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2018

Predicting Certification Success for the Family Nurse Practitioner

Tammy Lee Gravel
Walden University

Walden University

College of Education

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Tammy Lee Gravel

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Review Committee
Dr. Vicki Underwood, Committee Chairperson, Education Faculty
Dr. Janet Reid-Hector, Committee Member, Education Faculty
Dr. Nicolae Nistor, University Reviewer, Education Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2018

Abstract

Predicting Certification Success for the Family Nurse Practitioner

by

Tammy L. Gravel

MS, University of Massachusetts, 1992

BS, Salve Regina University, 1987

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Project Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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August 2018

Abstract

High-stakes licensure or certification examinations are required for many health professions disciplines to ensure safe entry-level practice. Accrediting agencies set a benchmark for graduates' first-time licensure or certification success as a measure of program effectiveness. Failures of graduates on licensure or certification examinations may directly affect the school's recruitment and retention of qualified students and faculty, as well as institutional financial viability. A health science university has added Health Education System, Inc. (HESI) standardized examinations using computer adaptive testing into the family nurse practitioner (FNP) master's program to support certification success, although research on these advanced practice examinations as related to certification outcomes was lacking. Guided by classical test theory, this study was an investigation of whether a relationship existed between students' performance on 4 HESI standardized examinations (Advanced Pathophysiology, Advanced Pharmacotherapeutics, Advanced Health Assessment, and the APRN/FNP Exit exam) and first-time FNP certification success. Binary logistic regression analysis of data from 117 students who graduated between 2013–2016 indicated that none of the 4 standardized HESI examinations significantly predicted FNP certification success, perhaps due to the examinations not carrying any evaluative weight within the program. The results of this project study may be used to promote positive social change by providing a means to improve first-time certification success and increasing the availability of primary care providers in the role of FNP.

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Dedication

I dedicate this project study to my loving husband, best friend, and partner, Steven, whose encouragement and support I could not do without. To my daughters, Hannah and Marissa who have tolerated their mother being in school most of their childhood. To my step-sons Joshua and Benjamin who have been forgiving when I spent most of their visits in my office. I am grateful for the support of my parents, friends, and colleagues who have been a source of encouragement even on my less than best days.

Acknowledgments

I would like to express my unending gratitude to my chair, Dr. Vicki Underwood. Dr. Underwood became my third committee chair and steered me through this journey. Words cannot express my appreciation for her guidance and support.

I would like to acknowledge Carol Eliadi, the dean of the School of Nursing and my mentor for the last 11 years. I appreciate her ongoing support as it has been invaluable to my growth as a faculty member and a leader in the academic setting.

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Section 1: The Problem

The Affordable Care Act (ACA; 2010) awarded citizens of the United States access to primary care providers through a universal health care model. Access to primary care providers will support health outcomes with chronic disease management, support health promotion activities, and decrease the burden on hospital emergency departments used for primary care activities. A federal initiative along with the ACA is the impetus behind the identified need for 241,200 qualified primary care providers by the year 2020 (DeNisco & Barker, 2016). An Institute of Medicine (IOM; 2010) report called for professional nurses to practice to the breadth and depth of their education to meet the health care needs of the U.S. population. The family nurse practitioner (FNP) is positioned to deliver primary care across the lifespan. The professional practice for the FNP is accomplished as a licensed, registered nurse (RN) with the completion of master's level education as well as successfully passing a national certification examination. The most recent 2015 FNP certification results from the American Association of Nurse Practitioners Certification Program (AANPCP) is 81.4% passing nationally (American Association of Nurse Practitioners; AANP, 2015). Failure of a graduate to pass the national certification examination has devastating results both emotionally and financially. A pattern of graduate certification examination failure can negatively affect a program's accreditation status as well as program viability (Yeom, 2013). Many nursing program faculty have implemented strategies to ensure students pass the certification examination. One such strategy is the curricular integration of Health Education System, Inc. (HESI) standardized specialty and exit examinations.

In this project study, I examined whether a relationship existed between student achievement on HESI standardized examinations at the master's level and first-time FNP certification test success. The project study took place within the School of Nursing located in Massachusetts, part of a private institution that will be referred to as the University.

The Local Problem

An opportunity exists in the United States to expand the scope of professional practice to the appropriate level of nurses' education to meet an anticipated gap in primary care practitioners' availability as a result of the ACA (2010) legislation. With the forethought of addressing this need, the master of science in nursing, family nurse practitioner (MSN/FNP), a 2-year part-time program at the University, was implemented. The terms *family nurse practitioner* (FNP) and *advanced practice registered nurse* (APRN) both refer to master's level nurses who are educated and certified to practice at the advanced level. Certification grants the advanced practice nurse the authority to diagnosis patients' illnesses and prescribe medications and treatments as described in the applicable state nurse practice act (DeNisco & Barker, 2016). In most states, practice at the advanced level requires both licensure to practice as an RN and certification to practice as an advanced practice nurse (Massachusetts Board of Registration in Nursing; MBORN, 2015). The culmination of the undergraduate nursing education is successful completion of the National Council of State Boards of Nursing (NCSBN) National Council Licensure Examination for Registered Nurses (NCLEX-RN), which is required to practice in any state. Similarly, students who graduate from the MSN/FNP program

must pass a certification examination developed and approved by a recognized accrediting agency, either the AANPCP or the American Nurses Credentialing Center (ANCC). Willson and Goodman (2015) discussed the integral relationship of national certification with that of education and clinical practice. The ability to support students' first-time certification examination success is meaningful to nursing educators. First-time certification examination success is related to student preparedness and curricular outcomes, as well as provides the evidence of program compliance with national accreditation standards (Willson & Goodman, 2015).

Many nursing programs, regardless of education preparation level, integrate the use of standardized computer adaptive examinations to replicate the experience of national licensure or certification examinations and to predict student first-time test success (Brodersen & Mills, 2014). Evidence suggests the HESI-RN Exit (E2) examination predicts students' first-time test success on the national NCLEX-RN licensure examination. Nine validity studies have been completed to date with a sample totaling almost 50,000 students (Elsevier, 2011; Zweighaft, 2013). These studies demonstrated an average of 96.61% predictive accuracy of future student success on the NCLEX-RN licensure examination (Lauer & Yoho, 2013; Zweighaft, 2013). However, a comprehensive review of the nursing literature found limited comparable evidence for the HESI APRN/FNP Exit examination and the predictability of future first-time certification test success as an advanced practice nurse. This noticeable gap in the literature corresponds to a gap in practice due to insufficient knowledge to support the use of the

HESI APRN/FNP Exit examination as a measure of predictability for first-time FNP certification test success.

Under its current testing policy, the University uses specialty HESI examinations, a midcurricular examination, and an Exit (E2) examination throughout the curriculum at the prelicensure baccalaureate level. The policy includes required postexamination remediation for students who do not achieve a faculty-designated benchmark. In a recent study by Young and Willson (2012), the predictive accuracy rate for first-time NCLEX-RN success was noted to be 97.93% regardless of which Exit (E2) exam version was completed when the benchmark of 900 was achieved. Many individual nursing programs set a faculty-designated HESI benchmark for progression or graduation. The faculty-designated HESI benchmark at the University for the prelicensure baccalaureate level is 850. According to Elkins (2015), the benchmark of 850 has a reported 97.5% accuracy with NCLEX-RN success, whereas a score of 900 has a predictive accuracy of 98.3%. Prelicensure BSN graduates from the University have had the consistent achievement on the national NCLEX-RN licensure examination with overall pass rates of 90% in 2013, 87% in 2014, and 92% in 2015 (MBORN, 2015). In contrast, the MSN/FNP program graduates have had inconsistent performance on national certification examinations. Results reported for the most recent years demonstrated pass rates for first-time test-takers as follows: for 2013, AANPCP 78% and ANCC 89%; for 2014, AANPCP 88% and ANCC 100% (dean of nursing, personal communication, January 20, 2015).

Approximately 350 universities in the United States (AANPCP, n.d.) offer advanced nurse practitioner programs. The ability to predict first-time certification test

success using the HESI APRN/FNP Exit examination would be beneficial as a final indicator of student preparation; however, it would also be helpful to the MSN/FNP program administrators if earlier indicators were integrated into the curriculum, similar to those used at the prelicensure level. Within the local MSN/FNP program, individual HESI exams are administered following three core courses: Advanced Pathophysiology, Advanced Pharmacotherapeutics, and Advanced Health Assessment. The HESI exams in these courses, deemed the *3 Ps*, might also provide an accurate and earlier prediction of certification success. A testing policy with a faculty-designated HESI benchmark score, required student remediation, and progression standards in alignment with those of the undergraduate program may support consistent advanced nurse practitioner graduate outcomes.

Rationale

The University is a private institution focused on the education of individuals for a variety of health professions. The mission statement of the institution states it "prepares students for successful careers in health care through excellence in teaching, scholarship, research, professional service and community engagement." The School of Nursing is one of the largest schools within the university and includes several programs focused on education of entry-level baccalaureate prepared RNs as well as the advanced practice, master's prepared nurses in the role of FNP. The community of interest, which includes both internal and external stakeholders to the university, drives programmatic and curricular changes. In Massachusetts, although a focal point for world-renowned health care, significant challenges exist to meet the demand for primary care providers. A July,

2013 study by the Massachusetts Medical Society (2013) found a 50-day average wait time for a patient to gain access to an internal medicine physician and 39-day average wait time for a family medicine practitioner. This study of 1,137 physician practices also indicated a decrease in practices accepting new patients. Thus, the present lack of access to primary care providers and the feedback from the community of interest was the impetus for the addition of the FNP program at the University.

The program is delivered face-to-face on two campuses and online to support the education of advanced practice nurses both locally, regionally, and nationally. The program is part-time with a core curriculum followed by clinical courses designed to advance the knowledge and practice of the professional nurse. The clinical component is predicated on patient care delivery across the lifespan. Certification is required at the culmination of the program and is achieved through the ANCC or the AANPCP. The FNP certification is requisite to practice at the advanced level and must be completed successfully and submitted to the nurse's state-specific board of nursing. This is a high-stakes examination where failure results in the inability to practice in the expanded role as an FNP. According to the ANCC (n.d.), the individual would be required to retake the examination after a waiting period of 60 days. For each exam, there is an associated cost of $270 and the candidate cannot test more than three times in a year (ANCC, n.d.).

Since the inception of the program, the most significant concern has been student achievement of first-time test success on the FNP certification examination (dean of nursing, personal communication, January 20, 2015). The inconsistent performance of FNP graduates at the University can negatively affect future recruitment and retention of

qualified students and faculty. As a private, tuition-driven institution, program outcomes and program accreditation are dependent on certification success and have a direct influence on the financial integrity of the organization (Yeom, 2013).

A comprehensive review of the literature indicated limited evidence that supports the HESI APRN/FNP Exit examination as a predictor of certification success. At the undergraduate prelicensure level, there are several studies that support the use of HESI specialty and HESI Exit (E2) examinations to predict future licensure success. Studies have consistently demonstrated rigor of the HESI Exit (E2) examinations' test item development and replicability of the predictive accuracy of this examination; nine published validity studies have 99.61% accuracy as a predictor for NCLEX-RN first-time test success (Zweighaft, 2013).

Studies on the use of the advanced practice HESI Exit examination as a predictor of certification success are limited. Published data from the only three studies available include a total of 339 students with predictive accuracy for the APRN/FNP Exit examination of 100% (Elsevier, 2011). In the only published study, Willson and Goodman (2015), recommend a benchmark score of 700 or above on the APRN/FNP Exit examination to be predictive of first-time certification success. A recent white paper published by Elsevier (2016) noted that test takers receiving a benchmark score of 800 or greater demonstrated 100% first-time success on the certification examination. These preliminary data are encouraging; however, the extensive use and similar documented predictive accuracy are not yet available for the HESI APRN/FNP Exit examination or the 3 P examinations.

Willson and Goodman (2015) suggested that standardized examinations such as the HESI/APRN Exit examination may be useful in validating student competency as well evaluation of program effectiveness. The authors intended to establish predictive validity and a benchmark score for the APRN Exit examination similar to that of the prelicensure level Exit examinations. In addition, Willson and Goodman surveyed 35 directors of graduate programs and found the limited use of a testing policy or progression standards using the standardized examinations. Thus, the purpose of this study was to determine whether a relationship existed between student achievement on the HESI standardized examinations at the master's level and first-time FNP certification success.

Definition of Terms

The following terms used in this project study are defined as follows:

American Nurses Credentialing Center (*ANCC*): An agency that develops and administers a national FNP certification examination. The examination measures knowledge requisite for safe entry-level practice as an FNP (ANCC, n.d.).

American Academy of Nurse Practitioners (*AANP*): An agency that develops and administers a national FNP certification examination (AANCP). The examination measures knowledge requisite for safe entry-level practice as an FNP (AANPCP, n.d.).

Health Education Systems, Inc. (*HESI*): Encompass standardized, computer-based examinations administered in a variety of programs that educate health professionals nationally and internationally (Elsevier, 2011). Elsevier is the parent company that owns rights and privileges to HESI examinations.

HESI Exit Examination (*E2*) *Exit examination*: A comprehensive computerized examination administered at the conclusion of the prelicensure education that uses a scoring formula and benchmarks to compare students nationally (Morrison, Adamson, Nibert, & Hsia, 2008).

HESI Advanced Health Assessment examination: A computerized examination administered following the completion of a required graduate-level core course to measure the student's understanding of advanced health assessment concepts across the lifespan (HESI, n.d.).

HESI Advanced Pathophysiology examination: A computerized examination administered following the completion of a required graduate-level core course to measure the student's understanding of concepts of pathophysiology across the lifespan (HESI, n.d.).

HESI Advanced Pharmacotherapeutics examination: A computerized examination administered following the completion of a required graduate-level core course to measure the student's understanding of pharmacokinetics, pharmacodynamics, and pharmacotherapeutics for general medications administered across the lifespan. (HESI, n.d.).

Family nurse practitioner (*FNP*): A licensed, advanced practice nurse who has completed a minimum of a master's or doctoral level education. The FNP must hold a license as an RN and certification as an FNP from a certifying agency to practice (AANP, n.d.).

National Council of State Boards of Nursing (*NCSBN*) *NCLEX-RN examination*:

A national computer-based examination which measures knowledge requisite for safe

entry-level practice as an RN. The results of the examination are reported as pass/fail

(NCSBN, n.d.).

Significance of the Study

The responsibility to address the health care needs of the U.S. population resides

in the ability of academic institutions to educate qualified and knowledgeable health care

providers. The increased need for primary care providers, particularly in the role of the

FNP, enhances the burden of responsibility. Students who complete an MSN/FNP

program should have the academic knowledge and clinical skill requisite to successfully

pass the certification exam and transition into the role of advanced practice nurse.

The ability to use predictors of certification success such as HESI standardized

exams is relevant to both nursing education and the local university. At the University,

the 3 P examinations are administered following the completion of the core curriculum,

and the Exit examination occurs at the conclusion of the curriculum. However, at present,

the examinations do not have an associated faculty-designated benchmark for

achievement, students are not required to complete remediation, and the results of the

examinations are not associated with any course grade. Thus, the examinations are

considered low-stakes tests with no effect on student progression or graduation. Students

in the FNP program have demonstrated inconsistent performance on the HESI

examinations as well as on the certification examination (dean of nursing, personal

communication, January 20, 2015).

The integration of HESI examinations as a mechanism to assess student knowledge and competency in nursing is well established in the literature (Langford & Young, 2013; Young & Willson, 2012; Zweighaft, 2013). The 3 P and APRN/FNP Exit examinations align with test plan blueprints for the national certification examinations (Elsevier, 2011, 2016; Willson & Goodman, 2015) and provide benchmarked data for comparison of individual student and cohort performance with other similar programs nationally. The HESI examinations can provide predictive testing and corresponding student remediation to support future certification success (Willson & Goodman, 2015). According to Willson and Goodman, students who achieve HESI scores of 700 or greater have achieved first-time certification examination success at a rate of 100%.

In this study, I aimed to assess whether a relationship existed between student achievement on standardized HESI examinations at the MSN/FNP level and first-time certification success. The use of nationally benchmarked examinations as a predictor of certification success could assist University graduate faculty to ensure course content and pedagogy align with the requisite knowledge for the entry-level FNP. In the local community, a cohort of certified FNPs can improve access to primary care providers as well as facilitate successful transition into the graduate's desired role as an FNP.

Research Questions and Hypotheses

According to Zweighaft (2013), several researchers have examined the value of HESI examinations as predictors of first-time NCLEX-RN success. Many schools of nursing use these examinations as a mechanism to support student learning, progression, and curricular evaluation (Willson & Goodman, 2015). However, the published data that

address the use of HESI examinations at the graduate or MSN/FNP level are sparse. In fact, according to Willson and Goodman, the literature is limited to conference presentations and the publisher's technical reports (e.g., see Elsevier's *Scientific Brief,* 2011). Thus, the study by Willson and Goodman is pivotal as the authors sought to find the predictive validity of the HESI APRN Exit examination and to provide insight into the use of the examinations by graduate program faculty. Similarly, the research questions that guided this study addressed whether student achievement on standardized testing at the MSN/FNP level is useful in predicting future first-time certification test success. I used binary logistic regression to explore the relationship between the dependent variable of first-time certification success or failure with the standardized HESI examinations being the multiple predictor variables.

The research questions that guided this quantitative study include:

RQ1 – Quantitative: Is student achievement on one or more of the 3 P HESI examinations a significant predictor of first-time test success on the FNP certification examination?

$H_0$1: Student achievement on the 3 P HESI examinations is not a significant predictor of first-time test success on the FNP certification examination.

H_a1: Student achievement on one or more of the 3 P HESI examinations is a significant predictor of first-time test success on the FNP certification examination.

RQ2 – Quantitative: Is student achievement on the HESI APRN/FNP Exit examination a significant predictor of first-time test success on the FNP certification examination?

$H_0 2$: Student achievement on the HESI APRN/FNP Exit examination is not a significant predictor of first-time test success on the FNP certification examination.

$H_a 2$: Student achievement on the HESI APRN/FNP Exit examination is a significant predictor of first-time test success on the FNP certification examination.

Review of the Literature

For any program in higher education that culminates with a high-stakes examination, education leaders seek to find a mechanism to predict the preparedness of their graduates (Oermann & Gaberson, 2014; Yeom, 2013). One such method is computer adaptive testing that replicates the future high-stakes examination. In this study, the high-stakes examination is the FNP certification examination. An analysis of the relevant literature was conducted related to the selected theoretical framework of classical test theory, as well as computer adaptive testing, use of standardized testing such as HESI examinations as a predictor for future licensure or certification success, the use of HESI examinations with curriculum testing policies, HESI examination as a predictor of success for RN licensure, validity and reliability of HESI examinations, advanced practice and FNP certification examinations, and predictors of certification success. The review of the literature I conducted through the library databases at Walden

University included: Academic Search Complete, CINAHL, Education Research

Complete, ERIC, OVID, Proquest, and Google Scholar. The review was limited to dates

inclusive of 2012-2017. However, literature that supported the theoretical framework for

HESI test development, as well as validity and reliability studies, were included dating

back to 1999. Seminal work on classical test theory from 1986 is also included. I used the

ancestry method to procure additional relevant resources. Search terms included *classical*

test theory, HESI examinations/exit examinations, computer adaptive testing, testing

policy, progression policy, NCLEX-RN licensure success, family nurse practitioner, and

family nurse practitioner certification. I used the terms *OR* and *AND* in a variety of

Boolean search strategies to ensure complete saturation of the literature.

Theoretical Foundation

The theoretical framework for this study aligns with the framework used in the

development of HESI examinations, classical test theory as described by Crocker and

Algina (1986). In their seminal work, the authors defined a *test* as, "procedures for

obtaining a sample of individual's optimal performance" (p. 4). The psychological

attributes that educators would like to measure are not easily discernable without a test.

Crocker and Algina deemed these psychological attributes to be *constructs*. In the field of

nursing, tests are generated to assess constructs or attributes as they link to knowledge

acquisition and assume safe clinical performance. Tests are a mechanism to assess both

student learning and course objectives. Nursing education uses both faculty-generated

and standardized examinations to assess learning outcomes and clinical competence

(Twigg, 2012). According to Oermann and Gaberson (2014), students should take

examinations across the curriculum that prepare them for the national licensure or certification examination. Thus, test items are written to advance the learner to a higher level of cognitive appraisal which is deemed critical thinking or application (Twigg, 2012). As students advance across the curriculum, they must demonstrate the integration of theory to application of clinical practice (Oermann & Gaberson, 2014).

De Champlain (2010) indicated, "A test theory model is needed to explain the relationship between actual test scores and estimated performance in the domain" (p. 110). As further discussed by De Champlain, "True knowledge of the domain is estimated based upon the test items which comprise the examination" (p. 110). Although De Champlain's work was partial to medical school examinations, many of the tenets discussed by the author can be applied to the HESI examinations. A key point that crossed from the discipline of medicine to nursing is that a test theory should match the knowledge and clinical practice. In this case, the student's clinical ability is inferred by performance on the examination (De Champlain, 2010). Thus, the students demonstrate their knowledge of clinical practice points through successfully answering the questions on the examination. In addition to these key points, De Champlain suggested that classical test theory may lack generalizability outside of the particular program or course of the specific examination. This is a key consideration when discussing the applicability of HESI examinations as a predictor for future success on licensure or certification examinations.

Crocker and Algina's (1986) framework outlined basic elements of test development and analysis. Crocker and Algina proposed the following formula for which

a relationship is described: observed score equals true (universal) score plus error score (error of measurement). The student's obtained score should represent the true score as closely as possible. The results indicate the student's knowledge of the content. The degree of error may relate directly to extraneous variables caused by the human element that could affect performance on the examination, such as test anxiety.

Morrison et al. (2008) described the use of classical test theory as a theoretical framework for HESI test design. The framework integrated the NCSBN constructs, clinical nursing knowledge, and HESI item writing to include Paul's (1993) critical thinking theory. According to Paul, as cited in Morrison, Nibert, and Flick (2006), "Knowledge is the foundation of minimal comprehension, analysis, synthesis and application" (p. 11). HESI examination developers have built on the definition of critical thinking to include "the process of analyzing and understanding how and why a certain conclusion was reached" (Morrison et al., 2006, p. 11). Additional components of the HESI framework for test design include validity, reliability, and test evaluation. The test design integrates specific psychological attributes or constructs and nursing behaviors identified by the NCSBN, is published with alignment to the NCLEX-RN test blueprint, and adjusted every 3 years to reflect contemporary practice. Similarly, the APRN/FNP Exit examination is based on the certification test blueprints of the certifying agencies and are updated every 3 years. Scores on the HESI examinations provide evidence of the acquisition of specific knowledge and competency-based behaviors because they are linked to the content of the NCLEX-RN exam for the entry-level nurse, or the FNP certification examination for the FNP graduate through the test blueprints.

Each HESI examination is subjected to testing for reliability and validity. Sijtsma and van der Ark (2015) described reliability and validity as key concepts related to test theory. According to Sijtsma and van der Ark, *reliability* is the "degree to which a set of measurement values can be repeated under precisely the same measurement conditions" (p. 128). The authors defined *validity* as, "the degree to which a measurement reflects the intended attribute, but it also refers to the suitability of the measurement value for a particular use" (p. 128). HESI examination development centers on construct validity in which each test item measures a specific trait or attribute inferred by testing (Morrison et al., 2008). As discussed further by Morrison et al., test items align with national licensure examination blueprints and are generated in collaboration with nursing faculty and nursing practice experts to meet contemporary practice standards. Convergent validity is a concept which reinforces construct validity. According to Morrison et al., convergent validity is obtained by parallel measures of similar constructs. One way in which this is accomplished is through the comparison of HESI specialty exam results and specialty course grades. Morrison et al. provided an example that indicated a statistically significant relationship between the pediatric specialty exam and pediatric course grades. Thus, validity assessment of HESI examinations as they measure constructs required for safe clinical practice is demonstrated through ongoing evaluation of test items and clinical practice. As described by Mee and Hallenbeck (2015), "Validity of a high-stakes exit examination in nursing can be determined by how accurately the test identifies students who will pass the licensure, or certification examination" (p. 494).

Reliability is calculated using the Kuder-Richardson (KR) Formula 20 each time any HESI examination is administered. Reliability ensures consistency of scores each time the exam is administered to a similar set of students (Oermann & Gaberson, 2014). Morrison et al. (2008) reported estimated reliability for HESI examinations of 0.86 to 0.99 (p. 42S). The target reliability for KR 20 with standardized testing is a value greater than 0.90. (Elsevier, 2016; Mee & Hallenbeck, 2015). This would indicate, for example, that the predictive value of the HESI Exit (E2) exam remains consistent in the measurement of knowledge and competency acquisition requisite for future NCLEX-RN success.

Finally, Utley (2011) provided a comparative analysis of classical test theory commonly used for test development and test analysis. Utley highlighted key components that affect test reliability to include the student, test item, and administration. HESI examinations used at the prelicensure level have been studied extensively and have addressed each of the factors discussed by Utley. Nine validity studies conducted across a variety of nursing program curriculums have addressed the reliability of the examinations. The HESI validity studies are discussed later in this review of the literature and a summary is presented in Table 1. The key elements examined in this summary include the alignment of test items as they relate to contemporary nursing practice, correlation of benchmark score with national licensure success, and test administration to ensure secure test environments. To ensure reliability and validity of examination content, HESI benchmarks each nursing program with similar programs nationally as well as with key curricular underpinnings such as the *Essentials of Baccalaureate*

Education (AACN, 2008), *Quality and Safety in Nursing Education* (QSEN, 2008), and *National League of Nursing* competencies (NLN, 2010). The results of the benchmarking and a summary item analysis are provided by HESI following each exam. These results also include a mean HESI score, median HESI score, and KR 20 value for the examination. Many nursing programs use these summary results for curricular assessment, course revision in each curricular domain, and overall program assessment. In addition, the examinations provide real-time assessment of student knowledge of requisite course and program–related content. Nursing educators are able to address these learning needs prior to the student graduation through a variety of teaching and learning strategies.

The scoring of the HESI examinations is based on the complexity of the questions, as each item is individually weighted. The more challenging the question, the greater the evaluative weight. The HESI predictability model supports the calculation of a student test score that is expressed in two forms, the HESI score is designated on a 1500-point scale, and a student conversion score expressed as a percent. The HESI score is a key indicator as it is this score that is used as a benchmark established for mastery of content and demonstrates a relationship to future NCLEX-RN examination success. The scoring model for HESI is similar to the scoring model used by the NCSBN to ensure psychometrically sound examinations with test item complexity and test item weight.

The disease detection model, used to validate the accuracy of a diagnostic test as a predictor of disease (Nibert et al., 2006), has also been used in a few studies as a theoretical framework to evaluate the validity and reliability of HESI exams. Nibert et al.

refuted the use of the disease detection model and supported the use of classical test

theory as the latter provides consideration for the human response in the testing

environment. Lavandera et al. (2011) used the disease detection model to study the

predictability of the HESI Exit (E2) examination, particularly for at-risk prelicensure

nursing students. The study sample included 240 students who were mainly minority and

were older students than those in previous studies. Using timeliness of licensure as a

dependent variable, the authors compared course scores, HESI scores, and grade point

average. Lavandera et al. suggested that by using this model, one can predict future

failures on the NCLEX-RN examination for at-risk students, a weakness in all of the

HESI validity studies to date. However, the authors found only 24% of students predicted

to fail the NCLEX-RN examination actually failed using all three predictors (Lavandera

et al., 2011). The limitation of HESI, as noted in the literature regardless of theoretical

framework used, is the inability of HESI to predict future student failures. Thus, much of

the literature indicates the use of standardized examinations as one tool to assess student

knowledge acquisition but other methods of assessment should also be used evaluate

students.

HESI tests are developed with the assistance of clinical nursing practice experts

and NCSBN licensure examination blueprints that delineate safe behaviors for entry-level

practice (Morrison et al., 2008). Respective nursing program course syllabi are used for

development of specialty examinations that test competency at specified points within the

program, such as the midcurricular examinations. The midcurricular examinations are

designed in collaboration with the nursing program faculty and are administered at the

midpoint in the curriculum to assess the students' knowledge to date, as well as identify students who may be at risk for nursing program failure (Harding, 2012). Individual student remediation is provided online by HESI following all HESI examinations. The remediation provides a review of content, provides resources for the student to gain additional information, and validates learning through quiz questions. Many programs require completion of the remediation in collaboration with nursing faculty to enhance student success and progression within the nursing program. The use of remediation to enhance student success will be discussed further in the literature review.

<div align="center">**Review of the General Literature**</div>

Computer Adaptive Testing

Many nursing programs, regardless of education preparation level, integrate the use of computer adaptive testing to replicate the experience of national licensure or certification examinations and to predict students' first-time test success (Brodersen & Mills, 2014). Computer adaptive testing may cause anxiety for students because the examination is one directional, meaning students cannot navigate back and forth to answer questions or change answers. Students must answer the question and move on to the next question. Computer adaptive testing provides immediate feedback that can support individualized student remediation (Lauchner, Newman & Britt, 2008). In 1994, the NCLEX-RN examination shifted from a paper and pencil test to computer adaptive testing (NCSBN, n.d.). Julian, Wendt, Way, and Zara (2001), described the implementation of the computer adaptive testing for the NCLEX-RN examination with the goal of a more efficient and accurate means of assessing competence. According to

Oermann and Gaberson (2014), the computer adaptive testing model allows for an

individualized examination with NCLEX items that have predetermined difficulty level.

The NCSBN NCLEX-RN computer adaptive test is criterion based, meaning that

students either pass or fail. Individual testers may answer 75 to 265 questions, including

15 pilot test items, to determine safe entry-level competence (Oermann & Gaberson,

2014). The variability of the number of test items completed by individual candidates is

dependent on their ability to meet the passing standard with 95% certainty (Oermann &

Gaberson, 2014).

Oermann and Gaberson (2014) described the use of standardized testing in a

computer adaptive environment to support future licensure or certification success

through simulation of a similar testing environment. Alternative format test questions

may require the students to listen to heart or lung sounds or mark a hot spot on a specific

body area. As with all types of testing, many students may experience test anxiety.

Oermann and Gaberson suggested that by replicating the environment for the licensure or

certification examination with standardized testing, students may experience reduced

anxiety with exposure to this testing modality prior to the high-stakes examination. One

means of replicating the testing environment is through the use of HESI exams within the

curriculum.

HESI Exams

HESI examinations are used across the curriculum and at the conclusion of many

undergraduate nursing programs to predict student performance on high-stakes licensure

examinations such as NCLEX-RN. McCarthy, Harris, and Tracz (2014) discussed the use

of standardized exams as a gatekeeper to the profession of nursing. The standardized exams with established benchmarks provide valuable information to nurse educators regarding at-risk students, which allows nursing faculty to intervene through remediation prior to these students completing the high-stakes licensure exam. The original HESI Exit (E2) examination was developed in 1994 as a standardized measure by which to evaluate student preparedness with nursing knowledge and readiness for clinical practice (Sosa & Sethares, 2015). In addition, the examinations allow for curricular assessment and evaluation as part of ongoing program improvement required for accreditation.

HESI examinations have undergone substantial evaluation. Nine validity studies have been published to date; two additional studies are in the data collection and data analysis phases (Nibert & Morrison, 2013). The authors of each validity study assessed the Exit (E2) examination as a predictor of students' NCLEX-RN success. In the ninth validity study, Zweighaft (2013) used a nonexperimental design to examine the predictive accuracy of the HESI Exit Examination for a sample of 3,790 nursing students from 63 programs. The predictive accuracy noted by Zweighaft was 96.36% to 99.16% for future NCLEX-RN test success, which reinforced the eight previous validity studies. Table 1 highlights each of the nine validity studies and the outcome of each study.

Table 1

HESI Exit Examination Validity and Reliability

Author/date	Theoretical/conceptual framework research question(s)/hypotheses	Academic year/*N*/ nursing program	Validity and reliability NCLEX-RN success
1st validity study Lauchner, Newman, & Britt (1999)	Critical Thinking Model for Item Writing Measure the effectiveness of a computerized exam that can provide immediate feedback Effect of proctoring the examination Predicative accuracy for CAT in predicting NCLEX-RN success	Academic year 1996-1997 *N* = 2,809 Diploma/AD/BSN/PN	Predicative accuracy of 99.49% "No difference noted in education level; associates degree, diploma or baccalaureate degree." (p. 120) KR20 = 0.85
2nd validity study Newman, Britt, & Lauchner (2000)	Critical Thinking Model for Item Writing HESI Predictability Model Replicate the 1st validity study Investigate the accuracy of the mathematical model, HESI Predictability Model (HPM) when used to calculate the students' probability of passing the NCLEX-RN Examine the pass rate of students scoring low on the HESI E2 and their success on the licensing exam	Academic year 1997-1998 *N* = 3,752 Diploma/AD/BSN/PN	Predictive accuracy of 98.27% for RN; 99.34% accuracy for PN KR 20 RN = 0.76 and PN = 0.77 "Significantly more (*p* = .001) of the low scoring students failed the licensure exam; while significantly fewer (*p* = .05) of the low scoring students failed the licensing exam when the E2 was used as a progression benchmark or a guide for NCLEX-RN remediation." (p. 132)

Author/date	Theoretical/conceptual framework research question(s)/hypotheses	Academic year/*N*/ nursing program	Validity and reliability NCLEX-RN success
3rd validity study Nibert, & Young (2001)	Critical Thinking Model for Item Writing HESI Predictability Model Replicate 1st and 2nd validity study Examine the accuracy of the E2 for low scoring students' results on NCLEX-RN and when E2 was used as a benchmark for remediation for students.	Academic Year 1998-1999 *N* = 6,277 Diploma/AD/BSN/PN	Predictive accuracy 97.64% RN; 99.12% KR20 RN = 0.74 and PN = 0.75 "HESI remediation was not significant for low scoring students." (p. 172)
4th validity study Nibert, Young, & Adamson (2002)	Critical Thinking Model for Item Writing HESI Predictability Model The aim of the study was to analyze the degree of risk associated with various benchmark E2 scoring intervals to support decisions for the use of E2 scores as benchmarks for progression and remediation to support future NCLEX-RN success.	Academic Year 1999-2000 *N* = 6,300 Diploma/AD/BSN/PN	Predictive accuracy of 98.46%; no significant difference in educational preparation KR20 RN= 0.75 an d PN = 0.79 "Significant differences in the NCLEX-RN pass rates for each scoring interval. There was no significant difference found among different level education programs when they were compared at like intervals." (p. 176) "Students who failed the NCLEX-RN significantly increased with each successive drop in benchmark E2 scoring interval. Remediation supported NCLEX-RN success on the first attempt." (p. 176)

(*table continues*)

Author/date	Theoretical/conceptual framework research question(s)/hypotheses	Academic year/*N*/ nursing program	Validity and reliability NCLEX-RN success
5th validity Study Lewis (2005)	Classical Test Theory HESI Predictability Model Weiner's attributional theory of motivation And motivation Re-evaluate predictive accuracy of the E2 with the weighted scoring method and the effect of progression policies on student performance on the E2.	Academic year 2001-2002 *N* = 9,695 Diploma/AD/BSN	Predictive accuracy of 97.83% As students' E2 scores decrease, their risk for failing the NCLEX-RN examination increased.
6th validity study Adamson, & Britt (2009)	Classical Test Theory Critical Thinking Theory HESI Predictability Model The aim of the study was to re-evaluate the accuracy of the E2 in predicting first-time NCLEX-RN success To investigate the accuracy of parallel versions of the E2 in predicting first-time NCLEX-RN success	Academic year 2004 *N* = 10,147 Diploma/AD/BSN	Predictive accuracy of 96.44% KR for 3 versions: 0.93; 0.92; 0.93 "There were no significant differences noted in the predictive accuracy of HESI E2 versions 1 and 2; version 3 was less accurate for predicting first-time NCLEX-RN success." (p. 397)
7th validity study Young, & Willson (2012)	Classical Test Theory Critical Thinking Theory The aim of the study was to examine the accuracy of 3 parallel versions of the E2 in predicting first-time NCLEX-RN success. To describe program policies regarding E2 benchmark scores, remediation programs, and retesting with parallel E2 exams.	Academic year 2006-2007 *N* = 4,383 Diploma/AD/BSN	Predicative accuracy of 99.16% KR for 3 versions: 0.91; 0.98; 0.91 Predictive accuracy E2 by versions > 90% "Remediation is effective to raise E2 scores." (p. 55)

(*table continues*)

Author/date	Theoretical/conceptual framework research question(s)/hypotheses	Academic year/*N*/ nursing program	Validity and reliability NCLEX-RN success
8th validity study Langford and Young (2013)	Classical Test Theory Critical Thinking Theory The aim of the study was to examine the predictive accuracy of 3 parallel versions of the E2. In addition, an assessment of testing protocols, remediation strategies, and progression policies were evaluated.	Academic year 2007-2008 *N* = 3,758 Diploma/AD/BSN	Predictive accuracy overall of 98.32% Predictive accuracy for each E2: V1 = 95.64% V2 = 88.36% V3 = 59.26% Langford and Young (2013) reaffirmed the predictive accuracy of 3 versions of the Exit examination as it relates to first time NCLEX-RN success.
9th validity study Zweighaft (2013)	Classical Test Theory Critical Thinking Theory The aim of the study was to reexamine the accuracy of E2 in predicting NCLEX-RN success and investigate the value of administering HESI specialty exams in terms of future E2 scores.	Academic year 2008-2009 *N* = 3,790 Diploma/AD/BSN	Predictive accuracy of 96.61% Mean score for students who completed other HESI exams = 865.7; nonusers = 837.3 Zweighaft (2013) noted that, "the 8 specialty exams were highly predictive of NCLEX-RN success which include; critical care, pediatrics, and medical/surgical nursing." (p. S10)

Zweighaft (2013) included HESI-developed specialty examinations used across the curriculum to determine whether these too predicted future student successes on the NCLEX-RN examination. Zweighaft found that the curricular integration of HESI specialty examinations such as critical care, medical-surgical, and pediatrics was highly predictive of future test success on the NCLEX-RN test if the students achieved the benchmark score of 850 or better. Many of the HESI examinations have been used as final examinations following a specialty course such as medical/surgical nursing, or as a remediation strategy to prepare students for the course final exam or exit examination. According to Schooley and Kuhn (2013), the HESI fundamentals examination significantly predicted NCLEX-RN success ($p < 0.05$) in a study where the authors examined HESI specialty exam test scores as a predictor of NCLEX-RN success for 306 students. The integration of these examinations across the curriculum is relevant to schools of nursing considering the implementation of a testing policy and progression benchmarks.

HESI examinations, particularly the HESI Exit (E2) examination, have had significant evaluation nationally and across a variety of entry-level nursing programs. Nibert and Morrison (2013) stated that the HESI Exit (E2) examination had been extensively studied for more than a decade, with these studies including a total student sample of 49,115. This experience in a variety of program settings suggests nurse educators can rely on the integration of the examinations across the curriculum as a mechanism to prepare students for NCLEX-RN test success. However, the issue of setting testing policy remains controversial.

A significant debate exists in the literature concerning the practice of using HESI examinations as a benchmark for progression within, or graduation from, a designated nursing program. Many schools of nursing use progression standards to ensure NCLEX-RN licensure pass rates are at or above the national average. Mee and Hallenbeck (2015) stated, "standardized testing is one way to gauge a student's potential for the program and NCLEX-RN success" (p. 493). Progression standards are set by faculty as a required benchmark for student achievement before progression to the next course or as a graduation requirement. Sosa and Sethares (2015) summarized the literature on the integration of HESI testing in baccalaureate nursing programs. It is clear from this extensive review that practice gaps exist in how and when examinations are used, as well as whether they are used as a progression standard. The evidence suggested for students who do not meet the benchmark, retesting with HESI Exit (E2) examinations (versions 2-4) has limited predictability for future NCLEX-RN success (Sosa & Sethares, 2015). One key outcome of the nine validity studies is the inability to predict future NCLEX-RN test failure.

Schroeder (2013) described the implementation of a testing policy that weaved HESI examinations across the curriculum of an associate degree program with the goal of enhancing NCLEX-RN test success as well as supporting internal and external curricular evaluation. Schroeder found a statistically significant difference between the mean NCLEX-RN pass rate for the 5 years prior ($M = 89.3$, $SD = 1.37$) to and the 5 years following ($M = 97.2$, $SD = 3.38$) the implementation of the HESI testing policy. The sample of 304 students in the 5 years pre-HESI testing policy had a mean pass rate of

84.1%, while post-HESI testing policy, a sample of 268 students achieved a mean pass rate of 97.01% (Schroeder, 2013). The findings of this study support the integration of HESI examinations to facilitate progression. However, others such as Spurlock (2013) suggested otherwise, referencing the *NLN Fair Testing Imperative in Nursing Education* (2012) and raising concerns about using one exit exam to determine student progression and graduation (Halstead, 2013, Mee & Hallenbeck, 2015; Stonecypher, Young, Langford, Symes, & Willson, 2015). Santo, Frander, and Hawkins (2013) found that there is no best practice standard for the implementation of progression policies with standardized exit examinations. Spurlock (2013) highlighted several controversial points with using HESI as a means for determining progression or graduation. According to Spurlock, the data from the Young and Langford (2010) study indicated a 14.2% failure on NCLEX-RN for students who scored less than 900. Further analysis revealed students scoring less than 700 passed the NCLEX-RN examination 61.8% of the time (Spurlock, 2013). This indicates that the HESI Exit examination cannot predict success or failure; students predicted to pass the licensure exam failed and those who were predicted to fail actually passed the licensure exam. The findings represent opportunities for further study to support the evidence-based integration of progression polices using standardized examinations within the nursing curriculum.

If progression policies are instituted, many programs require students to retest with a parallel HESI Exit examination until they achieve program-set benchmarks for the examination, usually scores of 850 or above. The authors of the eighth validity study explored this concept of parallel testing with the HESI Exit examination and subsequent

NCLEX-RN test success. Building on the seventh validity study by Young and Willson (2012) that examined the validity of the three parallel versions of the HESI Exit examination, Langford and Young (2013) examined HESI benchmark achievement and progression policies such as course failure, delayed graduation, or delayed or denied NCLEX-RN candidacy. Students who failed HESI Exit version 1 went on to retest with versions 2 and 3. The results indicated that HESI Exit version 1 is more predictive of NCLEX-RN success than versions 2 and 3. However, Langford and Young found that the overall predictive accuracy of all three versions was 94%. Student remediation between exams was also discussed as a viable option to enhance future Exit examination and NCLEX-RN test success.

HESI examinations provide for individual online student remediation following the completion of an examination. In addition to progression policy discussions, the faculty in many programs have debated the value of requiring remediation. Lauer and Yoho (2013) described using the remediation to meet students' learning needs to facilitate future NCLEX-RN test success. These authors built upon the eighth validity study that indicated a statistically significant relationship ($p < .01$) between programs that required a benchmark for the HESI Exit examination and required remediation (Lauer & Yoho, 2013). In Lauer and Yoho's study, those students who did not achieve the benchmark of 850 on the first HESI Exit examination and participated in required remediation had a mean of 870.77 on the subsequent HESI Exit examination, compared to a mean of 844.99 for those students who were not required to participate in remediation (Lauer & Yoho, 2013). Students who used the individual remediation

improved their respective test scores on a subsequent parallel HESI Exit exam,

demonstrating the preparedness of the student and readiness for successful completion of

the NCLEX-RN examination.

Stonecypher et al. (2015) used a descriptive phenomenological study to assess

faculty members' experiences with policy implementation for HESI Exit testing. The

sample included 15 nursing programs, both baccalaureate and associate degree levels.

The authors identified three main issues that are driving policy implementation: the

impetus for change, modifications to academic policies, and responses or outcomes of

change. Subcategories included such concerns as NCLEX-RN scores, benchmarking of

HESI scores, remediation, and as with all policy changes, resistance for a variety of

reasons. Many nursing programs function similarly, implementing policies as a swift

response to a negative outcome event such as a decrease in national examination scores.

Stonecypher et al. suggested that the result of policy implementation is ongoing

curricular assessment, student achievement, improved teaching strategies, and program

evaluation.

The University policy that includes the use of HESI Exit (E2) examinations with

established benchmarks and required remediation at the undergraduate level is an

evidenced-based strategy to support future student success on the NCLEX-RN licensure

examination. At the BSN level, the university faculty administer HESI specialty

examinations as final examinations in all but two courses, as well as a midcurricular

examination and custom cumulative examination prior to the start of the final semester.

The results of the policy have been demonstrated by NCLEX-RN success since the first

graduating cohort in 2007, meeting or exceeding the state and national benchmarks. However, a gap in testing policy exists at the master's FNP level.

RN Licensure Examination for Entry-level Practice

The culmination of undergraduate prelicensure nursing education is first-time NCLEX-RN examination success. This examination assesses the knowledge and competency requisite for safe entry-level nursing practice (McCarthy et al., 2014; Oermann & Gaberson, 2014). The NCSBN is the agency that develops the psychometrically sound, legally defensible examination for the entry-level RN and entry-level practical nurse. The NCSBN, in collaboration with nurse educators and practice partners, develops and publishes licensure examination blueprints that are updated every 3 years. In addition, the NCSBN sets the examination pass score requisite for safe entry-level practice although scores are reported only as pass or fail (NCSBN, n.d.). With the evidence of test success, licensure is granted by the state where the RN resides. Individual state boards of nursing regulate nursing practice through state laws and regulations, but in all states, the examination is high stakes as it precludes one from entering into practice if unsuccessful. Graduates may retake the NCLEX-RN examination after a 45-day waiting period for each failure and up to eight times per year (NCSBN, n.d.). The NCSBN (2015) reported that nationally, a total of 143,451 first-time NCLEX-RN test takers demonstrated a pass rate of 85.49%.

Schools of nursing are vested in the outcome of the NCLEX-RN examination and student success to maintain program viability, as well as recruitment of qualified students and faculty. According to Spurlock (2013), the NCLEX-RN pass rate has become an

important indicator of program quality. Elkins (2015) also suggested that NCLEX-RN

success is a mechanism to evaluate program quality using the 80% minimum benchmark

established by many accreditors and the NCSBN. Therefore, it is reasonable that every

effort is made to implement and evaluate strategies that would support student success.

Evidence-based strategies reported in the literature to support student test success on the

NCLEX-RN examination include faculty-developed examinations replicating the format

of NCLEX-RN questions, curricular crosswalks to ensure content saturation, and use of

standardized computer-based examinations, such as HESI.

As indicated, several studies at the prelicensure level assessed the use of

standardized testing as a predictor of future first-time NCLEX-RN success. The use of

the standardized examinations within the graduate program level has limited evidence as

a strategy to predict first-time FNP certification success. The role of the advanced

practice FNP and standardized testing as a means of assessment of FNP student learning

will be discussed in the following section.

Role of the Advanced Practice Nurse Practitioner

The role of the nurse practitioner (NP) in the advanced practice role has evolved

since its beginnings in the 1960s (DeNisco & Barker, 2016). Historically, the role of the

NP was associated with the most experienced nurse who had advanced clinical training.

The education of the RN who seeks to practice in the advanced role presently takes place

in the academic university setting. As mentioned, the role of the NP is pivotal in the

health care setting because these advanced practice clinicians can aid in addressing the

gap in available primary care practitioners. According to Forsberg, Swartwout, Murphy,

Danko and Delany (2015) the reasons driving the increased demand for NPs include increased access to health services awarded to the public by the ACA (2010), decreased availability of medical residency programs to train novice physicians, decreased availability of primary care physicians, and the need for chronic illness management.

The increased demand also recognizes the quality of care delivered by NPs across the health continuum (Forsberg et al., 2016; Stanik-Hutt et al., 2016). Stanik-Hutt et al. demonstrated improved patient care and outcomes in the area of health promotion and 11 key measures when health care was managed by an NP. Thus, the outcomes improved overall health and decreased health care costs, especially for the older adult living with chronic illness. Although mostly positive outcomes are related to the care of patients by an NP, there are still challenges in many areas of the country with insurance reimbursement (Richards & Polsky, 2016). All states regulate the role of the NP, and there are varying levels of practice autonomy. Most often, NPs work with a collaborating or supervising physician who can shift care priorities and alter the fee structure for insurance reimbursement. As the IOM report (2010), *The Future of Nursing* discussed, the goal is to expand the role of the nurse nationally to the appropriate level of educational preparation and licensure. Thus, certification plays an extremely important role in validating the knowledge, skills, and competency of the advanced practice nurse.

APRN/FNP Certification for Entry-level Advanced Nursing Practice

In 2008, the *Consensus Model for APRN Regulation, Licensure, Accreditation, Certification, and Education* was published by the APRN Joint Dialogue Group (DeNisco & Barker, 2016). This collaborative document highlighted seven core

requirements of all advanced practice nurses. Among the recommendations included was the creation of a national population-based certification examination that supports the advanced depth and breadth of knowledge for the professional nurse. In addition, in alignment with many other health professional disciplines, the AACN recommended that advanced practice nurses should be educated at the doctoral level and hold a Doctorate of Nursing Practice or DNP (DeNisco & Barker, 2016).

The culmination of master's level education with the focus on advanced practice nursing as an FNP requires successful performance on an FNP certification examination developed and administered by two primary nursing certification agencies, ANCC and the AANPCP. A candidate for certification must also be licensed as an RN in their respective state.

As with the NCLEX-RN examination, these are high-stakes examinations that measure entry-level knowledge and competency. The certification examination has an established blueprint that is woven through master's level curricula and is supported by clinical practice experts. According to AANPCP (2014), a total of 11,078 FNP certification examinations were administered to recent graduates, with an initial first-time pass rate of 87.52%. The ANCC does not report national certification pass rates; reports of students' aggregate performance are sent to their schools. Both agencies report the test results as pass/fail.

The certification examination, as with the NCLEX-RN examination, is requisite to entry-level professional nursing practice. The nursing faculty seeks strategies similar to

those used successfully at the bachelor's level to predict future certification success at the

master's level for the same reasons of program viability and student recruitment.

HESI Examinations for the APRN/FNP Level

HESI examinations have been developed to ascertain student entry-level

knowledge and competency for the advanced practice nurse (Elsevier, 2011). Willson

(2010) discussed the implications of using the predictive exams to support student

remediation and focus students' clinical experiences to enhance their learning of key

concepts. The examinations are based on the blueprints from the national certification

agencies (AANPCP and ANCC) as well as contributing advanced practice experts such

as the National Organization of Nurse Practitioner Faculties (NONPF), American

Organization of Nurse Executives (AONE), and HESI standard categories (Willson,

2011). The HESI course-related examinations available for the advanced practice nurse

include Advanced Pathophysiology, Advanced Pharmacotherapeutics, and Advanced

Health Assessment, deemed the *3 P* exams. These HESI advanced practice nurse

examinations have been in production since 2014 (personal communication, B. Schreiner,

Director of Research, HESI, November 20, 2014). As with all HESI examinations,

evidence of validity and reliability were studied during the pilot testing phase and are

ongoing. Schreiner (2014) reported that the frequency with which each test item has been

used contributes to the validity and reliability of the exam. Each test item included in the

advanced pathophysiology exam has been used between 275-800 times with an estimated

Kuder-Richardson 20 examination reliability of 0.924 (Schreiner, 2014).

In addition, a HESI APRN/FNP Exit examination has been developed to predict certification examination success, identify student remediation needs, and support program achievement and curricular evaluation (Willson, 2010). The APRN/FNP Exit examination has an estimated KR 20 reliability of 0.932, with each test item used between 466-2394 times (Willson, 2010).

The APRN/FNP Exit examination has not yet undergone significant study compared to that of the HESI Exit (E2) Examination. At present, three investigations with a total sample size of 339 students have demonstrated that a benchmark score of 800 or better aligned with a 100% certification pass rate for either certification examination (Elsevier, 2011). Willson and Goodman (2015) conducted the only reported study of standardized testing and FPN certification success. The authors found that of 141 students, those who scored above 700 on the HESI APRN Exit examination achieved first-time certification success. In addition to the benchmark score range, the authors noted the inconsistent use of the examination either with a testing policy or the requirement of remediation (Willson & Goodman, 2015). This notable gap in practice and experience with standardized testing at the MSN/FNP level provided an opportunity to study the use of HESI exams further.

Implications

There is considerable evidence in the literature that supports the HESI Exit (E2) examination as a predictor of student success on the NCLEX-RN licensure examination. Nine validity studies to date indicated a predictive accuracy of 96.61% for future NCLEX-RN success. At present, limited data from three studies have documented the

predictive accuracy of the HESI APRN/FNP Exit exam for future certification success of FNP students.

In the graduate program, the integration of the HESI standardized examinations across the curriculum and prior to graduation could be addressed through a policy recommendation. The policy would need to include the evaluative weight of the exam associated with a particular course with consideration given to the effect on progression and graduation in support of first-time certification success. As with the undergraduate policy, a proposed policy would include a faculty-designated benchmark with student remediation required for those who do not meet the benchmark. This noticeable gap in the literature and its consequent gap in practice at the University substantiate the need for an investigation of the HESI APRN/FNP Exit examination as a predictive measure of first-time FNP certification exam success.

<center>**Summary**</center>

Students' first-time FNP certification test results at the University have been inconsistent at best. Multiple studies have demonstrated the validity of the HESI Exit (E2) examination at the undergraduate prelicensure level; however, a review of the literature indicated a gap in knowledge related to the predictability of the HESI APRN/FNP Exit examination for certification success (Willson & Goodman, 2015). In this study, I determined if there was a relationship between HESI APRN/FNP Exit and 3 P examinations and first-time certification test success. A description of the data retrieval and analysis used for this study is highlighted in Section 2.

Section 2: The Methodology

The purpose of this project study was to examine whether a relationship existed between student adchievement on HESI standardized examinations at the master's level and first-time FNP certification success. A quantitative, nonexperimental retrospective correlational research design was used to determine whether a predictive relationship existed between student achievement on the 3 P examinations, the HESI APRN/FNP Exit examination and students' first-time test-taking success on the FNP certification examination. The limited published research on the HESI exams at the graduate APRN/FNP level provided an opportunity to address a program concern and gap in practice at the University concerning the validity of the 3 P and APRN/FNP Exit examinations as predictors of first-time certification success.

My goal in this study was to determine which of the 4 HESI standardized examinations or predictor variables, significantly predicted the criterion variable of first-time certification success. I was interested in determining whether there was a benchmark score for student performance on each of the exams that corresponded to first-time certification success. Data were retrieved from archived student records of 117 MSN/FNP graduates. In the remainder of Section 2, I provide a description of the data retrieval and analysis process, an overview of statistical analysis used to address the research questions, and the results of the analyses in alignment with the hypotheses.

Research Design and Approach

A correlational research design is useful when a researcher investigates a relationship between variables (Creswell, 2012). A binary logistic regression analysis was

most appropriate when considering the research questions posed for this study because the goal was to predict a single outcome of pass/fail on the certification examination using multiple predictor variables. Lodico, Spaulding, and Voegtle (2010) suggested that regression is focused on one of two goals, prediction or explanation. In the case of this project study, the goal was the prediction of future FNP certification success.

Tabachnick and Fidell (2007) supported the use of this method of analysis with the investigation of multiple independent variables with one dependent variable, such as certification success in this study. Stoltzfus (2011) asserted the usefulness of logistic regression as a means to understand the contribution of each independent variable to the outcome. Much of the previous HESI validity and reliability research has used the regression model as a means to predict future NCLEX-RN success. In this study, binary logistic regression analysis allowed for the consideration of each HESI exam as a single predictor of future certification success. Quantitative data were retrieved in the form of student HESI test results for the 3 P examinations and the APRN/FNP Exit examination, as well as certification data reported as pass/fail.

Setting and Sample

The setting for this project study was the MSN/FNP program at a private health professions university. The MSN program recently underwent a successful 5-year reaccreditation review by the Commission on Collegiate Nursing Education (CCNE) and has received 10-year accreditation. The goal of this accreditation visit was to validate adherence to curricular and programmatic outcomes in alignment with national nursing standards.

The sample for this study was composed of all students who have successfully graduated from the MSN/FNP program, both face-to-face and online tracks, within the years 2013-2016. These graduates were included in the sample as they have completed the HESI APRN/FNP Exit examination and the 3 P examinations during their tenure. Vittinghoff and McCulloch (2007) recommended when using the logistic model, 20 outcome events per predictor variable (EPV) should be used as a benchmark to predict outcomes of the study. Therefore, using this formula, the four independent variables multiplied by 20 EPV would yield a minimum sample size of 80. Each cohort admitted to the MSN/FNP program annually is approximately 60 students which includes both face-to-face and online. Therefore, the sample size, initially estimated at approximately 250 students, would meet the EPV recommendations and allow for useful analysis. Students have been excluded from this study if they did not complete the 3 P examinations or the HESI APRN/FNP Exit examinations, complete the program, or take either of the national certification examinations. A final sample size of 117 students from 176 screened students met the study selection criteria and were included in the data analysis.

Instrumentation and Materials

The instruments used in the study are the HESI standardized exams that included the 3 P exams and the HESI APRN/FNP Exit examination. Each of the four examinations provided an individual student numeric test score result using the HESI predictor model. The 3 P exams include Advanced Pathophysiology, Advanced Pharmacotherapeutics, and Advanced Health Assessment. According to a recent white paper published by Elsevier (2016), the HESI standardized examinations are appropriate measures to benchmark

student learning and program outcomes. Each test item has undergone and continues to undergo validity and reliability testing to ensure the item tests the appropriate constructs in alignment with the respective national certification test plan.

Each of the 3 P examinations includes 55 questions, 50 scored questions and five pilot test questions not counted toward the final score. The APRN/FNP Exit examination includes 110 questions, 100 scored questions and 10 pilot test questions. Each exam is scored as previously described on a 1500-point scale.

The 3 P exams are individual exams that assess student knowledge, skills, and competency in the core curricular content area of advanced pathophysiology, advanced pharmacotherapeutics, and advanced health assessment. Each content area builds upon the undergraduate prelicensure professional nursing curriculum to the advanced practice nurse level that integrates the common primary care health problems, diagnoses, assessment, and treatment modalities necessary for differential diagnosis. The role of the FNP includes care of the patient across the lifespan; thus, the focus of the 3 P exams are *womb to tomb* care. The APRN/FNP Exit examination is a comprehensive examination that aligns with the national certification examinations blueprint and provides a means for student and faculty assessment of learning and program outcome achievement (Willson, 2010).

Each student in the MSN program must complete the 3 P exams following core courses before advancing to the clinical courses. The APRN/FNP Exit examination is completed at the conclusion of the final semester before graduation. The computer-based examinations are proctored and secured as they are administered onsite during the annual

MSN nurse residency program. Students receive individual remediation electronically by logging into their Elsevier account. The remediation provides the students an opportunity to review gaps in their performance and to support mastery of content. Faculty use the summary reports for individual teaching and learning assessment in the respective course. Summary reports are also submitted to the respective School of Nursing committees such as curriculum committee or evaluation committee for program assessment.

All raw data associated with the project study were secured with access to the data limited to me, the MSN clinical coordinator, and members of my dissertation committee. Confidentiality agreements were obtained from the MSN clinical coordinator and submitted to the Walden University Institutional Review Board (IRB). I will delete or shred all data, both electronic and hard copy, 5 years after completion of the study.

Data Retrieval and Analysis

All data that I used for this project study were archival data. As described by Lodico et al. (2010), archival data may be retrieved from sources such as student education records. A letter of cooperation and data use agreement were executed with the University granting permission to complete the project study at the institution. Following appropriate approval of the IRBs of Walden University (04-24-17-0122340) and the research site University (IRB 041117G), student data were extracted from the School of Nursing electronic databases by the MSN clinical coordinator. The data were coded to de-identify any student information such as names or school identification numbers. Archival data representing student admission date, graduation date, and HESI numerical test scores on both the 3 P and the APRN/FNP Exit examination were included. The FNP

certification examination results were coded as pass/fail when retrieved from the school

of ursing evaluative data or state board of nursing licensure verification website. Data

were recorded in an Excel spreadsheet and were secured on a password-protected

computer.

I subsequently entered data into the Statistical Package for Social Sciences

(SPSS). The predictor variables for this study were scores on each of the HESI 3 P

examinations and the APRN/FNP Exit examination measured as continuous data and

coded as the actual scores on a 1500-point scale in SPSS. The criterion variable of

certification examination performance was a dichotomous, categorical variable coded as

pass/fail.

I computed descriptive statistics for scores on each of the four exams including

the range of scores, mean, and standard deviation. To answer the research questions of

whether each of the exams was predictive of first-time FNP certification success, I

conducted binary logistic regression with statistical significance of $\alpha = .05$.

Assumptions, Limitations, Scope, and Delimitations

The assumptions, limitations, scope, and delimitations were considered for this

study. The assumptions made, but not verified, include that all students who completed

the HESI 3 P and APRN/FNP Exit examinations did so with a full effort to achieve the

highest score representing their knowledge of the specific content areas. A second

assumption is that all data retrieved from student records were accurate. A third

assumption, was all students met the university criteria for graduation. In addition, it was

assumed that all students who completed the MSN program have or will write for a national certification examination.

Delimitations of the study included the use of data from one institution which resulted in a somewhat small sample and thus, affects the generalizability of the study results. Another delimitation is that I selected the examinations to be used and the time frame for student participants.

A limitation to be considered is the 3 P and APRN/FNP Exit examination results may not be an accurate representation of the students' knowledge and clinical competency as the examinations had no evaluative weight within the program. The scope of the study includes MSN/FNP students' HESI test score results for the HESI 3 P and APRN/FNP Exit examination and first-time certification test results from 2013 through 2016. Data were retrieved for each cohort of students enrolled since the adoption of HESI standardized testing at the MSN program level. My role at the University School of Nursing was within the BSN program; I was not directly involved in grading or evaluation of the MSN/FNP students.

<div align="center">**Protection of Participants' Rights**</div>

It is imperative that all researchers protect the rights and privacy of the study participants. For this study, confidentiality and privacy of student test scores and certification results were strictly maintained. As all students have graduated from the MSN/FNP program, the study can have no effect on course grades, progression, or graduation status. To that end, and to ensure the protection of human subjects whose data

were used in this study, human subjects' protection through IRB approval was reviewed by both Walden University and the University.

Data Analysis Results

In this section, I discuss the findings of the study in response to the following research questions and hypotheses:

RQ1: Is student achievement on one or more of the 3 P HESI examinations a significant predictor of first-time test success on the FNP certification examination?

$H_0$1: Student achievement on the 3 P HESI examinations is not a significant predictor of first-time test success on the FNP certification examination.

H_a1: Student achievement on one or more of the 3 P HESI examinations is a significant predictor of first-time test success on the FNP certification examination.

RQ2: Is student achievement on the HESI APRN/FNP Exit examination a significant predictor of first-time test success on the FNP certification examination?

$H_0$2: Student achievement on the HESI APRN/FNP Exit examination is not a significant predictor of first-time test success on the FNP certification examination.

H_a2: Student achievement on the HESI APRN/FNP Exit examination is a significant predictor of first-time test success on the FNP certification examination.

Descriptive Statistics

Of the 117 students who completed all of the four standardized HESI examinations and the FNP national certification examinations, ANCC or AANPCP, 104 (88.9%) students passed the certification exam, and 13 (11.1%) failed the certification exam.

Table 2 presents descriptive statistics for the HESI scores achieved on all the 3 P examinations and the APRN/FNP Exit examination for the sample. As discussed previously, HESI examinations are scored on a 1500-point scale and are graded according to the complexity of the question. The benchmark score recommended by Elsevier (2016) is 750 as a predictor for future ANCC/AANP certification success. Table 2 displays the range of scores for each examination, along with the mean and standard deviation. The range of scores for each examination indicates a widespread of student achievement. As noted in Table 2, the standard deviation is greatest for the Advanced Pharmacotherapeutics examination, representing a substantial variability in student test scores.

The mean score for the APRN/Family Exit is less than the benchmark of 750 for certification success. Although Elsevier sets a benchmark for future certification success, the University does not require a minimum score on the examination or associate any of the examinations with grades in a graduate-level course.

Table 2

Descriptive Statistics for Predictor Variables

HESI examination	Min.	Max.	Mean	*SD*
Pathophysiology	459	1411	847.30	173.15
Pharmacotherapeutics	402	1296	768.59	192.53
Physical Assessment	514	1228	833.04	158.84
Exit	518	994	725.46	103.00

Binary Logistic Regression Analysis

  Testing the assumptions. The first assumption to consider when selecting binary

logistic regression as statistical methodology, is whether the criterion variable has two

outcomes. This study meets this first assumption as the criterion variable is passing or

failing the FNP certification examination. A second assumption when considering the

predictor variables, is that they are continuous or nominal in nature. For this study, the

examinations are scored separately or have independence of observations from one

another, each having scores from 1–1500 (Keller & Kelvin, 2013).

  The Box-Tidwell procedure with Bonferroni correction was used to test for linear

relationships between the predictor variables and the logit of the criterion variable. Each

of the four predictor variables (Pathophysiology = .58, Pharmacotherapeutics = .80,

Physical Assessment = .67, and Exit = .07) were found to have probabilities exceeding

the modified p value of .0056 which indicated that the assumption of linear relationships

could not be rejected. With respect to the assumption that there are no significant outliers

in the data, there were two outliers with studentized residuals of -3.003 and -3.162 which

I chose to keep in the analysis.

  However, the assumption related to multicollinearity of predictor variables was of

greater concern given that these variables were all scores on exams developed using the

same processes and criteria. Pearson correlation coefficients were computed for

combinations of the predictor variables and each of the predictor variables with the

binary criterion variable, the latter producing point-biserial correlation coefficients. As

can be seen in Table 3, the predictor variables were all significantly correlated with each

other; however, none of the predictor variables were significantly correlated with the criterion variable. This latter finding made further analysis of multicollinearity unnecessary because none of the predictor variables individually were correlated with the criterion variable.

Table 3

Correlations Between Variables

	Independent variables				Certification
	Patho-physiology	Pharmaco-therapeutics	Physical Assessment	Exit	
Pathophysiology	--	.54**	.54**	.34**	.021
Pharmacotherapeutics		--	.47**	.21*	-.014
Physical Assessment			--	.35**	.001
Exit				--	-.002

* $p < .05$ (two tailed).
** $p < .01$ (two tailed).

As expected, the model for the binary logistic regression subsequently conducted was not statistically significant, $X^2 (4) = .191$, $p = .996$ although the Hosmer and Lemeshow goodness of fit test was also not significant, $X^2 (8) = 7.98$, $p = .436$ which normally would indicate that the model is not a poor fit. The model explained 0.3% (Nagelkerke R^2) of the variance in certification success and correctly classified 88.9% of students. Sensitivity, a measure of true positives, was noted to be 100% for 104 students predicted to pass and specificity, a measure of true negatives, was 0% as there were no students predicted to fail. All of the 13 students who failed the certification exam were predicted to pass. As noted in Table 4, of the four predictor variables, the 3 P exams and

APRN/FNP Exit examination, none of the examinations indicated a statistically

significant relationship with the criterion variable. Logistic regression uses the odds ratio,

in this case, the probability of occurrence that one or all of the four standardized

examinations would predict future FNP certification success. When reviewing the odds

ratio for each of the four exams, the *p*-values are greater than .05; thus, the odds ratios are

not significant and the null hypothesis cannot be rejected.

Table 4

Logistic Regression Predicting FNP Certification Success

Predictor	B	SE	Wald	*df*	Sig.	Exp(B)	95% CI for EXP(B)	
							Lower	Upper
Exit	.000	.003	.009	1	.924	1.000	.994	1.006
Pathophysiology	.001	.002	.140	1	.708	1.001	.996	1.005
Pharmocotherapeutics	-.001	.002	.092	1	.762	.999	.996	1.003
Physical Assessment	.001	.002	.001	1	.975	1.000	.995	1.005
Constant	2.082	2.335	.795	1	.372	8.024		

Table 5 provides a framework proposed by MacDonald (2018) to ascertain

whether the HESI standardized examinations provided predictive accuracy. The model

uses the benchmark score of 750 with the FNP certification outcome of pass or fail to

assess predictive accuracy. As noted in Table 4, the examination that had the highest

predictive accuracy was advanced pathophysiology. The exam with the least predictive

accuracy is the APRN/FNP Exit examination.

Table 5

Predictive Value of HESI Exams

Predictors	Predicted	Actual		Predictive value
		Pass	Fail	
Pathophysiology				
Pass	83	74	9	89%
Fail	34	30	4	12%
Correct predictions		74	4	63%
Pharmocotherapeutics				
Pass	60	54	6	90%
Fail	57	50	7	14%
Correct predictions		54	7	46%
Physical Assessment				
Pass	83	72	11	86%
Fail	34	31	2	6%
Correct predictions		72	2	61%
Exit				
Pass	47	42	5	89%
Fail	70	62	8	11%
Correct predictions		42	8	36%

The purpose of this study was to examine whether a relationship existed between student achievement on HESI standardized examinations at the master's level and first-time FNP certification success. Although the advanced pathophysiology examination indicated a higher accuracy of prediction, the analysis may not reflect the actual

predictive ability of the examinations as, to date, they have not been associated with any course grade and thus, may not demonstrate the full extent of the students' knowledge and competency. Willson and Goodman (2015) found that very few graduate programs have set a HESI benchmark or integrated the examinations as a course grade. This is similar to the situation at the University and may provide an opportunity for innovation through the project development.

Conclusion

A binary logistic regression analysis was used for my study to ascertain the predictive relationship between four standardized HESI examinations and future first-time FNP certification success. I examined the outcomes of the data analysis as related to the research questions. The examinations were not predictive of future first-time certification success with the sample used in the study.

After examining the study findings, I selected the project genre of policy recommendation. Although the analysis did not reveal a significant relationship between the HESI 3 P and Exit exams and subsequent first-time FNP certification success for this cohort of students, several factors may have been contributory based upon the evidence in the literature and experience in the prelicensure program at the University. As discussed in the review of the literature, substantial evidence at the prelicensure level supported first-time licensure success for students meeting a faculty-designated benchmark for student performance on HESI standardized testing. The lack of literature related to the MSN level indicated an opportunity for policy development and additional assessment of the HESI examinations as predictors of first-time certification success at the graduate

level as demonstrated in the study by Willson and Goodman (2015). The strategy of standardized testing coupled with required remediation at the undergraduate level at the University has demonstrated consistent student outcomes related to first-time NCLEX-RN licensure success. Thus, the limited use of the HESI examinations for student competency assessment or curricular evaluation at the master's level afforded an opportunity to develop a white paper in the form of a policy recommendation for the University.

  In Section 3, I describe the project that was developed based on these findings. The section also includes a review of the literature related to the project, implementation plan and evaluation, as well as the implications for social change.

Section 3: The Project

The project genre best supported by the analysis of the study data is a policy recommendation. The recommendation is the result of a cadre of evidence, which included the review of the literature in support of HESI standardized examinations as a predictor of first-time NCLEX-RN success inclusive of faculty designated benchmark and required student remediation, over 10 years of first-time NCLEX-RN success for the undergraduate students at the University and, finally, the lack of relationship between performance on the standardized HESI examinations and FNP first-time certification success in the graduate program at the University as demonstrated by the data analysis discussed in Section 2. Although statistically significant relationships between the standardized graduate HESI exams and FNP certification success might not be found for a number of reasons already discussed, the predictive values for the graduate HESI exams ranging from 43% to 67% for correct predictions does not correspond to predictive results for the undergraduate-level HESI Exit (E2) exam with the NCLEX-RN exam which tend to be above 90% (as summarized in Table 1), nor for the graduate HESI APRN Exit exams as reported by other researchers (Willson & Goodman, 2015). Thus, an alternative explanation seemed more viable; in this case, the lack of evaluative weight attached to the HESI exams led to lack of effort of many students as related to their performance on these exams.

The policy recommendation includes a testing plan that integrates the standardized HESI examinations across the curriculum, a required faculty-identified benchmark score for achievement in alignment with the literature, and a proposed

evaluative weight for each of the respective courses across the MSN/FNP curriculum. The discussion that follows describes the testing policy as supported by the literature, an outline of the policy recommendation in the form of a white paper, project description, and evaluation plan.

Overview of the Problem/Issue

The School of Nursing faculty is committed to consistent program outcomes by meeting the acceptable benchmark of 80% for FNP certification success for first-time test takers. Our accreditors established this benchmark as a measure of program quality. The NCSBN requires certification as a means to ensure safe entry-level practice for the advanced practice nurse (NCSBN, 2016). Since inception of the FNP program at the University in 2009, graduate success on the certification examination has been inconsistent, although the most recent certification result (see Table 6) was 92% combined pass rate for both ANCC and AANP (dean of nursing, personal communication, April 2017). Although the results are appropriate from an accreditation standpoint; there remains an opportunity to maintain or improve certification success as no program can afford to have a subpar outcome due to the possible long-term consequences on admission and retention of highly qualified students.

Table 6

MSN Program Outcomes: FNP Certification Results

Year	Test Results	
	ANCC	AANP
2011	100%	No data provided
2012	43%	78%
2013	40%	92%
2014	100%	100%
2015	100%	90%
2016	87%	96%
2017	pending	75%

Note: Dean of nursing, personal communication, March 2018

The FNP certification examinations administered by the two certifying agencies are updated every 3 to 5 years (NCSBN, n.d.). The standardized HESI examinations are updated frequently and use the national certifying agencies' test plan as a blueprint for the respective exit examination. Therefore, the HESI examinations may be a reasonable indicator of knowledge acquisition and future performance on the certification examination.

The standardized HESI 3 P and APRN/FNP Exit examinations are administered at two junctures within the program at the University, at the completion of the core courses and the conclusion of the curriculum before graduation, respectively. The results of the examinations have no evaluative weight, are not linked to any course grade, nor do they affect student progression in the curriculum. There is no remediation required by students. Thus, if a student does poorly, there is no opportunity for remediation of

content. Faculty, anecdotally, state they use the item analysis to enhance course content for the next course offering. However, there is no formal assessment that documents the gaps or tracks these gaps over time. Lauer and Yoho (2013) found that testing without consequences produces spurious data that have little usefulness to students and faculty to assess teaching and learning. In fact, many students predicted to fail based upon their HESI examinations scores successfully passed the certification exam on the first attempt. Conversely, students predicted to pass the certification exam failed; thus, supporting the premise discussed by Lauer and Yoho.

The cost associated with HESI examinations at the graduate level was $11,352 for the calendar year of 2017 (dean of nursing, personal communication, September 2017). The School of Nursing leadership must consider whether there is a reasonable return on the investment given the inconsistent certification results and the limited use of the assessment for program evaluation. A policy that recommends the standardized examinations be associated with a course, hold evaluative weight, and require student remediation may ensure appropriate course-level knowledge and support programmatic outcomes of certification success.

Description and Goals

The goal of the project is to develop a policy recommendation for the MSN/FNP program that will integrate standardized HESI examinations as one metric for the evaluation of student learning and program assessment. The primary goal is to ensure student knowledge of requisite content as described by accreditors, and demonstrated through standardized examinations that align with national certification examinations.

The secondary goal of the policy recommendation is to promote curricular excellence through teaching and learning. Ambrose and Mee (2014) discussed how internal and external curricular evaluation could be achieved through standardized testing policy. The authors recommended that the testing policy be transparent and included in respective syllabi along with the faculty designated benchmark score for acceptable achievement. Consequences of not meeting the benchmark score also need to include required remediation and retesting as necessary. A written policy following this format will be submitted to the dean and the Graduate Curriculum Committee.

The Graduate Curriculum Committee is a committee of the whole graduate faculty team with student representatives by cohort. The committee is responsible for vetting any proposed policy or curricular change. Any endorsed curricular change is approved by the dean who has final curricular responsibility. Any substantive change in policy that would affect student progression or graduation would be submitted to the Academic Council, a committee inclusive of the academic deans and provost, for final approval. Once implemented, ongoing assessment by the members of the Evaluation Committee in alignment with curricular content and program outcomes will take place.

Scholarly Rationale

Ambrose and Mee (2014) stated, "The purpose of the evaluation is to drive the curriculum so that the students receive the best possible education, become excellent practitioners, and ultimately provide worthwhile service to the community" (p. 4). Barton, Willson, Langford, and Schreiner's (2014) findings supported a testing policy that included achievement of a testing benchmark with required remediation and

retesting. Although much of the literature focused on the prelicensure nursing level, many of the assumptions are transferable to the MSN/FNP program. The results of the study presented by Willson and Goodman (2015) indicated that without a benchmark of achievement for each standardized HESI exam, it is difficult to discern which students are at high-risk for certification failure.

Although there is much discussion in the literature for and against the implementation of a testing policy (Spurlock, 2013), faculty must consider the how best to use standardized testing within the curriculum. As discussed throughout the literature at the prelicensure level, one exam should not determine progression. Another controversy with standardized testing is highlighted for the diverse student due to language barriers, or the test item itself may not be culturally appropriate, and thus may not be a good indicator of student knowledge (Spurlock, 2006). Molsbee and Benton (2016) indicated that embedding an exit examination into a final course may decrease student anxiety with high stakes testing. However, the authors do suggest transparency with any testing policy to include an examination benchmark and the relationship of these benchmarks to student progression within the respective program (Molsbee & Benton, 2016).

The AANP recently published a national pass rate for first-time test takers for the FNP certification examination for the year 2016 as 81.6% and a post-MSN initial pass rate of 77.6% (AANP, 2016). The post-MSN pass rate reflects scores of those graduates of post-master certificate programs. The national results coupled with the inconsistent performance of the University supports the recommendation of a testing policy as one

strategy to assess teaching and learning of requisite content for future certification success. MacDonald (2018) stated the inclusion of a testing and progression policy supports program quality and sets benchmarks for student learning across the curriculum. Also, MacDonald concluded that the integration of a testing policy using an exit examination could identify student strengths and weaknesses, provide an opportunity for remediation and increase the chance for licensure, or in this case certification, success.

The policy recommendation was selected to support student and programmatic outcomes of first-time FNP certification examination success. This strategy is supported in the literature at the undergraduate level as evidenced by a study completed by Barton and colleagues (2014). Barton et al. recommended the integration of a testing policy that included a pre-HESI Exit preparation plan, a designated mandatory benchmark for student achievement, and a retesting requirement if the benchmark is not reached with required remediation. In addition to the policy framework, Barton et al. discussed a variety of remediation strategies. These strategies included independent student review, formal review course, peer mentoring, and a remediation course followed by repeat exit testing.

The implementation of a testing policy requires thoughtful consideration by School of Nursing leadership and faculty. Faculty must consider if the standardized examinations will predict successful certification success, the predictive value of the exam, the target benchmark score that correlates to certification success, and finally, when using the assessment data, how many students who did fail the standardized exam actually passed the certification exam (MacDonald, 2018).

Review of the Literature

The review of the literature was conducted through the library databases at Walden University to include: Academic Search Complete, CINAHL, Education Research Complete, ERIC, OVID, Proquest, and Google Scholar. The review was limited to dates inclusive of 2012-2017. I used the ancestry method to procure additional relevant resources. Search terms included: *white paper, grey literature*, *testing, policy recommendation, progression, remediation, nursing education, and FNP certification.* In addition to these terms, I used *OR* and *AND* in a variety of Boolean search strategies to ensure complete saturation of the literature. The focus of this literature review is the structure of a white paper, policy recommendations, as well as testing, progression, and remediation policies in nursing education.

White Paper

A white paper is a means of communication a position, a technology guide, business benefits, a competitive or an evaluator's guide (Gordon & Graham, 2003). The origin of the white paper dates back to early 20th century England (Gordan & Graham). Many early white papers were products of the government to support a position or to communicate a policy. Stelzner (2007) highlighted a famous white paper authored by Winston Churchill in 1922 that discussed the Palestine political conflict.

According to McKeon (2005), a white paper can provide a solution to a problem. Most often white papers are used in the business arena to summarize new technology or a business solution. Although there is very little literature on the best practice for the development and publication of a white paper, there are some recommendations.

As McKeon (2005) suggested, a white paper should be educational, demonstrate a clear solution to the problem, target an appropriate cohort of stakeholders, be well written and have appropriate graphics within the document. Both McKeon and Stelzer (2007) recommended a professional writer for a white paper and that it should include substance and support from the literature.

Rotarius and Rotarius (2016) discussed the role of the white paper for healthcare leaders. The authors suggested the use of the white paper supports the communication of a specific area of concern locally but also allows authors to generate a scholarly paper to be disseminated across their respective professional organizations. Rotarius and Rotarius proposed two formats for a white paper that align with study methodology, empirical or conceptual with the goal of disseminating new knowledge within an appropriate structural framework. These guides elevate the white paper to that of a scholarly or scientific paper; the evidence found within a discipline's white paper can frame agency policy.

Policy

In many settings, policies are used to define acceptable behaviors and include consequences if those behavior benchmarks are not met. Sousa, Griffin, and Krainovich-Miller (2012) discussed the limited direction and guides for policy generation in nursing education. Policies are generated in response to a trigger for change such as a decrease in licensure or certification examination results (Stonecypher, Young, Langford, Symes, & Willson, 2015). Ambrose and Mee (2014) further described components of a testing policy to include the clear delineation of consequences of the policy and the relationship

to progression. The authors' recommendation also suggested that the benchmark score for the standardized test is published and transparent, a required remediation plan is clear, and there is parallel testing with a different iteration of the examination (Ambrose & Mee, 2014). The NLN position statement is also reiterated by the authors that no one test score should determine progression in the curriculum.

Barton et al. (2014) used an ex-post facto nonexperimental design to compare testing policies related to standardized testing and NCLEX results of 5,438 students across 99 prelicensure nursing programs. The findings of the study supported a testing policy as a means to improve student success rates on future high-stakes testing such as the licensure examination. The recommendations included student achievement of a faculty supported benchmark and required participation in pre-examination preparation, remediation and retesting programs.

Lauer and Yoho (2013) studied remediation as a post HESI examination requirement at the prelicensure level. The authors noted that students who participated in a required remediation program had improved testing scores with parallel testing compared to those who did not complete remediation. Lauer and Yoho also recommended consequences be attached to standardized testing as without it yields false data that is not helpful to assess student knowledge or curriculum evaluation. Lauer and Yoho also supported the tenet that one examination should determine student progression.

Schroeder (2013) found improved first-time licensure success following the implementation of a testing policy. However, there were noted concerns with this study

that included limited student progression, no required remediation, and no required parallel testing. These variables are considered in the testing policy proposed in this white paper.

Policy Recommendations

The evidence in the literature has established that a testing policy can support future high-stakes success with the integration of key strategies such as a set benchmark, required preparation and remediation, as well as parallel testing. Spurlock (2013) suggested the testing policy recommendation may be inadvertently providing false increases in NCLEX-RN success through frequent testing. Spurlock highlighted the controversy of using standardized testing as a strategy to increase NCLEX-RN scores. Spurlock suggested that the standardized tests should be used as one strategy to evaluate student learning and one must consider assessing the teaching as a variable in student success. Another point well documented in the literature about HESI Exit testing is that the examinations predict success but, cannot predict failure. According to the theoretical framework of classical test theory, examinations cannot account for the human component such as anxiety or other variables that could interfere with performance on a particular examination day.

Although high stakes testing in higher education is a discussion woven throughout the literature, consideration should be given to low stakes assessments. Attali (2016) suggested two salient points that can be considered for this project study. First, analysis of student performance on future high stakes testing can be assessed through time on task in the low stakes testing, and second as Attali reported, "without consequences for

performance, many students will not give their best effort to such low stakes test" (p. 1045). One variable that should be considered with low and high stakes testing is motivation. It is clear from findings of this study that there was no correlation of the various HESI standardized exams with future high stakes certification success for the cohort studied. Proficiency or competency level is difficult to determine when students do not give their full effort, thus making the assessment an invalid indicator of student knowledge.

Progression

Student progression within the academic program is of much debate especially with the use of standardized testing. According to March and Robinson (2015), 30% of schools of nursing use a HESI Exit examination as a condition for graduation at the prelicensure level. Santo, Frander, and Hawkins (2013) suggested that many progression policies using standardized testing set a benchmark for achievement as well as the number of times the student can repeat the testing before the student is excluded from graduation. The NLN (2012) white paper on testing suggested that the exit examinations are weighted too heavily and should not be used to preclude graduation or progression milestones. In addition to using the standardized examination as a student benchmark, assessment of the curriculum must be ongoing to ensure it is not a weak curriculum that has caused student poor performance (Sullivan, 2014). There is much discussion in the literature, as well as at local and regional state boards of nursing, about the legal ramifications of standardized testing and student graduation eligibility. Santo et al. (2013) suggested policy revisions to include student success committees to improve retention,

progression and graduation rates when employing standardized testing. The literature is clear with regard to recommendations that are fair and equitable using standardized exams as one means of student competency evaluation.

Remediation

Remediation is a strategy used to review content gaps following an evaluation. Most of the standardized testing vendors such as HESI have developed individual student remediation packages to support knowledge or competency acquisition for content areas where students have not met the benchmark for success. Stonecypher et al. (2015) suggested using remediation as a means to identify high-risk students. Lauer and Yoho (2013) maintained that student remediation is associated with higher scores when parallel testing is instituted. Barton et al. (2014) noted that for those schools that had a testing policy requiring remediation and parallel testing, a statistically higher mean score on the HESI Exit examination was demonstrated ($p < .0001$) in comparison to those schools who did not implement a testing policy. Kang, McDermott, and Roediger (2007) reinforced the concept of feedback following repeat testing, providing support to the concept of remediation and retention of learned concepts.

Key findings in the literature suggested organized remediation for high-risk students, the use of a variety of teaching and learning strategies, and ongoing assessment of remediation efficacy on licensure outcomes. Remediation can be accomplished through scheduled recitation hours. These hours can be used to to delve deeper into challenging concepts identified by faculty, students, and standardized testing gaps. These sessions can be considered a focused learning community using a variety of active

learning strategies such as case studies to reinforce key content areas that align with contemporary patient needs.

FNP Certification

Certification is required for entry into practice at the advanced practice role for the FNP. The literature has very little evidence that suggests the use of testing policies has been associated with certification success. The few published studies suggested findings similar to the prelicensure level, that a target HESI benchmark score between 700 and 850 is associated with success on the future certification examination (Willson & Goodman, 2015). Willson and Goodman noted that of the 35 schools that administered the HESI APRN/FNP Exit examination, only one school had a target benchmark or associated the examination with a course grade.

<div align="center">

Conclusion

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There are many challenges associated with the implementation of an academic policy focused on using standardized examinations as a means to assess student knowledge and competency along with curricular assessment. The literature suggested thoughtful consideration must be used with the integration of standardized testing as it relates to retention, progression, remediation, and graduation. There is limited discussion on the best practices for policy development and implementation within the nursing academic setting. However, recommendations for testing policy indicate transparency for all stakeholders, and caution with using only one means of assessment for progression or graduation. Further evaluation needs to be completed on the best strategies for and the

effect of remediation on the FNP student and future certification success. As with any academic intervention, formative and summative evaluation must take place.

Project Description

My project is a policy recommendation in the form of a white paper. The policy recommendation included the use of standardized testing across the MSN/FNP curriculum, required examination benchmark, the evaluative weight for the specific courses, and the remediation plan. Appendix A provides a detailed white paper inclusive of the policy recommendations, curricular plan, and evaluation.

Potential Resources and Existing Supports

Many of the resources required for the testing policy are already in place. The University already uses the four HESI standardized exams at the graduate level. Thus, the cost associated with the exams have already been budgeted and approved by the University senior leadership. The University dean is committed to student success through standardized testing at the undergraduate level. The policy would be initiated with the MSN/FNP students entering in May of 2018 with graduate curriculum committee approval. HESI examinations are required to be proctored to ensure the examinations remain valid and reliable. On campus, before initiating an exam, faculty enter IP addresses for all computers used for testing. During the testing, there is no access to the internet or any other application which would compromise the security of the examination. The secure testing site is available at the University for the face-to-face cohort. However, there is a need for secure testing for the online cohort. This will add additional costs for an outside vendor such as Proctor U to proctor the secured HESI

examinations. The cost associated with the use of a vendor such as Proctor U is determined by the number of test items and length of examination. Based on information provided by Proctor U website, the cost for the four examinations is estimated at $51.25 per student or $4,100 annually for approximately 80 students.

The timeline for the implementation of the policy would follow approval by the Graduate Curriculum Committee and final approval by the dean. The entering cohort of May 2018 would complete each of the 3 P examinations as a final examination for each of the core curricular courses. The examinations will be reviewed by faculty to include mean score for the cohort, content alignment with respective course curriculum, gaps identified by the examination concerning course curricular content, national achievement, and remediation completed by students not meeting the identified benchmark of 750. Appendix A provides a curriculum plan that integrates each of the standardized examinations and the placement of each examination within the current program of study.

Students who have entered the MSN/FNP program before May 2018 would continue to complete the HESI examinations as previously implemented. Students would have the option to remediate before graduation. All data garnered from the exams are reviewed by respective course and graduate-level faculty and subsequently submitted to the evaluation committee. Once an assessment has been completed with the graduating cohort of 2020, a final recommendation can be submitted to the Graduate Curriculum Committee and the University dean.

Roles and Responsibilities of Student and Others

The role of the dean is curricular oversight and ultimate responsibility for accreditation. The dean empowers the faculty through the shared governance process, in this case, the graduate curriculum committee, to integrate teaching and learning strategies that support program outcomes. The role and responsibilities for the implementation of the proposed policy require the endorsement by the respective course faculty and integration of the examination with the evaluative weight in their respective course for both online and face-to-face cohorts. The role of the students is to complete each respective examination, complete remediation if the designated HESI benchmark is not met, and seek additional faculty support with any content gaps before completing the MSN/FNP program.

Additional roles and responsibilities for the implementation of the policy are supported by the clinical coordinator and assessment coordinator. The clinical coordinator presently orders the examinations before the start of the semester. The data assessment staff member will collate the data and forward to the evaluation committee for assessment, review, and further recommendations to the graduate curriculum committee as needed.

My role within the School of Nursing is as the senior associate dean of curriculum and assessment. With the implementation of the proposed testing policy in the graduate school, my role would be to first present the policy at the respective committees, and ensure transparency of policy through posting in the course syllabi and in the student handbook. I would ensure the data captured via the exam summaries were sent to both the

graduate curriculum and evaluation committees for faculty assessment and revision as necessary.

Project Evaluation Plan

The dean, in collaboration with the faculty, has ultimate responsibility for curricular oversight. Oermann and Gaberson (2013) stated, "Evaluation is the process of systematic collection and interpretation of data gathered from a variety of sources to assess clinical competence and the product to interpret the decision of whether a student has achieved course or program outcomes" (p. 248). Implementation of the recommended testing policy will result in the collection of data needed for the evaluation from the standardized testing scores, the course outcomes, and their relationship with future certification success. Thus, an ongoing assessment to evaluate the policy outcomes of student preparedness and certification success will be conducted. The outcomes of the proposed policy will be assessed at the conclusion of each semester with the core curricular delivery and completion of the 3 P exams for both the face-to-face and online cohorts. Respective course faculty will submit a review of the assessment and course grades as part of the semester end course report. Ignatavicuius (2019) recommended faculty use the HESI examinations to drive curricular assessment and revision. This can be completed through a gap analysis that evaluates the required content against student performance both within the institution and nationally. This information is provided with each examination in the format of a summary analysis.

Ignatavicuius (2019) recommended setting a benchmark for key curricular concepts and addressing gaps with course revision. In addition to the curricular

assessment for the course and content alignment, test grades and student progression will be assessed by the Academic Standing Committee. Student feedback will be garnered by the end of the semester course evaluation as well as through respective graduate level committees as student are members of shared governance committees. The last component of the assessment process would be the annual certification results.

The University is accredited by CCNE. Ongoing program assessment is required by CCNE and is submitted through a variety of methods such as an annual survey, a mid-point accreditation cycle report and a self-study before the onsite review. The University received full 10-year accreditation in 2016. Thus, the first midpoint report will be submitted in the spring of 2021. The report will include the testing policy as a curricular change and assessment data to include student outcomes and programmatic outcomes of certification success.

Project Implications

The greatest implication for social change as a result of my project is to improve the first-time certification success for the FNP graduates of the University. Students will develop confidence with computer adaptive testing required for national certification. Curricular assessment will be completed promptly, allowing faculty to intervene if there is a documented learning gap in content in alignment with national certification examination blueprints. The interventions can be immediately implemented in the classroom through didactic content, and weaved through integrated simulation for the respective advanced health assessment or clinical courses. The results of the interventions can be evaluated swiftly through course-based examinations and with the final

APRN/FNP Exit exam. Finally, the project would ensure consistent program outcomes assessed as first-time certification success for the program graduates.

The integration of a testing policy will influence social change within the nursing education community as it will contribute to the current limited literature on the use of standardized testing at the graduate level. The contribution will not only add to the literature but provide strategies for the use of the data to drive curricular assessment as well as teaching and learning in the classroom both for online and face-to-face venues. This is relevant as many of our programs strive for viability and recruitment of quality students and faculty while maintaining full accreditation.

The importance of the project from the local stakeholder's perspective will be access to additional primary health care providers. Certification is required by respective state boards of nursing for safe, entry-level advanced practice. There is a significant need for primary care providers both regionally and nationally as described earlier. Sargent and Olmedo (2013) noted the need for nurse practitioners to manage patients with diversity and chronic medical issues is important within the local community. Thus, the effect of graduating qualified FNPs with first-time certification success allows for their timely transition into practice. The online cohort may address similar patient care needs in their respective region of the country, thus, extending the influence of social change addressed by this project.

Conclusion

The policy recommendation discussed in Section 3 provides a curriculum plan and assessment in alignment with the literature. The justification for required resources,

potential barriers, solutions, and project evaluation plan were delineated. As with any

policy implementation, it takes a clear vision to garner the endorsement of faculty,

students, and the organization. Program evaluation must lead to meaningful change in the

curriculum, course content, or teaching and learning. Student success and positive

program outcomes are common values for all internal and external stakeholders. The

implementation and realization of first-time certification success will positively influence

social change in nursing education.

Section 4: Reflections and Conclusions

The purpose of the project study was to examine whether a relationship existed between student achievement on the HESI standardized examinations at the master's level and first-time FNP certification test success. The goal was to consider a mechanism to address the local problem of inconsistent FNP first-time certification pass rates at the University. Following completion of my study, I proposed a testing policy based on the limited experience and evidence in the literature on standardized testing at the graduate level. In my study, I examined each of the four examinations used in the curriculum and whether there was evidence that the examinations supported future certification success. The analysis indicated that none of the four examinations were predictive of future first time certification success for students at the University. The examinations were not associated with any evaluative weight or course. The timing of the examinations was also problematic because there was a significant delay between completion of core courses and administration of the 3 P examinations. Based on these findings, I developed a white paper with a testing policy recommendation. The testing policy incorporated the standardized testing across the curriculum and associated the examinations with core courses and the final senior-level course before graduation. An evaluative weight is assigned to each examination with recommended remediation to support any learning gaps assessed using the item analysis provided by HESI following the administration of each exam. The goal of the testing policy aligns with the policy used at the undergraduate prelicensure level that has demonstrated consistently high NCLEX-RN first-time pass rates.

In Section 4, I will discuss the projects strengths, limitations, and alternative approaches for consideration as a component of the reflection.

Project Strengths and Limitations

The project strengths are focused on student success and readiness for safe entry-level practice for the FNP. A variety of evaluative methods are used across the graduate curriculum. One strategy includes HESI standardized exams that align with certifying body test plans to provide appropriate student feedback in the form of individualized remediation that can support future certification success. The standardized exams use computer adaptive testing format similar to that of the national certification examinations. The feedback and structured required remediation provide the students with an assessment of their mastery of core content and key concepts required for safe entry into advanced practice.

Another project strength is the use of data to drive curricular assessment and change as needed. Before the institution of this policy, the resultant data from these examinations were inconsistent at best. The examinations were not incorporated across the curriculum. School and national benchmarked data were not used to support student learning or support curriculum evaluation. Another consideration is to separately evaluate student performance within the face-to-face and online cohorts. Again, in line with the previous strength, assessment of learning in the online environment may provide additional programmatic data to positively affect teaching and learning.

Project limitations are associated with the timeframe for implementation of the testing policy. It will take a full 2 years to realize the full effect on teaching and learning

within the University and subsequent certification success. The policy cannot be implemented for students presently enrolled in the program as it would alter the progression standards and would therefore not be supported by the University leadership.

Recommendations for Alternative Approaches

Nurse educators are challenged to deliver a content-laden curriculum and ensure graduates can transition readily into nursing practice. An alternative approach to the project study would advance the project by including a structured recitation hour across the graduate program of study.

The remediation plan would replicate the undergraduate template of an hour of recitation associated with the core curriculum for each of the three courses: advanced pathophysiology, advanced pharmacology, and advanced health assessment. The recitation hour would integrate active teaching strategies to reinforce challenging concepts as assessed in course-based exams, the prior cohort exit exam or the results of the final exam in the respective course. Teaching strategies can include problem-based learning through case studies that replicate contemporary clinical concerns such as patients with multiple comorbidities requiring diagnostic and interventional therapies and access to care issues. In addition, multiple-choice questions similar to those on the certification examinations but in a gaming format would provide immediate feedback to faculty on the student mastery of content. The online recitation can be delivered through the learning management system. Assessment of program efficacy would be the final course exam in the respective core courses and the HESI APRN/FNP Exit exam.

Scholarship, Project Development, and Leadership and Change

Scholarship

The role of faculty in higher education requires a level of scholarship commensurate with faculty rank. Scholarship is an essential function of the nurse educator dating back to Florence Nightingale who is considered the first nursing scholar (Conrad & Pape, 2014). As indicated previously, scientific inquiry to ensure evidence-based practice is essential whether in the classroom or in the clinical arena. The University embraces Boyer's model of scholarship (1990). The AACN recommendations from AACN (1999) *Position Statement on Defining Scholarship for the Discipline of Nursing* builds on Boyer's seminal work. My scholarship journey as a faculty member and this project align with that of Boyer's model of scholarship that includes "discovery, integration, application and teaching" (Conrad & Pape, 2014). These four functions have framed this project study.

Scholarship of discovery. The scholarship of discovery is the primary component of Boyer's model. This area of scholarship relates to the development of new knowledge through research in nursing practice, nursing education, nursing research and nursing administration (Conrad & Pape, 2014). The scholarship of discovery took place through assessment of the current literature and University data to identify a need to address student certification success at the graduate FNP level. Data analysis provided new knowledge related to standardized testing within the study site as well as student outcomes that differed from the published literature. However, through assessment of the program outcomes and the use of standardized testing, I noted a practice opportunity to

develop a policy that provided a more structured approach to student and program assessment. In the role of nursing faculty, it is imperative to use research that supports knowledge or best practice as a means to improve both teaching and learning as well as professional nursing practice.

Scholarship of integration. The scholarship of integration is taking the new knowledge and making connections to practice (Conrad & Pape, 2014). The goal of integration is to bring new insight into the research. There is also encouragement in the literature to collaborate with other disciplines. In nursing, there is a significant opportunity for interprofessional education. In this project, I have looked for relationships between the standardized examinations, student outcomes, and program assessment to establish a policy that can address student learning of key concepts to support future certification success. I have used the data analysis to support curricular revision, using seminal works of classical test theory and evidence with prelicensure preparation for NCLEX-RN success. Lessons garnered with a testing policy may support standardized testing within other health professional discipline education.

Scholarship of application. The scholarship of application is inclusive of effective communication of the research findings through publication, podium presentation, or policy changes (Conrad & Pape, 2014). Improvement of practice, whether in the academic or clinical practice setting, is germane to nursing faculty. The project addressed an academic issue within the University while affecting the community through the academic preparation of knowledgeable and competent practitioners to

address health care needs of the local area. This contribution is immeasurable, as access to quality healthcare is essential to the communities served by health professionals.

Scholarship of teaching. As academicians, it is imperative that evidence-based teaching is integrated into the classroom to address learning needs of students regardless of program or level. Higher education has been challenged to ensure the quality of the deliverables of our programs is worth the cost. The issue of cost is of paramount importance to a private university. According to Conrad and Pape (2014), "The inspired teacher entices nurse scholars to be more inquisitive, thus keeping the flames of scholarship alive" (p. 90). This statement resonates with me as it is important to inspire the next generation of professional nurses and nurse educators to develop new knowledge to improve patient care and teaching and learning regardless of educational level. In this project, I have addressed the scholarship of teaching through the use of research methods that support student and program assessment and evaluation. The policy recommendation for a formal remediation or recitation program to address learning gaps and ensure student preparedness for the standardized examinations and safe entry-level practice is relevant to nursing faculty and nursing academic leaders.

Project Development and Evaluation

The project development followed the identification of a problem within the University graduate program. I have no formal role in the graduate program. However, the concern of inconsistent certification outcomes and the challenge of having student cohorts in both online and face-to-face venues afforded an opportunity for research. The assessment of the literature also indicated a gap in the integration of standardized testing

at the graduate level. Given my academic experience at the undergraduate level, the project was developed using a similar intervention for student success. The framework of the policy uses data garnered from the examinations to improve curriculum delivery, application of key concepts, and assessment of student learning and success.

Evaluation of the policy implementation is important to ensure all components of the policy are completed, including standardized examinations with assigned evaluative weight in the identified courses, assessment by the faculty of item analysis for each examination with a report to the evaluation committee, and required individual student remediation. Any curricular gaps noted by the faculty from results of the standardized examinations will be addressed through didactic content, integrated simulation, or clinical immersion. Student performance will also be assessed through course grades, on-time graduation, grade point average, and with the final assessment of first-time certification success.

Leadership and Change

Leadership in academia is different from what I experienced in the acute care setting as a nursing administrator. My primary role in curricular oversight and evaluation has a direct relationship to accreditation. I subscribe to the concept of the transformational leader who can inspire his or her followers within the organizational culture. Kouzes and Posner (2003) described leadership for academic administrators. Their framework delineates five practices of exemplary leadership. These strategies align with the those of the transformation leaders to include: model the way, inspire a vision,

challenge the process, enable others to act, and encourage the heart. I see many of these strategies employed to deliver this project study as well in my day-to-day leadership role.

My strategy is to empower faculty I collaborate with to assess teaching and learning opportunities, and to integrate evidenced-based strategies in the classroom, simulation lab, and clinical immersion settings. In the case of this project, collaborating with the graduate faculty is necessary to encourage them to use evaluative methods that will support student success, as well as use the data to make substantive course changes that will improve program outcomes. The University faculty carry a 22-credit workload annually with additional scholarship and service expectations. The leadership role is important to support faculty while not burdening them with additional work. The implementation of this policy will support their classroom efforts with the rewards of student success.

Analysis of self as a scholar. My personal doctoral journey has been marked with improvement as a scholar. I have previously published, presented at local and regional conferences, collaborated with interprofessional peers for the care of the veteran client, as well as supported student's scholarly efforts at the undergraduate and graduate level. I have not completed my project and thus, had doubts of whether I could execute a study of value. Although there were delays with data retrieval as I had to rely on others, data analysis was also difficult given my limited experience with statistical analysis. I found the journey supported my understanding of the research process, scholarly writing, and the use of data to support curricular change through the development of a policy

recommendation. I look forward to using the knowledge garnered in this journey to continue to improve teaching and learning as a scholar.

Analysis of self as a practitioner. Nursing is a practice-based discipline. The discipline integrates both art and science to deliver patient-centered care in a variety of settings. Nurses integrate evidence-based guidelines to ensure appropriate patient care delivery and outcomes. In my clinical experience, many of these guidelines were focused on the improvement of care for the patient with a variety of cardiac disorders. I am very passionate about my role as a nurse educator. I often receive feedback years later from students who remark about particular concepts I taught in the classroom and how it resonated with their clinical practice. In my leadership role, I am charged with mentoring faculty, supporting their transition into academia, ensuring the delivery of the curriculum aligns with our accrediting agencies, and ongoing program assessment. Using evidence to support my decisions is important to the success of our students and faculty. As an evidenced-based nurse educator, I will continue to use the literature to inform my decisions as a scholar-practitioner.

Analysis of self as a project developer. My present academic role includes project development. I have built certification programs with outside stakeholders, developed curriculum with other health professional colleagues and developed new programs within the University. The challenge is articulating the vision for others to effect positive change. I think much of the challenge is aligning others with the implementation and sustaining the project values and goals. This project allowed for me

to collaborate with graduate-level faculty and to draft a policy that aligned with the literature while integrating the organizational values.

Reflection on the Importance of the Work

The implementation of a testing policy that integrates standardized testing as a means to assess student learning and evaluate curriculum is useful to address the inconsistent outcomes noted at the University. The results of this policy will be a rigorous assessment of content delivery and student outcomes in both the face-to-face and online venues of the program. The identification of at-risk students is imperative to provide structured remediation and reassessment to ensure student learning is supported. The importance of this project is to support the education of future nurse practitioners who can fill the primary care practitioner gap noted in communities across the country.

The use of reflection in nursing education is not new. Students are required to reflect on their respective clinical experiences looking for opportunities to improve their professional nursing practice. Faculty use reflection as part of their assessment of performance in the domains of teaching, scholarship, and practice. As I reflect on this doctoral journey, it has been challenging at best. I experienced several committee and chair changes during my journey. This has influenced the direction of the project study and proved frustrating many times due to the lack of direction provided by the committee, not to mention the extended timeframe required for execution of the project study. Finally, I was assigned a chair who was truly an advocate for excellence both in the project developed by the student and the development of the student as a scholar-practitioner.

In addition to the struggles in the role of student, I was challenged many times with life and work balance. My professional role was called upon during my journey to cover for faculty or deans across the University. Accreditation preparation and site visits took precedence as well as stepping into the classroom to fill faculty gaps. I have learned over the last several months to remain focused and learned to control requests as a means to maintain balance and priorities.

My role as a scholar has certainly developed. I am grateful for the opportunity to walk through this process, to strengthen my skills as a researcher, and my scholarly writing. I believe this is the beginning of my journey as a scholar. Once the project has been implemented, there will be additional opportunities to study the influence of the policy on student outcomes.

I also believe that this journey will support my mentorship of both students and faculty in the area of scholarship. Having a passion to improve what we do in our practice arenas results in improved teaching and learning and ultimately patient care.

Implications, Applications, and Directions for Future Research

Nurse educators prepare practitioners who will care for patients and their families across the lifespan. The implications of inconsistent certification rates affect not only programs but limit access to qualified primary care practitioners. In addition, with rising tuition, students not prepared for success with the high-stakes certification exam are certain to feel dissatisfaction. The project may support student success as defined by first-time certification exam success. Thus, a strategy implemented to address student success

that also has positive effects on the organization and community demonstrates positive social change.

The application of the policy recommendation will support the identification of at-risk students before the high-stakes examination. Using a faculty-designated benchmark coupled with student remediation affords the opportunity to intervene before the student completes the certification examination following graduation. The policy addresses issues presently noted at the study site of spurious data garnered from the standardized examinations due to lack of assigned evaluative weight, and the inadequate use of results of the examination to identify at-risk students or needed curricular revision.

Future research is needed to solidify the HESI standardized examination benchmark as a valid and reliable predictor of future certification success. Additional research concerning structured remediation and pedagogy for curriculum delivery for both online and face-to-face venues is recommended for the graduate level. In addition, research to identify other student variables from a qualitative perspective such as test-taking anxiety on standardized examinations could be considered. Replication of the study within similar programs will support generalizability in graduate FNP programs.

<div align="center">**Conclusion**</div>

Scholarly endeavors should support evidenced-based teaching and learning in academic programs. Nurses use evidenced-based interventions to care for patients to ensure appropriate outcomes. In the academic setting, interventions should be implemented when they are appropriate and supported by the literature. Policies are often the result of a negative change such as a poor outcome or pressures from internal and

external stakeholders to address an issue. Many times, decisions are made without realizing the full influence of the intervention, as was the case with the implementation of the standardized examinations at the University. It is imperative that academic leaders integrate interventions that support the student, use data to drive curricular or programmatic change, and are fudiciarily responsible. This proposed policy provides the School of Nursing with an opportunity to improve programmatic outcomes and social change through addressing access to healthcare practitioners for the local community.

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Appendix A: Project

Increasing FNP Certification Success through HESI Testing

White Paper Recommendations
Tammy L. Gravel, MS RN
Walden University
August 2018

Executive Summary

The study was designed to address the problem of inconsistent first-time certification success for the family nurse practitioner (FNP) in the University's online and face-to-face cohorts. The inconsistent performance on national certification examinations affects the graduate both emotionally and financially as well as the local community in which the practitioner will be able to provide access to primary care. Inconsistent performance for first-time certification success has a fiduciary influence on the university through recruitment and retention of qualified students and faculty. The School of Nursing is affected as the national accreditation body, Commission on Collegiate Nursing Education (CCNE, 2013), requires a first-time pass rate of 80%.

The use of standardized testing is not new to the University. The undergraduate BSN program uses Health Education Systems, INC (HESI) standardized testing across the curriculum as final exams, as well as a mid-curricular examination administered a the mid-point in the curriculum, a custom comprehensive exam administered before the final semester and HESI Exit (E2) exam that replicates the National Council of State Boards of Nursing (NCSBN) NCLEX-RN examination. At the MSN level, there are three HESI core course examinations: Advanced Pathophysiology, Advanced Pharmacotherapeutics, and Advanced Health Assessment that are referred to as the 3P examinations, along with an advanced practice registered nurse (APRN)/FNP Exit exam that replicates the national certification examinations for the FNP. There is a gap in practice at the University and in the literature concerning the use of standardized HESI examinations to increase future first-time certification success at the MNS level, a goal that addresses issues of access to

primary care in the local community. This white paper provides a policy recommendation based on this noted gap in practice and the results of a study of performance on the HESI exams and subsequent first-time certification success.

Binary logistic regression analysis was used to determine the predictive relationship between the standardized HESI exams and future certification success. The data analysis revealed the exams were not predictive of first-time certification success. However, a key factor to be noted is that the examinations were not associated with any course, evaluative weight or progression policy. This finding may provide some insight into the current limited usefulness of the examinations as a predictor of future certification success.

Given the commitment of the School of Nursing faculty to the use of standardized testing at the University as an assessment strategy for mastery of crucial concepts requisite for certification success, it is the recommendation of this white paper to implement a testing policy in the MSN/FNP program.

Contents

Introduction

As with many health professions, a high stakes examination must be completed to practice in the respective role. Family nurse practitioners (FNPs) must complete a national certification examination along with holding a license as a registered nurse (RN) in the state in which they practice nursing. Thus, it is imperative that graduates of the MSN/FNP program have the knowledge, skills, and attributes to complete the certification examination and enter into practice; however, certification results have been inconsistent for graduates of the MSN/FNP program at the University. The most recent 2015 FNP certification results from the American Association of Nurse Practitioners Certification Program (AANPCP) is 81.4% passing nationally (American Association of Nurse Practitioners; AANP, 2015). The current results for the University are 92%. Although this is above the national benchmark and meet Commission on Collegiate Nursing Education (CCNE) accreditation standards of 80%, the School of Nursing faculty must integrate evidence-based teaching and learning strategies in the classroom or clinical to ensure graduates are prepared to be successful on the certification examination. Failure of a graduate to pass the national certification examination has devastating results both emotionally and financially.

The School of Nursing faculty presently uses standardized testing at the undergraduate prelicensure level. These exams administered across the curriculum are given to prepare students for the high stakes national licensure exam. Faculty review the item analysis and addresses any gaps in student learning through didactic, integrated simulation and clinical immersion. This strategy has enhanced student preparedness for

the examination as well as provided students with the familiarity of computer-based

testing. There is a gap in the practice of using standardized testing at the School of

Nursing at the MSN/FNP level. Although students complete four examinations during

their tenure in the program, there is not a grade associated with the examinations. There

is also limited use of the item analysis to support any remediation of content gaps in the

classroom, integrated simulation or clinical immersion.

The HESI standardized Exit (E2) examinations have nine validity studies with

predictive accuracy for future NCLEX-RN licensure success. At the graduate level, there

is limited literature to support future certification success and the use of the HESI

APRN/FNP Exit Examination. The purpose of the quantitative study was to determine

the predictive relationship between the standardized HESI examinations and first-time

certification success. Classical test theory was used in alignment with previous HESI

validation studies; the data analysis revealed no predictive relationship for any of the four

exams and future certification success. However, given there is no evaluative weight to

any of the examinations, it is difficult to determine whether this is an accurate

assumption. The results of the study support the School of Nursing strategic plan to meet

or exceed the certification benchmark set by the national accreditors, along with the

commitment to use data to improve teaching and learning across the curriculum to

prepare competent FNP graduates who can transition into practice.

Context of the Problem

The School of Nursing faculty is committed to consistent program outcomes by

meeting the acceptable benchmark of 80% for family nurse practitioner (FNP)

certification success. Our accreditors establish this benchmark as a measure of program quality. The National Council of State Boards of Nursing (NCSBN) requires certification as a means to ensure safe entry-level practice for the advanced practice nurse (NCSBN, 2016). Since the study site program's inception in 2009, graduate success on the certification examination has been inconsistent. The present certification outcome reported by the study site dean is 92% cumulative for both ANCC and AANP. The results are appropriate from an accreditation standpoint; there remains an opportunity to maintain or improve certification success as no program can afford to have a subpar outcome due to long-term implications for student admission and retention.

The FNP certification examinations administered by the two certifying agencies are updated every three to five years according to NCSBN (n.d.). The standardized HESI examinations are updated frequently and use the national certifying agencies test plan as a blueprint for the respective exit examination. Therefore, it is a reasonable indicator of knowledge acquisition and future performance on the certification examination.

The standardized HESI 3 P and APRN/FNP Exit examinations are administered two junctures within the program at the study site, at the completion of the core courses and the conclusion of the curriculum before graduation. The results of the examinations have no evaluative weight or associated with any course grade or have influence on student progression in the curriculum. There is no remediation required by students. Thus, if a student does poorly, there is no opportunity to assess the student outcome as it relates to student learning. Faculty, anecdotally, state they use the item analysis to enhance course content with the next course offering. However, there is no formal

documentation of the gaps or trends over time or whether they were addressed at the student or course level. Lauer and Yoho (2013) find that testing without consequences produces inconsistent data that detrimental to student and faculty. In fact, it provides an inaccurate assessment of student knowledge as indicated by the data analysis.

The cost associated with HESI examinations at the graduate level $11,352 for the calendar year of 2017 (communication with study site dean). The study site School of Nursing leadership must consider if there is a reasonable return on the investment given the inconsistent certification results and the limited use of the assessment for program evaluation. A policy that recommends the standardized examinations associated with a course, hold evaluative weight and are inclusive of student remediation will ensure appropriate course level knowledge and support programmatic outcomes of certification success.

Theoretical Framework

Classical test theory as described by Crocker and Algina (1986) provided the theoretical framework for this study. The framework provides a method to understand testing as it relates to constructs that demonstrate a relationship between knowledge acquisition and in nursing, safe entry-level practice. According to Morrison et al. (2008), classical test theory was used to develop HESI test design. The framework integrated the NCSBN NCLEX-RN constructs, clinical nursing knowledge, and HESI item writing to include Paul's (1993) critical thinking theory. The test items advance the learner to a higher level of cognitive appraisal, application. Many of the validity studies on HESI standardized testing use this framework to assess the predictive accuracy of the exam for

NCLEX-RN success. Crocker and Algina's (1986) framework outlined essential elements of test development and analysis. Crocker and Algina proposed a formula that describes this relationship: observed score equals true (universal) score plus error score (error of measurement). The student's obtained score should represent the true score as closely as possible. The results indicate the student's knowledge of the content. The degree of error may relate directly to extraneous variables caused by the human element that could influence student performance with the examination, such as test anxiety. The critique of the theoretical framework and many of the validity studies is that HESI E2 can predict NCLEX-RN success but, not accurately predict failure.

In alignment with previous HESI validity and reliability studies, classical test theory was used as a framework to understand the relationship between the HESI standardized examinations for the MSN/FNP student and the predictive accuracy for future first-time certification success.

Research Questions

The University School of Nursing integrates the HESI standardized examinations in the FNP program. The examinations used are at two junctures within the curriculum. However, the examinations hold no evaluative weight or are associated with progression or program completion. The literature has limited evidence of the predictive accuracy of the HESI examinations for the graduate level examinations and first-time certification success. Thus, two research questions guided this study.

Quantitative: Is student achievement on one or more of the 3 P HESI examinations a significant predictor of first-time test success on the FNP certification examination?

Quantitative: Is student achievement on the HESI APRN/FNP Exit examination a significant predictor of first-time test success on the FNP certification examination?

Data Retrieval

The data for this study, in the form of standardized test results and certification results were retrieved from archival data from School of Nursing. The sample for this study was 117 students. Each of these students met all criteria for the study that included the completion of the program of study, completion of all four examinations, and the graduate has sat for one of the national certification examinations. Archival data representing student admission date, graduation date, and HESI numerical test scores for the 4 HESI examinations were extracted from School of Nursing databases. The national FNP certification examination results were coded as pass/fail and retrieved from the School of Nursing evaluative databases or state board of nursing licensure verification website. Data were recorded in an Excel spreadsheet for analysis.

Data Analysis

Binary logistic analysis was executed to answer the research questions. The data analysis found no relationship between any of the 4 HESI examinations and first-time FNP certification success. Willson and Goodman (2015) suggested that a HESI benchmark of 700 was predictive of future certification success. This benchmark also could not be substantiated by the data analysis for the particular cohort of students in this study. Willson and Goodman (2015) found that many graduatelevel programs do not include the standardized examinations into a grading schematic for any course, progression or graduation. Thus, an understanding students' true mastery of program

content may not be represented by examination results. Many students who did not

achieve the benchmark score of 700 went on to pass the certification while a cohort of

students with greater than 700 did not achieve first-time certification success. As

troubling as these results are, the exams do have merit if used to support an assessment of

student learning of essential concepts.

Recommendations Based on Research Evidence

The recommendations based on the research evidence would suggest that future

study is necessary to assess the predictive value of the standardized HESI examinations at

the MSN/FNP level. The limited research presently available and the limited evidence of

validity and reliability of the examinations with future certification success affords the

opportunity for continued study. The present study does not align with the limited

evidence in the literature associated with validity and reliability of APRN/FNP Exit

examination and first-time certification success. Several considerations may provide the

answer as well as an opportunity for future study. The first is the nursing student at the

graduate level has prior experience with higher education as well as high stakes testing

that may result in of itself support certification success. In addition, the examinations

were not associated with any course or evaluative weight toward a student grade or

program progression. The result is a variety of test scores that are not associated with

mastery of content by the student. It also is a deterrent to curriculum assessment to ensure

ongoing program quality.

One other consideration with the specific study site is the program delivery in

two different venues, face-to-face and online. The data analysis focused on standardized

exams and their contribution to first-time certification success; there was no consideration given to which avenue of study contributed to certification success if at all. The evidence in the literature suggests this is equivocal. However, the course content, faculty, and delivery are different and thus, may provide an opportunity for future study as it relates to first-time certification success.

Integration of Standardized Testing into the Graduate Curriculum

Purpose:

The purpose of the integration of HESI standardized testing is to assess student knowledge and competency of fundamental concepts across the MSN core curriculum as part of the APRN Consensus Model (2008) which includes: Advanced Pathophysiology, Advanced Pharmacotherapeutics, and Advanced Health Assessment. APRN/FNP Exit testing is administered at the conclusion of NUR 820 (Spring semester) to assess readiness for FNP certification examination following graduation.

Policy:

Students in the MSN/FNP program are required to take online standardized tests (HESI exams) throughout the curriculum. These exams are integrated into the three core curriculum courses in the MSN/FNP program as the final examinations. Students are required to complete the APRN/FNP Exit examination before the conclusion of the program. The Exit examination is associated with a final exam grade in NUR 820 (spring section).

Table 1

Curriculum Plan With Integrated HESI Standardized Examinations

HESI examination	Timeline for examination within program of study	HESI benchmark for achievement	Evaluative weight
Advanced Pathophysiology	NUR 706 Advanced Pathophysiology Summer 2018	750	25% of the total course grade
Advanced Pharmacotherapeutics	NUR 707 Advanced Pharmacology Fall 2018	750	25% of the total course grade
Advanced Health Assessment	NUR 703 Advanced Health Assessment Spring 2019	750	25% of the total course grade
Exit Examination	NUR 820 Translating and Integrating Scholarship Practicum Spring 2020	750	25% of the total course grade

Graduate Level 1

All (G1) students, both face-to-face and online, will complete course HESI final exams in

NUR 706: Advanced Pathophysiology, NUR 707: Advanced Pharmacology and NUR

703: Advanced Health Assessment. Each examination represents 25% of the final course

grade. Students are required to meet a HESI benchmark of 750 or better. If this

benchmark is not achieved, the following steps are to be completed:

a. If the student does not meet the benchmark of 750 and has an overall course

grade of less than 83, the student cannot progress (Study Site, SON

Progression Policy) and will be referred to the Academic Standing

Committee. The custom remediation package provided by HESI is still

recommended for the student to gain a better understanding of course content.

b. If the student does not meet the benchmark of 750 and has an overall course

grade of 83, the student will receive an incomplete for the final course grade

and be required to complete the HESI remediation package for the respective

course before the final course grade being reported to the Office of the

Registrar. Students have two weeks following the close of the course to

complete their remediation package. The student will meet with his/her

faculty advisor in person (face-to-face program) or via Skype (online

program) to discuss and validate completion of the remediation package. The

course faculty will issue a final grade and forwarded to the Office of the

Registrar.

c. If the student does not meet the benchmark of 750 and does not complete the

remediation within the specified two-week period, the incomplete will be

converted to an F, and the student will not be allowed to progress with the

SON MSN/FNP program.

<u>Graduate Level 2</u>

All (G2) students, both face-to-face and online, will complete the respective course HESI

final exam in NUR 820: Translating and Integrating Scholarship Practicum (Spring

Section). The HESI APRN/FNP Exit examination represents 25% of the final course

grade. Students are required to meet a HESI benchmark of 750 or better. Students will

have one additional opportunity to reach the HESI benchmark following remediation.

The highest score will be the score of record for NUR 820. If this benchmark is not achieved, the following steps are to be completed:

a. If the student does not meet the benchmark of 750 and has an overall course grade of less than 83, the student cannot progress and graduate from the MSN/FNP program (Study Site, SON Progression Policy) and will be referred to the Academic Standing Committee. The custom remediation package provided by HESI is still recommended for the student to gain a better understanding of course content.

b. If the student does not meet the benchmark of 750 and has an overall course grade of 83, the student will receive an incomplete for the final course grade and be required to complete the HESI remediation package for the respective course before the final course grade being reported to the Office of the Registrar. Students have two weeks following the close of the course to complete their remediation package. The student will meet with his/her faculty advisor in person (face-to-face program) or via Skype (online program) to discuss and validate completion of the remediation package. The course faculty will issue a final grade and forwarded to the Office of the Registrar. Students are eligible to walk at graduation and participate in all graduation activities.

c. If the student does not meet the benchmark of 750 and does not complete the remediation within the specified two-week period, the incomplete will be

converted to an F and the student will not be allowed to progress with the SON MSN/FNP program.

Curriculum Assessment and Evaluation

The national accreditors, CCNE, requires a systematic program evaluation plan to include curricular assessment and data assessment as well as evidence that the data enhances the program. As the data analysis suggests, the HESI standardized examinations have little merit to assess student mastery of concepts required to future certification success unless associated with a respective course with an evaluative value. In addition, curriculum assessment is difficult without the item analysis from the standardized test. These are essential means to assess classroom teaching and learning as the exams align with the blueprint of the national certification exams. The MSN program is delivered to both the face-to-face and online venues. The nuances of the course delivery and the differences in faculty may contribute to a disparity in student and program outcomes.

The proposed policy includes a recommendation that requires the graduate committee in collaboration with the School of Nursing leadership to map knowledge gaps from the HESI exams' item analysis. The graduation committee in collaboration with respective course faculty is charged to develop a plan to address the gaps in didactic, integrated simulation or clinical immersion following the administration of each HESI examination for the MSN core curriculum.

Formative and summative evaluation will garner the value of the integration of the HESI examinations as an impetus to certification success. A summary of the course outcomes and HESI item analysis data will be reviewed at the Undergraduate and

Graduate Evaluation Committee. Student feedback will be garnered from representation on the respective graduate committees and the end of the semester course evaluation. Finally, an assessment of student program outcomes will be discussed with results from national certification exams.

<u>Recommendations for Practice</u>

Nursing program curriculum must involve evidenced-based interventions to ensure appropriate student outcomes. The findings of the study provide an opportunity to implement a policy recommendation for the graduate program at the university that replicates that of the undergraduate program. The recommendation for practice includes a testing policy that will support student learning. The components of the recommendation include: examinations are associated with a specific course, include an evaluative weight as a final examination, a benchmark score for achievement and required student remediation if the benchmark is not achieved.

The results of these exams can be used by faculty and students to assess mastery of content as well as to individualize the remediation required to address any knowledge gaps. From a faculty perspective, the item analysis can support course assessment in the spirit of ongoing quality improvement. The recommendation for practice supports student learning with the identification of concepts that can be reinforced through a variety of teaching strategies such as didactic, integrated simulation and clinical immersion. The outcomes of these interventions can be readily assessed through exit testing and certification results.

Conclusion

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The proposed testing policy delineated in this white paper provides the study site and other graduate programs with a standardized testing strategy to be weaved throughout the MSN/FNP curriculum. This recommendation was determined following program assessment, data retrieval, and analysis along with a comprehensive review of the literature. Nurse educators must consider evidenced-based strategies to improve teaching and learning in the classroom. HESI standardized examinations provide an objective assessment of student learning. The results can support interventions to address any knowledge gaps. It is the role of the program faculty to ensure the preparedness of entry-level FNP to address access to qualified primary care providers.

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