critical thinking skills (Baker, 2010; Carr, 2011).

Implementation strategies also vary so that some interventions are voluntary while others mandate student participation. There are also differences in the time these interventions are implemented with some offered at the beginning of study courses while others are integrated all throughout the program. While there have been studies to describe these programs, very little data have been collected on their effectiveness (Sportsman, 2012).

The anecdotal evidence however suggests that structured programs which enable students to learn beyond memorization and towards synthesis, application, and evaluation of key concepts are crucial to improving NCLEX-RN pass rates as well as retention rates in nursing programs (Carr, 2011; Sportsman, 2012). Some critical thinking strategies employed by nursing faculty include simulation, integration of case studies, and analysis of critical thinking scenarios that engage the student (Barr, 2010).

The success of interventions is contingent on contextual factors (Wolkowitz & Kelley, 2010; Frankel, 2009). Some students are in need of one-to-one relationship with faculty or another student for support (Lauer et al., 2011). For this reason, mentoring programs, which pair a student with a faculty or a peer, provide assistance to students when they face difficult tasks or assignments. Peer mentoring programs have been shown to extend support for at-risk nursing students (Robinson & Niemer, 2010).

According to Barr (2010) researchers have conducted several studies that suggested the effectiveness of individualized study plans in order to prepare nursing

students for standardized tests and licensure examinations. These plans are designed using a student's performance as basis. When the student completes the test, the faculty or mentor reviews the results and plan retention strategies to pinpoint areas of improvement. A variety of retention strategies are available and have been proven to be effective. Individualized intervention plans allow students to evaluate their academic performance, strengths, and weakness every semester so that they can autonomously craft their intervention plans (March & Ambrose, 2010).

Carr (2011) reported that using individual study plans while taking retention courses significantly improved NCLEX-RN exam pass rate. Students identified as at risk are required to enroll in retention strategies course and attend group meetings with faculty to collectively discuss their individualized intervention plans. Carr (2010) reported that the NCLEX-RN pass rate of students significantly spiked after the implementation of the retention strategy. This result is affirmed in other studies as well (March & Ambrose, 2010; Hyland, 2012).

According to Pennington and Spurlock (2010) nursing programs design their own types of retention strategies depending on the results of standardized examinations. However, the literature is not unanimous in finding retention as an effective tool in improving success in the NCLEX-RN exam. Pennington and Spurlock (2010) also reported no strong evidence to support the effectiveness of retention strategies.

### **Structured Learning Assistance**

The effectiveness of structured learning assistance (SLA) in improving NCLEX-RN performance has been established in the literature (Morton, as cited in Cant &

Cooper, 2010; Vittrup & Davey, 2009). SLA workshops were started in universities as a way of helping students' master course content to improve learning strategies. SLA workshops began in 1993 out of the finding that underachieving students did not maximize the academic support services available on campus (Cant & Cooper, 2010). Some students were hesitant to use mentoring programs or tutoring services while other students, who were maximizing such programs, had no problem with achievement. At-risk students did not receive mentoring programs because there was no policy or mechanism that mandated their involvement or participation. Hence, SLA workshops serve as an effective and economic tool to provide university students with assistance on how to accomplish student outcomes. Consistent with research findings of effective retention, the goal of SLA is to guarantee extra instruction to at-risk students and develop in them study skills, critical thinking, and time management to help them succeed in the course and eventually the NCLEX-RN exam (Morton, 2008; Heroff, 2012).

### **Project Overview**

The purpose of this project's policy recommendation was to provide pertinent, useful information and advice to the dean of the School of Nursing of the South Eastern Technical College concerning the problem of low predictor pass rate scores (see Appendix A). Also given are data about the background of the problem and multiple options from which the Dean may choose. The three parts of the policy recommendation are as follows:

Part 1: The problem. This section describes, with quantifiable data, the problem of low predictor exam scores from students who graduated from the five-semester ADN nursing program in spring and summer of 2010 and 2011.

Part 2: Options for consideration. This section offers three recommendations that can be weighed for possible use to address the problem. Rationale and evidence for these alternative recommendations are given.

Part 3: One of the three recommendations is proposed as the best option to help address the problem.

### **Implementation**

The policy recommendation will be implemented following several steps. First, the policy recommendation will be presented to the dean of the School of Nursing. Since the school adheres to a protocol when curriculum changes or reviews are made, a lengthy process may be expected before the policy recommendation can be carried out. The assessment committee may decide on the merits of the policy. Other stakeholders such as the student affairs committee may also bring in their suggestions and views regarding the policy recommendation.

The faculty committees will also be given the opportunity to provide feedback to the policy recommendation. Eventually, it will be the dean who will use his or her authority to endorse the policy recommendation. If the endorsement is in order, an implementation date for the project can be anticipated by October 2015.

After the policy recommendation is completed, faculties need to continue teaching strategies and administering exit exams as in previous semesters. Earlier exit



exam rates can be compared with post project exit exam rates. The number of students whose graduation was delayed can also be compared to the number after the project is implemented.

### **Potential Resources and Existing Supports**

The following resources and existing supports can be expected to influence the successful implementation of the project.

#### **Students**

Any enhancement to the curriculum or the development of policies seeking to improve student outcomes will be beneficial to the student. This project will assist students in developing their autonomy, independence, critical thinking, and proficient clinical judgment skills.

#### **The School of Nursing**

The university can provide full-fledged support for the policy recommendation since it is in its best interest to ensure that NCLEX-RN exam performance is enhanced.

#### **Faculty**

Faculty can provide great support for the policy recommendation. In terms of professional development and the fulfillment of their role as educators, it is in the vested interest of faculty to improve on their methods and to gain skills and experience.

### **Potential Barriers**

Various authors have demonstrated how nursing faculty can be a barrier to reform or change. The reasons for resistance to change include time limitations and comfort with existing systems and processes. Many faculties are resistant to incorporating various

teaching strategies into their curriculum to educate their students. They prefer the traditional method of educating the students primarily by lecturing to them. This level of resistance is an expected barrier to the policy recommendation. It has been shown that the implementation of new methods and pedagogies create anxiety and feeling of lack of control among faculty.

### **Roles and Responsibilities of Student and Others**

Students will ensure the presentation and dissemination of the policy recommendation to the dean of the School of Nursing and to the appropriate committees needed to obtain endorsement. If the policy recommendation is welcomed positively and approved, it is my responsibility to ensure that the head of the Faculty of Nursing Organization is duly briefed about the policy recommendation before having to present it to the school's Nursing faculty. The policy recommendation will be up for deliberation and criticism before the dean of the School of Nursing makes the final decision on the implementation of the policy.

### **Project Evaluation**

The policy recommendation includes three interventions, which the dean can choose. The assumption is that one of the three recommended retention activities can help improve predictor exam scores and, ultimately, enhance the overall NCLEX-RN performance of the school. Based on the results of the study and on the literature reviewed, the best option presented in the policy recommendation is the initiation of structured learning assistance (SLA) program for nursing students. University SLA workshops have been established to provide at-risk students with much needed support.

Comparing predictor exit exam scores before and after the initiation of SLA program will provide a benchmark to determine whether the program is effective or not.

The evaluation of this project will be measured based on indicators to determine the effectiveness of the policy recommendation. In terms of the present study, the measurable indicators would be an increase in the number of students passing the ATI Comprehensive Predictor Test. The following performance measures will be used:

1. Higher percentage of student successfully achieves passing score on predictor exams.
2. A higher number of senior students pass the exit exam and fewer senior nursing students enroll in retention after graduation.
3. Graduation rates for senior nursing students will increase.

The goal of the evaluation is based on the successful passage of the policy recommendation by the dean and/or the appropriate committee ensuring its passage. The policy recommendation is the creation of the structured SLA program that improves study habits and mastery of content among low performing students. Other evaluations will be made after each predictor exit exam to determine if the scores have increased after the SLA program has been implemented.

### **Implications for Social Change**

The findings from this study can result in numerous contributions to the research database on the predictive ability of exit examinations particularly the ATI Comprehensive Predictor Test. As it is, a literature gap on the predictive power of the

ATI on future NCLEX-RN exam performance exists. The findings from the study can guide admission and progression policy in nursing programs which utilize the ATI test.

The significance of this policy recommendation is that it contributes to evidence-based practice on the design and implementation of progression and retention policies in nursing schools undergoing decline in NCLEX-RN exam pass rates. This is especially important for schools under pressure to generate improved NCLEX-RN exam pass rates. The implications of NCLEX-RN exam pass rates to public health are significant. High first-time pass rates in the licensure examinations provide an assurance of safe and quality nursing practice for the benefit of the public. Reducing NCLEX-RN exam first-attempt failures will decrease the impact of nurse shortage, enhance patient outcomes and reduce costs in orienting fresh graduate nurses. NCLEX-RN exam failures negative impacts society based on research that establishes NCLEX-RN exam failure to lower mortality rate (Emory, 2013).

### **Conclusion**

Based on the quantitative results of the study, it is concluded that ATI Comprehensive Predictor Test scores are correlated to students passing the NCLEX-RN exam on the first attempt. As a result, there is a need to institute retention interventions in order to address low pass rates in NCLEX-RN exam by improving performance in the standardized exit examination. Literature has demonstrated that reform in policy through policy recommendations will contribute to improved discourse and change that will improve the quality of nursing education. The policy recommendation involves the

creation of a university SLA program to improve exit exam scores and ultimately, NCLEX-RN exam performance.

## Section 4: Reflections and Conclusions

### **Introduction**

In this final section, I present strengths and weaknesses of the proposed SLA program and the limitations of the said policy recommendation are presented. Also discussed in this section are possible alternative solutions as well as personal insight and reflections on the project's contributions to scholarship and program development. Moreover, my personal reflections as a scholar, practitioner, and project developer are also given space. Possible directions for future research in education and nursing are examined.

### **Project Strengths**

This project involves recommending the creation of a SLA program that incorporates content-specific NCLEX review questions as a way of improving ATI Comprehensive Predictor scores and ultimately boosting NCLEX-RN performance.

The SLA is an effective and economical retention strategy that will provide much-needed support to at-risk students who may hesitate in accessing academic support services. SLA workshops will equip students with competent study skills, mastery of course content, and test taking strategies. Thatcher's (2011) evaluation of the University SLA implemented at Ferris State University showed SLA workshops improve NCLEX-RN pass percentage within 2 years of implementation. In fact, the school's pass rate for first time takers increased from 65% to 92%. Incorporating NCLEX review questions in the university SLA workshops are expected to boost student performance.

### **Limitations**

While the project's quantitative findings offer promising support for retention strategies and the use of standardized test packages to predict future NCLEX-RN performance, there are several limitations to consider. This study was conducted at a small, ADN program in SC. The findings may not be generalized to other nursing programs, locations, and program sizes. The results from this study can serve as guidance for faculty to evaluate the merits of using standardized test packages. There is a variety of strategies that can be built upon this study's findings. The proposed policy in response to the study's findings is the implementation of an SLA program. Additional research needs to be conducted in order to determine the effectiveness of this program in relation to the context of the nursing school in which the program will be implemented.

### **Recommendations**

At risk students should be identified before they enroll in the last semester. Once identified, students who failed the exit exam and those who did not make the minimum 76% on assignments and coursework should be immediately enrolled in the University SLA program. The SLA program should be a requirement for retention. Moreover, SLA should start every first semester of the nursing program. When a student in the first semester of nursing school fails an exam, the student should be enrolled in the SLA program.

The findings from this research were based on one technical college (SETC). Therefore, the results cannot be generalized to larger universities. Further studies should

be conducted on ATI predictor test and NCLEX-RN exams for first attempt using several technical colleges and or universities.

### **Scholarship**

Many, including myself, are still attracted to the notion knowing what is crucial to being an effective teacher--a view that is potentially limiting in any attempt to define scholarship. Scholarship can be a number of things: discovery, integration, application, and teaching. Scholarship starts with discovery; this then becomes integrated within disciplines where it is applied; then it is taught to others.

Scholarship to me is a fun and creative activity. I would consider myself a work in progress, and so is the product of my scholarship. I hope to influence not only the immediate college this project addresses but to go beyond that. The fruits of scholarship should extend beyond academia. It is also my hope that this scholarship will make me a better faculty member since this is my primary role. Scholarship to me is also a service and this is, I hope, the noblest product of my scholarship.

### **Project Development and Evaluation**

This project was designed to address an existing problem. It was not something just concocted from imagination or from sport. The choice to pursue this project was borne out of the need of the college that I serve. Being a linear and logical planner, the development of this project was methodical. I want my project to make a real impact in society and improve the quality of our nursing programs and have great social benefits for all.



## **Leadership and Change**

The only thing permanent in this world is change. In the nursing practice, this is very true. As technology changes, so do the demands for more efficient and competent nurses who keep up with the time. Hospitals and health care facilities are under tremendous pressure with new regulations, patient safety requirements, and escalating standards of care and consumer expectations. It makes the life of nurses harder. In my leadership experience, I have played a leading role in building relationships with stakeholders, especially the community in the management and implementation of my project.

I have always been a firm believer of transformational leadership. I am not comfortable with top-down leadership that consists of giving orders and having followers do your bidding. The business of changing a discipline or a field is to transform it and to involve everyone in the process. It is about persuasion and the project that I have developed requires that. Policy reforms aimed at improving the quality of nursing education need an advocate who can persuade using an evidence-based research to convince the decision-makers to make a change.

## **Analysis of Self as Scholar**

This doctoral journey was really about finding me as a scholar. I admit that previously I defined scholarship in terms of publication. Therefore, at the onset, there was this drive towards doing research and scholarly work for the sake of getting published. Not that there is anything wrong with that—publication is very much a part of scholarship, but it is not the essence of scholarly undertaking. I consider myself a scholar because I

consider myself an expert on a particular field, in this case, nursing education. The downside to scholarship is that the enormity of the label sometimes makes the researcher doubt his or her own expertise, but it always takes self-reflection to assure one's self that he or she is indeed the expert.

Scholarship is also being open to assault and criticism. This is the risk taken for higher learning. Someone will be prepared to criticize, discredit, or debunk the data and findings. Therefore, scholarship entails rigor and meticulousness in order to avoid errors that can compromise the integrity of the findings. Scholarship also requires honesty. Dishonesty means death to scholarship. This is why I consider scholarship to be a form of transformation that requires me to continuously acquire skills, competencies, and attitudes that will help me to continue to be a scholar with integrity and value.

### **Analysis of Self as Practitioner**

As a nurse educator, I love what I do. Being able to apply new concepts and theories to practice is something I find fun and exciting. As a practitioner, I am always mindful of the ethics and responsibilities that go with the job description. Nurse education is a service oriented practice. I am tasked with developing nurses who will be in charge of the health and well-being of the general population. It is a demanding but fulfilling job and requires passion, caring, and a great deal of emotion. It is my task to ensure that students not only learn concepts but they develop the joy and anticipation in being of service to others in the future.

### **Analysis of Self as Project Developer**

As a project developer, I am a novice. I usually teach, not develop projects. This is why this project has been very exciting and fulfilling for me. It opened my creativity and challenged me to explore innovative ideas. Most of the time, I was unsure of the project, and developing an evidence-based policy recommendation was a daunting task. However, I always had a keen sense of curiosity and a pragmatic spirit that I am able to assess and evaluate which options are best and which were the most practical, given the circumstances and the data. It took a great deal of communication skills and persuasion on my part to see this project through. It was not easy trying to sell a policy that would be implemented at the university level. However, the potentialities for this policy recommendation to improve licensure performance were vast, and this kept me motivated. I have learned a lot from developing this project. I hope for other similar opportunities in the near future.

### **The Project's Potential Impact on Social Change**

The escalating nursing shortage in the United States makes it an imperative for schools to reexamine their policies and come up with measures to address the problem. Researchers have noted that there has been a steady decline in first-time NCLEX-RN exam pass rates (Grossbach & Kuncel, 2011; Truman, 2012). Researchers have also examined various strategies that can increase the pass rate (Carr, 2011). The declining pass rate in the NCLEX-RN exam is devastating for both the student and the school. Nursing programs that have substandard pass rates run the risk of losing their accreditation (Emory, 2013). The specific problem discussed in this study is the use of the

ATI Predictor Test as a high stakes test that can secure satisfactory first-time NCLEX-RN exam pass rates at a nursing school. If the ATI Predictor Scores cannot accurately forecast outcomes in the NCLEX-RN exam, then nursing schools should not make this test a prerequisite for taking the NCLEX-RN exam or basis for retention. If it can predict future NCLEX-RN exam performance accurately, then leaders of nursing schools must strengthen retention programs in order to alleviate declining pass rates and ensure improvement in NCLEX-RN exam pass rates.

### **Implications for Future Research**

The current study's findings lend support to existing literature stating that NCLEX predictor examinations accurately forecast future pass or fail status in the NCLEX-RN exam. Nevertheless, there is a need to replicate this study to different nursing schools across the United States to determine how the predictive power of the ATI varies across different program types, sizes, and settings. Future research should also incorporate a more extensive group of demographic variables such as race, economic status, and support systems to analyze differences.

### **Applications to the Field of Education**

There are several practitioner recommendations that can be made based on the study's findings. Faculties can develop course examinations using the same blueprint in the NCLEX-RN exam test plan to prepare students for the licensure examinations. Some students may perform well on course examinations but show poor performance on predictor tests. Since evidence suggests that the ATI test can accurately predict NCLEX-RN outcomes, nursing faculties can adjust the style and content of course examinations to

adhere more to what the student nurses are going to encounter in the licensure examinations. Faculties are challenged based on the evidence to look ahead at addressing the nursing shortage and not merely combat high attrition rates on the NCLEX-RN exam.

Some nursing faculty have been found to grapple with developing reliable and valid tests questions that are similar to those found on the NCLEX-RN exam. Hence, nursing instructors can benefit from item-writing workshops and other trainings that can equip them in the development of test items in course examinations to prepare students for the licensure examination. As hospitals continue to elevate quality in order to benefit patients, nursing faculty needs to elevate their skills in testing and retention procedures.

The following policy recommendations refer to local, state, and national levels:

#### **Local Level**

At the local level, the following recommendations apply to all career and technical programs.

1. Continue to use predictor examinations particularly the ATI Comprehensive Predictor test in order to forecast NCLEX-RN exam outcomes and help identify at-risk students for timely retention.
2. Train faculty on the implementation of the predictor tests and subsequent retention strategies needed to improve student success on the NCLEX-RN exam.
3. Evaluate the effectiveness of the predictor tests consistently.
4. Evaluate the effectiveness of retention programs.

**State Level**

The following recommendations are made:

1. Increase funding for nursing colleges to enhance research on determining how to address the declining NCLEX-RN pass rates.
2. Strengthen statewide database using consistent measures in order to improve research output.
3. Strengthen collaboration among different institutions, state agencies, administrators, and accrediting institutions to identify evidence-based strategies and interventions effective in improving student outcomes.

**National Level**

At the national level, the following recommendations are made:

1. Increase federal funding for all higher education institutions.
2. Implement competitive health care salaries in order to attract and retain more competent nursing personnel.
3. Provide incentives for professional development among nurses.

**Directions for Future Research**

A gap exists on the NCLEX predictor's capacity to predict successful career outcomes in the nursing profession; something which needs further exploration.

Qualitative studies can be conducted in order to give a more in-depth evaluation of the phenomenon of low licensure pass rates among nursing students. Longitudinal studies can be conducted for this purpose.

Collaborative research among associate degree or baccalaureate degree nursing programs can also be explored in order to expand the applicability of findings. Furthermore, more refined sampling methods including randomization can be applied. Future research can also deal with exploring the use of reliable measures, such as critical thinking and problem solving to examine how to improve professional nursing competencies. Mixed methods research or the use of both qualitative and quantitative methods can be initiated in order to provide a more in-depth and complete profile of at-risk students who need retention.

### **Reflection and Conclusion**

Section 4 entailed discussions concerning the project's strengths, weaknesses, and what I learned throughout the project progression process. Additionally, directions for future research are discussed. This study has been an eye opener for the author and the implications that this study yield for practice is significant. Failing at the NCLEX-RN exam for the first time is devastating for the student and the school. Hence, measures need to be made in order to mitigate failure. Identifying students at-risk of failing the licensure examination during the first try is unpredictable. I have often heard educators tell themselves "I never thought she would fail the NCLEX-RN the first time. She was excellent at her course work and all assessments!" Nurse educators then questioned what they could have done or implemented in order to identify more accurately which students needed help.

There is a logic circulating that the faculty can only do so much and whatever failure rests solely on the hands of the student. While nurse educators do not deserve the

backlash for the declining NCLEX pass rates, it is nevertheless an educator's duty to come up with the best possible ways to ensure student success at the NCLEX-RN exam. After all, educators are not only accountable to the students or the school but to the public. Educators are responsible for influencing the quality and competence of the professionals making up the health sector.

Evidence-based strategies are available for faculties to formally address students' needs which will eventually result in better student performance on the NCLEX-RN exam. One such intervention is the ATI predictor test. This study accurately predicts whether a student will pass the NCLEX-RN in the future. Testing is an important but preliminary step. A more important step is how to select and conduct retention strategies to arrest the weaknesses of the at-risk student. There are several tools for retention such as modules, practice tests, proctored content mastery, and NCLEX-RN exam readiness tests. Appendix A consists of the policy recommendation paper. Appendix B contains the policy I created for SETC nursing program. Appendix C is a sample case study I developed for the program. Appendix D is a copy of the required contract students. Appendix E is a copy of the student sign in sheet. Lastly, Appendix F contains the letter of consent signed by Dr. Lynn Brown-Bullock. Appendix G is the permission to letter for the 4-Circle Critical Thinking Model received from Rosalinda Alfaro-LeFevre.



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## Appendix A: Policy Recommendation

**To:** Dean of Nursing

**From:** Annie Ruth Grant

### **Executive Summary**

The purpose of this policy paper is to present for review three options to address the problem of low pass rates among first time takers of the National Council Licensure for Registered Nurses (NCLEX-RN) exam at South Eastern Technical College (SETC). Low NCLEX-RN pass rates have placed the Associate Degree Nursing (ADN) program at risk of losing its accreditation. The recommendation is for institution of a policy recommendation in the form of a Structured Learning Assistance (SLA) Program to assist student success on the NCLEX-RN exam.

### **Overview of the Problem/Issue**

A significant policy issue requires the immediate attention from the Dean at the School of Nursing. Our ADN program is in jeopardy of losing its accreditation for the reason that students are having difficulty passing the NCLEX-RN exam. At present, taking the NCLEX-RN predictor exam during the last semester is mandatory for all nursing students. While this has been our practice, the school currently does not have a policy in place to assist students become successful with the NCLEX-RN. Schools that necessitate the predictor test prior to completing the nursing program require all candidates who do not meet the 91% probability pass rate in the predictor test to undergo a remediation program. During the remediation period, the students will retest until they

achieve the required 91%. At present, the school does not have an established policy recommendation for nursing students.

Remediation is one of the strategies proposed to improve NCLEX-RN exam pass rates. In an effort to increase students' NCLEX-RN exam success for first time test takers, faculties at a Long Island University School of Nursing in New York examined causes for students' failure to pass the NCLEX-RN exam on their first attempt (Carr, 2011). The faculties concluded that causes for failure were gaps in curriculum content, student attitudes toward taking the NCLEX-RN exam, delays in taking the NCLEX-RN exam after completing the program, and lack of preparation for standardized testing, as well as incongruous and ineffectual exit exams (Carr, 2011). Faculty implemented strategies to improve students' pass rate which included materials designed to close the gaps in curriculum content, remediating students who performed poorly on standardized tests such as the NCLEX-RN Predictor exam, and making changes to the exit exam. The NCLEX-RN pass rate increased from 70% to 93% two years after the changes were implemented (Carr, 2011).

Horton, Polek, and Hardie (2012) conducted a study at a mid-Atlantic ADN School to examine the impact of three success measures: a computerized, self-directed remediation course, entrance examination scores, and selected course grades. After a drop in the pass rate from 91% to 82%, the school reviewed their curriculum, preadmission testing, exit examination, and remediation (Horton et al., 2012). These measures resulted in the implementation of remediation requirements to improve the NCLEX-RN pass rate.

After implementation of the remediation program, students' NCLEX-RN pass rate improved significantly (Horton et al., 2012).

Three policy recommendation options are presented and the Structured Learning Assistance (SLA) program is recommended as the best policy that can help address the dwindling number of successful NCLEX-RN first time test takers in our school.

Nursing programs with substandard pass rates have a significant problem. Prospective students utilize the school's pass rate as criteria for selecting its nursing programs. Application and admission rates are affected if the smarter students do not apply. When at-risk students are unsuccessful in completing their program of study, loss of program operating revenue may become a problem. Decreased customer satisfaction is also associated with low performance by the graduates. In addition, the school's perceived reputation among parents, health institution, and the community is affective. The nursing program is at risk for regulatory intervention with program approval and accreditation at stake (Norton et al., 2006).

Several negative implications arise when a nursing graduate fails the NCLEX-RN exam. Not only is the student devastated and embarrassed, but she or he experiences a decrease in self-esteem and confidence. The graduate has to wait 45 business days before being allowed to retake the NCLEX-RN exam which costs an additional \$300 to \$400 for the second test. The ethical responsibility of graduating students who meet the qualifications and academic rigor of the nursing program but cannot pass the NCLEX-RN exam needs to be addressed by educators (Roa et al., 2010). The table below shows that the percentage of successful first time test takers has decreased.

Table 1

*2010 /2011 NCLEX-RN National Pass Rates for Associate Degree, South Carolina, and School of Study*

NCLEX-RN	2010		2011	
	<i>N</i>	Percentage	<i>N</i>	Percentage
National	140,883	87.90	144,565	86.99
South Carolina	2,197	89.53	2,215	89.66
SETC	101	85.15	97	81.11

*Note.* *N* = the number of students taking the NCLEX-RN for the first time.

In 2010, the percentage of students passing the NCLEX-RN exam at the national level was 87.9 %. The percentage for South Carolina (SC) was 89.53% and 85.15 % for SETC. In 2011, the percentage pass rate decreased to 86.99 % for the national level, 89.66 % for South Carolina, and 81.11% for SETC.

Administrators and educational leaders are now reexamining their curricula whether this can appropriately enhance the success of first time test takers (Alameida et al., 2011; Norton et al., 2006). The numbers presented in Table 1 are troubling as students reach the last semester of nursing school and fail the predictor exam. The result is that our NCLEX-RN pass rate for first time test takers is declining.

### **Policy Analysis**

**Current policy.** There is currently no existing policy on remediation that addresses the declining NCLEX-RN pass rates among our graduates in the ADN program. As part of the preparation for the NCLEX-RN exam nursing students are required in their final semester of study, to achieve a satisfactory score on a

comprehensive predictor examination in order to receive approval for graduation. In practice, the school requires all nursing students to take a predictor test as a measure of readiness for the NCLEX-RN exam. While research has validated that the ATI comprehensive predictor test is correlated with the NCLEX-RN pass rate (Alameida et al., 2011), this was not established in this particular context of the school until now.

**Research.** Correlational research was conducted to determine whether ATI comprehensive predictor test scores were positively associated with NCLEX-RN pass rates during the first attempt. A correlational design was used to find associations between predictor test scores, the NCLEX-RN exam, and nonacademic variables. In addition, the correctional design was used to determine if any of these variables could account for NCLEX-RN success. The most significant finding of this research is that the predictive power of the ATI Comprehensive Predictor Scores in forecasting success of a nursing graduate during the first attempt. This is consistent with the finding from research conducted by Alameida et al. (2011) which measured the predictive power of the ATI RN comprehensive predictor on NCLEX-RN outcomes. Alameida and colleagues examined the predictive power from two versions of the ATI Comprehensive Predictor using test results from 589 graduates. These finding support the rationale for implementation and use of curriculum-wide standardized test packages that can significantly improve NCLEX-RN probabilities of success (Pennington & Spurlock, 2010; Spurlock & Hunt, 2008).

The finding that ATI scores predict NCLEX-RN exam success during the first attempt is consistent with studies that found exit examination scores such as ATI or HESI



with licensure examination success (Adamson & Britt, 2009; Alameida et al., 2011). The use of comprehensive standardized test have been found to greatly improve both exit examination scores and actual nursing NCLEX-RN exam scores (Vandenhouten, 2008; Zweighaft, 2011). Evidence from studies conducted has become foundation for the implementation of student progression and remediation policies that include a student's benchmark scores on exit examinations. This study imparts support to the implementation of such policies to enhance the likelihood of nursing students passing the NCLEX-RN exam.

Students failing the comprehensive predictor exam are likely to fail the NCLEX-RN exam on the first attempt. Failing the comprehensive predictor exam contributes to stress among students and affects the university, health institutions and the community at large. At the micro-level, the student lags in his or her entry into the workforce and in becoming a productive member of society. At the mesolevel, the university and our school of nursing will be affected as a result of such a delay and possible failure at the NCLEX-RN exam. The school's reputation and credibility as a producer of competent professionals who provide excellent nursing education will be imperiled. Possible loss of accreditation on our Associate Degree in Nursing (ADN) program will be a big blow to the school's status and profitability. Stakeholders will begin to question our low graduation rates and at worst, the loss of accreditation. At the macro-level, health care institutions who stand to hire our students will continue to have difficulty recruiting competent professionals to fill the vacant areas with nurses. A policy recommendation is the key to arrest the negative impact of our declining NCLEX-RN pass rates.

Hence, presented are three options for your consideration that could assist students in achieving success, not only on the comprehensive predictor exit exam, but the NCLEX-RN exam. Following those options is the one that I recommend be implemented.

### **Discussion of Policy Options**

**Option One:** Identify at risk students during the first semester of nursing school and enroll them in a SLA Program in order to decrease the likelihood of predictor exam failure.

**Evidence:** It is critical that at-risk students are identified early on to be placed in the SLA program for assistance (Morton, 2008). The identification of at-risk students is crucial if for the school is to improve its NCLEX-RN pass rates dramatically. These students can be identified in a number of ways. Some published research has indicated that “at risk” students are those who make failing grades in pathophysiology, medical-surgical courses (McDowell, 2008), or a “C” grade earned in any nursing course (McGann & Thompson, 2008). Furthermore, researchers have identified nursing students who received a “C” or below in pathophysiology, adult health nursing I and II and Critical Care nursing as students at risk for attrition. Students receiving a 75% on nursing courses, or grades below a 77% in nursing courses, are at risk for failure (Carrick, 2012).

At risk students should be identified during the first semester in nursing school. Once identified, these students should be immediately enrolled in the schools’ SLA program. The SLA program needs to be a requirement for student retention, beginning first semester of the nursing program when a student fails an exam. Since the indicators for at risk students vary, the standards in identifying “at-risk” students can be determined

for our school of nursing. However, it is my recommendation that beginning in the first semester of nursing school, students identified as at-risk makes are placed in a remediation program.

**Option Two:** Institute a peer tutoring program where successful nursing students tutor at-risk students.

**Evidence:** Peer mentoring is a strategic approach that can be used in order to relieve faculty of overwhelming workload and responsibilities. In peer mentoring successful nursing students in the same class with a “B” or higher in the courser are paired with at-risk students. There are several advantages when students are being tutored by their fellow students (Carrick, 2011). Students have shown to be more committed when they are mentored by their peers (Bearwald, 2011); anxiety is reduced for the mentee while confidence and leadership skills of the peer mentor are enhanced (Carrick, 2011). Research has shown that peer mentoring is effective because it is premised in a learning environment that is nonjudgmental and democratic (Knight, 2009). Due to the absence of the teacher/student pressure, learning in a peer mentoring context becomes an endeavor characterized by support, communication, and mutuality (O’Neil & Marsick, 2009).

**Peer Mentoring Program.** In order to become a mentor, the student must have and maintain a minimum GPA of 3.0 and a recommendation from a faculty member. It is important that the mentor is mature enough to lead another student and is willing to teach content set by the faculty. When peer mentors are identified, a short training session will be in order. The training session can include ways to keep the mentee (and mentor) on

track while studying together, how to answer questions from the mentee, and using time studying with another student wisely. It is important for the mentor to treat the mentee with respect. The faculty member referring a student for assistance will fill out a referral form that indicating the course content students need to review. The mentor and mentee will complete and sign the referral which lists course content studied and students, needs. A faculty member will be in charge of the program. Responsibilities will include conducting training sessions, receiving and keeping track of referrals, pairing mentors with mentees, and communicating with referring faculty.

**Option Three:** Designate a faculty member as a Student Retention Specialist who focuses on the at risk students.

**Evidence:** This strategy is widely used in the community college setting. The Student Retention Specialist is tasked with providing support services for at-risk students for the purpose of retention and academic success. A Student Retention Specialist assists the students to hone their study habits, test-taking skills, and developing better time management strategies (Southeast Community College, 2012). It is also the specialist's task to help at-risk students overcome socio-economic or learning barriers that they face.

An advantage of assigning a Student Retention Specialist to at risk student is a decline in students failing nursing courses (Pillemer, Meador, Henderson, Robison, Hegeman, Graham, & Schultz, 2008). The Student Retention Specialist can be instrumental in motivating students to study content, learn study skills, and improve test-taking abilities.

**Recommend Option Number 1:** A policy recommendation is the preeminent method to prepare our nursing students for success in the NCLEX-RN exam during the first take. Thatcher's (2011) evaluation of the University SLA implementation at Ferris State University showed SLA workshops improve NCLEX-RN pass rate within 2 years of implementation. In fact, the school's pass rate for first time takers increased from 65% to 92%. Incorporating NCLEX review questions in the university SLA workshops is expected to boost student performance.

### **Implementation**

The policy recommendation will be implemented following several steps. First, the policy recommendation will be presented to the Dean of the School of Nursing. Since the school adheres to a protocol when curriculum changes or reviews are made, a lengthy process may be expected before the policy recommendation can be carried out. The assessment committee may decide on the merits of the policy. Other stakeholders such as the student affairs committee may also bring suggestions and views regarding the policy recommendation.

The faculty committees will also be given the opportunity to provide feedback to the policy recommendation. Eventually, it will be the Dean who will use his or her authority to endorse the policy recommendation.

### **Summary**

Student success within nursing schools is costly to the student and nursing programs. The community at large is in desperate need of more nurses. Educators struggle to discover the paramount method to prepare nursing students for the NCLEX-

RN exam. Explanations for meager pass rates are multifaceted and comprised gaps in course content, student attitudes about taking the NCLEX-RN exam, postponements in taking the NCLEX-RN exam after graduation, insufficient preparation prior to taking the NCLEX-RN exams, and unsuitable and ineffectual exit exams. The continuing shortage of nurses necessitates a continual thrust by instruction to increase the number of new nurses into the work arena. Supporting students who may be having difficulty academically is a significant faculty responsibility. Some students necessitate a one-on-one relationship with an additional instructor or in order to be successful in a nursing program. For this reason, mentoring programs that couple a student with a more advanced peer or an instructor may inspire students to request support with challenging academic projects.

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## Appendix B: South Eastern Technical College Structured Learning Assistance Policy

Structured Learning Assistance (SLA) is designed to assist at risk for failure students in successful completion of course work. Students are provided collective learning activities study skills to increased concept understanding. The nursing resource center faculty (NRC) offers students study strategies, test-taking skills exclusive to the course content vital to educational success. SLA class encompasses course lectures, case studies, practice test, and teaching strategies to assist with retention of content.

### **Student Role**

1. Mandatory attendance is three hours per week for students identified as at risk.
2. Students must sign contract agreeing to the terms of SLA program.
3. SLA program counts as 10% of students' final grade.
4. Students obtaining grades less than 80% will be assigned to SLA.
5. Students arriving at the NRC more than 15 minutes late will be marked absent.
6. Students must be present for the entire time to receive credit for attending.
7. Students are allowed 2 days unexcused absences.
8. Students must actively participate in the review sessions.
9. Students arriving at the NRC more than 15 minutes late will be marked as absent.
10. Three tardiness will be counted as one unexcused absence.
11. Students will be marked absent if leaving the session early.
12. No food or drinks are permitted in NRC.
13. No cell phones or electronics not approved by the facilitator are allowed during review.

14. Students cannot bring children to the nursing resource center.
15. Address faculty and peers in an appropriate manner.
16. Work only on material/homework assigned.
17. Profanity and abusive behavior is not acceptable and will result in removal from the workshop and nursing program.

### **Faculty Role**

1. Provide students with a copy of syllabus with class requirements.
2. SLA faculty will develop structured activities through structured workshop activities in close association with the instructor.
3. Provide students contact information and office hours.
4. Provide students with copy of contract. (Thatcher, 2011)

*Note.* Adapted from “Structured Learning Assistance,” by J. Thatcher, 2011. Ferris State University. Retrieved from <http://www.ferris.edu/HTMLS/academics/sla/awards/docs/MTA-SLA-Presentation.pdf>

## Appendix C: Sample Case Study

The nurse is admitting a 60 year-old African-American female from the emergency room to the coronary care unit (CCU). The patient is complaining of chest pain, indigestion with nausea and vomiting. The patient states that she starting feeling chest pressure which progressed to chest pain about three hours ago. The patient has a history of gastric reflux disease (GERD) and thought this was the cause of the chest pain. The patient took Esomeprazole magnesium (Nexium) that the physician has ordered and drank lots of water. The patient also tried lying down to rest which did not help at all. The patient says “it just gets worse and worse.” The patient has also been seeing the physician for the past 15 years for hypertension and diabetes. She has a past history of smoking 2 packs per day for eighteen years, but stopped smoking five years ago. Admission laboratory test of troponin, CBC, BMP were drawn. A 12-lead electrocardiogram (EKG) and chest x-ray was also completed.

The patients’ vital signs on admission:

Blood Pressure	180/98
Heart Rate	118 to 132 beats/minute and irregular
O2 Saturation	90% on room air
Respiration rate	28 to 32 breaths/minute
Temperature	99.8 F (37.7 C) orally

Following admission to the CCU, which physician order takes first priority? Explain your answer.

- Place the patient on a cardiac monitor.
- Draw blood to test troponin.
- Obtain a 12-lead EKG.
- Monitor and record the patients’ intake and output.

The cardiac telemetry monitor shows a sinus tachycardia with premature ventricular contractions (PVCs). Which drug should be prepared to give the patient? Explain why this medication is appropriate for this patient.

Explain the action, side effects, and contraindications for giving this medication:

- Amiodarone (Cordarone) intravenous (IV) push.
- Nitroglycerin (Nitrostat) sublingually.
- Morphine sulfate (MS).
- Atenolol (Tenormin) IV push.

The patient is complaining of worsening chest pain. The cardiac monitor shows ST segment elevation, and you notify the physician. Which of the following orders is priority at this time? Explain why your answer is priority.

- Administer MS 2 mg IV push.
- Schedule an EKG.
- Draw blood for coagulation studies.

Administer ranitidine (Zantac) 75 mg orally every 12 hours.

The patient is continuing to experience chest pain, and has an elevated troponin level.

The following interventions have been ordered. Which intervention may you assign to the nursing assistant? (Select all that apply and explain why these interventions can be delegated to the nursing assistant).

- Measuring vital signs every 2 hours.
- Accurately recording intake and output.
- Administering tenecteplase (TNKase) IV push.
- Drawing blood for coagulation studies.
- Assessing the cardiac monitor every 4 hours.
- Assisting the patient to the bedside commode.

Three days later, the patients' condition is stable and is transferred to the cardiac step down unit. Which of the following should you instruct the nursing assistant to report immediately? Please explain your answer.

- Temperature of 100 F (38.2 C) with morning vital sign monitoring.
- Chest pain episode occurring during morning care.
- Systolic blood pressure increase of 8 mm Hg after morning care.
- Increase heart rate by 10 beats per minute after ambulation.

The physician orders captopril (Capoten) 12.5 mg orally twice daily and hydrochlorothiazide (HCTZ) 25 mg daily orally. Which information should you include when teaching the patient about these drugs? Explain why your answer is correct.

- “Take HCTZ in the morning.”
- “If you miss a dose of captopril, take two tablets next time.”
- “Avoid foods that are rich in potassium, such as bananas or oranges.”
- “You should expect an increase in blood pressure with these drugs.”

The patient is returning from a cardiac catheterization procedure. Which follow-up care orders could you delegate to the Licensed Practical Nurse (LPN)? Explain why the orders assigned to the LPN are appropriate (Select all that apply).

- Remind the patient to remain on bed rest with the insertion site (left leg) kept straight.
- Prepare a teaching plan that includes activity restrictions and risk factor modification.
- Assess the catheter insertion site for bleeding.
- Measure the patients’ vital signs every 15 minutes for the first hour.
- Monitor peripheral pulses, skin, temperature, and skin color with each measurement of vital signs.
- Administer 2 tablets of acetaminophen (Tylenol) for back pain.

Which instruction should you include in the discharge plan after the cardiac catheterization? Explain why your answer is appropriate.

- “Avoid heavy lifting and exercise today.”
- “Report any swelling, even a small one, to the physician.”
- “Leave the dressing in place for the first day that you are at home.”
- “Keep your affected extremity straight while sleeping for several days.”

## Appendix D: Student Signature Form

I \_\_\_\_\_ agree to complete 3 hours per week in the Nursing Resource Center (NRC) for SLA. I will abide by the policies for SLA and actively work with the faculty to improve mastery of course content.

Student \_\_\_\_\_  
Print Name

Student \_\_\_\_\_  
Signature Date

Faculty \_\_\_\_\_  
Signature Date

***Return completed and signed 'Statement of Understanding' to your SLA facilitator. Students will not be allowed to attend the SLA workshop until your facilitator receives this document.***



## Appendix F: Cover Letter

September 5, 2013

Dear Dr. Brown-Bulloch,

I am a student at the Walden University working on a Doctorate of Education in Adult Health. I am conducting a research study entitled Is There a Correlation between the NCLEX-RN Predictor Test scores and the NCLEX-RN Exam Success for First-Attempt Test Takers? The purpose of this study is to determine whether a correlation exists between a group of variables (predictive test scores, prenursing GPA, final GPA at graduation, age, and gender) and NCLEX-RN success for first time takers of students graduating with an associate of applied science degree in nursing from South Eastern Technical College. To complete this research project, I am requesting permission to use data of students who graduated from the ADN nursing program spring and summer 2010 and 2011. The findings from this research study may be published but your name or institution will not be used and your results will be maintained in confidence. In this research, there are no foreseeable risks to the college. The identity of students will be kept confidential. The possible benefit of your participation is that the information obtained from archival data may lead to the identification of properly prepared students admitted to nursing programs resulting in higher NCLEX-RN pass rates and, therefore, more nurses to combat the nursing shortage. Thank you for your assistance.

Sincerely,

Annie Ruth Grant



## Appendix G: Permission Letter

To: Annie Grant

Aug 10 at 4:37 AM

Dear Ms. Grant-

Thank you for asking permission. If you are only referencing the model in your thesis, you don't need permission (just use normal citation). If you want to put the actual model in your paper, I'm happy to give permission. As a condition of permission, you must put "used with permission" with the model. Also, save a copy of this email. Good luck with all. I would love to read your paper when done! Maybe I will cite it!

Best,

Rosalinda Alfaro-LeFevre

Sent from my iPhone